

SYMPOSIUM CH01

Frontiers of In Situ Materials Characterization—From New Instrumentation and Method to Imaging Aided Materials Design
May 9 - May 24, 2022

Symposium Organizers

Arnaud Demortiere, Universite de Picardie Jules Verne
Madeline Dukes, Protochips, Inc.
Wenpei Gao, North Carolina State University
Yuzi Liu, Argonne National Laboratory

* Invited Paper

SESSION CH01.01: In Situ Microscopy

Session Chairs: Arnaud Demortiere, Madeline Dukes, Wenpei Gao and Yuzi Liu
Monday Morning, May 9, 2022

Hawai'i Convention Center, Level 4, Kalakaua Ballroom A

10:30 AM *CH01.01.02

Connecting Atomic Scale Chemistry and Structure to Relaxor Ferroelectric Properties Using *In Situ* Scanning Transmission Electron Microscopy [James M. LeBeau](#); Massachusetts Institute of Technology, United States.

11:00 AM *CH01.01.03

In Situ Investigation of the Evolution of Materials and Interfaces in Solid-State Batteries [Matthew T. McDowell](#); Georgia Institute of Technology, United States.

11:30 AM CH01.01.04

GaP Nanowire VLS Growth Observed in a Closed Gas Cell *In Situ* TEM Setup [Maximilian Widemann](#); Philipps-Universität Marburg, Germany.

SESSION CH01.02: Bio Imaging and Ultrafast

Session Chairs: Arnaud Demortiere, Madeline Dukes, Wenpei Gao and Yuzi Liu
Monday Afternoon, May 9, 2022

Hawai'i Convention Center, Level 4, Kalakaua Ballroom A

1:30 PM *CH01.02.01

Advancing High-Resolution Imaging of Human Viruses and Vaccines in Liquid [Deb Kelly](#); The Pennsylvania State University, United States.

2:00 PM CH01.02.02

Optomechanical Detection of Vibration Modes of Single Bacterium [Eduardo Gil Santos](#); Instituto de Micro y Nanotecnología, Spain.

2:15 PM CH01.02.03

An *In Situ* Resonant Soft X-Ray Scattering (RSoXS) Study of a Blue Phase Liquid Crystal Martensitic Transformation [Hyeong Min Jin](#); Chungnam National University, Korea (the Republic of).

2:30 PM BREAK

3:00 PM *CH01.02.04

Transient Lensing from an Electron Gas Imaged by Ultrafast Electron Microscopy [Renske M. van der Veen](#)^{2,1}; ¹University of Illinois at Urbana-Champaign, United States; ²Helmholtz-Zentrum Berlin für Materialien und Energie, Germany.

3:30 PM CH01.02.05

Dynamics of a Light-Induced Phase Transformation Probed by X-Ray Photon Correlation Spectroscopy [Anudeep Mangu](#)^{1,2}; ¹Stanford University, United States; ²SLAC National Accelerator Laboratory, United States.

3:45 PM CH01.02.06

MerlinEM-Medipix3 Detector in Transmission Electron Microscope—Applications and Opportunities [John-Paul Stroud](#); Quantum Detectors Ltd, United Kingdom.

4:00 PM CH01.02.07

Time-Resolved Dark-Field X-Ray Microscopy—Imaging Strain Waves Deep in the Bulk with Picosecond Time Resolution [Theodor Secanell Holstad](#); Technical University of Denmark, Denmark.

4:15 PM CH01.02.08

Ultrafast Phase Contrast X-Ray Imaging of Mesoscale Structures Under Shockwave Compression [Christopher Campbell](#)^{1,2}; ¹Los Alamos National Laboratory, United States; ²Texas A&M University, United States.

4:30 PM *CH01.02.09

Probing Photoinduced Transient States and Material Response Under Microwave Excitations Using Ultrafast Electron Microscopy [Yimei Zhu](#); Brookhaven National Laboratory, United States.

SESSION CH01.03: In Situ Electron Microscopy

Session Chairs: Arnaud Demortiere, Madeline Dukes, Wenpei Gao and Yuze Liu

Tuesday Morning, May 10, 2022

Hawai'i Convention Center, Level 4, Kalakaua Ballroom A

8:30 AM *CH01.03.01

Atomic-Scale Understanding of Cu Oxidation Revealed by Correlated *In Situ* Environmental Transmission Electron Microscopy and First-Principles Theoretical Simulations [Judith C. Yang](#); University of Pittsburgh, United States.

9:00 AM CH01.03.02

***In Situ* TEM Study of Shear-Migration Coupling of Grain Boundaries** [Marc Legros](#); CEMES CNRS, France.

9:15 AM *CH01.03.04

Peering into the Self- and Directed-Assembly of Nanoparticles [Hongyou Fan](#); Sandia National Laboratories, United States.

9:45 AM BREAK**10:15 AM CH01.03.05**

Multimodal Study of Dis-Sodiation Mechanisms within Individual $\text{Na}_3\text{V}_2(\text{PO}_4)_3$ Cathode Crystals Using 4D-STEM-ASTAR and STXM-XANES and STEM-EELS [Nicolas Folastre](#)^{6, 2, 1}; ¹University of Picardie, France; ²Réseau sur le Stockage électrochimique de l'énergie (RS2E) CNRS FR 3459, France; ⁶Laboratoire Science et Ingénierie des Matériaux et Procédés (SIMaP) – Grenoble INP/CNRS/UJF, France.

10:30 AM CH01.03.06

Visualizing the Interaction of Electron and X-Ray Radiation in Halide Perovskite Semiconductors Using Nano-Probe Diffraction Techniques [Jordi Ferrer Orri](#); Cambridge University, United Kingdom.

10:45 AM CH01.03.07

Direct Visualisation of Nucleation and Growth of Ga_2Se_3 Nanostructures from Liquid Coordination Complexes Studied by *In Situ* TEM Techniques [Miryam Arredondo](#); Queen's University Belfast, United Kingdom.

11:00 AM CH01.03.08

Investigating the Effect of Atmosphere on Domains in BaTiO_3 Using *In Situ* TEM [Tamsin L. O'Reilly](#); Queen's University Belfast, United Kingdom.

SESSION CH01.04: Characterization of Energy Materials

Session Chairs: Arnaud Demortiere, Madeline Dukes, Wenpei Gao and Yuze Liu

Tuesday Afternoon, May 10, 2022

Hawai'i Convention Center, Level 4, Kalakaua Ballroom A

1:30 PM *CH01.04.01

Cathode Material for Battery Applications and Nanoparticles for OER Reaction Studied in a STEM at Cryogenic Temperature [Martial Duchamp](#)^{1, 2}; ¹Nanyang Technological University, Singapore; ²CNRS, Singapore.

2:00 PM CH01.04.02

Structural Dynamics of Nanoalloy Catalysts Inside Fuel Cells by *In Operando* High-Energy X-Ray Diffraction [Valeri Petkov](#); Central Michigan University, United States.

2:15 PM CH01.04.03

Mechanistic Understanding of LMR-NMC Synthesis via *In Situ* Characterization [Grace Busse](#); Stanford University, United States.

2:30 PM CH01.04.04

Chemo-Mechanical Characterization of Lithium-Ion and Lithium Metal Batteries Using *Operando* Acoustic Scanning [Wesley Chang](#); Columbia University, United States.

2:45 PM CH01.04.05

Multichannel Imaging and *In Situ* Process Monitoring for Vacuum-Assisted Drying of Inkjet-Printed and Blade-Coated Perovskite Thin Films [Fabian Schackmar](#)^{1, 2, 3}; ¹Karlsruhe Institute of Technology (KIT), Germany; ²Karlsruhe Institute of Technology (KIT), Germany; ³InnovationLab, Germany.

3:00 PM BREAK**3:30 PM CH01.04.06**

Real-Time Characterization of Micro-Sized Si-Based Anodes Using *In Situ* Atomic Force Microscopy [Jian Liu](#); Ohio State University, United States.

3:45 PM CH01.04.07

Complex Phase Transitions in Fast Charging Lithium-Ion Battery Anodes from *Operando* Synchrotron Diffraction and Complementary Techniques [Kent J. Griffith](#); Northwestern University, United States.

4:00 PM CH01.04.08

MaterialEyes—Acceleration of Materials Characterization Insights with Scientific Literature [Weixin Jiang](#)^{2, 1}; ¹Argonne National Laboratory, United States; ²Northwestern University, United States.

4:15 PM *CH01.04.09

Oscillatory Dynamics at Catalytically Active Interfaces Studied by Multi-Scale *Operando* Electron Microscopy [Marc Willinger](#); ETH Zürich, Switzerland.

4:45 PM CH01.04.10**Real-Time *In Situ* Optical Tracking of Oxygen Vacancy Migration in Memristors** [Giuliana Di Martino](#); Univ of Cambridge, United Kingdom.

SESSION CH01.05: Poster Session I: Frontiers of In Situ Materials Characterization—From New Instrumentation and Method to Imaging Aided Materials Design
Session Chairs: Arnaud Demortiere, Madeline Dukes, Wenpei Gao and Yuzi Liu
Tuesday Afternoon, May 10, 2022
5:00 PM - 7:00 PM
Hawai'i Convention Center, Level 1, Kamehameha Exhibit Hall 2 & 3

CH01.05.01**Fabrication and Characterization of Ferroelectric Hafnium Oxide Thin Film** [Yujin Jeong](#); Korea Advanced Institute of Science and Technology, Korea (the Republic of).**CH01.05.02****Quantitative Measurement of Hardening Precipitate State in Al-Zn-Mg Alloys Using Atom Probe Tomography at Different Ageing Conditions** [Sohail Shah](#); NTNU, Norway.**CH01.05.03****Synthesizing New Materials and Optimizing Materials Properties by Utilizing the Insights on Mechanisms of Materials** [Moon Kim](#); Seoul National University, Korea (the Republic of).**CH01.05.04****Rapid Downselection of Potential Fusion Structural Materials Using *In Situ* Ion Irradiation Transient Grating Spectroscopy** [Benjamin R. Dacus](#); Massachusetts Institute of Technology, United States.**CH01.05.05****Imaging Dilute Atomic Impurities in a Monolayer Semiconductor by Conductive Atomic Force Microscopy** [Nam T. Vu](#); National University of Singapore, Singapore.**CH01.05.06*****In Situ* Micro-Mechanical Testing of Cu-Pb Alloy Using High Resolution EBSD for the Study of Dislocation-Grain Boundary Interactions** [Dongyue Xie](#); Los Alamos National Laboratory, United States.**CH01.05.07****Ultra-High-Speed Imaging—A Tool for New Insights to Material Behaviors.** [Todd Rumbaugh](#); Hadland Imaging LLC, United States.**CH01.05.08****Real Time Nanoscale Observation of Metallic Electrodeposition in a Well-Controlled Chemical Environment** [Hongyu Sun](#); DENSsolutions, Netherlands.**CH01.05.09****Reversible Switching of Non-Volatile Bistable Defect Charge States in Monolayer MoS₂** [Bumsub Song](#); Sungkyunkwan University, Korea (the Republic of).**CH01.05.10****Spatially and Temporally Resolved Electroluminescence (EL) Imaging Measurements to Probe the Degradation of Perovskite Solar Cells** [Tamanna Mariam](#); University of Toledo, United States.**CH01.05.11*****In Situ* Nanoscale Dynamic Contact Mechanics of Compliant Materials** [Syed Asif Syed Amanulla](#); Instron Technical Services Inc, United States.**CH01.05.12****Investigation of Role of Oxobridge in the Immobilized Dinuclear Ir Complex for Electrochemical Oxygen Evolution Reacton by *In Operando* Raman Spectroscopy** [Sang Youn Chae](#); Ajou University, Korea (the Republic of).**CH01.05.13*****In Situ* Probing Liquid/Liquid Interfacial Kinetics via Single Entity Electrochemistry** [Jun Hui Park](#); Chungbuk National University, Korea (the Republic of).**CH01.05.14****Analysis of Dispersion and Size Distribution of Surfactant Modified Tungsten Carbide Cobalt Nanoparticles by Atomic Force Microscopy and Dynamic Light Scattering** [Chengmin Zhang](#); Korea University, Korea (the Republic of).

SESSION CH01.06/QT07.05: Keynote Presentation: Quantum Photonics at the Atomic Scale—Combined Optical and Electron Microscopy to Reveal, Create and Control Color Centers in 2D Materials and Nanoparticles
Session Chairs: Arnaud Demortiere, Madeline Dukes, Wenpei Gao and Yuzi Liu
Wednesday Morning, May 11, 2022
Hawai'i Convention Center, Level 4, Kalakaua Ballroom A

8:30 AM CH01.06/QT07.05.01**Keynote: Quantum Photonics at the Atomic Scale—Combined Optical and Electron Microscopy to Reveal, Create and Control Color Centers in 2D Materials and Nanoparticles** [Jennifer A. Dionne](#); Stanford University, United States.

SESSION CH01.07: Quantum Materials Ultrafast
Session Chairs: Arnaud Demortiere, Madeline Dukes, Wenpei Gao and Yuzi Liu
Wednesday Morning, May 11, 2022
Hawai'i Convention Center, Level 4, Kalakaua Ballroom A

9:00 AM CH01.07.01

Quantitative Measurements of Anisotropic Thermal Transport in vdW Materials via Cross-Sectional Scanning Thermal Microscopy (xSThM) [Sergio Gonzalez-Munoz](#); Lancaster University, United Kingdom.

9:15 AM CH01.07.02

Optimized Cathodoluminescence Microscopy of Buried Interfaces by Nanoscale Heterostructure Design [Luca Francaviglia](#); Lawrence Berkeley National Laboratory, United States.

9:30 AM CH01.07.03

Multi-Layer Multi-Semiconductor Characterization—Spectroscopic Toolbox for GaN HEMT [Yury Turkulets](#); Ben Gurion University of the Negev, Israel.

9:45 AM BREAK**10:15 AM *CH01.07.04**

Probing Electrically-Driven Phase Dynamics via Correlated Electron Scattering and Transport [Aaron Lindenberg](#); Stanford University, United States.

10:45 AM CH01.07.05

Probing Symmetry Breaking with Elemental Resolution in a Polar Metal Using Nonlinear X-Ray Spectroscopy [Michael Zuerch](#)^{1,2}; ¹University of California, Berkeley, United States; ²Lawrence Berkeley National Laboratory, United States.

11:00 AM CH01.07.06

Probing Elusive Intermediates by Synchrotron VUV Mass Spectrometry—The Formation of Aluminium Containing Intermediates in the Gas Phase [Sebastian Grimm](#); University of Duisburg-Essen, Germany.

11:15 AM *CH01.07.07

Operando Synchrotron Characterization of Ultrafast Phenomena in Metal Additive Manufacturing [Tao Sun](#); University of Virginia, United States.

SESSION CH01.08: X-Ray Technique and Ultrafast

Session Chairs: Arnaud Demortiere, Madeline Dukes, Wenpei Gao and Yuze Liu

Wednesday Afternoon, May 11, 2022

Hawai'i Convention Center, Level 4, Kalakaua Ballroom A

1:30 PM *CH01.08.01

X-Ray Nano-Imaging Applications in Material Designs [Xianghui Xiao](#); Brookhaven National Laboratory, United States.

2:00 PM CH01.08.02

Topological Defects and Phase Transitions in Ferroelectric Nanocrystals—What Coherent X-Rays Can Reveal About Them [Edwin Fohntung](#); Rensselaer Polytechnic Institute, United States.

2:15 PM CH01.08.03

Ultrafast Laser Ablation Processes Allow for Simple Two-Point Calibration Methods to Determine Low-Levels of Boron and Phosphorous in Metallic Alloys [Garry M. McGuirk](#); Fluor Marine Propulsion, LLC, United States.

2:30 PM BREAK**3:00 PM CH01.08.04**

Electric-Field Dependent Mapping of Nanotwin Variants and Elastic Energy in the Bulk [Jan Schultheiß](#); Norwegian University of Science and Technology, Norway.

3:15 PM CH01.08.05

Multi-Material Differential Strain Mapping with Reflectance Anisotropy Spectroscopy Microscopy [Joan Sendra](#); ETH Zürich, Switzerland.

3:30 PM CH01.08.06

Digital Twin—A Theorist's Playground for Synchrotron Science and Interfacial Science [Jin Qian](#)^{1,2}; ¹Lawrence Berkeley National Laboratory, United States; ²California Institute of Technology, United States.

3:45 PM CH01.08.07

Pseudo-4D X-Ray Imaging Strategy Captures the Solidification of a Polyphase Pattern [Paul Chao](#); University of Michigan, United States.

4:00 PM CH01.08.08

In Situ Time-Resolved Studies of Sub-Millisecond Metastable Phase Formation in Thin-Film Oxide Materials via Optical Imaging and Synchrotron X-Ray Diffraction [Aine Connolly](#); Cornell University, United States.

4:15 PM CH01.08.09

Subsurface Dynamics and 3D Structure of Boundary Dislocations During Thermal Annealing with Dark-Field X-Ray Microscopy [Leora E. Dresselhaus-Marais](#)^{1,2}; ¹Stanford University, United States; ²SLAC National Accelerator Laboratory, United States.

SESSION CH01.09: Poster Session II: Frontiers of In Situ Materials Characterization—From New Instrumentation and Method to Imaging Aided

Session Chairs: Arnaud Demortiere, Madeline Dukes, Wenpei Gao and Yuze Liu

Wednesday Afternoon, May 11, 2022

5:00 PM - 7:00 PM

Hawai'i Convention Center, Level 1, Kamehameha Exhibit Hall 2 & 3

CH01.09.01

In Situ X-Ray Scattering Methods for Probing Polymer Deconstruction [Sarah A. Hesse](#); SLAC National Accelerator Laboratory, United States.

CH01.09.02

Potential Dependent Ion Arrangement Near the Electrode/Electrolyte Interface [Julian Mars](#); University of Colorado Boulder, United States.

CH01.09.03

Operando Optical Tracking of Single-Particle Ion Dynamics in Batteries [Alice Merryweather](#); University of Cambridge, United Kingdom.

CH01.09.04

In Situ/Operando HERFD-XAS Study of Electrocatalytic Reduction of Carbon Dioxide with Transition Metal Diselenides [Khagesh Kumar](#); University of Illinois at Chicago, United States.

CH01.09.05

Spatially Resolved Electrochemical-Thermal Signatures in Lithium-Ion and Lithium-Metal Batteries [Divya Chalise](#)^{1,2}; ¹Lawrence Berkeley National Laboratory, United States; ²University of California, Berkeley, United States.

CH01.09.06

Characterization of Twinning and Dislocation Slip in Magnesium and Magnesium-Gadolinium Alloys by High Spatio-Temporal Resolution [Kristian Mathis](#); Charles University, Czechia.

CH01.09.07

In Situ Chemical Analysis of Complex Oxide Interfaces via Auger Electron Spectroscopy [Harish Kumarasubramanian](#); Mork Family Department of Chemical Engineering and Material Science, University of Southern California, United States.

CH01.09.08

Enabling Real-Time Human/AI Collaboration During Data Intensive Synchrotron Light Source Studies with Constrained Matrix Factorization [Daniel Olds](#); Brookhaven National Laboratory, United States.

CH01.09.09

Structural and Electronic Effects of X-Ray Radiation on Prototypical Catalysts [Nathalie Fernando](#); University College London, United Kingdom.

CH01.09.10

Evolution of Borides During Aging in Directionally Solidified Nickel-Based Superalloy [Richa Gupta](#); Indian Institute of Technology Bombay, India.

CH01.09.11

Quench-Dependent Kinetics and Dynamics of Strongly Coupled Nanocrystal Superlattice Self-Assembly in Electrolytic Environments Unveiled via In Situ X-Ray Scattering [Christian Tanner](#); University of California Berkeley, United States.

CH01.09.12

Complexity and Evolution of a Three-Phase Eutectic Pattern Uncovered by 4D X-Ray Nano-Tomography [George R. Lindemann](#); University of Michigan, United States.

CH01.09.13

Understanding Thermally Driven Microstructural Evolutions in Bulk Materials Using Non-Destructive Nanoscale 3D Imaging [Robin White](#); Carl Zeiss Microscopy, United States.

CH01.09.14

A Novel Non-Destructive Probe for Rapid Grain Boundary Characterization on the Mesoscopic Scale—Lab-Based Diffraction Contrast Tomography [Hrishikesh Bale](#); Carl Zeiss Research Microscopy Solutions, Ireland.

SESSION CH01.10: New Imaging Techniques I

Session Chairs: Arnaud Demortiere, Madeline Dukes, Wenpei Gao and Yuzi Liu

Thursday Morning, May 12, 2022

Hawai'i Convention Center, Level 4, Kalakaua Ballroom A

8:30 AM CH01.10.01

Assessing Multiple Convolutional Neural Networks for Denoising In Situ TEM Images with Ultra-Low Signal-to-Noise Ratios [Ramon Manzorro](#); Arizona State University, United States.

8:45 AM CH01.10.02

Electron Beam Micro-, Nanofabrication of Fine Spots and Exotic Transrotational Microcrystals in Amorphous and Recrystallized Films Studied In Situ in TEM [Vladimir Y. Kolosov](#); Ural Federal University, Russian Federation.

9:00 AM CH01.10.03

Viewing the Effect of a Plasma In Situ in the High Resolution Transmission Electron Microscope [Jean-Luc Maurice](#); École Polytechnique, Institut Polytechnique de Paris, CNRS, France.

9:15 AM CH01.10.04

Combined In Situ Synchrotron X-Ray and Electron Microscopy Studies of Metal-Organic Framework Crystallization [Angelica R. Talosig](#); University of California, United States.

9:30 AM CH01.10.05

Mechanistic Insights into Shape-Controlled Synthesis of Polymer Nano/Microstructures Enabled by In Situ Long-Focal Range Microscopy [Apoorva Jain](#); Cornell University, United States.

9:45 AM BREAK**10:15 AM *CH01.10.06**

Giant Polarization and Abnormal Super-Elasticity in Freestanding Perovskite Oxides [Xiaoqing Pan](#)^{1,2}; ¹University of California, Irvine, United States; ²University of California, Irvine, United States.

10:45 AM CH01.10.07

Quantifying Temperature Susceptivity of Electron Scattering in Scanning Transmission Electron Microscopy [Menglin Zhu](#); Ohio State University, United States.

11:00 AM CH01.10.08

Nucleation, Coarsening and Movement of MnAs Precipitates in Wurtzite GaAs Nanowire Shells During *In Situ* Annealing in transmission Electron Microscope [Anna Kaleta](#); Polish Academy of Sciences, Poland.

11:15 AM CH01.10.09

In Situ TEM Study of Oxygen Surface Exchange on Ceria-Based Oxides [Mai Tan](#); Arizona State University, United States.

11:30 AM CH01.10.10

True Atomic-Resolution Imaging Under Ambient Conditions via Conductive Atomic Force Microscopy [Saima A. Sumaiya](#); University of California Merced, United States.

SESSION CH01.11: New Imaging Techniques II

Session Chairs: Arnaud Demortiere, Madeline Dukes, Wenpei Gao and Yuzi Liu

Thursday Afternoon, May 12, 2022

Hawai'i Convention Center, Level 4, Kalakaua Ballroom A

1:30 PM *CH01.11.01

Liquid Phase TEM: Imaging Soft Nanomaterials in Solution, in Motion and in Action [Nathan C. Gianneschi](#); Northwestern University, United States.

2:00 PM CH01.11.02

In Situ Characterization of the Vegard Strain of Battery Electrode Materials by an Advanced Electrochemical Strain Microscopy Method [Andre Schirmeisen](#); Justus-Liebig-Universität Giessen, Germany.

2:15 PM CH01.11.03

Using *In Situ* Photoluminescence to Aid the Development of Wide Bandgap Perovskite Semiconductors for Use in Multijunction Photovoltaics [Daniel A. Morales](#); University of Colorado Boulder, United States.

2:30 PM CH01.11.04

Design of Electrochemical Systems for Simultaneous Neutron and X-Ray Tomography [Jacob LaManna](#); National Institute of Standards and Technology, United States.

2:45 PM BREAK

3:15 PM CH01.11.05

Imaging and Spectroscopy of Backscattered Electrons at Ultra-Low Energies—A New Characterization Approach for Beam Sensitive Organic Functional Materials [Daniel Ryklin](#)^{4, 1}; ¹Heidelberg University, Germany; ⁴Heidelberg University, Germany.

3:30 PM CH01.11.06

Applying Super High Resolution Fluorescence Microscope in Real-Time Quantitative Analysis of Electroconvection with Advanced Cloud Algorithm [Duhun Zhang](#)^{2, 1}; ¹Cornell University, United States; ²Massachusetts Institute of Technology, United States.

3:45 PM CH01.11.07

Multiscale *In Situ* Characterization of Deformation Dynamics in hcp Metals [Michal Knapek](#); Charles University, Czechia.

4:00 PM CH01.11.08

Simulated X-Ray Spectroscopy and Dynamical Stability of Lithiated Graphite Anode Material [Sasawat Jamnuch](#); University of California, San Diego, United States.

SESSION CH01.12: In Situ Imaging and Design of Nanomaterials

Session Chairs: Arnaud Demortiere, Madeline Dukes, Wenpei Gao and Yuzi Liu

Friday Morning, May 13, 2022

Hawai'i Convention Center, Level 4, Kalakaua Ballroom A

8:30 AM CH01.12.01

Computing Optical Flow from Machine Learning for Spatio-Temporal Characterization of Ultrafast Electron Microscopy Datasets [Arun Baskaran](#); Argonne National Laboratory, United States.

8:45 AM CH01.12.02

Imaging of Large Area Nanolattices with Simultaneous Reciprocal and Real Space X-Ray Imaging [Matias Kagias](#); California Institute of Technology, United States.

9:00 AM CH01.12.03

WITHDRAWN 5/16/22 CH01.12.03 A Versatile Optical Characterization Method for Analysis of Dynamic Swelling Properties and *In Situ* Morphology of Smart Hydrogels [Julia Koerner](#); Leibniz University Hannover, Germany.

9:15 AM CH01.12.04

Advantages of the New Technique of Corelative Single-Pass KPFM and Pseudo-Heterodyne s-SNOM *In Situ* Imaging [Artem Danilov](#); Attocube Systems AG, Germany.

9:30 AM BREAK

10:00 AM CH01.12.05

Wide-Field Raman Microscopy with STORM Post-Processing—A Powerful Approach to Increase Spatial Resolution and Acquisition Speed in Raman Imaging [Joachim Jelken](#); University of Western Ontario, Canada.

10:15 AM CH01.12.06

Probing Electron Transfer Dynamics of an Iron Porphyrin Photocatalyst for CO₂ Reduction Using X-Ray Transient Absorption Spectroscopy [Jin Yu](#); Argonne National Laboratory, United States.

10:30 AM CH01.12.07

Operando X-Ray Probes to Understand Nanoparticle Nucleation, Assembly and Catalysis [Sen Zhang](#); University of Virginia, United States.

10:45 AM CH01.12.08

Automated, High Throughput Analysis of HRTEM Image Dataset [Dhruv Dhiraj Gamdha](#); Iowa State University, United States.

11:00 AM CH01.12.09

Heterogeneous Deformation in ($\alpha+\beta$) Titanium Alloys—From *In Situ* Microscopy/Diffractometry to Microstructural Design [Shaolou Wei](#); Massachusetts Institute of Technology, United States.

11:15 AM CH01.12.10

Seeing the Forces—Single Avalanching Upconverting Nanoparticles as Ultrasensitive Local Force Transducers [Natalie Fardian-Melamed](#); Columbia University, United States.

11:30 AM CH01.12.11

***In Situ* Imaging of Brucite Carbonation in Supercritical CO₂ Reveals an Amorphous Intermediate Seeding Crystallization** [Xin Zhang](#); Pacific Northwest National Laboratory, United States.

SESSION CH01.13: Frontiers of In Situ Materials Characterization—From New Instrumentation and Method to Imaging Aided Materials Design I

Session Chairs: Arnaud Demortiere, Madeline Dukes, Wenpei Gao and Yuzi Liu

Monday Morning, May 23, 2022

CH01-Virtual

8:00 AM CH01.13.01

Simulating Electron-Excited Energy Dispersive X-Ray Spectra with the NIST DTSA-II Open-Source Software Platform [Dale E. Newbury](#); National Institute of Standards and Technology, United States.

8:15 AM *CH01.13.02

Nano-Scale *In Situ* TEM Observations of Electrodeposition/Dissolution Process of Zinc Metal onto a Platinum Electrode [Yuki Sasaki](#); Japan Fine Ceramics Center, Japan.

8:45 AM CH01.13.03

An Automated Scanning Transmission Electron Microscope Guided by Sparse Data Analytics [Steven R. Spurgeon](#); Pacific Northwest National Laboratory, United States.

9:00 AM *CH01.13.04

***In Situ* and *Operando* Force-Based Atomic Force Microscopy for Probing Local Functionality in Energy Storage Materials** [Nina Balke](#); North Carolina State University, United States.

9:30 AM *CH01.13.05

***In Situ* and *Operando* Characterization of Water-Mediated Ion Intercalation in Transition Metal Oxides** [Veronica Augustyn](#); North Carolina State University, United States.

10:00 AM CH01.13.06

Deep Learning Improves Lattice Strain Evolution in Na-NMC Battery from Electron Diffraction Patterns [Joydeep Munshi](#); Argonne National Laboratory, United States.

10:15 AM CH01.13.07

Phenomena Induced by Electric Current at the Active Si of Rectifier Diodes [Sara Román-Sánchez](#); Instituto de Cerámica y Vidrio (ICV), Madrid, Spain.

SESSION CH01.14: Frontiers of In Situ Materials Characterization—From New Instrumentation and Method to Imaging Aided Materials Design II

Session Chairs: Arnaud Demortiere, Madeline Dukes, Wenpei Gao and Yuzi Liu

Monday Afternoon, May 23, 2022

CH01-Virtual

1:00 PM CH01.14.01

***In Situ* ETEM Investigation of Size-Dependent Metallic Nanoparticle Oxidation—A Unified Oxidation Mechanism** [Yuanyuan Zhu](#); University of Connecticut, United States.

1:15 PM CH01.14.03

Cross-Sectional Functional Scanning Probe Microscopy for *In Situ* and *Post-Mortem* 3D Mapping of Nanoscale Physical Properties of Internal Structure of Advanced Optoelectronic Devices [Oleg V. Kolosov](#); Lancaster University, United Kingdom.

1:30 PM CH01.14.04

(2+1) D Temperature Mapping of Stacked Silicon Dies from X-Ray Diffraction Intensities [Darshan Chalise](#); University of Illinois - Urbana Champaign, United States.

1:45 PM CH01.14.05

Automated Time-Delay Characterization and Data Synchronization for *Operando* Gas and Heating Systems [Dan Zhou](#); DENSsolutions, Netherlands.

2:00 PM CH01.14.06

Density, Viscosity and Surface Tension Characterization of Supercooled Liquids and Oxide Melts Using Levitation in Microgravity [Vrishank Subodh Menon](#); Materials Development Inc., United States.

2:15 PM *CH01.14.07

Evolution Kinetics of Nanoparticles [Yugang Sun](#); Temple University, United States.

SESSION CH01.15: Frontiers of In Situ Materials Characterization—From New Instrumentation and Method to Imaging Aided Materials Design III
Session Chairs: Arnaud Demortiere, Madeline Dukes, Wenpei Gao and Yuzi Liu
Monday Afternoon, May 23, 2022
CH01-Virtual

4:00 PM *CH01.15.01

Dynamic Multimodal Chemical Imaging of Biological, Environmental and Material Interfaces [Xiao-Ying Yu](#); Pacific Northwest National Laboratory, United States.

4:30 PM *CH01.15.02

Nanoscale Imaging of Structure and Dynamics Through Time-Resolved Hard X-Ray Diffraction Microscopy [Martin V. Holt](#); Argonne National Laboratory, United States.

5:00 PM CH01.15.03

AI/ML-Guided Crystal Orientation Mapping from Electron Diffraction Images [Joydeep Munshi](#); Argonne National Laboratory, United States.

SESSION CH01.16: Frontiers of In Situ Materials Characterization—From New Instrumentation and Method to Imaging Aided Materials Design IV
Session Chairs: Arnaud Demortiere, Madeline Dukes, Wenpei Gao and Yuzi Liu
Tuesday Morning, May 24, 2022
CH01-Virtual

8:00 AM CH01.16.01

Scanning NV Magnetometry for Magnetic Memory Devices [Peter Rickhaus](#); Qnami AG, Switzerland.

8:15 AM CH01.16.02

Catalytic Transformation of Nano-Lepidocrocite (γ -FeOOH) with Fe(II)_(aq)—Non-Equilibrium Stages and Biomimetic-Like Behavior [Yiwen Chen](#); Shenyang University of Chemical Technology, China.

8:30 AM CH01.16.03

Tip Enhanced Rayleigh Scattering via a Gap Mode in Transmission Geometry [Bharathi Rajeswaran](#); Bar-Ilan University, Israel.

8:45 AM CH01.16.04

Ion-Gated Transistors as *In Operando* Diagnosis Tools for Battery Electrode Materials [Jose R. Herrera](#); Polytechnique Montréal, Canada.

9:00 AM CH01.16.05

Porous structures of ZrO₂ Fiber Insulation Tile Revealed By Synchrotron X-Ray In-Line Phase Contrast Microtomography [Shengkun Yao](#); Shandong Normal University, China.

9:05 AM CH01.16.06

Large-Area *In Situ* Multichannel Imaging on Blade Coated Hybrid Perovskite Thin Films [Simon Ternes](#)^{1,2,3}; ¹Karlsruhe Institute of Technology, Germany; ²Karlsruhe Institute of Technology, Germany; ³Karlsruhe Institute of Technology, Germany.

9:10 AM CH01.16.07

Return-Path Mueller Ellipsometry via Retroreflective Materials for Cryogenic Applications [Christopher Lewis](#); Auburn University, United States.

9:15 AM CH01.16.08

***In Situ* LP-TEM Visualization of Aqueous Dynamic Molecular and Particular Assembly of Amphiphilic Block Copolymer** [Junho Hwang](#); Gwangju Institute of Science and Technology, Korea (the Republic of).

SYMPOSIUM CH02

Ultrafast Probes in Emerging Materials
May 11 - May 23, 2022

Symposium Organizers

Margherita Maiuri, Politecnico di Milano
Carlos Silva, Georgia Institute of Technology
Ajay Ram Srimath Kandada, Wake Forest University
Parinda Vasa, Indian Institute of Technology Bombay

* Invited Paper

SESSION CH02.01: Ultrafast Dynamics in 2D Materials
Session Chairs: Margherita Maiuri and Carlos Silva
Wednesday Afternoon, May 11, 2022
Hawai'i Convention Center, Level 3, 321A

1:30 PM *CH02.01.01

Having It All—Spatiotemporally Discerning Charge and Heat in Energy Transduction and Nanoscale Transport [Naomi S. Ginsberg](#); University of California, Berkeley, United States.

2:00 PM CH02.01.02

Broadband and Ultrafast Optical Phase Modulation by Colloidal 2D Semiconductors [Pieter Geiregat](#); Ghent University, Belgium.

2:15 PM CH02.01.03

Exciton Dynamics in Functionalized Germanane [Eugenio Cinquanta](#); CNR-IFN, Italy.

2:30 PM BREAK

3:00 PM CH02.01.04

Ultrafast Optical and Magnetic Properties of the Liquid Phase Exfoliated Antiferromagnetic 2D Semiconductor NiPS₃ [Andrii Shcherbakov](#); Walter Schottky Institute Technical University of Munich, Germany.

3:15 PM *CH02.01.05

Ultrafast Probes of Semiconductor Junctions [Matthew C. Beard](#); National Renewable Energy Lab, United States.

3:45 PM CH02.01.06

High-Efficiency Photoemission Due to Ultrafast Spin-Exchange Auger Interactions in Mn-Doped CdSe Quantum Dots [Clement Livache](#); Los Alamos National Laboratory, United States.

4:00 PM CH02.01.07

Investigation of the Optical Properties and Ultrafast Plasmonic Dynamics of Digenite (C₉S₈) Thin Films [Andrea Villa](#); Politecnico di Milano, Italy.

4:15 PM CH02.01.08

Ultrafast Dynamics of Strongly Correlated Metal Oxide Clusters [Scott G. Sayres](#); Arizona State University, United States.

SESSION CH02.02: Poster Session: Ultrafast Probes
Session Chairs: Margherita Maiuri, Carlos Silva and Ajay Ram Srimath Kandada
Wednesday Afternoon, May 11, 2022
5:00 PM - 7:00 PM
Hawai'i Convention Center, Level 1, Kamehameha Exhibit Hall 2 & 3

CH02.02.01

Visible and Near-Infrared Optical Properties of Indium Tin Oxide Nanoparticle Films [Fabio Marangi](#)^{1,2}; ¹Politecnico di Milano, Italy; ²IIT - Istituto italiano di Tecnologia, Italy.

CH02.02.02

WITHDRAWN 5/7/22 CH02.02.02 Nanosecond Fluctuations in Skyrmions [Tadesse Assefa](#); Stanford University and SLAC National Accelerator Laboratory, United States.

CH02.02.03

Ultrafast Excited State Decay Pathways in Epigenetic Deoxycytidine Derivatives [Piotr Kabacinski](#); Politecnico di Milano, Italy.

CH02.02.04

Computational X-Ray Photon Correlation Spectroscopy from Molecular Dynamics Trajectories [Shaswat Mohanty](#); Stanford University, United States.

CH02.02.06

Phase-Sensitive Pump-Probe Spectroscopy of Organic Semiconductors [Chad Cruz](#); National Institute of Standards and Technology, United States.

CH02.02.07

Multifrequency Carrier Dynamics of A-Site Cation Modulated Organic-Inorganic Halide Perovskites [HyuenWoo Yang](#); Sungkyunkwan University, Korea (the Republic of).

CH02.02.08

Charge Carrier Self-Localization in Organic Semiconductors Revealed via Time-Resolved THz Spectroscopy [Paul D. Cunningham](#); U.S. Naval Research Laboratory, United States.

CH02.02.09

Vibronic Coupling and Nonradiative Relaxation in Cyanine Dimers on DNA Scaffolds [Paul D. Cunningham](#); U.S. Naval Research Laboratory, United States.

SESSION CH02.03: Ultrafast Dynamics in Metal Halide Perovskites

Session Chairs: Carlos Silva and Ajay Ram Srimath Kandada

Thursday Morning, May 12, 2022

Hawai'i Convention Center, Level 3, 321A

8:30 AM *CH02.03.01

Photo-Induced Hot Carrier Cooling in Two-Dimensional Perovskite Single Crystals Studied by Transient Absorption and Time-Resolved Two-Photon Photoelectron Spectroscopy [Tonu Pullerits](#); Lund University, Sweden.

9:00 AM CH02.03.02

Revealing Ultrafast Charge-Carrier Thermalization in Tin-Iodide Perovskites Through Novel Pump-Push-Probe Terahertz Spectroscopy [Aleksander M. Ulatowski](#); University of Oxford, Department of Physics, United Kingdom.

9:15 AM CH02.03.03

Direct Visualization of Ultrafast Lattice Ordering via Resonant Electron-Phonon Coupling in 2D Perovskites [Hao Zhang](#)^{1,2}; ¹Rice University, United States; ²Rice University, United States.

9:30 AM CH02.03.04

Tuning Hot Carriers Cooling Rate by Pressure in Hybrid Organic-Inorganic Perovskites [Yaxin Zhai](#)^{1,2}; ¹Hunan Normal University, China; ²National Renewable Energy Laboratory, United States.

9:45 AM CH02.03.05

The Impact of Interfacial Energetics on Charge Extraction and Recombination Dynamics in MAPbI₃ Perovskite Solar Cells [Tuo Liu](#)^{1,2}; ¹University of Kentucky, United States; ²National Renewable Energy Laboratory, United States.

10:00 AM BREAK

SESSION CH02.04: Exciton Dynamics - Theory and Experiment

Session Chairs: Margherita Maiuri and Ajay Ram Srimath Kandada

Thursday Afternoon, May 12, 2022

Hawai'i Convention Center, Level 3, 321A

1:30 PM *CH02.04.01

Coherent Photoexcited Dynamics in Molecular Systems [Sergei Tretiak](#); Los Alamos National Laboratory, United States.

2:00 PM CH02.04.02

Unraveling Exciton Dynamics in van der Waals Heterostructures from First Principles [Junyi Liu](#); California State University Northridge, United States.

2:15 PM CH02.04.03

Tracking Environment Sensitive Ultrafast Photophysics of Tryptophan with Sub-20-fs UV Pulses [Piotr Kabacinski](#); Politecnico di Milano, Italy.

2:30 PM CH02.04.04

Vibronic Coupling Within the Q-Bands in a Free-Base Porphyrin Unveiled via Multidimensional Spectroscopies [Vasilis Petropoulos](#); Politecnico di Milano, Italy.

2:45 PM *CH02.04.05

The Photophysics of Molecular Polaritons in the Collective Regime [Joel Yuen-Zhou](#); University of California, San Diego, United States.

SESSION CH02.05: Ultrafast Microscopy/2D Materials/2D Spectroscopy

Session Chairs: Tonu Pullerits and Ajay Ram Srimath Kandada

Friday Morning, May 13, 2022

Hawai'i Convention Center, Level 3, 321A

8:30 AM *CH02.05.01

Ultrafast Dynamic Microscopy of Exciton and Charge Transport [Libai Huang](#); Purdue University, United States.

9:00 AM CH02.05.02

Charge Dynamics Electron Microscopy [Simone Gargiulo](#); EPFL, Switzerland.

9:15 AM CH02.05.04

Controlling Electrons with Strong Laser Fields—From 2D Materials to Topological Insulators [Christian Heide](#)^{1,2}; ¹Stanford University, United States; ²Friedrich-Alexander-Universität Erlangen-Nürnberg, Germany.

9:30 AM BREAK**10:00 AM *CH02.05.05**

Understanding the Role of Dark Exciton Processes in Ultrafast Excitation Dynamics [Eric Bittner](#); University of Houston, United States.

10:30 AM CH02.05.06

Direct Evidence of Long-Range Polariton-Assisted Energy Transfer in an Organic Microcavity Probed by Two-Dimensional Electronic Spectroscopy [Mattia Russo](#); Politecnico di Milano, Italy.

10:45 AM CH02.05.07

The Persistence of Orientational Memory in Ionic Transport Probed by Time-Domain Nonlinear Optical Spectroscopy [Andrey Poletayev](#)^{1,2}; ¹Stanford University, United States; ²SLAC National Accelerator Laboratory, United States.

SESSION CH02.06: Ultrafast X-ray and Electron Probes

Session Chairs: Eric Bittner and Margherita Maiuri

Friday Afternoon, May 13, 2022

Hawai'i Convention Center, Level 3, 321A

1:30 PM CH02.06.01

Non-Equilibrium Signature of Photoexcited Kitaev Interaction in Honeycomb Mott Insulator α -Li₂IrO₃ [Hui-Yuan Chen](#); École Polytechnique Fédérale de Lausanne, Switzerland.

1:45 PM CH02.06.02

Coherent Excitation of Sub-Terahertz Coherent Dynamics of Polar Skyrmions by Terahertz Pulses and Probed by Ultrafast X-Ray Pulses [Huaiyu Wang](#); The Pennsylvania State University, United States.

2:00 PM CH02.06.03

Recording Light-Induced Structural Dynamics in Quantum Materials via Ultrafast Electron Diffraction [Daniel B. Durham](#)^{1,2}; ¹University of California, Berkeley, United States; ²Lawrence Berkeley National Laboratory, United States.

2:15 PM CH02.06.04

Fluctuations in Quantum Materials at the Linac Coherent Light Source [Joshua J. Turner](#); SLAC National Accelerator Laboratory, United States.

2:30 PM CH02.06.05

Photoinduced Structural Dynamics Across Metal-Insulator Transition in Nickelate Thin Films [Jugal Mehta](#); University of California, Davis, United States.

2:45 PM CH02.06.06

WITHDRAWN 5/12/22 CH02.06.06 Nanosecond Dynamic of Skyrmions in Magnetic Multilayered Materials Probed by x-Ray Photon Fluctuation Spectroscopy [Nicolas Burdet](#); Stanford SLAC, United States.

SESSION CH02.07: Ultrafast Probes I

Session Chairs: Carlos Silva and Ajay Ram Srimath Kandada

Monday Morning, May 23, 2022

CH02-Virtual

8:00 AM *CH02.07.01

ZnO—Ultrafast Generation and Decay of a Surface Metal [Julia Stähler](#)^{1,2}; ¹Humboldt-Universität zu Berlin, Germany; ²Fritz Haber Institute of the Max Planck Society, Germany.

8:30 AM *CH02.07.02

Multi-Dimensional Photoemission Spectroscopy of Semiconductor Heterostructures—Resolving Photoelectrons in Space, Time, Momentum and Energy [Keshav M. Dani](#); Okinawa Institute of Science and Technology, Japan.

9:00 AM CH02.07.03

Visualizing Ultrafast Structural Deformations in Nanocrystals Under Nonequilibrium Conditions [Burak Guzelturk](#); Argonne National Laboratory, United States.

9:15 AM CH02.07.04

Photoluminescence Studies from ps to ms with High-Power Fast-Gate cw Pulse Pattern by a RGB Laser Excitation Source in Combination with a Laser Scanning Microscope [Christian Oelsner](#); PicoQuant GmbH, Germany.

SESSION CH02.08: Ultrafast Probes II

Session Chairs: Carlos Silva and Ajay Ram Srimath Kandada

Monday Morning, May 23, 2022

CH02-Virtual

10:30 AM *CH02.08.01

Tracking Ultrafast Charge Transfer Processes in Heterostructures of 2D Materials [Giulio Cerrulo](#); Politecnico di Milano, Italy.

11:00 AM *CH02.08.02

Exciton Dynamics Controlled by Twisted Angles in Semiconductor Moire Superlattices [Xiaoqin E. Li](#); The University of Texas at Austin, United States.

11:30 AM CH02.08.03

Strong Electron-Phonon Coupling in 2D Silver Phenyl Chalcogenolates Revealed by Ultrafast Impulsive Vibrational Spectroscopy [Eric Powers](#); Massachusetts Institute of Technology, United States.

11:45 AM *CH02.08.04

Probing Ultrafast Spin and Electron Dynamics in Momentum Space and Time [Martin Aeschlimann](#); University of Kaiserslautern, Germany.

SESSION CH02.09: Ultrafast Probes III
Session Chairs: Carlos Silva and Ajay Ram Srimath Kandada
Monday Afternoon, May 23, 2022
CH02-Virtual

1:00 PM *CH02.09.01

Charge-lattice correlations probed by ultrabroadband THz spectroscopy [David Cooke](#); McGill University, Canada.

1:30 PM *CH02.09.02

Tracking Ultrafast Three-Dimensional Transport With Sub-10fs Time-Resolution and Sub-10nm Spatial Precision Using Interferometrically Enhanced Pump-Probe Microscopy [Akshay Rao](#); University of Cambridge, United Kingdom.

2:00 PM CH02.09.03

Two Regimes of Organic-Inorganic Vibrational and Electronic Interactions in Layered Hybrid Perovskites [Shunran Li](#); Yale University, United States.

SYMPOSIUM CH03

Advances in In Situ and Operando TEM Methods for the Study of Dynamic Processes in Materials
May 9 - May 25, 2022

Symposium Organizers

Ursel Bangert, University of Limerick
Martial Duchamp, Nanyang Technological University
Andrew Minor, University of California, Berkeley
Leopoldo Molina-Luna, Darmstadt University of Technology

* Invited Paper

SESSION CH03.01: Advances in In Situ TEM Methodology
Session Chairs: Andrew Minor and Leopoldo Molina-Luna
Monday Morning, May 9, 2022
Hawai'i Convention Center, Level 4, Ballroom C

10:30 AM CH03.01.02

Development and Demonstration of a Real-Time Machine Vision Platform for *In Situ* Microscopy [Kevin G. Field](#)^{1,2}; ¹University of Michigan, United States; ²Theia Scientific, LLC, United States.

10:45 AM CH03.01.03

Simple Streamlined Continuous 4D STEM Recording for *In Situ* Experiments [Benjamin Miller](#); Gatan, Inc., United States.

SESSION CH03.02: In Situ Studies of Metals
Session Chairs: Ursel Bangert, Martial Duchamp, Andrew Minor and Mitra Taheri
Monday Afternoon, May 9, 2022
Hawai'i Convention Center, Level 4, Ballroom C

1:30 PM *CH03.02.01

Grain Boundary Shear-Migration Coupling in UFG Al Studied Using *In Situ* TEM and Other Advanced Methods [Marc Legros](#); CEMES CNRS, France.

2:00 PM *CH03.02.02

***In Situ* Straining TEM Experiments for the Characterization of Deformation Induced Phase Transformations** [Djamel Kaoumi](#); North Carolina State University, United States.

2:30 PM BREAK

3:00 PM *CH03.02.03

***In Situ* TEM Observations of Dislocation and Twinning Activities of Mg via Nanoindentation** [Kelvin Y. Xie](#); Texas A&M University, United States.

3:30 PM CH03.02.04

***In Situ* TEM Observations on an Aluminium Alloy Elaborated by Laser Beam Melting** [Nicolas Bello](#); Centre d'Élaboration des Matériaux et d'Études Structurales, France.

3:45 PM CH03.02.05

Development of New Multiscale STEM-Based Techniques to Characterize Defects [Sean Mills](#); University of California, Berkeley, United States.

SESSION CH03.03: Poster Session: Advances in In Situ and Operando TEM Methods for the Study of Dynamic Processes in Materials
Session Chairs: Ursel Bangert, Martial Duchamp, Andrew Minor and Leopoldo Molina-Luna
Monday Afternoon, May 9, 2022
5:00 PM - 7:00 PM
Hawai'i Convention Center, Level 1, Kamehameha Exhibit Hall 2 & 3

CH03.03.01

Extensible Real-Time Data Processing with Python in DigitalMicrograph [Benjamin Miller](#); Gatan, Inc., United States.

CH03.03.02

Fluidic Liquid-Phase TEM - Evolving Methods for Flow Experiments from Fluid Dynamics and Reaction Kinetics Considerations [Stefan Merckens](#); CIC nanoGUNE BRTA, Spain.

CH03.03.03

Rapid Interpretable Incoherent Imaging with Dynamic Hollow-Cone Illumination TEM [Jim Ciston](#); Lawrence Berkeley National Laboratory, United States.

CH03.03.04

Strain Mapping Using Precession Electron Diffraction Data [Kelvin Y. Xie](#); Texas A&M University, United States.

CH03.03.05

Stability-Limited Subsampled Scanning in Scanning Transmission Electron Microscopy [Daniel Nicholls](#); University of Liverpool, United Kingdom.

CH03.03.06

Void Dynamics and Crystal Reconstruction in Double Perovskite Nanocrystals Revealed by *In Situ* TEM [Sasha Khalfin](#); Technion, Israel.

CH03.03.07

A Machine-Learning Approach to Characterization of Amorphous Materials with EELS-SI and 4D-STEM [Jinseok Ryu](#); Seoul National University, Korea (the Republic of).

CH03.03.08

Unsupervised Learning to Understand the Structural Transformation of Ultrathin AuAg Nanowires into Double Helical Structures Using 4D-STEM [Alexandra Bruefach](#); University of California, Berkeley, United States.

CH03.03.09

III/V Semiconductor Precursor Decomposition in a Closed Gas Cell *In Situ* TEM Holder [Maximilian Widemann](#); Philipps-Universität Marburg, Germany.

CH03.03.10

Optimizing and Understanding Neural Networks for Automated High-Resolution TEM Analysis [Katherine Sytwu](#); Lawrence Berkeley National Laboratory, United States.

CH03.03.11

Blob Detection—A Computer Vision Technique to Accurately Track Atom Dynamics in Time-Resolved *In Situ* TEM. [Ramon Manzorro](#); Arizona State University, United States.

CH03.03.12

Quantifying the Early Stages of Crystallization in Co-Based Magnetic Amorphous Nano-Composite Alloys [Alicia Wadsworth](#); University of Alabama, United States.

CH03.03.13

ω - α Phase Transformation and Plastic Deformation in ω -Ti [Lei Cao](#); University of Nevada, Reno, United States.

CH03.03.14

Effect of Deformation Temperature on the Slip Activity in Pure Mg and AZX211 [Umer Masood CH](#); Incheon National University, Korea (the Republic of).

CH03.03.15

Unsupervised Machine Learning Applied on Correlated EDS/4DSTEM Data to Investigate the Structural Ordering of Co₂FeSi Thin Films [Ercin Duran](#); University of Manchester, United Kingdom.

CH03.03.16

WITHDRAWN 5/9/22 CH03.03.16 *In Operando* Transmission Electron Microscopy Studies on Diffusion Induced Phenomena at the Dielectric-Electrode Interfaces in Ge₂Te₃-Based Memristor Devices [Krishnamurthy Mahalingam](#)^{1,2}; ¹U.S. Air Force Research Laboratory, United States; ²UES, Inc., United States.

CH03.03.17

Inorganic Self-Replicating Nanoparticles [Connor McGlothlin](#); University of Michigan, United States.

SESSION CH03.04: Memristors

Session Chairs: Martial Duchamp and Leopoldo Molina-Luna

Tuesday Morning, May 10, 2022

Hawai'i Convention Center, Level 4, Ballroom C

8:30 AM *CH03.04.01

Visualizing Dielectric Breakdown in Pt/HfO₂/Ti RRAM with STEM EBIC [B C Regan](#)^{1,2}; ¹UCLA, United States; ²NanoElectronic Imaging (NEI), Inc., United States.

9:00 AM CH03.04.02

***In Situ* TEM Studies of Resistive Switching in HfO₂ Based Memristors** [Robert Eilhardt](#); Technical University of Darmstadt, Germany.

9:15 AM CH03.04.03

Understanding Memristive Switching in Off-Stoichiometric SrTiO₃ for Neuromorphic Applications by Advanced *In Situ* Transmission Electron Microscopy [Houari Amari](#); Institut für Kristallzüchtung (IKZ), Germany.

9:30 AM BREAK

SESSION CH03.05: In Situ Electrical and Magnetic Characterization

Session Chairs: Martial Duchamp and B C Regan

Tuesday Morning, May 10, 2022

Hawai'i Convention Center, Level 4, Ballroom C

10:30 AM CH03.05.01

***In Situ* and *Operando* TEM Studies on the Magnetic Textures in Permalloy** [Martial Duchamp](#)^{2,1}; ¹Université Côte d'Azur, Sorbonne Université, National University of Singapore, Nanyang Technological University, Singapore; ²Nanyang Technological University, Singapore.

10:45 AM CH03.05.02

Unraveling the Mechanism of Iridium Nanoparticle Exsolution through *In Situ* Scanning Transmission Electron Microscopy, Density Functional Theory and Machine-Learning Image-Analytics [Eleonora Cali](#); Imperial College London, United Kingdom.

11:00 AM CH03.05.03

Novel FIB-Based Fabrication Routine of Operative Oxide-Based Devices for *In Situ/Operando* TEM [Oscar Recalde](#); TU Darmstadt, Germany.

11:15 AM CH03.05.04

Direct Imaging of π - π Stacking and Its Mechanical Impact on the Kerogen [Yujun Xie](#)^{1,2}; ¹University of California, Berkeley, United States; ²Lawrence Berkeley National Laboratory, United States.

11:30 AM CH03.05.05

Improved FIB-Based Fabrication of an Operative Pt/HfO₂/TiN Device for Biasing and/or Heating TEM Using an *In Situ* FIB Method [Robert Eilhardt](#); TU Darmstadt, Germany.

SESSION CH03.06: Ferroelectrics and Multiferroics
Session Chairs: Ursel Bangert and Leopoldo Molina-Luna
Tuesday Afternoon, May 10, 2022
Hawai'i Convention Center, Level 4, Ballroom C

1:30 PM *CH03.06.01

Domain Dynamics in Ferroelectric Materials [Vasililki Tileli](#); École Polytechnique fédérale de Lausanne, Switzerland.

2:00 PM CH03.06.02

Thermally Driven Domains in BaTiO₃—An *In Situ* Study [Tamsin I. O'Reilly](#); Queen's University Belfast, United Kingdom.

2:15 PM CH03.06.03

Direct Probing of Electric-Field-Induced Resistance Switching of a Ferroelectric Oxide Tunnel Junction [Min-Hyoung Jung](#); Sungkyunkwan University, Korea (the Republic of).

2:30 PM *CH03.06.04

Probing the Dynamics of Multiferroic Domain Wall Topologies at the Atomic Scale [Michele S. Conroy](#)^{1,2}; ¹Imperial College London, United Kingdom; ²University of Limerick, Ireland.

3:00 PM BREAK

SESSION CH03.07: In Situ Imaging Methods
Session Chairs: Martial Duchamp and Leopoldo Molina-Luna
Tuesday Afternoon, May 10, 2022
Hawai'i Convention Center, Level 4, Ballroom C

3:30 PM *CH03.07.01

Data Analysis Pipelines for Low Dose *In Situ* SPLEEM and TEM Experiments [Colin Ophus](#); Lawrence Berkeley National Lab, United States.

4:00 PM CH03.07.02

Simultaneous Atomic Resolution Imaging and Electrical Characterization of 2D Quantum Devices [Joachim D. Thomsen](#)^{1,2}; ¹Massachusetts Institute of Technology, United States; ²Harvard University, United States.

4:15 PM CH03.07.03

Direct Visualisation of Perovskite Microstructural Transformation Under Electrical Bias *Operando* TEM [Lan L. Nguyen](#); Nanyang Technological University, Singapore.

4:30 PM CH03.07.04

In Situ Imaging of Anisotropic Layer-by-Layer Phase Transition in Few-Layer MoTe₂ [Chia-Hao Lee](#); University of Illinois at Urbana-Champaign, United States.

SESSION CH03.08: Catalysts I
Session Chair: Miaofang Chi
Wednesday Morning, May 11, 2022
Hawai'i Convention Center, Level 4, Ballroom C

8:30 AM *CH03.08.01

Elucidating Redox Dynamics of High Entropy Oxide Catalysts by Using *In Situ* and Cryogenic STEM [Miaofang Chi](#); Oak Ridge National Laboratory, United States.

9:00 AM CH03.08.02

In Situ EELS Study of Photonic Modes in Reducible Oxides [Yifan Wang](#); Arizona State University, United States.

9:15 AM CH03.08.03

Detecting Catalytic Turnover on a Single, Isolated Nanoparticle Under Real Reaction Conditions [Tobias G. Boneyk](#); Technical University of Denmark, Denmark.

9:30 AM CH03.08.04

Atomic-Level Dynamics Far from Equilibrium—Fluxionality of Metastable CeO₂ [Ramon Manzorro](#); Arizona State University, United States.

9:45 AM BREAK

10:15 AM *CH03.08.05

Describing Chemically Induced Fluxional Behavior in Nanoparticles at the Atomic Level and Assessing its Impact on Functionality [Peter A. Crozier](#); Arizona State University, United States.

10:45 AM CH03.08.06

Transitional Structures of Continuous Variations in Atomic Positions Induce High Photocatalytic Efficiency [Dongsheng Li](#); Pacific Northwest National Laboratory, United States.

11:00 AM CH03.08.08

Quantifying Fluxionality in Catalytic Nanoparticles from Large *In Situ* TEM Data Sets [Advait Gilankar](#); Arizona State University, United States.

SESSION CH03.09: In Situ Liquid TEM

Session Chairs: Martial Duchamp, Serin Lee and Leopoldo Molina-Luna

Wednesday Afternoon, May 11, 2022

Hawai'i Convention Center, Level 4, Ballroom C

2:00 PM CH03.09.01

***In Situ* TEM and STEM Characterization of Local Structure and Dynamics in Supercooled Liquids with an Ultrafast Camera** [Shuoyuan Huang](#); University of Wisconsin-Madison, United States.

2:15 PM CH03.09.03

Temperature-Dependent Nanochemistry and Kinetics in Liquid Cell Electron Microscopy—Modeling and Nanomaterials Growth [Serin Lee](#); Massachusetts Institute of Technology, United States.

2:30 PM BREAK

SESSION CH03.10: ETEM and Gas Cell

Session Chairs: Ursel Bangert and Peter Crozier

Wednesday Afternoon, May 11, 2022

Hawai'i Convention Center, Level 4, Ballroom C

3:30 PM *CH03.10.01

Intelligent Tracking of Catalytic Nanoparticles Trajectories During *In Situ* ETEM Experiments [Thierry Epicier](#)^{1,3}; ¹Université de Lyon, UCBL, France; ³Université de Lyon, INSA de Lyon, UCBL, France.

4:00 PM CH03.10.02

***In Situ* Hydrogenation of Single Bimetallic Nanoparticles Visualized by Environmental Transmission Electron Microscopy** [Briley Bourgeois](#); Stanford University, United States.

SESSION CH03.11: In Situ Liquid TEM

Session Chairs: Ursel Bangert and Thierry Epicier

Thursday Morning, May 12, 2022

Hawai'i Convention Center, Level 4, Ballroom C

8:30 AM *CH03.11.01

***In Situ* Liquid Electrochemical TEM Investigation of $\text{LiMn}_{1.5}\text{Ni}_{0.5}\text{O}_4$ Thin-Film Cathode for Micro-Battery Application** [Arnaud Demortiere](#); Universite de Picardie Jules Verne, France.

9:00 AM CH03.11.02

Lithium Metal Plating/Stripping Mechanism Studies Through Electrochemical Liquid Cell Transmission Electron Microscopy [Seung-Yong Lee](#)^{1,2}; ¹Hanyang University, Korea (the Republic of); ²Lawrence Berkeley National Laboratory, United States.

9:15 AM CH03.11.03

***In Situ* TEM for Dynamic Materials Behaviors in Li-Ion and Beyond-Li Batteries** [Kai He](#); Clemson University, United States.

9:30 AM CH03.11.04

Crystallization and 3D Structures of Nanoparticles by *In Situ* TEM [Jungwon Park](#); Seoul National University, Korea (the Republic of).

9:45 AM BREAK

SESSION CH03.12: Data Processing

Session Chairs: Ursel Bangert and Colin Ophus

Thursday Morning, May 12, 2022

Hawai'i Convention Center, Level 4, Ballroom C

10:30 AM *CH03.12.01

Automated Defect Detection in Electron Microscopy of Radiation Damage in Metals [Dane Morgan](#); University of Wisconsin--Madison, United States.

11:00 AM CH03.12.02

Semantic Segmentation for Analysis of Melting of Nanoscale Ice via Convolutional Neural Networks [Arun Baskaran](#); Argonne National Laboratory, United States.

11:15 AM CH03.12.03

Denoising of Sparse *In Situ* Electron Microscopy Datasets Using a Total Variational Method [Steven Zeltmann](#); University of California, Berkeley, United States.

11:30 AM CH03.12.04

WITHDRAWN 5/10/22 CH03.12.04 Ultra-High Energy Resolution STEM-EELS for *In Situ* Analysis [Tracy C. Lovejoy](#); Nion, United States.

SESSION CH03.13: Catalysts II

Session Chairs: Arnaud Demortiere and Martial Duchamp

Thursday Afternoon, May 12, 2022

Hawai'i Convention Center, Level 4, Ballroom C

1:30 PM CH03.13.02

***In Situ* HRTEM of Facet Stabilization by Solute Partitioning** [Jonathan Priedeman](#); The University of Alabama, United States.

1:45 PM CH03.13.03

Windowless Wet Environmental TEM—A Dedicated Approach for Water Condensation/Evaporation Experiments [Thierry Epicier](#); Université de Lyon, UCBL, IRCELYON, umr5256, France.

SESSION CH03.14: Advances in In Situ and Operando TEM Methods for the Study of Dynamic Processes in Materials I

Session Chair: Leopoldo Molina-Luna

Wednesday Morning, May 25, 2022

CH03-Virtual

8:00 AM *CH03.14.01

Probing Electric Field and Charge Distributions at Interfaces Using Nanofluidic Liquid Phase Electron Holography [Kristian S. Mølhave](#); Technical University of Denmark, Denmark.

8:30 AM CH03.14.02

Grain Rotation Mediated Deformation in Nano-Grained Mg-Gd Binary Alloy via *In Situ* TEM Indentation [Yushun Liu](#); University of Manitoba, Canada.

8:35 AM *CH03.14.03

***In Situ* TEM and Electron Holography Investigation of the Perpendicular Shape Anisotropy and Thermal Stability of STT-MRAM Nano-Pillars** [Trevor Almeida](#)^{1,2};

¹University of Glasgow, United Kingdom; ²Université Grenoble Alpes, France.

9:05 AM *CH03.14.04

Sub-Kelvin Thermometry for Evaluating the Local Temperature Stability Within *In Situ* TEM Gas Cells [Erdmann Spiecker](#); Institute of Micro- and Nanostructure Research (IMN) & Center for Nanoanalysis and Electron Microscopy (CENEM), Interdisciplinary Center for Nanostructured Films (IZNF), Germany.

9:35 AM *CH03.14.05

Recent Advances in Nanoscale Strain Mapping of Complex Materials During *In Situ* Deformation [Christoph Gammer](#); Erich Schmid Institute of Materials Science, Austrian Academy of Sciences, Austria.

SESSION CH03.15: Advances in In Situ and Operando TEM Methods for the Study of Dynamic Processes in Materials II

Session Chair: Leopoldo Molina-Luna

Wednesday Morning, May 25, 2022

CH03-Virtual

10:30 AM *CH03.15.01

***In Situ* TEM Measurement of Magnetic and Thermal Dynamic Process of Nano-Scale Structures** [Kiyohi Shibata](#); The University of Tokyo, Japan.

11:00 AM CH03.15.02

Large Scale Ferroelectric Domain Mapping by 4D STEM [Ursula Ludacka](#); NTNU, Norway.

11:15 AM CH03.15.03

***In Situ* Dynamics of Metal-Oxides Nanofluids for Solar Thermal Applications** [Praveen Kumar](#); Queen's University Belfast, United Kingdom.

11:30 AM CH03.15.04

Quantitative Comparison of Simulated and Experimental Electric Fields in Nanocapacitors Measured by *Operando* Electron Holography [Kilian Gruel](#); CEMES - CNRS, France.

11:45 AM CH03.15.05

***In Situ* Atomic-Scale Electron Beam Fabrication of 2D Materials with Automated Feedback-Control** [Matthew G. Boebinger](#); Oak Ridge National Laboratory, United States.

12:00 PM CH03.15.06

Electron-Beam Induced Degradation Dynamics of BNNT *In Situ* The ETEM [Hsin-Yun Chao](#)^{2,1,5}; ¹University of Maryland, United States; ²Oak Ridge National Laboratory, United States; ⁵National Institute of Standards and Technology, United States.

12:15 PM *CH03.15.07

Liquid Phase Electron Microscopy as an Innovative Tool to Probe Pharmaceutical Crystallisation [Jennifer Cookman](#); University of Limerick, Castletroy, Ireland.

SESSION CH03.16: Advances in In Situ and Operando TEM Methods for the Study of Dynamic Processes in Materials III

Session Chair: Martial Duchamp
Wednesday Afternoon, May 25, 2022
CH03-Virtual

9:00 PM *CH03.16.01

In Situ and Atomic-Scale Electron Microscopy Characterization of Relaxor Ferroelectrics Yukio Sato; Kyushu University, Japan.

9:30 PM CH03.16.02

The Kinetics and Mechanisms of Light-Induced Phase Separation in a Mixed-Halide Perovskite Siyang Peng^{3,1}; ¹Westlake University, China; ³Stanford University, United States.

9:45 PM CH03.16.03

Atomistic Observation on Diffusion-Mediated Friction Between Single-Asperity Contacts Xiang Wang; University of Pittsburgh, United States.

10:00 PM *CH03.16.04

In Situ TEM Studies of Microstructure Control During Nanoscale Phase Transformation Judy Cha; Yale University, United States.

10:30 PM *CH03.01.01

The New *Operando*—Incorporation Intelligent Decisions into *In Situ* TEM Mitra Taheri; Johns Hopkins University, United States.

SYMPOSIUM DS01

Integrating Machine Learning and Simulations for Materials Modeling, Design and Manufacturing
May 8 - May 24, 2022

Symposium Organizers

Mathieu Bauchy, University of California, Los Angeles
Mathew Cherukara, Argonne National Laboratory
Grace Gu, Massachusetts Institute of Technology
Badri Narayanan, University of Louisville

* Invited Paper

SESSION DS01.01: Simulation and Machine Learning I
Session Chair: Mathieu Bauchy
Sunday Morning, May 8, 2022
Hawai'i Convention Center, Level 3, Lili'U Theater, 310

9:00 AM DS01.01.01

Graph Neural Network for Improved Property Predictions of Molecules, Solids and Metal Organic Frameworks [Kamal Choudhary](#); National Institute of Standards and Technology, United States.

9:15 AM DS01.01.02

Theoretical Prediction of the Electronic and Structural Properties of Van der Waals Heterostructures Using a Combined Machine Learning and Density Functional Theory Approach [Daniel Wilhelm](#); Texas A&M University, United States.

9:30 AM DS01.01.03

Efficient Pneumatic Gripper Simulator Using Machine Learning And Optimization [Zhizhou Zhang](#); University of California, Berkeley, United States.

9:45 AM DS01.01.04

Accelerating Phase-Field Based Predictions via Surrogate Models Trained by Machine Learning Methods [Remi Dingreville](#); Sandia National Laboratories, United States.

10:00 AM BREAK

10:30 AM DS01.01.05

A Machine Learning Framework for Damage Mechanism Identification from Acoustic Emission in Unidirectional SiC/SiC CMCs [Caelin Muir](#); University of California, Santa Barbara, United States.

10:45 AM DS01.01.06

Computational and Machine Learning Approach to Electrochemistry of Disordered Rocksalt Cathode Materials [Peichen Zhong](#)^{1,2}; ¹University of California, Berkeley, United States; ²Lawrence Berkeley National Laboratory, United States.

11:00 AM DS01.01.07

Automated Framework for the Inversion of Experimental Data to Atomistic Structure Using Computer Vision and Multi-Objective Evolutionary Algorithms [Venkata Surya Chaitanya Kolluru](#); Argonne National Laboratory, United States.

11:15 AM DS01.01.08

Lightweight and Strong Lattice Structure Designs by Generative Machine Learning and Additive Manufacturing [Sangryun Lee](#); University of California, Berkeley, United States.

11:30 AM DS01.01.09

Molecular Dynamics Simulations for the Molecular Polarization of Salt-Free and Salt-Containing Liquids with Stockmayer Fluids and Ensemble Neural Networks [Issei Nakamura](#); Michigan Technological University, United States.

SESSION DS01.02: Simulation and Machine Learning II
Session Chair: Mathieu Bauchy
Sunday Afternoon, May 8, 2022
Hawai'i Convention Center, Level 3, Lili'U Theater, 310

1:30 PM *DS01.02.01

Neural Networks for Modeling Materials with Long-Range Interactions [Emine Kucukbenli](#)^{1,2}; ¹Boston University, United States; ²Harvard University, United States.

2:00 PM DS01.02.02

Crystal Diffusion Variational Autoencoder for Periodic Material Generation [Tian Xie](#); Massachusetts Institute of Technology, United States.

2:15 PM DS01.02.04

Predicting Plastic Anisotropy Using Crystal Plasticity and Bayesian Neural Network Surrogate Models [David Montes de Oca Zapain](#); Sandia National Laboratories, United States.

2:30 PM DS01.02.05

Using ML Tools to Enable High-throughput Studies of Amorphous Material Surfaces, and Its Application to Plasma Etching [Martin Siron](#)^{1,2}; ¹University of California, Berkeley, United States; ²Intel Corporation, United States.

2:45 PM BREAK

3:15 PM DS01.02.06

Predicting Compositional Changes of Organic-Inorganic Hybrid Materials with Augmented CycleGAN [Qianxiang Ai](#); Fordham University, United States.

3:30 PM DS01.02.07

Learning to Simulate Time-Averaged Coarse-Grained Molecular Dynamics with Geometric Machine Learning [Xiang Fu](#); Massachusetts Institute of Technology, United States.

3:45 PM DS01.02.08

Atomistic Modeling and Uncertainty Quantification for Mechanical Properties of Graphene Aerogels [Bowen Zheng](#); University of California, Berkeley, United States.

4:00 PM DS01.02.09

Predicting Solvent-Polymer Solubility with Machine Learning [Joseph D. Kern](#); Georgia Institute of Technology, United States.

SESSION DS01.03: Simulation and Machine Learning III

Session Chairs: Ekin Cubuk and Badri Narayanan

Monday Morning, May 9, 2022

Hawai'i Convention Center, Level 3, Lili'u Theater, 310

10:30 AM *DS01.03.01

Polymer Informatics—Recent Advances in Algorithms to Solve Forward and Inverse Problems [Rampi Ramprasad](#); Georgia Institute of Technology, United States.

11:00 AM DS01.03.02

Learning Hierarchical Synthesis Recipes by Spectral Shape Matching and Optimization on Hyperbolic Spaces [Kiran Vaddi](#)^{1,2}; ¹University of Washington, United States; ²University of Washington, United States.

11:15 AM DS01.03.03

Studying Disordered Material Dynamics Using a Simulator/Machine Learning Pipeline for X-Ray Speckle Analysis [Sathya R. Chitturi](#)^{1,2}; ¹Stanford University, United States; ²SLAC National Accelerator Laboratory, United States.

11:30 AM DS01.03.04

Calibrating DFT Formation Enthalpy Calculations by Multi-Fidelity Machine Learning [Sheng Gong](#); Massachusetts Institute of Technology, United States.

11:45 AM DS01.03.05

Case Studies in Representation Learning for Inverse Materials Design [Wesley Reinhart](#); The Pennsylvania State University, United States.

SESSION DS01.04: Simulation and Machine Learning IV

Session Chair: Grace Gu

Monday Afternoon, May 9, 2022

Hawai'i Convention Center, Level 3, Lili'u Theater, 310

1:30 PM *DS01.04.01

Materials Discovery Using Deep Learning and Differentiable Physics [Ekin D. Cubuk](#); Google, United States.

2:00 PM DS01.04.02

CO-Induced Restructuring of Pt Nanoparticles from Machine-Learning Molecular Dynamics—Bayesian Active Learning and Neural Network Approaches [Cameron J. Owen](#); Harvard University, United States.

2:15 PM DS01.04.03

Learning Hidden Elasticity with Deep Neural Networks [Chun-Teh Chen](#); University of California, Berkeley, United States.

2:30 PM DS01.04.04

Fully Automated Nanoscale to Atomistic Structure from Theory and X-Ray Spectroscopy Experiments [Davis G. Unruh](#); Argonne National Laboratory, United States.

2:45 PM DS01.04.05

Decision Trees in Continuous Action Space for High-Throughput Exploration of Potential Energy Surface of Nanoclusters [Sukriti Manna](#); Argonne National Laboratory, United States.

3:00 PM BREAK

3:30 PM DS01.04.06

High-Throughput Simulation for Machine Learning and Transfer Learning for Applications in Automated Characterization with High-Resolution Transmission Electron Microscopy (HRTEM) [Luis E. Rangel DaCosta](#); University of California, Berkeley, United States.

3:45 PM DS01.04.07

Many-Body Interatomic Potential with Bayesian Active Learning, an Application to SiC [Yu Xie](#); Harvard University, United States.

4:00 PM DS01.04.08

Process Modeling of Direct Ink Write 3D Printing Using Computer Vision and Machine Learning [Devin J. Roach](#); Sandia National Laboratories, United States.

4:15 PM DS01.04.09

A Critical Assessment of Neural Network Potentials for Water and the Role of Nuclear Quantum Effects Through the Van Hove Correlation Function [Murali Gopal Muraleedharan](#); Oak Ridge National Laboratory, United States.

4:30 PM DS01.04.10

Machine-Learning Interatomic Potentials for Bulk Metallic Glasses [Nicholas Martinez](#); University of North Texas, United States.

4:45 PM DS01.04.11

Data Ecosystem of the Ultrahigh Temperature Refractory Alloys (ULTERA) Database [Adam M. Krajewski](#); The Pennsylvania State University, United States.

SESSION DS01.05: Simulation and Machine Learning V
Session Chairs: N M Anoop Krishnan and Badri Narayanan
Tuesday Morning, May 10, 2022
Hawai'i Convention Center, Level 3, Lili'U Theater, 310

8:30 AM *DS01.05.01

Active Learning of Neural Network Interatomic Potentials with Differentiable Uncertainty [Rafael Gomez-Bombarelli](#); Massachusetts Institute of Technology, United States.

9:00 AM DS01.05.02

NequIP—Equivariance Enables Machine Learning Interatomic Potentials at Unprecedented Sample Efficiency and Accuracy [Simon L. Batzner](#); Harvard University, United States.

9:15 AM DS01.05.03

Navigating to Islands of Photostability—Multi-Objective Optimization of Perovskite Absorber Compositions for Targeted Photovoltaic Applications Using High-Throughput Robotic Experimentation [Rishi Kumar](#)^{1,2}; ¹University of California, San Diego, United States; ²University of California, San Diego, United States.

9:30 AM DS01.05.04

Understanding Phase Stability and Phase Transition of Boron Suboxide Using First-Principles Based Potentials [Bin Liu](#); Kansas State University, United States.

9:45 AM DS01.05.05

Exploring Kinetic Pathways for Ice Nucleation Using Evolutionary Reinforcement Learning [Anirban Chandra](#); University of Illinois at Chicago, United States.

10:00 AM BREAK

10:30 AM DS01.05.06

Computer Vision and Artificial Intelligence for Smart Additive Manufacturing [Grace Gu](#); University of California, Berkeley, United States.

10:45 AM DS01.05.07

Overcoming Data Scarcity in Materials Science with Meta-Learning [Rees Chang](#); University of Illinois at Urbana-Champaign, United States.

11:00 AM DS01.05.08

Free Energy Calculation of Crystalline Solids Using Normalizing Flow [Rasool Ahmad](#); Stanford University, United States.

11:15 AM DS01.05.09

Ab Initio Modeling Data Based Autoencoder to Interpret ARPES Data and Assist Inverse Design of Semiconductor Heterostructures [Sanghamitra Neogi](#); University of Colorado Boulder, United States.

11:30 AM DS01.05.10

How Machine Learning Can Help Thermodynamics and Kinetics Modeling in Metallic Materials [Liang Tian](#); University of Alabama, United States.

SESSION DS01.06: Simulation and Machine Learning VI
Session Chairs: Rafael Gomez-Bombarelli and Grace Gu
Tuesday Afternoon, May 10, 2022
Hawai'i Convention Center, Level 3, Lili'U Theater, 310

1:30 PM *DS01.06.01

ML+Modeling for Materials Characterization and Design [Maria K. Chan](#); Argonne National Laboratory, United States.

2:00 PM DS01.06.02

Designing New Forcefield Using Board AI [Troy Loeffler](#); Argonne National Laboratory, United States.

2:15 PM DS01.06.03

GDSPEC—Graph Order and Atomic Density Spectrum for Learning Chemical Environments [Suvo Banik](#); University of Illinois at Chicago, United States.

2:30 PM DS01.06.04

Multi-Reward Reinforcement Learning Based Inter-Atomic Potential Models for Silica [Aditya Koneru](#)^{1,2}; ¹University of Illinois at Chicago, United States; ²Argonne National Laboratory, United States.

2:45 PM DS01.06.05

Towards Systematically Improvable Deep Learning Interatomic Potentials with Deep Interatomic Cluster Expansions (DICE) [Albert Musaelian](#); Harvard University,

United States.

3:00 PM BREAK

3:30 PM DS01.06.06

Multi-Objective Optimization of Graphene-Based Sensors with Batch Evaluations [Patrick Johnson](#); University of Wyoming, United States.

3:45 PM DS01.06.07

Inductive Bise Graph Network for Robust Molecular Dynamics Simulation of Materials [Pankaj Rajak](#); University of Southern California, United States.

4:00 PM DS01.06.08

High-Throughput Experiments and Holistic Integration with Computational Data to Accelerate Alloy Design [Ji-Cheng Zhao](#); University of Maryland, United States.

4:15 PM DS01.06.09

Bio-Inspired Computational Design of Vascularized Electrodes for High-Performance Fast-Charging Batteries Optimized by Deep Learning [Po-Chun Hsu](#); Duke University, United States.

4:30 PM DS01.06.10

Machine Learning for Exploration of Defects in 2D Grain Boundaries [Jianan Zhang](#); University of Illinois at Chicago, United States.

4:45 PM DS01.06.11

Data Problems in Materials Modeling and Closed-Loop Experiments [Henry Chan](#); Argonne National Laboratory, United States.

SESSION DS01.07: Poster Session I: Integrating Machine Learning and Simulations for Materials Modeling, Design and Manufacturing I

Session Chairs: Rafael Gomez-Bombarelli and N M Anoop Krishnan

Tuesday Afternoon, May 10, 2022

5:00 PM - 7:00 PM

Hawai'i Convention Center, Level 1, Kamehameha Exhibit Hall 2 & 3

DS01.07.01

Machine Learning Model for Electrical and Thermal Conductivities of Copper – Carbon Nanotubes Composites [Faizan Ejaz](#); Arizona State University, United States.

DS01.07.02

A Machine Learning Study for Designing Thin-Film Optical Metamaterials [Goeun Kim](#); Kyung Hee University, Korea (the Republic of).

DS01.07.03

Machine Learning-Based Optimization of Biomimetic Hierarchical Porous Structures Inspired by the Sea Glass Sponge [Ailin Chen](#); University of California, Berkeley, United States.

DS01.07.04

Crystal Level Features Developed Using Edge Prediction on Graphs Derived from Crystals [Divya Sharma](#); Johns Hopkins University, United States.

DS01.07.05

Generative Machine Learning Approach for Asymmetric Cellular Architectures with Enhanced Mechanical Properties [Shao-Yi Yu](#); University of California, Berkeley, United States.

DS01.07.06

Machine-Learning Accelerated Synthesis of Nitride Materials—Prediction of Synthesis Pathways [Linus Kautzsch](#); University of California, Santa Barbara, United States.

SESSION DS01.08: Simulation and Machine Learning VII

Session Chairs: Mathieu Bauchy and Valeria Molinero

Wednesday Morning, May 11, 2022

Hawai'i Convention Center, Level 3, Lili'U Theater, 310

8:30 AM *DS01.08.01

Investigating Atomic-Scale Mechanisms of Crystallization Using Machine Learning [Rodrigo Freitas](#); Massachusetts Institute of Technology, United States.

9:00 AM DS01.08.02

Data-Driven Decision Making for Autonomous Materials Synthesis [Nathan Szymanski](#)^{1,2}; ¹University of California, Berkeley, United States; ²Lawrence Berkeley National Laboratory, United States.

9:15 AM DS01.08.03

A Cluster-Based Approach for Identifying and Meshing Crystalline Regions in Molecular Dynamics Simulation [Thomas J. Barrett](#); Northeastern University, United States.

9:30 AM DS01.08.04

Automated Discovery of Chemical Reaction Kinetics for Carbon Dioxide Capture Solutions [Theodore G. van Kessel](#); IBM, United States.

9:45 AM DS01.08.05

A Data-Driven Approach to Predict Full-Field Nonlinear Stress Distribution and Crack Path in Microstructural Representation of Composites [Maryam Shakiba](#); Virginia Tech, United States.

10:00 AM BREAK

10:30 AM DS01.08.06

Differentiable Physics for Materials Discovery [Samuel S. Schoenholz](#); Google, United States.

10:45 AM DS01.08.07

Controlling Hydrogen Cottrell Atmospheres Around Dislocations in Austenitic Stainless Steels Through Alloying Using a Combined MD-DFT Pipeline [Chris Nowak](#); Sandia National Laboratories, United States.

11:00 AM DS01.08.08

Machine-Learning Studies of Hydrogen Effects on Stacking Fault Energies in an Fe_{0.70}Ni_{0.11}Cr_{0.19} Austenitic Stainless Steels [Xiaowang Zhou](#); Sandia National Laboratories, United States.

11:15 AM DS01.08.09

On Generalizability of Data-Driven Microstructure-Property Mappings in Organic Solar Cells [Hao Liu](#); University at Buffalo, The State University of New York, United States.

11:30 AM DS01.08.10

Unsupervised Large-Scale 3D Phase-Contrast Imaging From Scanning Diffraction Measurements [Philipp M. Pelz](#)^{1,2}; ¹UC Berkeley, United States; ²National Center for Electron Microscopy, United States.

SESSION DS01.09: Simulation and Machine Learning VIII

Session Chair: Mathieu Bauchy

Wednesday Afternoon, May 11, 2022

Hawai'i Convention Center, Level 3, Lili'u Theater, 310

1:30 PM *DS01.09.01

Elucidating the Mechanisms of Synthesis of Zeolites Using Data Science and Molecular Simulations [Valeria Molinero](#); University of Utah, United States.

2:00 PM DS01.09.03

Ultra-Fast Interpretable Machine-Learning Potentials for Metals and Semiconductors [Richard Hennig](#); University of Florida, United States.

2:15 PM DS01.09.04

Data-Augmentation for Graph Neural Network Learning of the Relaxed Energy of Unrelaxed Structures [Jason B. Gibson](#); University of Florida, United States.

2:30 PM BREAK

3:00 PM DS01.09.05

Graph-Based Strategy for Microstructure Similarity in Large Datasets [Parth Desai](#); University at Buffalo, The State University of New York, United States.

3:15 PM DS01.09.06

Data-Driven Field Inversion of Molecular Simulations to Construct Free Energy Landscapes of Organic Semiconducting Systems [Chih-Hsuan \(Bella\) Yang](#); Iowa State University, United States.

3:30 PM DS01.09.07

Reinforcement Learning for Molecule Space Exploration: Conditioned Latent Representations via Large Scale Self-Supervised Learning [Chih-Hsuan \(Bella\) Yang](#); Iowa State University, United States.

3:45 PM DS01.09.08

Determining the Thermal Conductivity and Phonon Behavior of SiC Materials with Quantum Accuracy via Deep Learning Interatomic Potential Model [Baoqin Fu](#); Sichuan University, China.

4:00 PM DS01.09.10

Exploring the Necessary Complexity of Interatomic Potentials [Joshua Vita](#); University of Illinois at Urbana-Champaign, United States.

SESSION DS01.10: Poster Session II: Integrating Machine Learning and Simulations for Materials Modeling, Design and Manufacturing II

Session Chair: Valeria Molinero

Wednesday Afternoon, May 11, 2022

5:00 PM - 7:00 PM

Hawai'i Convention Center, Level 1, Kamehameha Exhibit Hall 2 & 3

DS01.10.01

Towards Interpretable Polyamide Property Prediction [Franklin L. Lee](#); Corning Incorporated, United States.

DS01.10.02

Multiscale Neural-Network Quantum Molecular Dynamics and Molecular Mechanics for Polar Topological Structures [Ken-ichi Nomura](#); University of Southern California, United States.

DS01.10.03

Fast Assessment of Metal Performances Through Dislocation Physics and Machine Learning [Jaehyun Cho](#)^{1,2}; ¹NASA Ames Research Center, United States; ²Analytical Mechanics Associates, United States.

DS01.10.04

Calibrated Uncertainty for Molecular Property Prediction [Jonas Busk](#); Technical University of Denmark, Denmark.

DS01.10.05

Learning Interatomic Potentials from First Principles Data Using Symbolic Regression [Bilvin Varughese](#)^{1,2}; ¹University of Illinois Chicago, United States; ²Argonne National Laboratory, United States.

DS01.10.06

Motif-Based Graph Neural Networks for Predicting Quantum Molecular Properties [Pengyu Hong](#); Brandeis University, United States.

DS01.10.07

Discovery of Structure-Property Relationships of Intercalated Graphite Compounds Using Machine Learning [Olivia F. Milavetz](#); Rowland Hall, United States.

SESSION DS01.11: Simulation and Machine Learning IX

Session Chairs: Raymundo Arroyave and Mathieu Bauchy

Thursday Morning, May 12, 2022

Hawai'i Convention Center, Level 3, Lili'U Theater, 310

8:30 AM DS01.11.01

Physics-Based Electronic Structure Theory Development Enabling Large-scale Materials Simulations [Jin Qian](#)^{1,2}; ¹Lawrence Berkeley National Laboratory, United States; ²California Institute of Technology, United States.

8:45 AM DS01.11.03

Neuro-Symbolic Reinforcement Learning for Polymer Discovery [Sarathkrishna Swaminathan](#); IBM Research, United States.

9:00 AM DS01.11.04

Molecular Dynamics Simulations of Solid Electrolyte Interfaces with NequIP Equivariant Machine Learning Models [Juan F. Gomez](#); Harvard University, United States.

9:15 AM DS01.11.05

Predicting the Dynamics of Atoms in Liquids by a Surrogate Machine-Learned Simulator [Mathieu Bauchy](#); University of California, Los Angeles, United States.

9:30 AM BREAK**10:00 AM DS01.11.06**

Machine Learning Force Field for B-C Systems and Applications to Mechanical Deformation [Qi An](#); University of Nevada, Reno, United States.

10:15 AM DS01.11.07

Using Convolutional Neural Networks to Segment Scanning Electron Microscopy Images of Graphene [Aagam Shah](#); University of Illinois at Urbana-Champaign, United States.

10:30 AM DS01.11.08

Physically-Informed Machine Learning Enhances Predictive Design of Fluorescent DNA-Stabilized Silver Clusters [Peter M. Mastracco](#); University of California, Irvine, United States.

SESSION DS01.12: Simulation and Machine Learning X

Session Chair: N M Anoop Krishnan

Thursday Afternoon, May 12, 2022

Hawai'i Convention Center, Level 3, Lili'U Theater, 310

1:30 PM *DS01.12.01

Towards Microstructure-Aware Autonomous Alloy Design [Raymundo Arroyave](#); Texas A&M University, United States.

2:00 PM DS01.12.02

Study of HfO₂ Phases Using Machine Learning Potentials [Sebastian Bichelmaier](#)^{2,1}; ¹KAI GmbH, Austria; ²Technical University of Vienna, Austria.

2:15 PM DS01.12.03

Intelligent Design of Solid-State Mechanochemical Transformations for Supramolecular Structures [Jan R. Gröls](#); University of Bath, United Kingdom.

2:30 PM DS01.12.04

Cost-Efficient Training of a Neural Network Potential by Means of Active Learning for Fast and Accurate Molecular Dynamics Simulations [Sung-Ho Lee](#)^{1,2}; ¹CEA-Leti, France; ²Université Grenoble Alpes, France.

2:45 PM BREAK**3:15 PM DS01.12.05**

A-RAFFLE—The Search for New Materials [Joe Pitfield](#); University of Exeter, United Kingdom.

3:30 PM DS01.12.06

Hierarchical Molecular Time Dynamics Models [Max Wilson](#); DTU, Denmark.

3:45 PM DS01.12.07

AI-Enhanced Manufacturing to Improve Material Formulations [Federico Zipoli](#); IBM Research Zurich, Switzerland.

4:00 PM DS01.12.08

The Identification of Transition Mechanism and Estimation of the rate of Atomic Rearrangements Accelerated with Gaussian Process Regression [Hannes Jonsson](#)^{1,2}; ¹University of Iceland, Iceland; ²Faculty of Physical Sciences, Iceland.

4:15 PM DS01.12.09

Machine Learning Assisted Modelling of a Ductile Fracture [Sandra Baltic](#); Materials Center Leoben Forschung GmbH, Austria.

SESSION DS01.13: Simulation and Machine Learning XI
Session Chair: Badri Narayanan
Friday Morning, May 13, 2022
Hawai'i Convention Center, Level 3, Lili'U Theater, 310

8:30 AM DS01.13.02

Unified Language of Synthesis Actions for Representation of Synthesis Protocols—Making Steps Toward Autonomous Materials Synthesis [Zheren Wang](#)^{1,2}; ¹University of California, Berkeley, United States; ²Lawrence Berkeley National Laboratory, United States.

8:45 AM DS01.13.03

Structure and Dielectric Properties of Aqueous LiOH Solutions Using Neural Network Quantum Molecular Dynamics [Ruru Ma](#); University of Southern California, United States.

9:00 AM DS01.13.04

Large-Scale Dynamics Simulations of Complex Liquid Electrolytes with NequIP Equivariant Machine Learning [Nicola Molinari](#)^{1,2}; ¹Harvard University, United States; ²Robert Bosch LLC, United States.

9:15 AM DS01.13.05

A Reinforcement Learning-Based Approach to find the Global Minimum of Atomically Precise Nanoclusters [Sukriti Manna](#); Argonne National Laboratory, United States.

9:30 AM BREAK**10:00 AM DS01.13.06**

Automation to Improve the Research Process via Human-Robot Interactions [Anesia D. Auguste](#)^{2,1}; ¹Air Force Research Laboratory, United States; ²UES, Inc., United States.

10:15 AM DS01.13.07

Efficient Multiscale Multiphysics Modeling with Machine Learning Based Surrogate Models [Joshua Stuckner](#); NASA Glenn Research Center, United States.

10:30 AM DS01.13.08

Exploring Polymer Degradation Pathways Using Reinforcement Learning and Monte Carlo Tree Search [Rohit Batra](#); Argonne National Laboratory, United States.

10:45 AM DS01.13.09

Predicting Indium Phosphide Quantum Dot Properties Using Machine Learning on Synthetic Procedures [Hao A. Nguyen](#); University of Washington, United States.

SESSION DS01.14: Simulation and Machine Learning XII
Session Chairs: N M Anoop Krishnan and Subramanian Sankaranarayanan
Friday Afternoon, May 13, 2022
Hawai'i Convention Center, Level 3, Lili'U Theater, 310

1:30 PM DS01.14.01

Deep Learning Techniques for Integrated Circuit Die Performance Prediction [Alexander Kovalenko](#)^{1,2}; ¹Inference Technologies, Czechia; ²Czech Technical University in Prague, Czechia.

1:45 PM DS01.14.02

Understanding Self-Assembly Behavior with Self-Supervised Learning [Matthew Spellings](#); Vector Institute, Canada.

2:00 PM DS01.14.03

AI Physicist—Data-Driven Discovery of Mathematical Expressions via Natural Language Processing [Juwon Na](#); Pohang University of Science and Technology, Korea (the Republic of).

2:15 PM DS01.14.04

Deep Learning-Based Prediction of Electrical Properties of Polymers with Feature Extraction of Process Conditions [Hajime Shimakawa](#); The University of Tokyo, Japan.

2:30 PM BREAK**3:00 PM DS01.14.05**

Multi-Property Prediction of Polymers and Exploration of Optimal Polymer Structures with Deep Learning [Hajime Shimakawa](#); The University of Tokyo, Japan.

3:15 PM DS01.14.06

Data-Driven Prediction of CO₂ Absorption Performances of Aqueous Amine Solutions via Multi-Task Transfer Learning [Yuta Aoki](#); The Institute of Statistical Mathematics, Japan.

3:30 PM DS01.14.08

Informing Experiments Through Visualization and Machine-learned Representations of Text-Mined Materials Synthesis Conditions [Kevin J. Cruse](#)^{1,2}; ¹University of California, Berkeley, United States; ²Lawrence Berkeley National Laboratory, United States.

3:45 PM DS01.14.09

Structure and Dynamics of Supercritical Water Determined with Neural Network Quantum Molecular Dynamics [Nitish Baradwaj](#); University of Southern California, United States.

SESSION DS01.15: Simulation and Machine Learning XIII
Session Chairs: Mathew Cherukara and Badri Narayanan
Monday Morning, May 23, 2022
DS01-Virtual

10:30 AM *DS01.15.01

Modelling of Complex Energy Materials with Machine Learning [Nongnuch Artrith](#); Debye Institute for Nanomaterials Science, Netherlands.

11:00 AM DS01.15.02

Optimization of Superconductors Fabrication by High-Throughput Experimentation and Machine Learning [Albert Queraltó](#); ICMAB-CSIC, Spain.

11:15 AM DS01.15.03

Identification of Enzymatic Active Sites with Unsupervised Language Modelling [Matteo Manica](#); IBM Research Europe, Switzerland.

11:30 AM DS01.15.04

Regression Transformer—Blending Numerical and Textual Tokens for Concurrent Property Prediction and Conditional Generation [Jannis Born](#)^{1,2}; ¹IBM Research Europe, Switzerland; ²ETH Zürich, Switzerland.

11:45 AM DS01.15.05

Disambiguation of Amorphous Magnetic Microwire Signatures [Akshar Varma](#); Northeastern University, United States.

12:00 PM DS01.15.06

Data-Driven Approaches for Defect Concentration Prediction of Microwave-Synthesized TiO₂ [Shuyan Zhang](#); Carnegie Mellon University, United States.

12:15 PM DS01.15.07

Strain Engineering of Monolayer MoS₂ on SiO₂ Substrate by Developing a Neural Network Interatomic Potential Based on Density Functional Theory [Ali Barooni](#); University of Tehran, Iran (the Islamic Republic of).

12:20 PM DS01.15.08

Application of Radiation Detection Materials for Radiation Source Mapping with Machine Learning [Ryotaro Okabe](#); Massachusetts Institute of Technology, United States.

12:25 PM DS01.15.09

Long Time-Scale Accuracy of Neural Network Potentials in Molecular Dynamics Simulations [Difan Zhang](#); Pacific Northwest National Laboratory, United States.

SESSION DS01.16: Simulation and Machine Learning XIV
Session Chairs: Mathew Cherukara and Grace Gu
Monday Afternoon, May 23, 2022
DS01-Virtual

1:00 PM *DS01.16.01

Controlled Conjugated Polymer Assembly by Autonomous Solution-Processing Platform [Jie Xu](#); Argonne National Lab, United States.

1:30 PM DS01.16.02

Design of Graphene-Based Anhydrous Proton Conducting Materials Using Deep Learning Methods [Siddarth K. Achar](#); University of Pittsburgh, United States.

1:45 PM DS01.16.03

Deep Neural Networks for Predicting Formation Energy and Synthesizability of Crystal Structures [Ali Davariashtiyani](#); University of Illinois at Chicago, United States.

2:00 PM DS01.16.04

Insights from Computational Studies on the Anisotropic Volume Change of Li_xNiO₂ at High State of Charge (x < 0.25) [Juan C. Garcia](#); Argonne National Laboratory, United States.

2:15 PM DS01.16.05

Accelerating the Prediction of Large Carbon Clusters via Structure Search—Evaluation of Machine-Learning and Classical Potentials [Bora Karasulu](#)^{1,2}; ¹University of Warwick, United Kingdom; ²Happy Electron Ltd., United Kingdom.

2:30 PM DS01.16.06

On-Demand Generation of Large Polymer Datasets for Accelerated Materials Discovery [Pedro L. Arrechea](#); IBM, United States.

2:45 PM DS01.16.07

Finite-temperature Crystal Structure Prediction of Lithium Using Machine Learning Potentials [James Chapman](#); Lawrence Livermore National Laboratory, United States.

SESSION DS01.17: Simulation and Machine Learning XV
Session Chairs: Mathew Cherukara and N M Anoop Krishnan
Monday Afternoon, May 23, 2022
DS01-Virtual

6:30 PM *DS01.17.01

Inverse Design of Silver Nanoparticles Using Multi-Target Machine Learning [Amanda Barnard](#); Australian National University, Australia.

7:00 PM *DS01.17.02

Smart Systems Engineering Contributing to the Life Cycle of Material Discovery and a Net-Zero Future [Xiaonan Wang](#)^{2,1}; ¹National University of Singapore, Singapore; ²Tsinghua University, China.

7:30 PM *DS01.17.03

Robust Topological Designs for Extreme Metamaterial Micro-Structures [Souvik Chakraborty](#); IIT Delhi, India.

8:00 PM DS01.17.04

Computing Device Signatures in Resistive-Switching Memory Materials—Utilization of Machine Learning [Shao Xiang Go](#); Singapore University of Technology and Design, Singapore.

8:05 PM DS01.11.02

Machine Learning the Scaling Property of Density Functionals via Data Augmentation [Weiyi Gong](#); Temple University, United States.

8:20 PM *DS01.13.01

Reinforcement Learning for Inverse Design of Materials [Subramanian Sankaranarayanan](#); Argonne National Laboratory, United States.

SESSION DS01.18: Simulation and Machine Learning XVI

Session Chairs: Mathew Cherukara and Jie Xu

Tuesday Morning, May 24, 2022

DS01-Virtual

10:30 AM *DS01.18.01

Discovering Interactions Laws of Multiparticle Systems with Lagrangian Neural Networks [N M Anoop Krishnan](#); Indian Institute of Technology Delhi, India.

11:00 AM DS01.18.02

Images as Molecular Descriptors for Materials Discovery [Matthew Wilkinson](#); University of Bath, United Kingdom.

11:15 AM DS01.18.03

Deep Reinforcement Learning for Autonomous Discovery of Atomic Transition Pathways [Bjarke Hastrup](#); Technical University of Denmark, Denmark.

11:30 AM DS01.18.04

Achieving Machine Learning Generalizability Using Out-of-Domain Prediction of Adsorption Energies on High-Entropy Alloys [Ritesh Kumar](#); Indian Institute of Science, India.

11:45 AM DS01.18.05

Atomistic Simulation of Plasmonic Hot Carrier Dynamics Using Machine Learning [Adela Habib](#); Los Alamos National Laboratory, United States.

12:00 PM *DS01.18.06

Predicting New Materials that Exhibit Magnetocaloric Effects Using Concerted Text-Mining and Machine-Learning with Computational Screening [Jacqueline M. Cole](#)^{1,2};

¹University of Cambridge, United Kingdom; ²ISIS Pulsed Neutron and Muon Source, United Kingdom.

SYMPOSIUM DS02

Advanced Manufactured Materials—Innovative Experiments, Computational Modeling and Applications
May 9 - May 24, 2022

Symposium Organizers

Vitor Coluci, UNICAMP
Kun Fu, University of Delaware
Veruska Malavé, National Institute of Standards and Technology
Hui Ying Yang, SUTD

* Invited Paper

SESSION DS02.01: Metal Additive Manufacturing: Characterization, Properties, and Modeling I

Session Chair: Vitor Coluci

Tuesday Morning, May 10, 2022

Hawai'i Convention Center, Level 3, 313C

8:30 AM *DS02.01.01

Electronically Available NIST/TRC Resource for Thermophysical Property Data of Metal Systems [Boris Wilthan](#); NIST, United States.

9:00 AM *DS02.01.02

Simultaneous X-Ray Imaging and Laser Absorption Radiometry—A Unique Combination for Simulation Validation [Brian Simonds](#); NIST, United States.

9:30 AM DS02.01.03

Experiment/Simulation Integration Approach to Investigate Microstructure and Plastic Deformation of AM 316L Stainless Steels [Thomas Voisin](#); Lawrence Livermore National Laboratory, United States.

9:45 AM BREAK

10:15 AM DS02.01.04

Influence of High-Intensity Ultrasound on Ti-6Al-4V Microstructure During Laser Powder Bed Fusion Solidification Conditions [Brodan M. Richter](#); NASA Langley Research Center, United States.

10:30 AM DS02.01.05

The Additive Manufacturing Moment Measure—A Parallel Computation Technique for Determining Build Variance in the Laser Powder Bed Fusion Process [J.-A. S. Hocker](#); NASA Langley Research Ctr, United States.

10:45 AM DS02.01.06

Fused Filament Fabrication of 316L Stainless Steel—Microstructures and Properties Arising from the Sintering Step [Marius Wagner](#); ETH Zürich, Switzerland.

11:00 AM DS02.01.07

A Novel Approach to Study the Sulfidation Kinetics of Ti-6Al-4V with and Without Iodine for Additive Manufacturing Applications [Subbarao Raikar](#); Colorado School of Mines, United States.

11:15 AM DS02.01.08

Design of Cellular Lattices by Atom-Mimetics—How to reproduce Elastic Anisotropy of Metals [Sosuke Kanegae](#); Osaka University, Japan.

SESSION DS02.02: Metal Additive Manufacturing: Characterization, Properties, and Modeling II

Session Chairs: Kun Fu and Brian Simonds

Tuesday Afternoon, May 10, 2022

Hawai'i Convention Center, Level 3, 313C

1:30 PM *DS02.02.01

Applications of X-Ray Tomography to Additively Manufactured Materials [Edward J. Garboczi](#); NIST, United States.

2:00 PM DS02.02.02

Developing Capabilities to Predict Fatigue and Fracture Behavior of Additively Manufactured Parts Containing a Range of Pore and Grain Structures [Jake Benzing](#); National Institute of Standards and Technology, United States.

2:15 PM BREAK

2:45 PM DS02.02.03

Solid-State Additive Manufacturing of Al-Si-Mg-Graphene Metal Matrix Composites [Jessica Lopez](#); The University of Alabama, United States.

3:00 PM DS02.02.04

Time Resolved Strain Evolution Under Additive Manufacturing Conditions [Philip DePond](#); Stanford University, United States.

3:15 PM DS02.02.05

Role of Micro Residual Stress on Deformation of Additively Manufactured Steel [Abdullah Al Mamun](#); Bangor University, United Kingdom.

3:30 PM DS02.02.06

Combating Localized Corrosion in Additively Manufactured 316L Using Ceramic Dopants [William S. Cunningham](#); Stony Brook University, United States.

3:45 PM DS02.02.07

Hydrogel Infusion Additive Manufacturing of Mesoscale Metals and Alloys—Opportunities and Challenges for Modeling and Optimization [Max Saccone](#); California Institute of Technology, United States.

SESSION DS02.03: Poster Session I: Additive Manufacturing: Properties and Experimental and Modeling Characterization I

Session Chair: Hui Ying Yang

Tuesday Afternoon, May 10, 2022

5:00 PM - 7:00 PM

Hawai'i Convention Center, Level 1, Kamehameha Exhibit Hall 2 & 3

DS02.03.01

Additively Manufactured Bimetallic Turbine Blade [Gwang Ho Jeong](#); Changwon National university, Korea (the Republic of).

DS02.03.02

Mechanical Strength Behavior of 3D-Printed Composites Manufactured According to the Difference in the Rotational Tool Path [Ye Jin Kim](#); Changwon National University, Korea (the Republic of).

DS02.03.03

Performance Evaluation of Post-Processing Depending on Surface Roughness of the Additively Manufactured Metal Parts [Hwi Jun Son](#); Changwon National University, Korea (the Republic of).

DS02.03.04

Wire Arc Additive Manufacturing Using High Hardness Steel and Virtual Process of Robot Simulator [Chang Jong Kim](#); Changwon National University, Korea (the Republic of).

DS02.03.05

Multiple Laser Beam Processing in Powder Bed Fusion [Marco Rupp](#); Princeton University, United States.

SESSION DS02.04: Resin 3D Printing: Materials, Processes, Modeling, and Characterization I

Session Chairs: Hui Ying Yang and Mostafa Yourdkhani

Wednesday Morning, May 11, 2022

Hawai'i Convention Center, Level 3, 313C

8:30 AM *DS02.04.01

Potential Applications of Computed Axial Lithography in Manufacturing Optical Elements [Yaxuan Sun](#); University of California, Berkeley, United States.

9:00 AM *DS02.04.02

Multiphysics Modeling and Experimental Study of a Concurrent Polymerization and Vascularization Process for Manufacturing Polymer and Polymer Composites with Embedded Microvascular System [Xiang Zhang](#); University of Wyoming, United States.

9:30 AM BREAK

10:00 AM DS02.04.03

Predicting Char Yield of High-Temperature Resins [Jacob Gissingner](#); NASA Langley Research Center, United States.

10:15 AM DS02.04.04

Wrinkle Formation in Multilayer Polymer-Based Composite Materials [Zeynab Mousavikhamene](#); Northwestern University, United States.

10:30 AM DS02.04.05

Self-Assembly in Supercritical Fluids: Using Photolithography for Additive Manufacturing [Loren G. Kaake](#); Simon Fraser University, Canada.

10:45 AM DS02.04.06

Harnessing Surface Tension Driven Flows During Frontal Polymerization for the Fabrication of Functional Materials [Justine E. Paul](#); University of Illinois at Urbana-Champaign, United States.

11:00 AM DS02.04.07

Multi-Material 3D Printing with a Twist [Natalie Larson](#); Harvard University, United States.

11:15 AM DS02.04.08

Responsive AM Feedstock Materials [Caitlyn C. Krikorian \(Cook\)](#); Lawrence Livermore National Laboratory, United States.

SESSION DS02.05: Resin 3D Printing: Materials, Processes, Modeling, and Characterization II

Session Chairs: Veruska Malavé and Mostafa Yourdkhani

Wednesday Afternoon, May 11, 2022
Hawai'i Convention Center, Level 3, 313C

1:30 PM *DS02.05.01

Frontal-Polymerization-Based 3D Printing of Thermoset Polymers and Composites—Experiments and Modeling [Xiang Zhang](#); University of Wyoming, United States.

2:00 PM DS02.05.02

Controlled Sequential Reactions for 3D Printing of Spatially Defined Multimodulus Materials [Steven Adelmund](#); Crystal Equation, United States.

2:15 PM DS02.05.03

Co-Printing of SiC Components Using Vibration Assisted Printing and Fused Filament Fabrication [I. Emre Gunduz](#)^{1,2}; ¹Naval Postgraduate School, United States; ²Purdue University, United States.

2:30 PM BREAK**3:00 PM DS02.05.04**

Visualizing and Mapping Resin Distribution During Thermal Debinding of Stereolithography Ceramics Using Neutron Imaging [Jacob LaManna](#); National Institute of Standards and Technology, United States.

3:15 PM DS02.05.05

Two-Photon Polymerized Trimodal Carbon Quantum Dot-Based Photonic Crystal for Ultra-Selective Detection of Blood Glucose [Sweta Rani](#); IITB-Monash Research Academy, Indian Institute of Technology Bombay, India.

3:30 PM DS02.05.06

Contrast is Key—Step Growth Polymerizations in Volumetric Additive Manufacturing [Johanna J. Schwartz](#); Lawrence Livermore National Laboratory, United States.

SESSION DS02.06: Poster Session II: Additive Manufacturing: Properties and Experimental and Modeling Characterization II

Session Chair: Veruska Malavé

Wednesday Afternoon, May 11, 2022

5:00 PM - 7:00 PM

Hawai'i Convention Center, Level 1, Kamehameha Exhibit Hall 2 & 3

DS02.06.01

WITHDRAWN 5/8/22 DS02.06.01 A New Approach to Dense Ceramic Additive Manufacturing: from Mechanism to Machine Implementation [Jong Wan Ko](#); Korea Institute of Industrial Technology, Korea (the Republic of).

DS02.06.02

FDM 3D Printing of Main-Chain Polybenzoxazine with Diels-Alder Moieties [E. A. Dineshi A. Peiris](#); The University of Arizona, United States.

DS02.06.03

WITHDRAWN 5/8/22 DS02.06.03 Polymer-Free Al₂O₃ Sol-Gel Slurry Composite for Materials Extrusion 3D Printing [Jong Wan Ko](#); Korea Institute of Industrial Technology, Korea (the Republic of).

DS02.06.04

Rugged Materials for Structural Electronics [Emily Huntley](#); Sandia National Laboratories, United States.

DS02.14.05

Optimization of Mechanical Interlocking Joints at Additively Manufactured Bi-Material Composite Interfaces [Elizabeth Pegg](#); University of California, Berkeley, United States.

SESSION DS02.07: Poster Session: Computational Modeling of Additively Manufactured, Nanocomposite and other Modern Materials

Session Chair: Hui Ying Yang

Monday Afternoon, May 9, 2022

5:00 PM - 7:00 PM

Hawai'i Convention Center, Level 1, Kamehameha Exhibit Hall 2 & 3

DS02.07.01

Multi-Jet Fusion Printed Lattice Materials—Characterization and Prediction of Mechanical Performance [Andrew Y. Chen](#); University of California, Berkeley, United States.

DS02.07.02

Simulation and Design of Piezoelectric Shape Morphing Geometries [Songhee Min](#); University of California, Berkeley, United States.

DS02.07.03

Machine Learning Nanoparticles for Disease Diagnostics and Food Safety [Mehmet V. Yigit](#); University of Albany, United States.

DS02.07.04

Designing Efficient Microarchitecture for Li-Ion Battery Electrode Using Fused Deposition Modelling [Albin Prince John](#); Purdue University, United States.

DS02.07.05

Mesoscale Modeling of Cold Spray Deposition of Tantalum Powders [Ching Chen](#); University of Connecticut, United States.

DS02.07.06

Creation of a Lattice Structure Showing a Thermally-Induced Phase Transition Using Bimetal [Hayato Nagayama](#); Osaka University, Japan.

DS02.07.07

Tubulanes as Lightweight Hypervelocity Impact Resistant Structures—From Atomic to 3D Printed Models [Raphael M. Tromer](#); Universidade Estadual de Campinas, Brazil.

SESSION DS02.08: Computational Modeling of Additively Manufactured and Layered Materials I

Session Chairs: Vitor Coluci and Veruska Malavé

Thursday Morning, May 12, 2022

Hawai'i Convention Center, Level 3, 313C

8:30 AM *DS02.08.01

Machine Learning-Accelerated Molecular Design of Multi-Functional Polymers—Shifting from Thomas Edison to Iron Man [Ying Li](#); University Of Connecticut, United States.

9:00 AM *DS02.08.02

Computational Thermal Multi-Phase Flow with Mixed Interface-Capturing/Interface-Tracking for Metal Additive Manufacturing Processes [Jinhui Yan](#); University of Illinois at Urbana-Champaign, United States.

9:30 AM BREAK**10:00 AM DS02.08.03**

Development of a Transferrable Force Field Using On-the-Fly Gaussian Process Method for Gallium Nitride Crystal Growth During the Additive Manufacturing Process [Xiangyu Chen](#); Johns Hopkins University, United States.

10:15 AM DS02.08.04

What is the Smallest Nano-Zeolite that Could be Synthesized? [Debdas Dhabal](#); The University of Utah, United States.

10:30 AM DS02.08.05

A Multiscale Modeling Approach to Predict Residual Stresses During Processing of Semicrystalline Thermoplastics [Khatereh Kashmari](#); Michigan Technological University, United States.

10:45 AM DS02.08.06

Model Based Control of Microstructure for Additive Manufacturing 316L Stainless Steel [Matthew Michalek](#); Sandia National Laboratories, United States.

11:00 AM DS02.08.07

Mechanical Properties of 3D-Printed Macroscopic Models of Schwarzites [Levi C. Felix](#); State University of Campinas, Brazil.

SESSION DS02.09: Computational Modeling of Additively Manufactured and Layered Materials II

Session Chairs: Vitor Coluci and Veruska Malavé

Thursday Afternoon, May 12, 2022

Hawai'i Convention Center, Level 3, 313C

1:30 PM *DS02.09.01

Investigation of Novel 2D Material Heterostructures [Susan B. Sinnott](#); The Pennsylvania State University, United States.

2:00 PM *DS02.09.02

Cooperative Development of Printable Alloys for Additive Manufacturing Through Metaheuristic Optimization [Branden B. Kappes](#)^{2, 1}; ¹Contextualize, LLC, United States; ²KMMD, LLC, United States.

2:30 PM DS02.09.03

First Principles Study of Electronic and Optical Properties of Type-II InAs/GaSb Superlattices [Yun Hee Chang](#)^{1, 2}; ¹Chungnam National University, Korea (the Republic of); ²Pusan National University, Korea (the Republic of).

2:45 PM DS02.09.04

Extracting Anisotropy Strength and Interfacial Free Energy of Al-Cu Alloy under Rapid Cooling Conditions Using Molecular Dynamics Simulations [Amrutdyuti Swamy](#); New Mexico Institute of Mining and Technology, United States.

3:00 PM BREAK**3:30 PM DS02.09.05**

Tuning the Edge States of Bismuthene via Substrate Effects [Nikhil Medhekar](#)^{1, 3}; ¹Monash University, Australia; ³Monash University, Australia.

3:45 PM DS02.09.06

Simulation-Guided Thermal Process Discovery for Flash Lamp Annealing Crystallization of On-Chip HfO₂-ZrO₂ Ferroelectric Memories [Manohar H. Karigerasi](#); SLAC National Accelerator Laboratory, United States.

4:00 PM DS02.09.07

Superlattices of SnS₂ with other TMDCs for Use as Electrodes in Li-Ion Batteries [Conor J. Price](#); University of Exeter, United Kingdom.

4:15 PM DS02.09.08

Step-Edge Epitaxy for Borophene Growth on Insulators [Ksenia V. Bets](#); Rice University, United States.

4:30 PM DS02.09.09

Numerical Investigation of Macro-Scale Step Morphology in Long-Term Solution Growth of SiC [Yifan Dang](#); Nagoya University, Japan.

4:45 PM DS02.09.10

Geometric Design and Inverse Design of Multi-Axial Bistable Lattice Mechanical Metamaterial Inspired by Atomic Arrangement of Crystals [Sosuke Kanegae](#); Osaka university, Japan.

SESSION DS02.10: Emerging Applications in Multifunctional Advanced Materials I
Session Chairs: Kun Fu and Veruska Malavé
Friday Morning, May 13, 2022
Hawai'i Convention Center, Level 3, 313C

8:30 AM *DS02.10.01

3D Printing Active Electronic & Optoelectronic Devices [Michael C. McAlpine](#); University of Minnesota, United States.

9:00 AM *DS02.10.02

3D Printing of Bioelectronics and Soft Robots [Xuanhe Zhao](#); Massachusetts Institute of Technology, United States.

9:30 AM DS02.10.03

WITHDRAWN 5/9/22 DS02.10.03 3D Printing of Tissue Adhesives for Customized Applications [Sarah Wu](#); Massachusetts Institute of Technology, United States.

9:45 AM BREAK

10:15 AM DS02.10.04

Rheological Research of 3D Printable All-Inorganic Thermoelectric Inks for Direct Writing of Micro-Thermoelectric Generator [Hyejin Ju](#); Ulsan National Institute of Science and Technology, Korea (the Republic of).

10:30 AM DS02.10.05

An Automated Materials Optimization Approach for Large, Lightweight, Additively Manufactured Direct Drive Generators with Triply Periodic Minimal Surfaces [Austin Hayes](#); CU Boulder, United States.

10:45 AM DS02.10.06

From 3D and 4D Printing of Carbon Architectures to Engineered Living Carbon Materials [Monsur Islam](#); Karlsruhe Institute of Technology, Germany.

SESSION DS02.11: Emerging Applications in Multifunctional Advanced Materials II
Session Chairs: Kun Fu and Veruska Malavé
Friday Afternoon, May 13, 2022
Hawai'i Convention Center, Level 3, 313C

1:30 PM *DS02.11.01

Additive Manufacturing of Multi-Functional Materials and Devices for Space Applications [Gregory L. Whiting](#); University of Colorado Boulder, United States.

2:00 PM DS02.11.02

Additive Manufacturing of Structured Electrodes for Lithium-Ion Batteries [Soyeon Park](#); University of Delaware, United States.

2:15 PM DS02.11.03

Near-Field Electrospinning Facilitates the Fabrication of High-Aspect Ratio 3D Structures [Monsur Islam](#); Karlsruhe Institute of Technology, Germany.

2:30 PM BREAK

3:00 PM DS02.11.04

Interface Modification with Functionalized Carbon Nanotube Composite Films Processed by Electrophoretic Deposition and Characterization of Interfacial Properties [Dae Han Sung](#)^{1,2}; ¹University of Delaware, United States; ²University of Delaware, United States.

3:15 PM DS02.11.05

Facile Synthesis of Shape-Programmed Polymer Nanoparticles for Agile Manufacturing [Rong Yang](#); Cornell University, United States.

3:30 PM DS02.11.06

Tunable Non-Linear Stiffening by Deformation-Induced Topological Transitions in Mechanical Metamaterials [Marius Wagner](#); ETH Zürich, Switzerland.

3:45 PM DS02.11.07

Directed Energy Deposition of Additively Grown Carbon Fibers from Various Hydrocarbon Precursors [Charles A. Cook](#); The University of Alabama, United States.

SESSION DS02.12: Advanced Materials: Characterization, Modeling, and Applications I
Session Chairs: Veruska Malavé and Hui Ying Yang
Monday Morning, May 23, 2022
DS02-Virtual

10:30 AM *DS02.12.01

Material Extrusion 3D Printing of Polymer Matrix Composites for Energy Storage and Sensing Applications [Junjun Ding](#); Alfred University, United States.

11:00 AM *DS02.12.02

Fundamental Photopolymer Additive Manufacturing Using a Uniformly Illuminated, Individual-Pixel-Characterized Light Engine [Callie I. Higgins](#); National Institute of Standards and Technology, United States.

11:30 AM DS02.12.03

Mechanical Energy Absorption Properties of Nanoscale Hierarchical Schwarzite-Based Structures Applied to Additive Manufacturing [Leonardo V. Bastos](#); Federal University of Paraná, Brazil.

11:45 AM DS02.12.04

Modeling Scaled 3D-Printed Electronic Mesostructures with Graph Theory [William J. Scheideler](#); Dartmouth College, United States.

12:00 PM DS02.12.05

3D Printing of Continuous Fiber/ Acrylate Resin-Based Thermoset Composites [Arif M. Abdullah](#); University of Colorado Denver, United States.

12:15 PM DS02.12.06

3D Printing of Ultrahigh Viscosity Nanoparticle Suspensions via Acoustophoretic Liquefaction [Zheng Liu](#)^{1,2}; ¹Cornell University, United States; ²University of Illinois Urbana-Champaign, United States.

SESSION DS02.13: Advanced Materials: Characterization, Modeling, and Applications II

Session Chairs: Veruska Malavé and Hui Ying Yang

Monday Afternoon, May 23, 2022

DS02-Virtual

9:00 PM *DS02.13.01

Sequence-Conformation Relationship of Zwitterionic Peptide Brushes—Experiments, Theories and Simulations [Jing Yu](#); Nanyang Institute of Technology, Singapore.

9:30 PM DS02.13.02

WITHDRAWN 5/18/22 DS02.13.02 Droplet Generation in Parallelized Microfluidic Flow-Focusing Droplet Generators via 3D Printing [Adedamola D. Aladese](#); Chonnam National University, Korea (the Republic of).

9:45 PM DS02.13.03

Optimization of Electron-Beam Melting Technique for Fabrication of Refractory Metal Ingot [HyunChul Kim](#); Korea Institute of Industrial Technology, Korea (the Republic of).

10:00 PM *DS02.13.04

Modeling and Simulation of 2D and 3D Metamaterials for Microwave Application [Balamati Choudhury](#); CSIR-National Aerospace Laboratories, India.

10:30 PM DS02.13.05

Bistable Heterogeneous Reconfigurable Mechanical Metamaterials [Latha Nataraj](#); US ARL, United States.

10:45 PM DS02.13.06

Carbide and Nitride Based MXene Substrates for SERS—Theoretical Consideration [Hayk Minassian](#); Yerevan Physics Institute (NSL after A.Alikhanyan), Armenia.

SESSION DS02.14: Advanced Materials: Characterization, Modeling, and Applications III

Session Chairs: Vitor Coluci and Veruska Malavé

Tuesday Morning, May 24, 2022

DS02-Virtual

8:00 AM *DS02.14.01

Engineered Two-Dimensional Voids as Angstrom-Scale Capillaries [Radha Boya](#)^{1,2}; ¹University of Manchester, United Kingdom; ²National Graphene Institute, United Kingdom.

8:30 AM DS02.14.02

Crystallinity Controlled 3D Printing of Self-Assembled Dipeptides [Jihyuk Yang](#); The University of Hong Kong, Hong Kong.

8:45 AM DS02.14.03

WITHDRAWN 5/18/22 Improving Adhesion for Hybrid 3D-Printing of Different Material Combinations [Christian Schmid](#); FH Kufstein Tirol Bildungs GmbH / University of Applied Sciences, Austria.

9:00 AM DS02.14.04

3D Printing of Glass Imaging Optics with High Precision by Liquid Silica Resin [Piaoran Ye](#); The University of Arizona, United States.

9:05 AM DS02.14.06

3D Printing Tricalcium Phosphate-Polymer Composites for Biomimetic Bone Scaffolds [Luis F. Arciniaga](#); The University of Arizona, United States.

SESSION DS02.15: Advanced Materials: Characterization, Modeling, and Applications IV

Session Chair: Veruska Malavé

Tuesday Afternoon, May 24, 2022

DS02-Virtual

9:00 PM DS02.15.01

Non-Templated Fabrication of Patterned Fluoropolymer Microfiltration Membranes via Direct Ink Writing and Non-Solvent Induced Phase Separation [Beenish Imtiaz](#); The University of Melbourne, Australia.

9:15 PM DS02.15.02

Additive Manufacturing of Fins for Surfboards [Marc In het Panhuis](#); University of Wollongong, Australia.

9:30 PM DS02.15.03

VIRTUAL PRESENTATIONS ARE LISTED IN EASTERN TIME

Last Updated 5/18/22

3D Meta-Optics for Twisted Light Holography and Molecular Sensing [Haoran Ren](#); Macquarie University, Australia.

9:45 PM DS02.15.04

CFD and Experimental Performance Evaluation of Grooved Fins for Surfboards [Marc In het Panhuis](#); University of Wollongong, Australia.

SYMPOSIUM DS03

Phonon Properties of Complex Materials—Challenges in Data Generation, Data Availability and Machine Learning Approaches
May 11 - May 23, 2022

Symposium Organizers

Ming Hu, University of South Carolina
Sanghamitra Neogi, University of Colorado Boulder
Subramanian Sankaranarayanan, Argonne National Laboratory
Junichiro Shiomi, The University of Tokyo

* Invited Paper

SESSION DS03.01: Phonon Property Prediction and Characterization I
Session Chair: Pierre Darancet
Wednesday Afternoon, May 11, 2022
Hawai'i Convention Center, Level 3, 313B

1:30 PM *DS03.01.01

High-Throughput Study of Lattice Thermal Conductivity Including Higher-Order Anharmonicity [Christopher Wolverton](#); Northwestern University, United States.

2:00 PM DS03.01.02

Anharmonic Lattice Dynamics in Metastable Ternary Nitrides [Franziska S. Hegner](#); Technical University of Munich, Germany.

2:15 PM *DS03.01.03

Anharmonic Phonons, Superionic Diffusion and Ultralow Thermal Conductivity in Complex Argyrodite Cu_7PSe_6 [Olivier Delaire](#); Duke University, United States.

2:45 PM DS03.01.04

Precisely and Efficiently Computing Phonons via Irreducible Derivatives: Characterizing Soft Modes [Sasaank Bandi](#); Columbia University, United States.

3:00 PM BREAK

3:30 PM *DS03.01.05

Phonon Scattering in Compositionally Disordered Alloys [Apurva Mehta](#); SLAC National Accelerator Laboratory, United States.

4:00 PM DS03.01.07

Structural Effect on Phonon Attenuation in Metallic Liquids and Glasses [Jaeyun Moon](#); Oak Ridge National Laboratory, United States.

4:15 PM DS03.02.06

Poster Spotlight: Super-Suppression of Long Phonon Mean-Free-Paths in Nano-Engineered Si Due to Anticorrelated Heat Current Effects [Laura de Sousa Oliveira](#); University of Wyoming, United States.

4:20 PM DS03.02.01

Poster Spotlight: Nonequilibrium Phonon Transport Induced by Finite Sizes—Effect of Phonon-Phonon Coupling [Tianli Feng](#); University of Utah, United States.

4:25 PM DS03.02.03

Poster Spotlight: Accelerating Green's Function Molecular Dynamics Using Spatial Decomposition [Vitor R. Coluci](#); University of Campinas, UNICAMP, Brazil.

SESSION DS03.02: Poster Session: Phonon Properties Prediction and Characterization
Session Chairs: Ming Hu, Sanghamitra Neogi, Subramanian Sankaranarayanan and Junichiro Shiomi
Wednesday Afternoon, May 11, 2022
5:00 PM - 7:00 PM
Hawai'i Convention Center, Level 1, Kamehameha Exhibit Hall 2 & 3

DS03.02.01

Poster Spotlight: Nonequilibrium Phonon Transport Induced by Finite Sizes—Effect of Phonon-Phonon Coupling [Tianli Feng](#); University of Utah, United States.

DS03.02.02

Predicting Thermal Conductivity from Green's Function Molecular Dynamics Simulations [Vitor R. Coluci](#); University of Campinas, UNICAMP, Brazil.

DS03.02.03

Poster Spotlight: Accelerating Green's Function Molecular Dynamics Using Spatial Decomposition [Vitor R. Coluci](#); University of Campinas, UNICAMP, Brazil.

DS03.02.04

Anomalous Dimensionality Dependence of the Phonon Heat Conduction in Poly (para-phenylene) Chains Using Molecular Dynamics Simulations [Cong Yang](#); North Carolina State University, United States.

DS03.02.05

Phonon-Focusing and Rattler-Mode Interference in Thermal Conductivity Transitions of the Breathing Metal-Organic Framework MIL-53 [Masoumeh Mahmoudi Gahrouei](#); University of Wyoming, United States.

DS03.02.06

Poster Spotlight: Super-Suppression of Long Phonon Mean-Free-Paths in Nano-Engineered Si Due to Anticorrelated Heat Current Effects [Laura de Sousa Oliveira](#); University of Wyoming, United States.

DS03.02.07

Pressure and Temperature Dependent Thermal Conductivity Tensor of High Explosive Crystals [Romain Perriot](#); Los Alamos National Laboratory, United States.

DS03.02.09

Blocking the Heat Radiation Properties of the High Entropy A2B2O7 Fluorite Oxide Containing Zn²⁺ [Mycungwoo Ryu](#); Hanyang University, Korea (the Republic of).

SESSION DS03.03: Phonon Informatics Approaches I

Session Chair: Andrea Cepellotti

Thursday Morning, May 12, 2022

Hawai'i Convention Center, Level 3, 313B

8:30 AM *DS03.03.01

Using Machine-Learning Models to Accelerate Interatomic-Force-Constant Calculations [Jesús Carrete Montaña](#); Institute of Materials Chemistry, TU Wien, Austria.

9:00 AM DS03.03.02

Anharmonic Lattice Dynamics and Thermal Transport in Type-I Inorganic Clathrates [Ankit Jain](#); Indian Institute of Technology Bombay, India.

9:15 AM *DS03.03.03

Data-driven Explorations of Materials Phase Stability for Improved Rational Design [Kristin A. Persson](#); University of California, Berkeley, United States.

9:45 AM DS03.03.04

The Inelastic Light Scattering of Crystals at Finite Temperatures and the Correct Tensor to Describe It [Nimrod Benschalom](#); Weizman Institute of Science, Israel.

10:00 AM BREAK**10:30 AM *DS03.03.05**

Comparison of Simulation Approaches for Thermal Transport Properties [Maria K. Chan](#); Argonne National Laboratory, United States.

11:00 AM DS03.03.07

Describing Phonon Properties of Nanostructures: Perspective from Atomistic Modeling and Data Driven Techniques [Sanghamitra Neogi](#); University of Colorado Boulder, United States.

SESSION DS03.04: Phonon Property Prediction and Characterization II

Session Chair: Olivier Delaire

Thursday Afternoon, May 12, 2022

Hawai'i Convention Center, Level 3, 313B

1:30 PM *DS03.04.01

Wavelet Analysis Unfolds Thermal Phonon Coherence [Sebastian Volz](#); The University of Tokyo, Japan.

2:00 PM DS03.04.02

Thermoelectric Transport Properties from the Boltzmann Equation and Beyond [Andrea Cepellotti](#); Harvard University, United States.

2:15 PM DS03.04.03

Thermal Conduction in Bulk Titanium Oxides with Natural Superlattice Structure Containing Coherent Interface for Phonons with Tunable Interspacing [Shunta Harada](#)^{1, 3, 2}; ¹Nagoya University, Japan; ²Japan Science and Technology Agency, Japan; ³Nagoya University, Japan.

2:30 PM DS03.04.04

Novel Thermal Behaviors from Nanostructured Heat Sources—Experiments and Theory on Directional Channeling [Joshua Knobloch](#); STROBE, JILA, University of Colorado Boulder, United States.

2:45 PM DS03.04.05

A Machine Learning Framework for Raman Spectrum Prediction [Nina Andrejevic](#); Massachusetts Institute of Technology, United States.

3:00 PM BREAK

SESSION DS03.05: Phonon Informatics Approaches II

Session Chair: Subramanian Sankaranarayanan

Thursday Afternoon, May 12, 2022

Hawai'i Convention Center, Level 3, 313B

3:30 PM *DS03.05.01

Physics-Informed Deep Learning for Solving Phonon Boltzmann Transport Equation [Tengfei Luo](#); University of Notre Dame, United States.

4:00 PM DS03.05.02

Machine-Learning-Assisted Prediction and Optimization of Lattice Thermal Conductivity of Superlattices [Yan Wang](#); University of Nevada, Reno, United States.

4:15 PM *DS03.05.03

Machine Learning for Optimizing and Disrupting Thermal Transport Science [Xiulin Ruan](#); Purdue Univ, United States.

4:45 PM DS03.08.02

Disorder Enhanced Raman Scattering [Matan Menahem](#); Weizmann Institute of Science, Israel.

SESSION DS03.06: Phonon Informatics Approaches III

Session Chair: Tengfei Luo

Friday Morning, May 13, 2022

Hawai'i Convention Center, Level 3, 313B

8:30 AM *DS03.06.01

A High-Throughput Database Of Phonons: Automation, Infrastructure, Machine Learning and Data-Driven Ferroelectric Materials Discovery [Geoffroy Hautier](#)^{2, 1}; ¹University Catholique de Louvain, Belgium; ²Dartmouth College, United States.

9:00 AM DS03.06.02

GPU-Accelerated Simulations of Thermal Transport using Machine Learning Molecular Dynamics [Anders Johansson](#); Harvard University, United States.

9:15 AM DS03.06.03

Anomalous Thermoelectric Transport Phenomena Arising from Interband Electron-Phonon Scattering [Boris Kozinsky](#)^{1, 2}; ¹Harvard University, United States; ²Bosch Research, United States.

9:30 AM DS03.06.04

WITHDRAWN 5/6/22 DS03.06.04 Investigating Phonon-Magnon Interaction with Quantum Accuracy Using Deep Learning Model [Ben Xu](#); Graduate School of CAEP, China.

9:45 AM DS03.06.05

Phonon Dynamics in Complex Structures and Across Interfaces [Zhiting Tian](#); Cornell University, United States.

10:00 AM BREAK

SESSION DS03.07: Phonon Property Prediction and Characterization III

Session Chair: Brian Foley

Friday Morning, May 13, 2022

Hawai'i Convention Center, Level 3, 313B

10:30 AM *DS03.07.01

Giant Optomechanical Coupling and Nonlinear Phononics in Broken-Symmetry and Charge Density Wave Materials [Pierre T. Darancet](#); Argonne National Laboratory, United States.

11:00 AM DS03.07.02

Plasmon-Phonon Interactions in Acoustic Raman Scattering [Nicolas Large](#); The University of Texas at San Antonio, United States.

11:15 AM DS03.07.03

Theoretical Analysis of Phonons and Their Influence on Charge Transport in Novel Thienoacene Molecular Crystals [Nemo McIntosh](#); University of Mons, Belgium.

11:30 AM DS03.07.04

Temperature-Dependent Thermal Conductivity and Heat Capacity of InGaAs and InAlAs Thin Films [Carlos Perez](#); The Pennsylvania State University, United States.

11:45 AM DS03.07.05

Spatially Resolved Phonon Dispersion Relations Throughout the Brillouin Zone from Electron Thermal Diffuse Scattering [Dennis Kim](#); Massachusetts Institute of Technology, United States.

12:00 PM DS03.08.01

Universal Effective Medium Theory to Predict the Thermal Conductivity in Nanostructured Materials [Seyed Aria Hosseini](#)^{1, 2}; ¹University of California, Riverside, United States; ²Massachusetts Institute of Technology, United States.

12:15 PM DS03.08.03

Accounting for Correlated Thermal Vibrations in Quantitative STEM Simulations [Xi Chen](#); Massachusetts Institute of Technology, United States.

SESSION DS03.09: Phonon Property Prediction and Characterization IV

Session Chairs: Ming Hu and Subramanian Sankaranarayanan

Monday Morning, May 23, 2022

DS03-Virtual

8:00 AM DS03.09.01

Phonon Transport in Ultrahigh Thermal Conductivity Materials Beyond the Relaxation Time Approximation [Nikhil Malviya](#); Indian Institute of Science Bangalore, India.

8:15 AM *DS03.09.02

From Data to Knowledge in Disorder Ceramics for Ultra-High-Temperature Applications [Stefano Curtarolo](#); Duke University, United States.

8:45 AM *DS03.09.03

Materials Property Prediction for Limited Datasets [Gian-Marco Rignanese](#); Université catholique de Louvain, Belgium.

9:15 AM DS03.09.04

Kohn-Sham Density Functional Perturbation Theory at Unprecedented Scale and Accuracy [Abhiraj Sharma](#); Georgia Institute of Technology, United States.

9:30 AM DS03.09.05

Phonon Transport in Nanostructures Studied Using a Monte Carlo Solution of Frequency-Dependent Boltzmann Equation [Vasumathy Ravishankar](#); Indian Institute of Science, India.

9:45 AM DS03.09.06

Optimization of Thermal Conductivity and Viscosity of Liquid Mixtures Using an Automated Continuous Flow System [Jia Xin Peng](#); The University of Tokyo, Japan.

9:50 AM *DS03.09.07

WITHDRAWN 5/17/22 DS03.09.07 Data-Assisted Insights into Thermoelectric Materials [Abhishek K. Singh](#); Indian Institute of Science, India.

SESSION DS03.10: Phonon Property Prediction and Characterization V
Session Chairs: Ming Hu and Junichiro Shiomi
Monday Afternoon, May 23, 2022
DS03-Virtual

8:45 PM DS03.03.07

Deep Neural Network Potentials for >50 Elements and Applications to Phonon Dispersions and Lattice Thermal Conductivity [Ming Hu](#); University of South Carolina, United States.

9:00 PM *DS03.10.01

Integration of Materials Data and Substance Data [Yibin Xu](#); National Institute for Materials Science, Japan.

9:30 PM DS03.10.02

Effect of Four-Phonon Scattering on the Phonon Lineshapes in Weakly-Bonded Solids from First Principles [Navaneetha Krishnan Ravichandran](#); Indian Institute of Science, India.

9:45 PM *DS03.10.03

High Throughput Screening of Materials for Interfacial Thermal Transport [Shenghong Ju](#); Shanghai Jiao Tong University, China.

10:15 PM *DS03.10.04

Machine Learning-Driven Discovery of New Thermal Transport Mechanisms in Porous Materials [Hua Bao](#); Shanghai Jiao Tong University, China.

10:45 PM DS03.10.05

Searching Graphene-WS₂ Heterostructures with the Lowest Thermal Conductivity via Materials Informatics [Wenyang Ding](#); The University of Tokyo, Japan.

SYMPOSIUM DS04

Recent Advances in Data-Driven Discovery of Materials for Energy Conversion and Storage
May 8 - May 23, 2022

Symposium Organizers

Chibueze Amanchukwu, University of Chicago
Jeffrey Lopez, Northwestern University
Rajeev Surendran Assary, Argonne National Laboratory
Tian Xie, Massachusetts Institute of Technology

* Invited Paper

SESSION DS04.01: Accelerating Materials Discovery I

Session Chair: Jeffrey Lopez

Sunday Afternoon, May 8, 2022

Hawai'i Convention Center, Level 3, 313B

1:30 PM DS04.01.07

Atomistic Modeling and AI-enabled Energy Storage Materials Discovery [Rajeev Surendran Assary](#); Argonne National Laboratory, United States.

1:45 PM DS04.01.01

Simmate—A Framework and Toolbox for Materials Discovery and Its Application in the High-Throughput Search of Fluoride-Ion Conductors [Jack D. Sundberg](#); University of North Carolina, United States.

2:00 PM DS04.01.02

Autonomous Reinforcement Learning Approach for Development of Reactive Potentials for Energy Applications [Aditya Koneru](#)^{1,2}; ¹University of Illinois at Chicago, United States; ²Argonne National Laboratory, United States.

2:15 PM DS04.01.03

A Flexible and Scaleable Scheme for Combining Formation Energies Computed with Different Density Functionals [Ryan S. Kingsbury](#); Lawrence Berkeley National Laboratory, United States.

2:30 PM DS04.01.04

Equivariant Graph Network for Fast Charge Density Estimation of Molecules, Liquids and Solids [Peter B. Jørgensen](#); Technical University of Denmark, Denmark.

2:45 PM DS04.01.05

High-Throughput Characterization of Mixed-Metal Salt Hydrates for Heat Storage via Density Functional Theory and Machine Learning [Steven G. Kiyabu](#); University of Michigan, United States.

3:00 PM DS04.01.06

Machine-Learning Based Optimization of Sorbent Materials for Energy Storage—A Case Study on Metal Organic Frameworks—MOFs [Giovanni Trezza](#); Politecnico di Torino, Italy.

SESSION DS04.02: Data-Driven Advances in Energy Storage I

Session Chairs: Jeffrey Lopez and Nicola Molinari

Monday Morning, May 9, 2022

Hawai'i Convention Center, Level 3, 313B

10:30 AM *DS04.02.01

Learning Governing Relations in Battery Electrodes—Hybridizing Physics- and Data-Driven Approaches [Vivek N. Lam](#); Stanford University, United States.

11:00 AM DS04.02.03

Spectral Denoising for Accelerated Analysis of Correlated Ionic Transport [Nicola Molinari](#)^{1,2}; ¹Harvard University, United States; ²Robert Bosch LLC, United States.

11:15 AM DS04.02.04

Materials Design Principles of Amorphous Cathode Coatings for Lithium-Ion Battery Applications [Jianli Cheng](#); Lawrence Berkeley National Laboratory, United States.

11:30 AM DS04.02.02

Comprehensive Analytics for Massive and Diverse Li-Ion Battery Aging Datasets [Vivek N. Lam](#); Stanford University, United States.

SESSION DS04.03: Data-Driven Advances in Energy Storage II
Session Chairs: Shadow Huang and Rajeev Surendran Assary
Monday Afternoon, May 9, 2022
Hawai'i Convention Center, Level 3, 313B

1:30 PM *DS04.03.01

A Data-Driven Approach to Understanding and Predicting the Early Formation of the Solid-Liquid Electrolyte Interphase [Kristin A. Persson](#)^{2, 1}; ¹Lawrence Berkeley National Laboratory, United States; ²University of California, Berkeley, United States.

2:00 PM DS04.03.02

High Dimensional and Low Sample Size Case Statistics for the Screening on Crystal Information of the Solid-State Electrolytes [Hirotaka Sakamoto](#); Toyota Motor Corporation, Japan.

2:15 PM DS04.03.03

Element Selection for Crystalline Inorganic Solid Discovery Guided by Unsupervised Machine Learning of Experimentally Explored Chemistry [Andriy Vasylenko](#); University of Liverpool, United Kingdom.

2:30 PM DS04.03.04

WITHDRAWN 5/5/22 DS04.03.04 Autonomous Development of a Reference Database and a Machine-Learned Interatomic Potential for Lithium-Intercalated Carbon [Sam W. Norwood](#); Technical University of Denmark, Denmark.

2:45 PM BREAK**3:15 PM *DS04.03.05**

The ElectroLab—An Integrated Platform for High-throughput Characterization of Redox-Active Materials [Oliver Rodriguez](#); University of Illinois at Urbana-Champaign, United States.

3:45 PM DS04.03.06

Data-Driven Approach to Design/Discover Intercalating Ions and Layered Materials for Metal-Ion Batteries [Shayani Parida](#); University of Connecticut, United States.

4:00 PM DS04.03.08

Computational Screening of Positive Electrode Materials for Ca-Ion Batteries [Sai Gautam Gopalakrishnan](#); Indian Institute of Science, India.

4:15 PM DS04.03.09

In Silico Paradigm for Predicting Green Battery Material Phenomena [Shadow Huang](#); North Carolina State Univ, United States.

SESSION DS04.04: Accelerating Materials Discovery II
Session Chairs: Qizhi He and Tian Xie
Tuesday Morning, May 10, 2022
Hawai'i Convention Center, Level 3, 313B

9:15 AM DS04.04.01

Predicting and Understanding Perovskite Nanostructure Formation Through Machine Learning and Data-Driven Modelling of In Situ Spectroscopic Data [Jakob Dahl](#)^{1, 2}; ¹University of California, Berkeley, United States; ²Lawrence Berkeley National Laboratory, United States.

9:30 AM DS04.04.02

Physics-Constrained Deep Neural Network Method for Estimation and Simulation of Vanadium Redox Flow Battery [Qizhi He](#); University of Minnesota Twin Cities, United States.

9:45 AM DS04.04.03

Remote and On-the-Fly—Artificial Intelligence Driven Science in Laboratories and Central Facilities [Phillip Maffettone](#); Brookhaven National Laboratory, United States.

10:00 AM BREAK**10:30 AM *DS04.04.04**

Controlling Polymorphism in Nanoporous Aluminosilicates from First Principles [Rafael Gomez-Bombarelli](#); Massachusetts Institute of Technology, United States.

11:00 AM DS04.04.05

Inorganic Synthesis Recommendation by Machine Learning the Similarity of Materials from Scientific Literature [Tanjin He](#)^{1, 2}; ¹University of California, Berkeley, United States; ²Lawrence Berkeley National Laboratory, United States.

11:15 AM DS04.04.06

Towards Materials "Synthesis by Design"—Assessing Selectivity of Solid-State Reactions Using Chemical Potential Differences at Interfaces [Matthew J. McDermott](#)^{1, 2}; ¹Lawrence Berkeley National Laboratory, United States; ²University of California, Berkeley, United States.

11:30 AM DS04.04.07

Research Data Infrastructure for Data-Driven Experimental Materials Science [Andriy Zakutayev](#); National Renewable Energy Laboratory, United States.

11:45 AM DS04.04.08

Graph Convolutional Neural Network Modeling of Vacancy Formation for Materials Discovery in Solar Thermochemical Water Splitting [Matthew Witman](#); Sandia National Laboratories, United States.

SESSION DS04.05: Data-Driven Advances in Energy Conversion
Session Chairs: Rachel Woods-Robinson and Tian Xie

Tuesday Afternoon, May 10, 2022
Hawai'i Convention Center, Level 3, 313B

1:30 PM DS04.05.01

Lessons Learned in Combining Computational and Experimental Materials Discovery—A P-Type Transparent Conductor Case Study [Rachel Woods-Robinson](#); Lawrence Berkeley National Laboratory, United States.

1:45 PM DS04.05.02

A Machine Vision Tool for Facilitating the Optimization of Large-Area Perovskite Photovoltaics [Mathilde Fievez](#)^{1,2}; ¹CEA, France; ²Stanford University, United States.

2:00 PM DS04.05.03

WITHDRAWN 5/8/22 DS04.05.03 Identifying Materials Selection Criteria for 2D Capping Layer in Perovskite Solar Cells via Machine Learning [Zhe Liu](#); Northwestern Polytechnical University, China.

2:15 PM DS04.05.04

Using High-Throughput Calculations and Machine Learning to Understand Electronic Transport in Semiconductors [Alex M. Ganose](#); Imperial College London, United Kingdom.

2:30 PM BREAK**3:00 PM DS04.05.05**

High-Throughput Discovery of Multiferroic Materials Based on *Ab Initio* Calculations [Francesco Ricci](#)^{2,3,1}; ¹University of California, Berkeley, United States; ²Lawrence Berkeley National Laboratory, United States; ³Lawrence Berkeley National Laboratory, United States.

3:15 PM DS04.05.06

Anisotropic Conductance Descriptor for *Ab Initio* Screening of Next-Generation Interconnect Metals [Sushant Kumar](#); Rensselaer Polytechnic Institute, United States.

SESSION DS04.06: Poster Session: Recent Advances in Data-Driven Discovery of Materials for Energy Conversion and Storage

Session Chairs: Jeffrey Lopez and Tian Xie

Tuesday Afternoon, May 10, 2022

5:00 PM - 7:00 PM

Hawai'i Convention Center, Level 1, Kamehameha Exhibit Hall 2 & 3

DS04.06.01

Using Neural Network Potential and Metadynamics to Investigate Oxygen Reduction at Gold-Water Interface [Xin Yang](#); Danmarks Tekniske Universitet, Denmark.

DS04.06.03

Iterative Peak-Fitting of Frequency-Domain Data via Deep Convolution Neural Networks [Hyeongseon Park](#); Institute for Accelerator Science, Kangwon National University, Korea (the Republic of).

SESSION DS04.07: Data-Driven Advances in Electrocatalysis
Session Chairs: Jeffrey Lopez, Rajeev Surendran Assary and Tian Xie
Wednesday Morning, May 11, 2022
Hawai'i Convention Center, Level 3, 313B

8:00 AM *DS04.07.01

Machine-Learning Assisted discovery of Catalytic Materials [Richard Tran](#); Carnegie Mellon University, United States.

8:30 AM DS04.07.02

High Throughput Screening of Metal-Oxide Systems for Facile OER Kinetics in Electrochemical Mining [Jaclyn Lunger](#); Massachusetts Institute of Technology, United States.

8:45 AM DS04.07.03

High-Throughput Electrocatalyst Screening and Machine Learning for Feature Selection and Prediction of Alkaline Fuel Cell Catalysts [Jeremy Hitt](#); University of Pennsylvania, United States.

9:00 AM DS04.07.04

Predicting Electronic and Photophysical Properties of Photocatalytically Active Metal-Organic Frameworks [Andres A. Ortega Guerrero](#); EPFL, Switzerland.

9:15 AM DS04.07.05

High-Throughput study of Tellurium-Containing Semiconductors for Photocatalysis [Martin Siron](#)^{1,2,3}; ¹University of California, Berkeley, United States; ²Lawrence Berkeley National Laboratory, United States; ³Lawrence Berkeley National Laboratory, United States.

9:30 AM BREAK**10:00 AM DS04.07.07**

Accelerated Materials Discovery Using Quantum-Inspired Optimizers [Hitarth Choubisa](#); University of Toronto, Canada.

10:15 AM DS04.07.08

An Automated Adsorption Workflow for Semiconductors [Oxana Andriuc](#)^{1,2}; ¹University of California, Berkeley, United States; ²Lawrence Berkeley National Lab, United States.

10:30 AM DS04.07.09

Analysis of Multi-Component Perovskites as Oxygen Evolution Reaction Catalysts through High-Throughput Simulations and Machine Learning [James K. Damewood](#);

Massachusetts Institute of Technology, United States.

10:45 AM DS04.07.10

Ligation in Data-Driven Synthesis Studies of Nanoparticles—A Case Study of Phosphine-Stabilized Gold [Caitlin McCandler](#)^{1,2}; ¹Lawrence Berkeley National Laboratory, United States; ²University of California, Berkeley, United States.

11:00 AM DS04.07.11

Multivariate Analysis of Peptide-Driven Nucleation and Growth of Au Nanoparticles [Kacper J. Lachowski](#); University of Washington, United States.

SESSION DS04.08: Recent Advances in Data-Driven Discovery of Materials for Energy Conversion and Storage I
Session Chairs: Chibueze Amanchukwu and Jeffrey Lopez
Monday Morning, May 23, 2022
DS04-Virtual

8:00 AM DS04.08.01

Predicting Quasiparticle and Excitonic Properties of Materials Using Machine Learning [Tathagata Biswas](#); Arizona State University, United States.

8:15 AM DS04.08.02

High-Throughput Screening of Li-Ion Solid Electrolytes with Experimental Evaluation [Joohwi Lee](#); Toyota Central R&D Labs., Inc., Japan.

8:30 AM DS04.08.03

Identification of Electromagnetic Steel Sheets for Motors by Material Structure Characteristics [Hiroyuki Suzuki](#); Hitachi, Ltd., Japan.

8:45 AM DS04.08.04

Toward Combinatorial Characterization of LLZO-Based Solid Electrolyte Thin Films [Euimin Cheong](#); SungKyunKwan University, Korea (the Republic of).

9:00 AM DS04.08.05

Data-Driven Improvement of ZT in SnSe-Based Thermoelectric Systems [Jino Im](#); Korea Research Institute of Chemical Technology, Korea (the Republic of).

9:15 AM DS04.08.06

A Broad Structural Search of Binary Precipitates via Active Learning [Angel Diaz Carral](#); University of Stuttgart, Germany.

9:30 AM *DS04.08.07

Auto-Generating Material and Device Databases on Batteries and Solar Cells for Data-Driven Materials Discovery [Jacqueline M. Cole](#)^{1,2}; ¹University of Cambridge, United Kingdom; ²ISIS Pulsed Neutron and Muon Source, United Kingdom.

SESSION DS04.09: Recent Advances in Data-Driven Discovery of Materials for Energy Conversion and Storage II
Session Chairs: Chibueze Amanchukwu and Jeffrey Lopez
Monday Morning, May 23, 2022
DS04-Virtual

10:30 AM *DS04.09.01

On the Interplay of High Throughput Experiments and Data Science for Accelerated Materials Discovery [John M. Gregoire](#); California Institute of Technology, United States.

11:00 AM *DS04.09.02

Accelerated Materials Discovery for Sustainable Energy Storage [Dmitry Zubarev](#); IBM Almaden Research Center, United States.

11:30 AM DS04.09.03

Molecular Structure–Redox Potential Relationship for Organic Electrode Materials—Density Functional Theory–Machine Learning Approach [Omar A. Allam](#)^{2,3}; ²Georgia Institute of Technology, United States; ³Georgia Institute of Technology, United States.

11:45 AM DS04.09.04

Physics-Informed XGBoost Model for Electrocaloric Temperature Change Predictions in Ceramics [Jie Gong](#); Carnegie Mellon University, United States.

12:00 PM DS04.09.05

Design and Discovery of Novel OLED Materials via Active Learning [Hadi Abroshan](#); Schrödinger Inc, United States.

12:15 PM DS04.09.06

Alcohol-Based Electrolytes—An Alternative Between Aqueous and Nonaqueous for Increased Voltage and High-Rate Lithium-Ion Batteries [Hewei Xu](#); Institute of Condensed Matter and Nanosciences, Molecular Chemistry, Materials and Catalysis, Université catholique de Louvain, Belgium.

12:30 PM *DS04.07.06

Natural Language Processing for Energy Technology Scalability [Elsa Olivetti](#); Massachusetts Institute of Technology, United States.

SYMPOSIUM EN01

Silicon for Photovoltaics
May 9 - May 23, 2022

Symposium Organizers

Kaining Ding, Forschungszentrum Jülich GmbH
Daniel Hiller, TU Bergakademie Freiberg
Alison Lennon, UNSW Sydney
David Young, National Renewable Energy Laboratory

* Invited Paper

SESSION EN01.01: Passivating Contacts I
Session Chairs: Daniel Hiller and David Young
Monday Morning, May 9, 2022
Hawai'i Convention Center, Level 3, 325A

10:30 AM *EN01.01.01

The Magical Triangle—Transparency, Conductivity and Passivation—Concepts and Realizations of Contacts to Silicon Solar Cells for Highest Conversion Efficiencies Uwe Rau; IEK-5 Forschungszentrum Jülich, Germany.

11:00 AM EN01.01.02

Bottom-up Filling of Nanosized Trenches with Silver and Copper to Fabricate Transparent Conducting Electrodes Yorick Bleijl; AMOLF, Netherlands.

SESSION EN01.02: Nanomaterials for Si-PV
Session Chairs: Daniel Hiller and Uwe Rau
Monday Morning, May 9, 2022
Hawai'i Convention Center, Level 3, 325A

11:15 AM EN01.02.01

Mediating Triplet Energy Transfer for Photon Upconversion in a Silicon Quantum Dot-Molecular Hybrid System Kefu Wang; University of Utah, United States.

11:30 AM EN01.02.02

Bidirectional Triplet Exciton Transfer Between Silicon Nanocrystals and Perylene Tingting Huang; The University of Utah, United States.

11:45 AM EN01.02.03

Absorption of Omnidirectional Solar Radiation with Light Funnel Arrays and Quasi-Elliptical Sub-Micron Nanolens Ashish Prajapati; School of Electrical and Computer Engineering, Ben-Gurion University of the Negev, Israel, Israel.

SESSION EN01.03: Passivating Contacts II
Session Chairs: Cassidy Sainsbury and David Young
Monday Afternoon, May 9, 2022
Hawai'i Convention Center, Level 3, 325A

1:45 PM *EN01.03.01

Al-Doped Zinc Oxide as a Passivating Conductive Contact Layer for PERC, TOPCon and Perovskite Tandem Cells Erwin Kessels; Eindhoven University of Technology, Netherlands.

2:15 PM EN01.03.02

Hafnium Oxide Surface Passivation for Silicon Solar Cells Ailish Wratten; University of Warwick, United Kingdom.

2:30 PM EN01.03.03

Excellent Surface Passivation of n^+ -doped Silicon by $\text{PO}_x/\text{Al}_2\text{O}_3$ Stacks with High Positive Fixed Charge Density Roel J. Theeuwes; Eindhoven University of Technology, Netherlands.

2:45 PM BREAK

SESSION EN01.04: Cells and Modules Optimization I
Session Chairs: Daniel Hiller and Erwin Kessels

Monday Afternoon, May 9, 2022
Hawai'i Convention Center, Level 3, 325A

3:15 PM *EN01.04.01

Improving Cell Production Lines Through Easy Data [Cassidy L. Sainsbury](#); Sinton Instruments, United States.

3:45 PM EN01.04.02

Incorporation of Stokes Shifting Dyes into a Si-Based Photovoltaic-Thermal System [Lindsey Gray](#); Wake Forest University, United States.

4:00 PM EN01.04.03

Correlation Between Nature of Glass in Metallization Paste and Resistive Losses in Fabricated Si Solar Cells [Shiwani Pareek](#); Indian Institute of Technology Bombay, India.

4:15 PM EN01.04.04

Formation of a Porous Monolithic Silver Layer for Deep Metal-Assisted Chemical Etching—For the Commercialization of the Neutral-Colored Transparent Silicon Photovoltaics [HyeonOh Shin](#); Ulsan National Institute of Science and Technology, Korea (the Republic of).

4:30 PM EN01.04.05

Feasibility Analysis of Integrating Silicon Luminescent Solar Concentrators into Greenhouses [Yaling Liu](#); University of Minnesota, United States.

SESSION EN01.05: Silicon, Defects and Degradation

Session Chairs: Kaining Ding and Daniel Hiller

Tuesday Morning, May 10, 2022

Hawai'i Convention Center, Level 3, 325A

9:00 AM *EN01.05.01

Gallium Doped Silicon for PERC Solar Cells—Carrier Lifetime Potential and Instability [John D. Murphy](#); University of Warwick, United Kingdom.

9:30 AM EN01.05.02

Atomistic Insight into the Defect Structure and Mechanism of Light- and Elevated-Temperature-Induced Degradation and Regeneration in Ga-Doped Cz Si [Abigail R. Meyer](#)^{1,2}; ¹Colorado School of Mines, United States; ²National Renewable Energy Laboratory, United States.

9:45 AM EN01.05.03

Understanding the Microscopic Mechanisms of Auger Recombination in Crystalline Silicon [Kyle Bushick](#); University of Michigan, United States.

10:00 AM BREAK**10:30 AM EN01.05.04**

Hydrogen Movement from Passivating Dielectrics Measured by Mass Spectrometry and Vibrational Spectroscopy [Matthew B. Hartenstein](#)^{1,2}; ¹Colorado School of Mines, United States; ²National Renewable Energy Laboratory, United States.

10:45 AM EN01.05.05

Quantifying the Influence of Free Carriers and Crystal Polytypes on Silicon PV with Theoretical Characterization [Xiao Zhang](#); The University of Michigan, United States.

11:00 AM EN01.05.06

Intermediate Band (IB) Induced by Nitrogen Chemical Complexes in Silicon [Abdennaceur Karoui](#); North Carolina Central University, United States.

SESSION EN01.06: Cells and Modules Optimization II

Session Chairs: Kaining Ding and John Murphy

Tuesday Afternoon, May 10, 2022

Hawai'i Convention Center, Level 3, 325A

1:45 PM *EN01.06.01

Stability of Silicon Photovoltaic Modules in Intermediate Precision Conditions of Measurement [Mauro Pravettoni](#); National University of Singapore, Singapore.

2:15 PM *EN01.07.01

Three-Terminal Tandem Solar Cells Using IBC-Si and III-V Materials [Emily Warren](#); National Renewable Energy Laboratory, United States.

2:45 PM EN01.06.03

Energy Harvesting with Solar and Thermoelectric Materials—A Hybrid Concept [Sarath Witanachchi](#); University of South Florida, United States.

SESSION EN01.08: Poster Session: Silicon for Photovoltaics

Session Chairs: Daniel Hiller and David Young

Tuesday Afternoon, May 10, 2022

5:00 PM - 7:00 PM

Hawai'i Convention Center, Level 1, Kamehameha Exhibit Hall 2 & 3

EN01.08.01

Systematically Calculated Efficient Perovskite/Si Tandem Solar Cell-Thermoelectric Hybrid System [Myeong Hoon Jeong](#); Ulsan National Institute of Science and Technology, Korea (the Republic of).

EN01.08.02

Colorful Transparent and Flexible Silicon Based Transparent Solar Cells for BIPV Applications [Baurzhan Salimzhanov](#); Ulsan National Institute of Science and

Technology, Korea (the Republic of).

EN01.08.03

FRay—A Free from Freiberg Ray Tracer for the PV Community [Matthias Müller](#); institute of Applied Physics, Germany.

EN01.08.04

Water Permeability of Organic/Inorganic Hybrid Moisture Barriers for c-Si Solar Cells [Kyungmin Kwak](#); kyonggi University, Korea (the Republic of).

SESSION EN01.09: Silicon for Photovoltaics I
Session Chairs: Kaining Ding and Alison Lennon
Monday Morning, May 23, 2022
EN01-Virtual

8:00 AM *EN01.09.01

100% Renewables—Rapid, Deep and Cheap Emissions Reductions [Andrew Blakers](#); Australian National Univ, Australia.

8:30 AM *EN01.09.02

Concepts for Mass Manufacturing of Vehicle Integrated PV Components [Bonna Newman](#); TNO, Netherlands.

9:00 AM *EN01.09.03

Degradation Rates of High-Efficiency Silicon Modules from the 7GW PV Fleet Performance Data Initiative [Chris Deline](#); National Renewable Energy Laboratory, United States.

9:30 AM *EN01.09.04

Copper Metallization for Heterojunction Solar Cells [Agata Lachowicz](#); CSEM, Switzerland.

SESSION EN01.10: Silicon for Photovoltaics II
Session Chairs: Daniel Hiller and David Young
Monday Morning, May 23, 2022
EN01-Virtual

10:30 AM *EN01.10.01

Passivating Contacts for High-Efficiency Silicon Solar Cells Based on Poly-Si/SiO_x Structures [Stefan Glunz](#)^{1,2}; ¹Fraunhofer Institute for Solar Energy Systems (ISE), Germany; ²University of Freiburg, Germany.

11:00 AM EN01.10.02

Study of the Defects in Multicrystalline Silicon Using a Three-Dimensional Model of a Silicon Ingot Based on Photoluminescent Images [Sergey M. Karabanov](#); Ryazan State Radio Engineering University, Russian Federation.

11:05 AM EN01.10.03

Impact of Copper Plated Grid on the Performance of Heterojunction Solar Cells [Sergey M. Karabanov](#); Ryazan State Radio Engineering University, Russian Federation.

11:10 AM EN01.10.04

Modeling of the Effects of Porosity and Passivation on Porous Silicon [Panus Sundarapura](#); Tokyo Institute of Technology, Japan.

11:15 AM EN01.10.05

MXenes as Contacts for PERC Solar Cells [Loay A. Madbouly](#)^{1,2}; ¹Middle East Technical University, Turkey; ²Middle East Technical University (METU), Turkey.

11:20 AM EN01.10.06

Interfacial Degradation in Bifacial Glass/Glass Silicon Photovoltaic Modules Under Applied Bias and Humidity [Sona Ulicna](#); SLAC National Accelerator Laboratory, United States.

11:35 AM EN01.06.02

Performance of Silicon Solar Cells and Modules Using High-Resistivity Wafers in Relevant Field Conditions of Illumination, Temperature and Shading [Andre Augusto](#); Arizona State University, United States.

SYMPOSIUM EN02

III-V Semiconductors for Energy Conversion Technologies
May 9 - May 24, 2022

Symposium Organizers

Esther Alarcon-Llado, AMOLF
Todd Deutsch, National Renewable Energy Laboratory
Shu Hu, Yale University
Vijay Parameshwaran, U.S. Army Research Laboratory

* Invited Paper

SESSION EN02.01: III-V Epitaxy
Session Chairs: Marina Leite and Xiaowang Zhou
Monday Morning, May 9, 2022
Hawai'i Convention Center, Level 3, 321B

10:45 AM EN02.01.01

Coalescence of GaP on V-Groove Si Substrates [Theresa E. Saenz](#)^{1,2}; ¹National Renewable Energy Lab, United States; ²Colorado School of Mines, United States.

11:00 AM *EN02.01.02

Recent III-V Materials Development Using Dynamic Hydride Vapor Phase Epitaxy [Aaron Ptak](#); National Renewable Energy Lab, United States.

11:30 AM EN02.01.03

GaAs Overgrowth of a Faceted Surface Using HVPE Towards Planarization of Rough Substrates [Anna K. Braun](#); Colorado School of Mines, United States.

11:45 AM EN02.01.04

Low-Cost Synthesis Methods for Single Crystal Quality III-V Alloys [Sonia J. Calero](#)^{1,2}; ¹University of Louisville, United States; ²Conn Center for Renewable Energy Research, United States.

SESSION EN02.02: Modeling Materials Growth
Session Chairs: Marina Leite and Aaron Ptak
Monday Afternoon, May 9, 2022
Hawai'i Convention Center, Level 3, 321B

1:45 PM *EN02.02.01

Impact of Molecular Dynamics (MD) in Semiconductor Materials Research [Xiaowang Zhou](#); Sandia National Laboratories, United States.

2:15 PM EN02.02.02

Understanding Zn Doping of Vapor-Liquid-Solid Grown GaAs Nanowires [Jonas Johansson](#); Lund University, Sweden.

2:30 PM EN02.02.03

Kinetic Modeling of Vertical Cation Segregation During $A_3B_{1-x}N$ Epitaxy [Christopher M. Matthews](#); Georgia Institute of Technology, United States.

2:45 PM BREAK

SESSION EN02.03: Thermoelectric/Thermophotovoltaic Energy
Session Chairs: Aaron Ptak and Xiaowang Zhou
Monday Afternoon, May 9, 2022
Hawai'i Convention Center, Level 3, 321B

3:15 PM EN02.03.02

Silicon Air-Bridge Thermophotovoltaics [Rebecca Lentz](#); University of Michigan, United States.

3:30 PM EN02.03.03

Enhanced Thermoelectric ZT in the Tails of the Fermi Distribution via Electron Filtering by Nanoscale Defects — Model Electron Transport in Nanostructured Materials [Seyed Aria Hosseini](#)^{1,2}; ¹University of California, Riverside, United States; ²Massachusetts Institute of Technology, United States.

3:45 PM EN02.03.04

Effect of Particle-Size Distribution and Pressure-Induced Densification on the Structure and Properties of Thermoelectric Composites and Flexible Devices [Deepa Madan](#); University of Maryland, United States.

4:00 PM EN02.03.05

Waste Heat Harvesting Using Thermoelectric Generators—Materials Sustainability Assessment [Satish Vitta](#); IIT-Bombay, India.

SESSION EN02.04: Poster Session: III-V Semiconductors for Energy Conversion Technologies

Session Chairs: Todd Deutsch and Shu Hu

Monday Afternoon, May 9, 2022

5:00 PM - 7:00 PM

Hawai'i Convention Center, Level 1, Kamehameha Exhibit Hall 2 & 3

EN02.04.01

High-Resolution Elemental and Strain Study of High Entropy Thermoelectric Materials [Yong Yu](#); National University of Singapore, Singapore.

EN02.04.02

Carrier Escaping Effect in InAs/InGaAs Sub-Monolayer Quantum Dot-in-a-Well Solar Cell [Gyoung Du Park](#); Yeungnam University, Korea (the Republic of).

SESSION EN02.05: Heterogeneous and Device—Enabling Materials Growth/Integration

Session Chairs: Minjoo Larry Lee and Myles Steiner

Tuesday Morning, May 10, 2022

Hawai'i Convention Center, Level 3, 321B

8:45 AM *EN02.05.01

The Prospects and Alternatives of III-Vs for Next Generation PV [Anna Fontcuberta i Morral](#); Ecole Polytechnique Federale de Lausanne, Switzerland.

9:15 AM *EN02.05.02

Monolithic Growth of Crystalline III-Vs on Non-Epitaxial and Heteroepitaxial Substrates for Solar Energy Conversion [Rehan R. Kapadia](#); Univ of Southern California, United States.

9:45 AM BREAK

10:15 AM EN02.05.03

Defects in Heteroepitaxy of III-Vs on Si by Templated Liquid-Phase Growth [Olivia Schneble](#)^{1,2}; ¹National Renewable Energy Laboratory, United States; ²Colorado School of Mines, United States.

10:30 AM EN02.05.04

Development of AlInP-Passivated GaAs Solar Cells Grown by Dynamic-Hydride Vapor Phase Epitaxy [Jacob T. Boyer](#); National Renewable Energy Laboratory, United States.

10:45 AM EN02.05.05

Large Scale III-V Material Template Growth Directly on Metal for Device Application [Hyun Uk Chae](#); University of Southern California, United States.

11:00 AM *EN02.06.01

Radically Reimagining III-V Compound Semiconductor Photovoltaics: Epitaxy-Free Approach to Scalable Synthesis of Flexible Low-Cost Thin-Film Solar Cells [Harry A. Atwater](#); California Institute of Technology, United States.

SESSION EN02.06: III-V Photovoltaics

Session Chairs: Anna Fontcuberta i Morral and Rehan Kapadia

Tuesday Afternoon, May 10, 2022

Hawai'i Convention Center, Level 3, 321B

2:45 PM EN02.06.03

Advanced Multi-Junction Solar Cells [Robert J. Walters](#); Air Force Research Laboratory, United States.

3:00 PM *EN02.06.04

III-V/Si Epitaxial Tandem Solar Cells [Minjoo Larry Lee](#); University of Illinois at Urbana-Champaign, United States.

3:30 PM *EN02.06.05

Record Efficiency Multijunction Solar Cells with Strain-Balanced Quantum Well Superlattices [Myles Steiner](#); NREL, United States.

4:00 PM EN02.06.06

Optoelectrical Characterization of Epitaxial InGaAs and InAlAs in Multilayer Stacks by Wide Spectral Range Ellipsometry [Madan K. Mainali](#)^{1,3}; ¹The University of Toledo, United States; ³Wright Center for Photovoltaics Innovation and Commercialization, United States.

SESSION EN02.07: Wide Bandgap Materials and Devices

Session Chairs: Todd Deutsch and Shu Hu

Wednesday Morning, May 11, 2022

Hawai'i Convention Center, Level 3, 321B

9:30 AM EN02.07.01

Diamond Growth on GaN Membranes Using Microwave Plasma Chemical Vapour Deposition [Oliver A. Williams](#); Cardiff University, United Kingdom.

9:45 AM EN02.07.02

Diamond Growth on Wide Band Gap Semiconductors for Thermal Management in High Power Devices [Oliver A. Williams](#); Cardiff University, United Kingdom.

10:00 AM BREAK

SESSION EN02.08: III-V Nitrides

Session Chairs: Todd Deutsch and Mahendra Sunkara

Wednesday Morning, May 11, 2022

Hawai'i Convention Center, Level 3, 321B

10:30 AM EN02.08.01

Structure, Chemistry and Optical Properties of ZnGeN₂ Quantum Wells in GaN [Marshall B. Tellekamp](#); National Renewable Energy Laboratory, United States.

10:45 AM EN02.08.02

ZnGeN₂/GaN Heterostructures for Green LEDs—Band Offsets and Device Modelling [Moira Miller](#)^{1,2}; ¹Colorado School of Mines, United States; ²National Renewable Energy Laboratory, United States.

11:00 AM EN02.08.03

WITHDRAWN 5/6/22 EN02.08.03 Control of Facet-Selective Photodeposition of Nanoparticle Co-Catalysts on GaN Nanostructures for Photocatalysis [Theresa Hoffmann](#); Walter Schottky Institut, TU München, Germany.

11:15 AM EN02.08.04

Flexible Piezoelectric Nanogenerator with Excellent Durability by Heteroepitaxially Grown GaN Nanowires on Metallic Cu Foil [Sang-Wan Ryu](#); Chonnam National Univ, Korea (the Republic of).

11:30 AM EN02.08.05

Influence of Environmental Conditions and Surface Treatments on the Photoluminescence Properties of GaN Nanowires and Nanofins [Florian Pantle](#); Walter Schottky Institute, Germany.

SESSION EN02.09: Photoelectrochemical (PEC) Devices and Systems

Session Chairs: Minjoo Larry Lee and Myles Steiner

Thursday Morning, May 12, 2022

Hawai'i Convention Center, Level 3, 321B

8:30 AM *EN02.09.01

Dilute Anion Alloying of III-V Materials for Photoelectrochemical Water Splitting [Mahendra K. Sunkara](#); University of Louisville, United States.

9:00 AM EN02.09.02

III-V's via Hydride Vapor Phase Epitaxy for Photoelectrochemical Water Splitting [Todd G. Deutsch](#); National Renewable Energy Laboratory, United States.

9:15 AM EN02.09.03

Investigating the Impacts of Surface Layers on the Durability of GaInP₂ Photocathodes for Photoelectrochemical Water-Splitting [Micha Ben-Naim](#)^{1,2}; ¹Stanford University, United States; ²Lawrence Livermore National Laboratory, United States.

9:30 AM EN02.09.04

Discretized Photoanodes Design Tolerates Nanoscale Corrosion Defects for >600 Hours Stable Photoelectrochemical Water Oxidation [Xin Shen](#); Yale University, United States.

9:45 AM BREAK

10:15 AM EN02.09.05

Novel Protective Coatings for Efficient Photoanodes with Tunable Intermediate Bands Induced by Transition-Metal Cations in TiO₂ [Haoqing Su](#)^{1,2}; ¹Yale University, United States; ²Yale University, United States.

10:30 AM EN02.09.06

Engineering Defects and Interfaces of ALD TiO_x Protective Coatings for Highly Efficient III-V Photocathodes [Oliver Bienek](#); Technische Universität München, Germany.

10:45 AM EN02.09.07

A Quantum Approach to Simulating Photoelectrochemical Cells [Lassi Hällström](#); Aalto University, Finland.

11:00 AM EN02.09.08

Tandem Cascade Photoelectrochemical Devices [Calton J. Kong](#)^{1,2}; ¹UC Berkeley, United States; ²Lawrence Berkeley National Laboratory, United States.

11:15 AM EN02.09.09

Photocatalytic Upgrading of Abundant Aromatic Feedstocks on Coated III-V Semiconductors [Devan Solanki](#)^{1,2}; ¹Yale University, United States; ²Energy Sciences Institute, United States.

11:30 AM EN02.09.10

Bioinspired Photocatalytic CO₂ Reduction Exploiting CO₂ Direct Air Capture (DAC) and III-V Semiconductors [Rito Yanagi](#)^{1,2}; ¹Yale University, United States; ²Yale University, United States.

SESSION EN02.10: General Session I

Session Chairs: Esther Alarcon-Llado and Sophia Haussener

Monday Morning, May 23, 2022
EN02-Virtual

8:00 AM EN02.10.01

Axial GaAs/AlGaAs Nanowire Solar Cell on Si with Ultra-High Power-per-Weight Ratio [Helge Weman](#); Norwegian Univ of S&T, Norway.

8:15 AM *EN02.10.02

Suitability of GaAsBi as a Candidate Junction in a III-V Multi-Junction Solar Cell [Nicholas Ekins-Daukes](#); University of New South Wales Sydney, Australia.

8:45 AM *EN02.10.03

Artificial Photosynthesis on III-Nitride Nanostructures [Zetian Mi](#); University of Michigan, United States.

9:15 AM *EN02.10.04

III-V Nanowires for Solar Energy Harvesting—From Growth to Integration in Substrate-Free Devices [Hannah J. Joyce](#); University of Cambridge, United Kingdom.

9:45 AM EN02.10.05

Effects of Doping Ni on the Microstructures and Thermoelectric Properties of Co-Excessive NbCoSn Half-Heusler Compounds [Ruijuan Yan](#); Technical University Darmstadt, Germany.

SESSION EN02.11: General Session II
Session Chairs: Rebecca Anthony and Hannah Joyce
Monday Afternoon, May 23, 2022
EN02-Virtual

1:00 PM EN02.11.01

Rapid Growth of GaInP Graded Buffers and Metamorphic Devices Grown by Hydride Vapor Phase Epitaxy [Kevin Schulte](#); NREL, United States.

1:15 PM EN02.11.02

(110)-Oriented GaAs Devices and Spalling as a Platform for Low-Cost III-V Photovoltaics [Kevin Schulte](#); NREL, United States.

1:30 PM EN02.11.03

Increasing PV Conversion Efficiency via Nanobonding™ ≤ 220°C In Air Of GaAs/Si and Surface Energy Engineering Combining 3LCAA, High Resolution IBA, XPS, SAWM And TEM [Nicole Herbots](#); Arizona State University, United States.

1:45 PM EN02.11.04

Designing Electrochemical Junctions with MBE-Grown III-Nitride Semiconductors and Electrocatalysts [Vijay Parameshwaran](#); U.S. Army Research Laboratory, United States.

2:00 PM *EN02.11.05

Real Time Investigation of Crystal Growth Processes in Semiconductor Nanostructures [Kimberly Dick Thelander](#); Lund University, Sweden.

2:30 PM *EN02.03.01

Optical Emitter Materials for Thermophotovoltaics with Efficiency >50% [Marina S. Leite](#); University of California, Davis, United States.

SESSION EN02.12: General Session III
Session Chairs: Zetian Mi and Vijay Parameshwaran
Tuesday Morning, May 24, 2022
EN02-Virtual

10:30 AM EN02.06.02

Approaches for High-Efficiency and Low-Cost Multi-Junction Solar Cells [Masafumi Yamaguchi](#); Toyota Technological Inst, Japan.

10:45 AM *EN02.12.01

Nuclear Battery Technology [Michael G. Spencer](#)^{1,2}; ¹Morgan State University, United States; ²Cornell University, United States.

11:15 AM *EN02.12.02

Concentrated Radiation for Low-Temperature and High-Temperature Solar Water and CO₂ Reduction Devices [Sophia Haussener](#); Ecole Polytechnique Federale de Lausanne, Switzerland, Switzerland.

11:45 AM *EN02.12.03

Low-temperature plasma synthesis of III-nitride nanocrystals [Rebecca J. Anthony](#); Michigan State University, United States.

12:15 PM EN02.12.04

Quantitative Nanoscale Electrical and Thermal Transport Studies in Enhanced Thermoelectric Performance Sb₂Te₃/MoS₂ Multilayer Sample [Khushboo Agarwal](#); Lancaster University, United Kingdom.

SYMPOSIUM EN03

Emerging Inorganic Semiconductors for Solar Energy and Fuels
May 9 - May 24, 2022

Symposium Organizers

Sage Bauers, National Renewable Energy Laboratory
Kazuhiko Maeda, Tokyo Inst of Technology
Jeffrey Neaton, University of California, Berkeley
Lydia Wong, Nanyang Technological University

* Invited Paper

SESSION EN03.01: Nanostructured Oxides and Chalcogenides
Session Chairs: Sage Bauers and Nicolas Gaillard
Monday Morning, May 9, 2022
Hawai'i Convention Center, Level 3, 323B

10:30 AM *EN03.01.01

Nanostructured Ferrite Materials for (Photo)electrochemical Energy Conversion [Roland Marschall](#); University of Bayreuth, Germany.

11:00 AM EN03.01.02

Facet-Dependent Photocatalytic Water Splitting at ZnFe₂O₄ Nanoparticles [Yihuang Xiong](#); Dartmouth College, United States.

11:15 AM EN03.01.03

Engineering Solution-Processable 2D TMD Nanoflakes for Photoelectrochemical Applications [Rebekah Wells](#); Ecole Polytechnique Federale de Lausanne, Switzerland.

11:30 AM EN03.01.04

3D Nanostructured WO₃ Photoanode for Water Splitting [Jungmin Kim](#); Chungnam National University, Korea (the Republic of).

SESSION EN03.02: Inorganic Perovskite Absorbers for Photocatalysis
Session Chairs: Sage Bauers and Roland Marschall
Monday Afternoon, May 9, 2022
Hawai'i Convention Center, Level 3, 323B

1:30 PM *EN03.02.01

Bismuth-Based Perovskite-Inspired Materials for Energy Harvesting [Robert Hoyer](#); Imperial College London, United Kingdom.

2:00 PM EN03.02.02

Solar Water-Splitting with Low-Cost Hybrid Halide Perovskites at >13% STH [Austin Fehr](#); Rice University, United States.

2:15 PM EN03.02.03

Inorganic Lead Halide Perovskites Based Tandem Photoelectrodes for Unassisted Water-Splitting [Zhaoning Song](#); University of Toledo, United States.

2:30 PM EN03.02.04

Unraveling the Structure-Property Correlations in Durable Multimetal Oxyhalide Photocatalysts [Kaustav Chatterjee](#); Indiana University, United States.

2:45 PM EN03.02.05

Charge Transport Mechanisms in SrTiO₃:Rh Nanoparticle Photocatalysts for Z-Scheme Water Splitting [Brian T. Zutter](#); Sandia National Laboratory, United States.

3:00 PM BREAK

SESSION EN03.03: Chalcopyrite Based Materials and Technologies for PV and PEC
Session Chairs: Robert Hoyer and Lydia Wong
Monday Afternoon, May 9, 2022
Hawai'i Convention Center, Level 3, 323B

3:30 PM *EN03.03.01

New Absorbers, Interfaces and Integration Methods for Chalcopyrite-Based Photoelectrochemical Water Splitting Tandems [Nicolas Gaillard](#); University of Hawaii, United States.

4:00 PM EN03.03.02

WITHDRAWN 5/9/22 EN03.03.02 Atomic Gradient-Passivation Layer for CuInS₂-Based Photocathode for Solar-Driven H₂ Production [Noyoung Yoon](#)^{1,2}; ¹Korea Institute of Science and Technology, Korea (the Republic of); ²Korea University, Korea (the Republic of).

4:15 PM EN03.03.03

IZO and IOH Window Layers in Ag-Alloyed CuInSe₂ Thin-Film Solar Cells for Tandem Applications [Maximilian Krause](#); Empa–Swiss Federal Laboratories for Materials Science and Technology, Switzerland.

4:30 PM EN03.03.04

Transparent Back Contact Interface Modification for Bifacial (Ag,Cu)(In,Ga)Se₂ Thin-Film Solar Cells with Efficiencies Beyond 20% [Shih-Chi Yang](#); EMPA, Switzerland.

4:45 PM EN03.03.05

Atomic Layer Deposited Metal Oxide Buffer Layers to Mitigate Sputter Damage on Co-Evaporated CIGS Solar Cell Absorbers [Ramis Hertwig](#); Empa, Switzerland.

SESSION EN03.04: Poster Session I: Inorganic Photoabsorbers for PEC

Session Chairs: Jeffrey Neaton and Lydia Wong

Monday Afternoon, May 9, 2022

5:00 PM - 7:00 PM

Hawai'i Convention Center, Level 1, Kamehameha Exhibit Hall 2 & 3

EN03.04.01

A First-Principles Analysis of Hydrogen Evolution Reaction Using an AgTe Catalyst [Heeju Kim](#); Sejong University, Korea (the Republic of).

EN03.04.02

Enhancing the Photocatalytic Activity of TiO₂ Through the Use of Selective Contacts Based on Photovoltaic Solar Cells [Lluís Soler](#); University of Politecnica-Catalunya, Spain.

EN03.04.03

Tailoring Metal-Insulator-Semiconductor Junctions for Photoelectrochemical Water and Urea Oxidation [Sol A Lee](#); Seoul National University, Korea (the Republic of).

EN03.04.04

Effects of 1D/2D Heterostructure Formation on the Charge Carrier Recombination Dynamics of TiO₂ Nanotube Photoanodes for Solar Photoelectrochemical Water Splitting [Lilly A. Schaffer](#); University of Houston, United States.

EN03.04.05

High-Quality Ta₃N₅ Photoelectrodes for Photoelectrochemical Energy Conversion [Lukas Wolz](#); Technische Universität München, Germany.

EN03.04.06

Tandem PEC Device with Perovskite/g-C₃N₄ and Phosphorene/g-C₃N₄ as the Electrodes for Hydrogen Evolution and Ciprofloxacin Photodegradation [Tzu-Heng Wang](#); National Tsing Hua University, Taiwan.

EN03.04.08

Unbiased Photoelectrochemical Solar Fuel Generation Enabled by Antimony Trisulfide Photoanode Based on Iodide Oxidation Reaction [Jooho Moon](#); Yonsei University, Korea (the Republic of).

EN03.04.09

Band Edge Engineering in Metal Oxide Heterostructures for Efficient Charge Separation for Solar Water Oxidation in Photoelectrochemical Cell [Ornella Laouadi](#); Aalto University, Finland.

EN03.04.10

Ge-Doped ZnO Nanorods Grown on FTO for Photoelectrochemical Water Splitting with Exceptional Photoconversion Efficiency [Nageh K. Allam](#); American University in Cairo, Egypt.

EN03.04.11

Multiple Synergistic Effects of Zr-Alloying on the Phase Stability and Photostability of Black Niobium Oxide Nanotubes as Efficient Photoelectrodes for Solar Hydrogen Production [Nageh K. Allam](#); American University in Cairo, Egypt.

EN03.04.12

Bicontinuous SiO₂-Cu_xO_y-TiO₂ Heterostructure Prepared from Nanoporous Hybrid Film (NHF) for Photocatalytic Applications [Kyeong Eun Yeo](#); Gwangju Institute of Science & Technology, Korea (the Republic of).

EN03.04.13

Preparation of p-p Heterojunction and Its Photocatalytic H₂ Production by CuO-Mn₃O₄ Nanocomposite [Bee Lyong Yang](#); Kumoh National Inst of Tech, Korea (the Republic of).

EN03.04.14

Boosted Photoelectrochemical Water Splitting by BiVO₄ Nanodots on In₂O₃ Nanorods [Jin Wook Yang](#); Seoul National University, Korea (the Republic of).

EN03.04.15

Bundle-Type Columnar Cu₂O Photoabsorbers with Vertical Grain-Boundaries Using Instant Strike Processed Metallic Seeds and Their Enhanced Photoelectrochemical Efficiency [Ji Hoon Choj](#); Sungkyunkwan University, Korea (the Republic of).

EN03.04.16

Exploring the Roles of Nafion Ionomer in CO₂ Electrolysis [Pan Ding](#); Walter Schottky Institut, TUM, Germany.

EN03.04.17

The CO₂ Impact of Materials Science Research [Rachel Woods-Robinson](#); Lawrence Berkeley National Laboratory, United States.

EN03.04.18

Employing the Optical Properties of a MgZnO Layer with Different Mg Concentrations to Analyze and Simulate Thin-Film CdTe Solar Cell Performance [Mohammed Alaani](#); The University of Toledo, United States.

EN03.04.19

BiVO₄ Photoanode Surface Modification with Metal Borate Decorated Ti₃C₂T_x MXenes OER Catalyst [Ruben Dell'Oro](#); Politecnico di Milano, Italy.

EN03.04.20

Solar-Driven Simultaneous Electrochemical CO₂ Reduction and Water Oxidation Using Perovskite Solar Cells [Jaehoon Chung](#); The University of Toledo, United States.

EN03.04.21

Designing of Self Standing Binder Free Fe₃O₄/NiCo₂O₄ Photoanode and Synergistic Cathode Contribution in Photoelectrocatalytic Water Remediation at Low Current Density [Ravinder Kaushik](#); Indian Institute of Technology Mandi, India.

EN03.04.22

Towards Energy Efficient Photocatalysts via QD-Based Photon Upconversion [Tsumugi Miyashita](#); University of Utah, United States.

SESSION EN03.05: Inorganic Perovskite Absorbers for Photovoltaics

Session Chairs: Sage Bauers and Jeffrey Neaton

Tuesday Morning, May 10, 2022

Hawai'i Convention Center, Level 3, 323B

8:30 AM EN03.05.01

Chalcogenide Perovskite Thin Films as Next-Generation Solar Absorbers [Mythili Surendran](#); University of Southern California, United States.

8:45 AM EN03.05.02

Synthesis, Properties and Prospects for Photovoltaics of Chalcogenide Perovskite Thin Films [Rafael Jaramillo](#); Massachusetts Institute of Technology, United States.

9:00 AM EN03.05.03

NaBiS₂ as an Emerging Lead-Free Perovskite-Inspired Material—Defect Tolerance and PV Application [Yi-Teng Huang](#); University of Cambridge, United Kingdom.

9:15 AM EN03.05.04

Highly Absorbing Lead-Free Semiconductors CuAgBiI₅ and Cu₂AgBiI₆ from the Quaternary CuI-AgI-BiI₃ Phase Space for Photovoltaic Applications [Harry C. Sansom](#)^{1,2}; ¹University of Oxford, United Kingdom; ²University of Liverpool, United Kingdom.

9:30 AM EN03.05.05

From Monolayers to Bilayers and Cs₂AgBiBr₆ (Elpasolite) Nanoplatelets, Investigation of Their Formation and Engineering Their Properties [Shaked Dror](#); Technion, Israel.

9:45 AM EN03.05.06

Flexible Dye-Sensitized Solar Cells Assisted with Lead-Free Perovskite Halide [Xiaojuan Fan](#); Marshall University, United States.

10:00 AM BREAK

SESSION EN03.06: Advanced Characterization of Photoactive Materials

Session Chairs: Sage Bauers and Lydia Wong

Tuesday Morning, May 10, 2022

Hawai'i Convention Center, Level 3, 323B

10:45 AM EN03.06.01

Carrier Recombination and Open-Circuit Voltage Loss in Na-Engineered Cu₂ZnSn(S,Se)₄ Flexible Solar Cells [Ha Kyung Park](#); Ewha Womans University, Korea (the Republic of).

11:00 AM EN03.06.02

Expanding the Scope of Electrocatalysis Through Catalyst Design and Operando Spectroscopy [Nikolay Kornienko](#); University of Montreal, Canada.

11:15 AM EN03.06.03

Why Should We Consider Integrated Photoelectrochemical Devices? [Tobias Kistler](#)^{1,3,2}; ¹Lawrence Berkeley National Laboratory, United States; ²Technische Universität München, Germany; ³Lawrence Berkeley National Laboratory, United States.

11:30 AM *EN03.06.04

Surface Photovoltage Spectroscopy Observes Quasi-Fermi Level Splitting in BiVO₄ and Other Solar Fuel Photoelectrodes [Frank E. Osterloh](#); University of California, Davis, United States.

SESSION EN03.07: Emerging Chalcogenide Photoabsorbers I

Session Chairs: Jeffrey Neaton and Frank Osterloh

Tuesday Afternoon, May 10, 2022

Hawai'i Convention Center, Level 3, 323B

2:00 PM EN03.07.01

Efficient Ultrathin AgBiS₂ Nanocrystal Solar Cells via Cation Disorder Engineering [Seán R. Kavanagh](#)^{1,3}; ¹University College London, United Kingdom; ³Imperial College London, United Kingdom.

2:15 PM EN03.07.02

High-Specific-Power Flexible Transition Metal Dichalcogenide Solar Cells [Koosha Nassiri Nazif](#); Stanford University, United States.

2:30 PM EN03.07.03

Combinatorial Investigations of ZnTe_xSe_{1-x} Alloys for Applications as CO₂ Reduction Photocathodes [Sage Bauers](#); National Renewable Energy Laboratory, United States.

2:45 PM EN03.07.04

Graded Cd_{1-x}Zn_xTe Films for Use in Wide Bandgap Photovoltaics [Ebin Bastola](#); University of Toledo, United States.

3:00 PM BREAK

SESSION EN03.08: Complex Oxides I
Session Chairs: Sage Bauers and Rachel Woods-Robinson
Tuesday Afternoon, May 10, 2022
Hawai'i Convention Center, Level 3, 323B

3:45 PM EN03.08.01

Growth, Intermixing and Composition Control of Atomic Layer Deposited Zinc Tin Oxide [Poorani Gnanasambandan](#)^{1,2}; ¹Luxembourg Institute of Science and Technology, Luxembourg; ²University of Luxembourg, Luxembourg.

4:00 PM EN03.08.02

Direct Z-Scheme Photocatalytic Water Splitting over an α -Fe₂O₃-Cu₂O Heterojunction with Ultrafast Interfacial Charge Transfer [Jake Heinlein](#)^{1,2}; ¹Yale University, United States; ²Yale University, United States.

4:15 PM EN03.08.03

Designing Catalytically Active and Stable Multifunctional CoO_x Layers by Plasma-Enhanced Atomic Layer Deposition for Efficient Electrochemical Energy Conversion [Matthias Kuhl](#); Technische Universität München, Germany.

SESSION EN03.09: Poster Session II: Inorganic Photoabsorbers for PV
Session Chairs: Sage Bauers and Kazuhiko Maeda
Tuesday Afternoon, May 10, 2022
5:00 PM - 7:00 PM
Hawai'i Convention Center, Level 1, Kamehameha Exhibit Hall 2 & 3

EN03.09.01

Efficient and Stable CsPbI_{3-x}Br_x Perovskite Solar Cells and Submodules by Orthogonal Processable Spray Coating [Jin Hyuck Heo](#); Korea University, Korea (the Republic of).

EN03.09.02

Lead-Free Halide Perovskite Inspired Solar Cells—Organic-Inorganic A-Site Engineering in Bismuth Halide Absorbers [Michael Wilhelm](#); University of Cologne, Germany.

EN03.09.03

Electrical Properties of Zn₃P₂ Grown on InP [Rajrupa Paul](#); EPFL, Switzerland.

EN03.09.04

High-Performance Perovskite-Kesterite Monolithic Tandem Solar Cells Enabled by the Roughness Control [Sun Kyung Hwang](#); Seoul National University, Korea (the Republic of).

EN03.09.05

Subcell Characterization of Monolithic Perovskite/Silicon Tandem Solar Cells [Jae-Hyun Park](#)^{1,2}; ¹Seoul National University, Korea (the Republic of); ²Research Institute of Advanced Materials, Korea (the Republic of).

EN03.09.06

Cadmium Selenide (CdSe) as an Active Absorber Layer for Photovoltaic Device with Voc Exceeding 750 mV [Ebin Bastola](#); University of Toledo, United States.

EN03.09.07

Problems and Possible Solutions for Antimony Selenide Interfaces [Maykel Jiménez Guerra](#); Universitat Politècnica de Catalunya, Spain.

EN03.09.08

Antimony Sulfide Absorber Developed by Hydrothermal Method for Efficient Solar Cells [Dipendra Pokhrel](#); University of Toledo, United States.

EN03.09.09

Templated Growth and Passivation of Vertically Oriented Antimony Selenide Thin Films for High-Efficiency Solar Cells [Suman Rijal](#); The University of Toledo, United States.

EN03.09.10

Post-Annealing Treatment of Hydrothermally Grown Antimony Selenosulfide Solar Cells [Suman Rijal](#); The University of Toledo, United States.

EN03.09.11

Tin-Based Nanoparticles for Solar Cell Applications [Luis Alamo-Nole](#); Pontifical Catholic University of Puerto Rico, United States.

EN03.09.14

Substitution of Elements—From Ternary Chalcopyrite-Type CuInS₂ to Quaternary Adamantines CuBCX₄ with B= Al, Ga, C= Ge, Sn, X= S, Se [Yvonne Tomm](#); Helmholtz-Zentrum Berlin, Germany.

EN03.09.15

Vacuum-Deposited $\text{Cu}_2\text{BaGe}_{1-x}\text{Sn}_x\text{Se}_4$ Films and Solar Cells [Yongshin Kim](#); Duke University, United States.

EN03.09.16

Evolution of Structural and Optoelectronic Properties in Fluorine–Aluminum co-doped Zinc Oxide (FAZO) Thin Films and Their Application in CZTSSe Thin-Film Solar Cells [Suyoung Jang](#); Chonnam National University, Korea (the Republic of).

EN03.09.17

Na Ion Migration in NaF-Doped $\text{Cu}_2\text{ZnSn}(\text{S},\text{Se})_4$ Thin-Film Solar Cells on Flexible Mo Foil [Eunae Jo](#); Chonnam National University, Korea (the Republic of).

EN03.09.18

Role of CdTe Deposition Temperature in the Fabrication and Optimization of Sputtered CdTe Solar Cells [Stephen K. O'Leary](#); University of British Columbia, Canada.

EN03.09.19

Loss Analysis for Thin-Film Solar Cells via Transfer Matrix and Electrical Finite Element Method [Mario Zinßer](#)^{1, 2}; ¹Zentrum für Sonnenenergie- und Wasserstoff-Forschung Baden-Württemberg (ZSW), Germany; ²Karlsruhe Institute of Technology (KIT), Germany.

EN03.09.20

Lightweight and Flexible CdTe Solar Cell via Lift-Off Process [Sandip S. Bista](#); The University of Toledo, United States.

EN03.09.22

Absorber Delamination-Induced Shunt Defects in CIGS Solar Modules [Seung Hoon Lee](#); Korea University, Korea (the Republic of).

EN03.09.23

Understanding the Role of High Vacuum Annealed Magnesium doped Zinc Oxide as a Buffer Layer [Manoj K. Jamarkattel](#); University of Toledo, United States.

EN03.09.24

Solution-Processing of Chalcogenide Perovskites [Jonathan Turnley](#); Purdue University, United States.

EN03.09.25

Chemical and Electronic Structure of Cd^{2+} -Treated CuGa_3Ses Solar Absorbers and Their Interfaces with $\text{Mg}_x\text{Zn}_{1-x}\text{O}$ Buffers [Mary Blankenship](#); University of Nevada, Las Vegas, United States.

EN03.09.26

Exploration of Organic Hole Transport Layers for Chalcogenide Solar Cells [Dengbing Li](#); University of Toledo, United States.

SESSION EN03.10: Novel Materials for Tandem Solar Cells

Session Chairs: Xiaojing Hao and Jeffrey Neaton

Wednesday Morning, May 11, 2022

Hawai'i Convention Center, Level 3, 323B

8:30 AM *EN03.10.01

Monolithic Photoelectrochemical Tandem Devices Consisting of Tunnel Oxide Passivated Contact Silicon and BiVO_4 Enabling Unassisted Water Splitting [Byungha Shin](#); Korea Advanced Institute of Science and Technology, Korea (the Republic of).

9:00 AM EN03.10.02

Tandem Semiconductor Microwire Slurries for Solar Hydrogen Generation [Joshua M. Spurgeon](#); University of Louisville, United States.

9:15 AM EN03.10.03

Novel Monolithic Three-Terminal Tandem Solar Cells Based on Antimony Chalcogenide Absorbers [Zacharie Jehl Li-Kao](#); Polytechnic University of Catalonia, Spain.

9:30 AM EN03.10.04

Elemental Selenium as a Wide Bandgap Photoabsorber Appropriate for Tandem Integration with Silicon or CIGS [Rasmus Nielsen](#); Technical University of Denmark, Denmark.

9:45 AM EN03.10.05

Tapered-Nanoflakes-Array of Cupric Oxide for Bias-Free Tandem Solar Water-Splitting [Hyun Soo Han](#); Stanford University, United States.

10:00 AM BREAK

SESSION EN03.11: Complex Oxides II

Session Chairs: Sage Bauers and Jon Major

Wednesday Morning, May 11, 2022

Hawai'i Convention Center, Level 3, 323B

10:30 AM *EN03.11.01

Synthesizability and Properties of Carbon Nitride Semiconductors for Solar Energy Conversion [Paul Maggard](#); North Carolina State University, United States.

11:00 AM EN03.11.04

Co-doping Strategy of Hematite for Efficient Water Splitting [Ji-Hyun Jang](#); UNIST, Korea (the Republic of).

11:15 AM EN03.15.02

Computationally Accelerated Discovery of Gd-based Perovskite Oxides for Solar Thermochemical Applications [Ryan J. Morelock](#); University of Colorado Boulder, United States.

States.

SESSION EN03.13: Emerging Chalcogenide Photoabsorbers II

Session Chairs: Paul Maggard and Lydia Wong

Wednesday Afternoon, May 11, 2022

Hawai'i Convention Center, Level 3, 323B

4:00 PM *EN03.13.01

Interface Control in Antimony Selenide Solar Cells [Jon Major](#); University of Liverpool, United Kingdom.

4:30 PM EN03.13.03

In₂O₃:Mo as an Alternative Partner Layer for Sb₂Se₃ Thin-Film Solar Cells [Nicole Fleck](#); Northumbria University, United Kingdom.

4:45 PM EN03.13.04

Unravelling Light-Driven CO₂ Reduction Mechanisms on Semiconductors—A Case Study of Sb₂Se₃ and Si [Rajiv Ramanujam Prabhakar](#); Lawrence Berkeley National Laboratory, United States.

SESSION EN03.14: Catalysts and Electrolytes

Session Chairs: Stephan Lany and David Mitzi

Thursday Morning, May 12, 2022

Hawai'i Convention Center, Level 3, 323B

8:45 AM EN03.14.01

Stabilization of NiFe Layered Double Hydroxides on n-Si by an Activated TiO₂ Interlayer for Efficient Solar Water Oxidation [Sungkyun Choi](#); Seoul National University, Korea (the Republic of).

9:00 AM EN03.14.02

Boosting Unassisted Alkaline Solar Water Splitting Using Silicon Photocathode with TiO₂ Nanorods Decorated by Edge-Rich MoS₂ Nanoplates [Sang Eon Jun](#); Seoul National University, Korea (the Republic of).

9:15 AM EN03.14.03

Solar Photodeposition of Nanocatalysts as a Sustainable Fabrication Route [Camilla Tossi](#); Aalto University, Finland.

9:30 AM *EN03.14.04

Water Splitting Under Modal Strong and Ultra Strong Coupling Conditions [Hiroaki Misawa](#)^{1,2}; ¹Hokkaido University, Japan; ²National Yang Ming Chiao Tung University, Taiwan.

10:00 AM BREAK

SESSION EN03.15: Materials Design and Theory

Session Chairs: Jeffrey Neaton and Rachel Woods-Robinson

Thursday Morning, May 12, 2022

Hawai'i Convention Center, Level 3, 323B

10:30 AM EN03.15.01

Redox Defect Thermochemistry of FeAl₂O₄ Hercynite in Water-Splitting from First Principles Methods [Stephan Lany](#); National Renewable Energy Laboratory, United States.

10:45 AM DISCUSSION TIME

11:00 AM EN03.15.03

Enhancement of Photoelectrolysis of MoS₂ and PdSe₂ Using Heterostructuring [Edward A. Baker](#); University of Exeter, United Kingdom.

11:15 AM EN03.15.04

WITHDRAWN 5/11/22 EN03.15.04 Simulating Changing Order Parameter in ZnGeP₂ with Cluster-Based Monte Carlo [Linda Pucurimay](#)^{1,2}; ¹Princeton University, United States; ²National Renewable Energy Laboratory, United States.

11:30 AM EN03.15.05

Identifying New Inorganic Solar Absorbers with Long Carrier Lifetime Using High-Throughput Computational Screening [Geoffroy Hautier](#); Universite catholique de Louvain, Belgium.

SESSION EN03.16: Pnictide Photoabsorbers for PV and PEC

Session Chairs: Sage Bauers and Maarja Grossberg

Thursday Afternoon, May 12, 2022

Hawai'i Convention Center, Level 3, 323B

1:45 PM *EN03.16.01

Leveraging Surface Transformations in the Design of New Photoabsorbers for CO₂ Reduction [Andriy Zakutayev](#); National Renewable Energy Laboratory, United States.

2:15 PM EN03.16.02

ZrTaN₃—A New Visible Light Absorbing Ternary Nitride Semiconductor Photoanode [Laura I. Wagner](#); TU Munich, Germany.

2:30 PM EN03.16.03

ZnGeN₂—A Disorder Tunable Material [Susan Schorr](#)^{1,2}; ¹Helmholtz-Zentrum Berlin for Materials and Energy, Germany; ²Freie Universität Berlin, Germany.

2:45 PM EN03.16.04

Towards High-Performing and Sustainable Zinc Phosphide Solar Cell Absorbers [Mirjana Dimitrievska](#); École Polytechnique Fédérale de Lausanne, Switzerland.

3:00 PM BREAK

SESSION EN03.17: Progress in Kesterite Photoabsorbers I
Session Chairs: Geoffroy Hautier, Lydia Wong and Andriy Zakutayev
Thursday Afternoon, May 12, 2022
Hawai'i Convention Center, Level 3, 323B

3:30 PM *EN03.17.01

Perspectives of the Kesterite Cu₂ZnSnS₄ Based Photovoltaics [Maarja Grossberg](#); Tallinn University of Technology, Estonia.

4:00 PM *EN03.17.02

Structure and Property Control in I₂-II-IV-X₄ Multinary Chalcogenide Solar Absorbers [David B. Mitzi](#); Duke University, United States.

4:30 PM EN03.17.03

Small Atoms Doping—A Strategy to Reduce Sn_{zn} Recombination Center Concentration in CZTSe [Alex Jimenez Arguijo](#); Institut de Recerca Energètica de Catalunya(IREC), Spain.

4:45 PM EN03.17.04

Crystallographic Structure and Point Defects vs Efficiency and Stability in Cu₂ZnSn(S,Se)₄ Monograin Solar Cells [Galina Gurieva](#); Helmholtz Zentrum Berlin, Germany.

5:00 PM EN03.12.03

Cation Order Determination in Kesterite-Type Quaternary Semiconductors by Multiple Edge Anomalous Diffraction (MEAD) [Daniel M. Toebbens](#); Helmholtz-Zentrum Berlin, Germany.

SESSION EN03.18: Materials Science and Engineering of Emerging Oxide and Chalcogenide Photoabsorbers I
Session Chair: Roel Van de Krol
Monday Morning, May 23, 2022
EN03-Virtual

8:00 AM *EN03.18.01

Structure and Chemistry of Delafossite CuRhO₂ [Tachun Lee](#); Princeton University, United States.

8:30 AM EN03.18.02

Manipulating the Fate of Charge Carrier with Tungsten Concentration—Enhancing Photoelectrochemical Water Oxidation of Bi₂WO₆ [Hoi Ying Chung](#); City University of Hong Kong, Hong Kong.

8:45 AM EN03.18.03

Impact of Post Deposition Heat Treatment on Optical Properties of Pulsed Laser Deposited ZnO Thin Film [Prosenjit Sarkar](#); Gurukula Kangri (Deemed to be University), India.

9:00 AM EN03.18.05

Lowering Manufacturing Costs of Multi-Junction Solar Cells, While Increasing Photo-Voltaic Efficiency by Using Nano-Bonding™ of Semiconductor Absorbers in Air Using Surface Energy Engineering (SEE) at Low Temperature (T ≤ 220°C) [Pranav V. Penmatcha](#); Arizona State University, United States.

9:05 AM EN03.18.06

Encapsulating Cu₂O with Metal-Organic Frameworks for Solar Fuel Production [Hao Wu](#); City University of Hong Kong, Hong Kong.

9:10 AM *EN03.18.07

N-Type SnS and Its Application to Homo Junction PV [Issei Suzuki](#); Tohoku University, Japan.

9:40 AM EN03.09.12

A Novel V₂O₅/ZnTiO₃ Nanocomposite as a Highly Effective Adsorbent for Congo Red Adsorption Applications [Yogendra Yadawa](#); Rajiv Gandhi Institute of Petroleum Technology, Jais, Amethi, UP, Pin code: 229304, India.

SESSION EN03.19: Accelerated Discovery and Testing of Advanced Photoabsorber Systems
Session Chairs: Jeffrey Neaton and Julia Wiktor
Monday Morning, May 23, 2022
EN03-Virtual

10:30 AM *EN03.19.01

Rapid Screening Method for the Viability of Emerging Photoelectrode Materials and Compositions [Sophia Haussener](#); Ecole Polytechnique Federale de Lausanne, Switzerland, Switzerland.

11:00 AM EN03.19.02

Designing Nanostructures and Multilayers with Numerical Simulation for Efficient Solar Energy Conversion [David Waligo](#); University of Houston, United States.

11:15 AM EN03.19.03

High Throughput Evaluation of Multi-Element, Multi-Functional Coatings for Improved Photocathodes [Joel Haber](#); California Institute of Technology, United States.

11:30 AM EN03.19.04

Designing New Semiconductor Materials with Multinary Cu-Chalcogenide Nanocrystals [Soubantika Palchoudhury](#); University of Dayton, United States.

SESSION EN03.20: Materials Science and Engineering of Emerging Oxide and Chalcogenide Photoabsorbers II

Session Chairs: Sage Bauers and Jeffrey Neaton

Tuesday Morning, May 24, 2022

EN03-Virtual

8:00 AM *EN03.20.01

Understanding Oxide Interfaces in Photoelectrochemistry with XPS [Roel Van de Kroel](#)^{1,2}; ¹Helmholtz-Zentrum Berlin für Materialien und Energie, Germany; ²Technische Universität Berlin, Germany.

8:30 AM EN03.20.02

Earth-Abundant Electrocatalysts for the Oxygen-Evolution Reaction (OER) Supported on Zirconium Phosphate Layered Nanomaterials [Jorge L. Colón](#); University of Puerto Rico, United States.

8:45 AM EN03.20.04

Ternary Ti-Mo-Fe Nanotubes as Efficient Photoanodes for Solar Assisted Water Splitting [Abdussalam M. Elbanna](#); The American University in Cairo, Egypt.

8:50 AM EN03.20.05

Hierarchical Porous Nickel Phosphide Electrode for Solar-Driven Green Hydrogen Production [Tiejun Zhang](#); Khalifa University of Science and Technology, United Arab Emirates.

9:05 AM EN03.20.06

WITHDRAWN 5/18/22 EN03.20.06 Functional Imaging-Guided Rational Design of Anisotropically-Faceted Semiconductor Particles for Photoelectrochemical Energy Conversion [Xianwen Mao](#); National University of Singapore, Singapore.

9:20 AM EN03.20.07

Photoelectrochemical Water Oxidation Using Halide Double Perovskites [Poonam Sikarwar](#); Indian Institute of Technology Madras, India.

9:25 AM EN03.12.02

Bulk and Surface Properties of $\text{Cu}_2\text{ZnGe}(\text{S}_x\text{Se}_{1-x})_4$ Thin-Film Solar Cell Absorbers [Marcus Baer](#)^{1,8,9}; ¹Helmholtz-Zentrum Berlin für Materialien und Energie GmbH, Germany; ⁸Helmholtz Institute Erlangen-Nürnberg for Renewable Energies, Germany; ⁹Friedrich-Alexander-Universität Erlangen-Nürnberg, Germany.

9:40 AM *EN03.13.02

Binary Selenide (Sb_2Se_3 and CdSe) Thin-Film Solar Cells [Jiang Tang](#); Huazhong University of Science and Technology, China.

SESSION EN03.21: Materials Science and Engineering of Emerging Oxide and Chalcogenide Photoabsorbers IV

Session Chairs: Sage Bauers and Jeffrey Neaton

Tuesday Morning, May 24, 2022

EN03-Virtual

10:30 AM *EN03.21.01

Towards Realistic *Ab Initio* Modeling of Complex Photoabsorbers [Julia Wiktor](#); Chalmers University of Technology, Sweden.

11:00 AM EN03.21.02

Metal Chalcogenide Heterostructure Based Photoanode for Highly Efficient Water Splitting [Muthuraja Velpandian](#); Indian Institute of Technology Hyderabad, India.

11:15 AM EN03.21.03

Highly Efficient AgBiS_2 Nanocrystal Solar Cells Enabled by Cation Disorder Engineering [Yongjie Wang](#); ICFO-Institut de Ciències Fotoniques, The Barcelona Institute of Science and Technology, Spain.

11:30 AM EN03.21.04

Contrasting the Performance of BiFeO_3 Thin Films as Photocathodes and in All-Oxide Photovoltaic Devices [David J. Fermin](#); University of Bristol, United Kingdom.

11:45 AM EN03.21.05

Covalent S-O bonding enables enhanced photoelectrochemical performance of $\text{Cu}_2\text{S}/\text{Fe}_2\text{O}_3$ heterojunction for water splitting [Artur Braun](#); Empa, Switzerland.

12:00 PM EN03.21.06

BaHfS_3 Thin Film Growth by Sputtering [Haolei Hui](#); University at Buffalo, The State University of New York, United States.

12:05 PM *EN03.21.07

Photoanode Discovery in the Ni-Sb Oxide System for Durable Oxygen Evolution [John M. Gregoire](#); California Institute of Technology, United States.

SESSION EN03.22: Materials Science and Engineering of Emerging Oxide and Chalcogenide Photoabsorbers III

Session Chairs: Kazuhiko Maeda and Lydia Wong

Tuesday Afternoon, May 24, 2022

EN03-Virtual

9:00 PM *EN03.22.01

More Se Vacancies in Sb_2Se_3 Under Se-Rich Conditions—An Abnormal Behavior Induced by Defect-Correlation in Compensated Compound Semiconductors [Shiyu Chen](#); Fudan University, China.

9:30 PM EN03.22.02

Quantum Confinement and Carrier Transport in π -SnS Colloidal Quantum Dot Solids [Satria Z. Bisri](#)^{1,2}; ¹RIKEN Center for Emergent Matter Science, Japan; ²Tokyo Institute of Technology, Japan.

9:45 PM EN03.22.03

A New Strategy of Vanadium Doping in Centimeter-Scaled MoS_2 Thin Film for CO_2 Reduction [Ying-Ti Hung](#)^{1,2}; ¹Academia Sinica, Taiwan; ²National Taiwan University, Taiwan.

10:00 PM *EN03.22.04

Design of Efficient Photocatalysts for Solar Fuel Generation by Water Splitting and CO_2 Reduction [Rong Xu](#)^{1,2}; ¹Nanyang Technological University, Singapore; ²Cambridge Centre for Advanced Research and Education in Singapore (CARES), Singapore.

10:30 PM *EN03.12.01

Efficient Green Kesterite for Solar Photovoltaic and Solar Fuel Devices [Xiaoqing Hao](#); Univ of New South Wales, Australia.

SYMPOSIUM EN04

Next-Generation Organic Photovoltaics—Fundamentals and Applications for Flexible, Stretchable and Wearable Devices
May 8 - May 25, 2022

Symposium Organizers

Derya Baran, King Abdullah University of Science and Technology
Jung-Yong Lee, Korea Advanced Institute of Science and Technology
Gregory Welch, University of Calgary
Han Young Woo, Korea University

* Invited Paper

SESSION EN04.01: Materials—OPV Synthesis and Characterization
Session Chairs: Safa Shoaee and Han Young Woo
Sunday Afternoon, May 8, 2022
Hawai'i Convention Center, Level 3, 321A

1:30 PM *EN04.01.01

Development of Conjugated Polymers and Devices for High Performance Large-Area Organic Photovoltaics [Hae Jung Son](#); KIST, Korea (the Republic of).

2:00 PM EN04.01.02

Phase Behavior and Charge Transfer Network in High Performing Non-Fullerene Acceptor Organic Solar Cells [Christina Cheng](#); Stanford University, United States.

2:15 PM EN04.01.03

Conjugated Polymer Blends—X-Ray and Neutron Scattering Analysis of Structure and Relationships to Electronic Properties [Sage Scheiwiller](#); University of Washington, United States.

2:30 PM EN04.01.04

Impact of Charge Separation on Solar Cell Performance in PBDB-T-SF and PBDB-T-2Cl:NFA Photoactive Blends [Jafar I. Khan](#); King Abdullah University of Science and Technology, Saudi Arabia.

2:45 PM BREAK

SESSION EN04.02: Fundamentals—OPV Photophysics and Device Physics III
Session Chairs: Safa Shoaee and Han Young Woo
Sunday Afternoon, May 8, 2022
Hawai'i Convention Center, Level 3, 321A

3:00 PM *EN04.02.01

Reducing Energetic Disorder and Nonradiative Recombination of Charge Transfer State for Better Organic Solar Cells [Safa Shoaee](#); University of Potsdam, United States.

3:30 PM *EN04.02.02

Organic Photovoltaics with Small Driving Force—Spectroscopic Perspectives [Natalie Banerji](#); University of Bern, Switzerland.

4:00 PM EN04.02.03

Origin of Charge Generation in Neat Non-Fullerene Acceptor Domains [Kaila M. Yallum](#); Universität Bern, Switzerland.

4:15 PM EN04.02.04

Revealing the Impact of Interfacial Structure on Charge Generation and Recombination in Organic Photovoltaics [Brian A. Collins](#); Washington State University, United States.

4:30 PM EN04.02.05

Unraveling Photoelectric Processes in Semitransparent Organic Solar Cells [Viktor Brus](#); Nazarbayev University, Kazakhstan.

4:45 PM EN04.02.06

A Simple Approach for Unraveling Optoelectronic Processes in Organic Solar Cells Under Short-Circuit Conditions [Nora Schopp](#); University of California, Santa Barbara, United States.

SESSION EN04.03: Materials—OPV Processing and Reliability I
Session Chairs: Jung-Yong Lee and Erin Ratcliff

Monday Morning, May 9, 2022
Hawai'i Convention Center, Level 3, 321A

10:30 AM *EN04.03.01

Molecular Orientation of Polymer Semiconductors and Non-Fullerene Acceptors in Organic Photovoltaics [Keisuke Tajima](#); RIKEN, Japan.

11:00 AM EN04.03.02

Crystallization Driven Boost in Fill Factor and Stability in Additive-Free Organic Solar Cells [David Garcia Romero](#); RUG, Netherlands.

11:15 AM *EN04.03.03

Non-Radiative Recombination in Organic Solar Cells [Koen Vandewal](#); Hasselt University, Belgium.

11:45 AM EN04.03.04

The Effects of Chromophore Halogenation on Reliability of UV-Absorbing Organic Transparent Photovoltaics [Tianran Liu](#); Princeton University, United States.

SESSION EN04.04: Materials—OPV Processing and Reliability II

Session Chairs: Natalie Banerji and Gregory Welch

Monday Afternoon, May 9, 2022

Hawai'i Convention Center, Level 3, 321A

1:30 PM *EN04.04.01

A Multi-Length Scale Look at Interfaces in Organic Photovoltaics—Structure-Property Relationships, Functionalities and Stability to Power the Internet of Things [Erin L. Ratcliff](#); University of Arizona, United States.

2:00 PM *EN04.04.02

Trace Impurity Tolerance of Polymer Solar Cells [Guillaume Wantz](#); Univ of Bordeaux, France.

2:30 PM EN04.04.03

Non-Fullerene Acceptor Organic Photovoltaics with Intrinsic Operational Lifetimes over 30 Years [Yongxi Li](#); University of Michigan, United States.

2:45 PM EN04.04.04

Narrow Bandgap Approach for All-Day Operation Solar Cell with Functional Interlayer [Yongju Lee](#); University of Seoul, Korea (the Republic of).

3:00 PM EN04.04.05

Scalable Alcohol-Amine-Capped Tin Oxide Interlayers for Organic Solar Cells [David Garcia Romero](#); RUG, Netherlands.

3:15 PM BREAK

SESSION EN04.05: Mechanical Stability of Organic Photovoltaics

Session Chairs: Guillaume Wantz and Gregory Welch

Monday Afternoon, May 9, 2022

Hawai'i Convention Center, Level 3, 321A

3:45 PM *EN04.05.01

Fundamental Relationships Between Morphological and Mechanical Stability of Organic Solar Cells [Brendan T. O'Connor](#); North Carolina State University, United States.

4:15 PM EN04.05.02

Dynamic Mechanical Analysis of Bulk-Heterojunction Active Layers Using a Kirigami-Inspired Substrate Support to Gain Insights into the Mechanical Stability of Organic Solar Cells [Salma Siddika](#)^{1,4}; ¹NC State University, United States; ⁴NC State University, United States.

4:30 PM *EN04.05.03

Metal Nanowire Network Transparent Electrodes Towards High-Performance Flexible Optoelectronic Devices [Dongling Ma](#); Institut national de la recherche scientifique, Canada.

5:00 PM EN04.05.04

Amphiphilic Polymer Conetworks—Wearable and High Energy Transfer Rate Luminescent Solar Concentrators for Fiber Dye-Sensitized Solar Cells [Chieh-Szu Huang](#)^{1,2}; ¹Empa-Swiss Federal Laboratories for Materials Science and Technology, Switzerland; ²ETH Zürich, Switzerland.

SESSION EN04.06: Poster Session: Next-Generation Organic Photovoltaics—Fundamentals and Applications for Flexible, Stretchable and Wearable Devices

Session Chairs: Jung-Yong Lee and Han Young Woo

Monday Afternoon, May 9, 2022

5:00 PM - 7:00 PM

Hawai'i Convention Center, Level 1, Kamehameha Exhibit Hall 2 & 3

EN04.06.01

Exploring Charge Generation and Recombination in Dilute-Donor Organic Solar Cell Blends Using Ultrafast Transient Absorption Spectroscopy [Gareth J. Moore](#); University of Bern, Switzerland.

EN04.06.02

Machine Learning-Assisted Optimization of Organic Photovoltaics via High-Throughput *In Situ* Formulation [Na Gyeong An](#)^{1,2}; ¹Ulsan National Institute of Science and Technology, Korea (the Republic of); ²Commonwealth Scientific and Industrial Research Organisation, Australia.

EN04.06.03

Investigation of Cu-Doped ZrO₂ Nanostructure for Hydrogen Production via Water Splitting [Mohamed Mahrous](#); The American University in Cairo, Egypt.

EN04.06.04

Development of Efficient Organic Photovoltaics using Green Solvent-Based Processing [Jueun Kim](#); Hongik University, Korea (the Republic of).

EN04.06.05

Encapsulated Polymers for Organic Photovoltaics [Darcy Unson](#); University of Cambridge, United Kingdom.

EN04.06.06

Design of Non-Fullerene Acceptors for Organic Photovoltaics—From Theory to Application [Mathieu Mainville](#); Université Laval, Canada.

EN04.06.07

A Simple Structured Exciplex Device with a Multi-Color Sensing Capability [Hyun Woo Jo](#); Korea University, Korea (the Republic of).

EN04.06.08

Excellent Thermal Stability of 1D/2A Terpolymer-Based Polymer Solar Cells Processed with Nonhalogenated Solvent [Hyeonwoo Jung](#); DGIST, Korea (the Republic of).

EN04.06.09

Importance of Terminal Group Pairing of Polymer Donor and Small-Molecule Acceptor in Optimizing Blend Morphology and Voltage Loss of High-Performance Solar Cells [Geon-U Kim](#); KAIST, Korea (the Republic of).

EN04.06.11

Impact of Amino Acids on the Structure, Conductivity and Work Function of PEDOT:PSS [Aman Anand](#)^{1,2}; ¹Laboratory of Organic and Macromolecular Chemistry (IOMC), Friedrich Schiller University Jena, Humboldtstraße 10, Germany; ²Center for Energy and Environmental Chemistry Jena (CEEC Jena), Friedrich Schiller University Jena, Philosophenweg 7a, Germany.

EN04.06.12

Synthesis and Characterization of Graphene/Multiwalled Carbon Nanotubes/TiO₂ Composites for Flexible Solar Cells [Luis I. Serrano Corrales](#); Univ of Sonora, Mexico.

EN04.06.13

Control of Conformational Asymmetry in Narrow Bandgap Nonfullerene Acceptors for Efficient NIR Organic Photovoltaics and Photodetectors [Jaewon Lee](#); Chungnam National University, Korea (the Republic of).

EN04.06.14

Effective Dark Current Suppression Strategy Through Non-Fullerene Acceptor for High-Performance Near-Infrared Organic Photodetectors [Hyeong Ju Eun](#); Ajou University, Korea (the Republic of).

EN04.06.15

Inverted Organic Solar Cells with Oxidized Carbon Materials as Effective Hole Transport Layer [Nara Han](#); Gwangju Institute of Science and Technology, Korea (the Republic of).

EN04.06.16

Physical and Chemical Interface Modification to Improve Device Characteristics of AgNW-Based Optoelectronic Devices [Dongwook Ko](#); Kumoh National Institute of Technology, Korea (the Republic of).

EN04.06.17

Effect of the Side Core Engineering of Y6-Based NFAs for Organic Photovoltaics (OPVs) [Su Bin Lee](#); Gyeongsang National University, Korea (the Republic of).

EN04.06.18

Super Flexible Transparent Conducting Oxide-Free Organic-Inorganic Perovskite Solar Cells [Jin Hyuck Heo](#); Korea University, Korea (the Republic of).

EN04.06.20

Analysis of deterioration of CIGS Photovoltaic Module Based on Electrical and Thermal Equivalent Circuit Modeling. [Yongki Kim](#); Korea Aerospace University, Korea (the Republic of).

EN04.06.21

Combined Engineering of Backbone Building Block and Regioregularity in Polymerized Small-Molecule Acceptors for Efficient All-Polymer Solar Cells with High Electron Mobility [Soodeok Seo](#); Korea Advanced Institute of Science and Technology, Korea (the Republic of).

EN04.06.22

Optimization of Crystallinity and Hole Mobility of BDT-Based Polymer Donor Enables Simultaneous Enhancements of Voc, Jsc, and FF in Efficient Nonfullerene Organic Solar Cells [Jin Su Park](#); Korea Advanced Institute of Science and Technology, Korea (the Republic of).

EN04.06.23

Organic Photovoltaics for 'Extreme' Worlds—Exploring the Frontiers of the Temperature Window of Operation [Jeroen Hustings](#); University of Hasselt, Belgium.

EN04.06.24

A GIWAXS Investigation of the Small Molecule Donor X2 [Andrew J. Levin](#); University of Colorado Boulder, United States.

EN04.06.25

Fabrication of Efficient Mixed Cation Materials for Perovskite Solar Cells to Enhance the Stability and Conversion Efficiency [Abid Ullah](#); Korea Institute of Energy Research, University of Science and Technology South Korea, Korea (the Republic of).

EN04.06.26

First principles Exploration of Hybrid Perovskite Superlattice and Solid Solutions for Efficient and Structurally Stable Stand-Alone Hybrid Solar PV Material [Steven P. Hepplestone](#); University of Exeter, United Kingdom.

EN04.06.27

Environment-Friendly, Low-Waste, Low Power Gas and Photoactivated NIR Sensors for Health Monitoring and Medical Diagnostics [Sheida Faraji](#)^{1,2,3}; ¹Istanbul

Technical University, Turkey; ²ITU Ayazaga Campus, Turkey; ³The Scientific and Technological Research Council of Turkey, Turkey.

EN04.06.28

Luminescent Solar Concentrators as Detectors in Free-Space Optical Communication Systems and Their Bandwidth Limits [Ioannis Papakonstantinou](#); University College London, United Kingdom.

EN04.06.29

Identifying Optimal Photovoltaic Materials for Underwater Applications [Jason A. Röhr](#); New York University, United States.

EN04.06.30

A Universal Cathode Lamination Protocol for Intrinsically Stretchable Light-Emitting Diods [HuanYu Zhou](#); Seoul National University, Korea (the Republic of).

SESSION EN04.07: Organic Photovoltaic Device Engineering

Session Chairs: Jung-Yong Lee and Han Young Woo

Tuesday Morning, May 10, 2022

Hawai'i Convention Center, Level 3, 321A

8:30 AM *EN04.07.01

Aesthetic and Colorful—Dichroic Polymer Solar Cells Using High-Performance Fabry-Pérot Etalon Electrodes [Jin Young Kim](#); Ulsan National Institute of Science and Technology, Korea (the Republic of).

9:00 AM *EN04.07.00

How Organic Semiconductors Can Contribute to a More Sustainable Electronics Industry [Jean-Rémi Pouliot](#); Brilliant Matters Organic Electronics, Canada.

9:30 AM EN04.07.03

Roll-to-Roll Printing—A High-Throughput Digital Research Platform for Organic Photovoltaics [Na Gyeong An](#); CSIRO Manufacturing, Australia.

9:45 AM BREAK

SESSION EN04.08: Fundamentals—OPV Photophysics and Device Physics

Session Chairs: Jung-Yong Lee and Keisuke Tajima

Tuesday Morning, May 10, 2022

Hawai'i Convention Center, Level 3, 321A

10:15 AM *EN04.08.01

Organic Solar Cells Processed from Green Solvents [Thuc-Quyen Nguyen](#); University of California, Santa Barbara, United States.

10:45 AM EN04.08.02

Kinetically Driven Near-Unity Charge Generation Yield in Organic Solar Cells [Ardalan Armin](#); Swansea University, United Kingdom.

11:00 AM EN04.08.03

Accounting for Excitation Losses in UV-Absorbing Organic Heterojunctions with Bright Charge-Transfer State Emission [Quinn C. Burlingame](#); Princeton University, United States.

11:15 AM EN04.08.04

Electron Transport Layers Based on Oligo(Ethylene Glycol)-Incorporated Conjugated Polymers Enabling Reproducible Fabrication of High-Performance Organic Solar Cells [Seungjin Lee](#); KAIST, Korea (the Republic of).

11:30 AM EN04.08.05

Green Solvent Processed Perylene Diimides for Slot-Die Coated Photovoltaics [Gregory C. Welch](#); University of Calgary, Canada.

11:45 AM EN04.08.06

Organic Double Heterojunction Solar Cells [Loren G. Kaake](#); Simon Fraser University, Canada.

SESSION EN04.09: General Session I

Session Chairs: Jung-Yong Lee and Han Young Woo

Tuesday Afternoon, May 24, 2022

EN04-Virtual

9:00 PM *EN04.09.01

Polymer Solar Cells Made with Two-Component or Single-Component Active Layer [Dong Hoon Choi](#); Korea Univ, Korea (the Republic of).

9:30 PM *EN04.09.02

Flexible and Stretchable Conductors for Soft Electronics [Pooi See Lee](#); Nanyang Technological University, Singapore, Singapore.

10:00 PM EN04.09.04

Non-Halogenated Solvent Processed Polymer Solar Cells Derived from a Conjugated Donor-Acceptor Block Copolymer [Su Hong Park](#); Korea University, Korea (the Republic of).

10:05 PM EN04.09.05

Patterned Sandwich-Type Silver Nanowire-Based Flexible Electrode Through Simple Solution-Process Photolithography for Organic Photovoltaics [Na Yeon Kwon](#); Korea University, Korea (the Republic of).

10:10 PM EN04.09.06

Tuning Mechanical Properties of High-Performance Organic Solar Cells with the Addition of a Thermoplastic Elastomer [Abdullah Al Shafe](#); NC State University, United States.

10:15 PM EN04.06.19

WITHDRAWN 5/18/22 EN04.06.19 Van der Waals Lift-Off Process for Fabrication of Highly Efficient Flexible Perovskite Solar Cell and Module [Oh Yeong Gong](#); Sungkyunkwan University, Korea (the Republic of).

SESSION EN04.10: General Session II
Session Chairs: Jung-Yong Lee and Han Young Woo
Wednesday Morning, May 25, 2022
EN04-Virtual

10:30 AM *EN04.10.01

Imide/Cyano-Functionalized n-Type Polymers for Applications in All-Polymer Solar Cells [Xugang Guo](#); Southern University of Science and Technology, China.

11:00 AM EN04.10.03

Fabrication and Characterization of Surface Modified Graphene Oxide as Flexible Anode for Organic Light Emitting Diodes [Munkh-Erdene Erdene-Ochir](#); National University of Mongolia, Mongolia.

11:15 AM EN04.10.04

Linker Modulated Peroxide Electrosynthesis Using Metal-Organic Nanosheets [Kirankumar Kuruvinashetti](#); University of Montreal, Canada.

11:30 AM EN04.10.05

Understanding the Thermal Stability of Cl-Rich Non-Fullerene Acceptor-Based Organic Photovoltaics [Kan Ding](#); North Carolina State University, United States.

11:45 AM *EN04.10.06

Green Chemistry for Green Energy [Mario LeClerc](#); Laval University, Canada.

12:15 PM EN04.10.07

Flexible and Stretchable Piezoelectric Nanogenerators (S-PENG) for Wearable energy harvesting [Gurneet Kaur](#); Indian Institute of Technology Delhi, India.

SESSION EN04.11: General Session III
Session Chairs: Gregory Welch and Han Young Woo
Wednesday Afternoon, May 25, 2022
EN04-Virtual

9:00 PM *EN04.07.02

Recent Advances in Organic Photovoltaics—Morphology, Interface and Device [Yang Yang](#); University of California, Los Angeles, United States.

9:30 PM *EN04.09.03

Active Material Design for Mechanically-Robust, Stretchable Polymer Solar Cells [Bumjoon Kim](#); Korea Advanced Institute of Science and Technology, Korea (the Republic of).

10:00 PM EN04.10.02

Thermoplastic Elastomer Tunes Phase Structure and Promotes Stretchability of High-Efficiency Organic Solar Cells [Zhongxiang Peng](#)^{1,3}; ¹Tianjin University, China; ³State Key Laboratory of Applied Optics, Changchun Institute of Optics, Fine Mechanics and Physics, Chinese Academy of Sciences, China.

SYMPOSIUM EN05

Emerging Materials for Electrochemical Energy Storage Devices—Degradation and Failure Characterization—From Composition, Structure and Interfaces to Deployed Systems
May 9 - May 24, 2022

Symposium Organizers

Thomas Barrera, LIB-X Consulting
Matthieu Dubarry, University of Hawaii at Manoa
Andreas Pfrang, European Commission Joint Research Centre
Loraine Torres-Castro, Sandia National Laboratories

* Invited Paper

SESSION EN05.01: Thermal Characterization of Energy Storage Materials and Devices I

Session Chairs: Partha Mukherjee and Loraine Torres-Castro

Monday Morning, May 9, 2022

Hawai'i Convention Center, Level 3, Emalani Theater 320

11:00 AM *EN05.01.01

Thermal Stability in Solid-State Batteries [Partha P. Mukherjee](#); Purdue University, United States.

11:30 AM EN05.01.03

Accelerating Rate Calorimetry Investigations of Thermal Runaway in Multiple Formats and Capacities [Joshua Lamb](#); Sandia National Laboratories, United States.

11:45 AM EN05.01.04

Isothermal Calorimetry as a Valuable Tool for Developing Smart & Safe Charging Protocols [Gordon Waller](#); Naval Research Laboratory, United States.

SESSION EN05.02: Thermal Characterization of Energy Storage Materials and Devices II

Session Chairs: Qian Huang and Loraine Torres-Castro

Monday Afternoon, May 9, 2022

Hawai'i Convention Center, Level 3, Emalani Theater 320

1:30 PM *EN05.02.01

Insight into the Degradation Mechanism of Li-Ion Batteries by Heat Measurement [Qian Huang](#); Pacific Northwest National Laboratory, United States.

2:00 PM EN05.02.02

Thermal Stability of Solid-State Battery Components with Liquid Electrolyte [Alex Bates](#); Sandia National Laboratories, United States.

2:15 PM EN05.02.03

An Optical Thermorefectance Technique for Accurately Measuring Thermal Energy Storage of Nanoscale Materials [Milena Milich](#); University of Virginia, United States.

2:30 PM BREAK

SESSION EN05.03: Novel Materials for Li-Ion Technologies

Session Chairs: Valerio De Angelis and Dibyendu Mukherjee

Monday Afternoon, May 9, 2022

Hawai'i Convention Center, Level 3, Emalani Theater 320

3:00 PM EN05.03.01

Synthesis and Characterization of Phosphorus-Doped Silicon for Electrochemical Applications [Isabelle Gordon](#); Montana State University, United States.

3:15 PM EN05.03.02

Crack-Free Ni-Rich Cathode Materials via Rational Gradient Concentration Design [Tongchao Liu](#); Argonne National Laboratory, China.

3:30 PM EN05.03.03

Investigating Low-Temperature Behavior of Alloy Anodes for Lithium-Ion Batteries [Kelsey A. Cavallaro](#); Georgia Institute of Technology, United States.

3:45 PM EN05.03.04

3D Electrode Architectures and Advanced Materials for Next-Generation Lithium-Ion Battery [Wilhelm Pfleging](#); Karlsruhe Institute of Technology, Germany.

4:00 PM EN05.03.05

Improved Stability of LiCoO₂ Positive Electrode with Kosmotropic Anion in Aqueous Lithium-Ion Batteries [Hyunjeong Oh](#); Korea Advanced Institute of Science and Technology, Korea (the Republic of).

4:15 PM EN05.03.06

Multiscale Evidence of LiH Formation in Lithium Batteries [Rafael A. Vila](#); Stanford University, United States.

4:30 PM EN05.03.07

Tailoring Surface of Ni-Rich LiNi_{1-x}Co_{x/2}Mn_{x/2}O₂ by Using Lithium-Ion Conducting Solid-Electrolytes [Xinwei Jiao](#); The Ohio State University, United States.

4:45 PM EN05.03.08

3D Printing of Batteries—Comparison Between Fabrication Processes [Sergio Pinilla](#); Trinity College Dublin, Ireland.

SESSION EN05.04: Poster Session I: Novel Materials for Li-Ion Technologies

Session Chairs: Thomas Barrera, Matthieu Dubarry and Loraine Torres-Castro

Monday Afternoon, May 9, 2022

5:00 PM - 7:00 PM

Hawai'i Convention Center, Level 1, Kamehameha Exhibit Hall 2 & 3

EN05.04.01

A New TiO with *In Situ* Transformed Rutile TiO₂ Nanorhorns as a Next-Generation Anode Material for Lithium-Ion Battery [Jong-Sung Yu](#); Daegu Gyeongbuk Institute of Science and Technology (DGIST), Korea (the Republic of).

EN05.04.02

Mesoparticle-Nanoparticle Size Relation for Improved Silicon-Carbon Composite Cycling Stability in Lithium-Ion Batteries [Joseph Schwan](#); University of California, Riverside, United States.

EN05.04.03

Further Improving Coulombic Efficiency and Discharge Capacity in LiNiO₂ Material by Activating Sluggish ~3.5V Discharge Reaction [Changgeun Bae](#); Pohang University of Science and Technology (POSTECH), Pohang 37673, Korea (the Republic of).

EN05.04.04

Superior Cyclic Reversibility of Amorphous Lithium-Iron Fluorosulphate Based on Both Insertion and Conversion Reaction for High Energy Density Lithium-Ion Battery Cathode Material [Jachoon Heo](#); Seoul National University, Korea (the Republic of).

EN05.04.05

High-Energy Spinel-Type Li-Ion Cathodes by Continuously Tuning the Level of Cation Disorder [Zijian Cai](#)^{1,4}; ¹University of California, Berkeley, United States; ⁴Lawrence Berkeley National Laboratory, United States.

EN05.04.06

Towards Higher Electric Conductivity and Wider Phase Stability Range via Nanostructured Glass-Ceramics Processing [Tomasz K. Pietrzak](#); Warsaw Univ. of Technology, Poland.

EN05.04.07

Atomic Layer Deposition of Sulfide Films for Improved Electrochemical performance of LiNi_{0.8}Mn_{0.1}Co_{0.1}O₂ Cathodes [Xiangbo Meng](#); University of Arkansas, United States.

EN05.04.08

Understanding the Improvement Mechanism of Triethyl Borate as an Electrolyte Additive for 5 V Spinel/Graphite Lithium-Ion Batteries [Tianyang Wang](#); The Ohio State University, United States.

EN05.04.09

Epitaxial Oxide Films and Nanoparticle Network for Lithium-Ion Battery and Oxygen Electrocatalyst Applications [Hongmei Luo](#); New Mexico State University, United States.

EN05.04.10

Two New Low-Expansion Li-Ion Cathode Materials with Promising Multi-Property Performance [Brandi Ransom](#); Stanford University, United States.

EN05.04.11

Yolk-Shell Structured SiO₂@N,P Co-Doped Carbon Sphere as Highly Stable Anode Materials for Lithium-Ion Batteries [Kyeongseok Min](#); Inha University, Korea (the Republic of).

EN05.04.12

Structure Design and Improved Performance of the Carbon Coated Silicon/Graphite Composite Anodes for Lithium-Ion Batteries [Seungwoo Lee](#); Hanyang University, Korea (the Republic of).

EN05.04.13

Controlling Ag Nanoparticles with Carbon Matrix for High Performance Lithium-Ion Anode [Jose F. Florez Gomez](#); University of Puerto Rico Rio Piedras, Puerto Rico.

EN05.04.14

Incorporation of Aniline Tetramer into Alginate-Grafted-Polyacrylamide as Polymeric Binder for High-Capacity Silicon/Graphite Anodes [Bolormaa Gendensuren](#); University of Ulsan, Korea (the Republic of).

EN05.04.15

Two Dimensional (2D) Materials for the Next Generation Li Batteries [Reza Shahbazian-Yassar](#); University of Illinois at Chicago, United States.

EN05.04.16

Development of NMC622/Graphite Hybrid Polymer Lithium Battery [J r mie Salomon](#); Univ. Grenoble Alpes, CEA Liten, France.

EN05.04.17

Development of Bipolar Cells in the SOLGAIN® Technology for Lithium-Ion Batteries [Djamel Mourzagh](#); CEA - LITEN, France.

SESSION EN05.05: Poster Session II: Emerging Energy Storage Materials—Sodium Based Batteries

Session Chairs: Thomas Barrera, Matthieu Dubarry and Loraine Torres-Castro

Monday Afternoon, May 9, 2022

5:00 PM - 7:00 PM

Hawai'i Convention Center, Level 1, Kamehameha Exhibit Hall 2 & 3

EN05.05.01

Development of Lithium/Sodium-Ion Battery Electrodes Based on Solvent Engineered Tin(II) Oxide Nanomaterials [Sean Ryan](#); Trinity College Dublin, Ireland.

EN05.05.02

Insights into the Storage Mechanism of Lithium and Sodium in Phosphorus-Doped Graphite [Cassius Clark](#); University of Cambridge, United Kingdom.

EN05.05.03

Unlocking New Redox Activity in Alluaudite Cathodes Through Compositional Design [Vincent Wu](#); University of California, Santa Barbara, United States.

EN05.05.04

3D-Microarchitected, Free-Standing Carbon Lattices for Sodium-Ion Batteries with Ultra-High Areal Capacity and Study on Na-Ion Storage Mechanism in Hard Carbon [Yuto Katsuyama](#); University of California, Los Angeles, United States.

EN05.05.05

Optimization of Prussian Blue Analogues for Na-Ion Desalination Batteries [Jacob Morton](#); University of Hawaii at Manoa, United States.

EN05.05.06

Experimental and Modeling Studies of Metal Halide Catholyte and Cathode Materials to Enable Low-temperature Molten Sodium Batteries [Adam M. Maraschky](#); Sandia National Laboratories, United States.

EN05.05.07

Hierarchical Nanocellulose-Based Gel Polymer Electrolytes for Stable Na Electrodeposition in Sodium-Ion Batteries [Neeru Mittal](#); ETH Zurich, Switzerland.

SESSION EN05.06: Poster Session III: Emerging Energy Storage Materials—Lithium-Metal Batteries

Session Chairs: Thomas Barrera, Matthieu Dubarry and Loraine Torres-Castro

Monday Afternoon, May 9, 2022

5:00 PM - 7:00 PM

Hawai'i Convention Center, Level 1, Kamehameha Exhibit Hall 2 & 3

EN05.06.01

Double-Layer Protection for Lithium-Metal Anode [Ju-Myung Kim](#); Pacific Northwest National Laboratory, United States.

EN05.06.02

Functional Composite Separator for High Energy Density Lithium-Metal Batteries [Hao Jia](#); Pacific Northwest National Laboratory, United States.

EN05.06.03

Rational Solvent Molecule Tuning for High-Performance Lithium-Metal Battery Electrolytes [Zhiao Yu](#); Stanford University, United States.

EN05.06.05

Structurally Tailored Hierarchical Cu Current Collector for Suppressing Dendrite Failure in Lithium Metal Batteries [Inyeong Yang](#); Korea Advanced Institute of Science and Technology (KAIST), Korea (the Republic of).

EN05.06.06

Copper Nitride Nanowires Coated Li-Metal with Improved Performances for Li-Metal Batteries [Jaek Kim](#); Hanyang University, Korea (the Republic of).

EN05.06.07

Cross-Sectional Preparation of Challenging Devices and Their Micro- and Nanoanalytical Characterization [Benjamin Butz](#); University of Siegen, LMN, Germany.

EN05.06.08

Super-Lithiophilic Porous Copper Host for Enhancing Performance of Lithium Metal Anode [Seungeun Paik](#); Seoul National University, Korea (the Republic of).

EN05.06.09

Polyethylene Separator Surface Induced by Ge Interlayer for Robust SEI Layer [Jiwoon Kim](#); Hanyang University, Korea (the Republic of).

EN05.06.10

Characterization of Alkali Metal Anodes with Xe Focused Ion Beam [Hyeong-Jun Koh](#); University of Pennsylvania, United States.

EN05.06.11

Reversible Li Plating and Stripping Enabled by 3D-Structured Current Collectors for Anode-Free Batteries [Jae Chul Kim](#); Stevens Institute of Technology, United States.

SESSION EN05.07: Emerging Energy Storage Materials—Sodium Based Batteries
Session Chairs: Matthieu Dubarry and Erik Spørke
Tuesday Morning, May 10, 2022
Hawai'i Convention Center, Level 3, Emalani Theater 320

8:00 AM EN05.15.07

Transition Metal Migrations and Anionic Redox Stability in NMO Cathode [Kuan Hsiang Hsu](#); Stanford University, United States.

8:15 AM EN05.07.01

Ambient Sodium-Sulfur Battery Behaviors Elucidated with Optical Microscopy and Ultrafast Spectroscopy [Rachel Carter](#); U.S. Naval Research Laboratory, United States.

8:30 AM EN05.07.02

Understanding the Effect of Redox-Inactive Dopants on Na₂Mn₃O₇ Cathodes Using Density Functional Theory Calculations [Yong-Seok Choi](#)^{1,2,3}; ¹University College London, United Kingdom; ²The Faraday institution, United Kingdom; ³Thomas Young Centre, United Kingdom.

8:45 AM EN05.07.03

Unlocking Record Capacity and Rate Capability of HxCrS₂ by Proton-Exchange Pretreatment [Joseph Stiles](#); Princeton University, United States.

9:00 AM EN05.07.04

Reversible Phase Transition of Layered Materials by Electrochemical Insertion/Deinsertion of Li⁺ and Na⁺ [Suwon Lee](#); Korea University, Korea (the Republic of).

9:15 AM EN05.07.05

Molten Salt-Based Batteries for Safe, Reliable Long-Duration Energy Storage [Erik D. Spørke](#); Sandia National Laboratories, United States.

9:30 AM EN05.07.07

Microstructural Investigation into Na-Ion Storage Behaviors of Cellulose-Based Hard Carbons for Na-Ion Batteries [Jae-Bum Kim](#); Korea university, Korea (the Republic of).

9:45 AM BREAK

SESSION EN05.08: Emerging Energy Storage Materials—Lithium-Metal Batteries
Session Chairs: Alex Bates and Stephen Harris
Tuesday Morning, May 10, 2022
Hawai'i Convention Center, Level 3, Emalani Theater 320

10:15 AM *EN05.08.01

Advanced Characterization of Electrochemical Materials and Interfaces for Better Batteries [Y. Shirley Meng](#); University of California, San Diego, United States.

10:45 AM EN05.08.02

Superior Polymeric Lithicones for Extremely Long-Life Lithium Metal Anodes [Xiangbo Meng](#); University of Arkansas, United States.

11:00 AM EN05.08.03

Strategy to Design Functionalized Battery Separator for Highly Stable Lithium Metal Batteries [Patrick J. Kim](#); Kyungpook National University, Korea (the Republic of).

11:15 AM EN05.08.04

Data-Driven Automated Robotic Experiments Accelerate Discovery of Multi-Components Electrolyte for Rechargeable Lithium-Metal Batteries [Shoichi Matsuda](#); National Institute for Materials Science, Japan.

11:30 AM EN05.08.05

Dynamic Electrochemical Responses of "Dead Li" During Battery Operations [Fang Liu](#); Stanford University, United States.

11:45 AM EN05.08.06

Pressure-Tailored Lithium Deposition and Dissolution in Lithium Metal Batteries [Chengcheng Fang](#); Michigan State University, United States.

12:00 PM EN05.08.07

New Insights on Reaction Pathways for FeS₂ Cathodes [Grace Whang](#); University of California, Los Angeles, United States.

SESSION EN05.09: Emerging Energy Storage Materials—New Technologies
Session Chairs: John Hewson and Nicholas Stadie
Tuesday Afternoon, May 10, 2022
Hawai'i Convention Center, Level 3, Emalani Theater 320

1:30 PM *EN05.09.01

Highlighting the Versatility of Ionogel Solid Electrolytes [Bruce S. Dunn](#); University of California, Los Angeles, United States.

2:00 PM EN05.09.02

In Situ Study of Multi-Ion Intercalation and Conversion Mechanism in Disordered Sodium Vanadate Cathode in Aqueous Zn-Ion Batteries [SaeWon Kim](#); University of New Hampshire, United States.

2:15 PM EN05.09.03

3D Printing of Aqueous Zinc-Ion Batteries with High Cycling Stability [Stefano Tagliaferri](#); Imperial College London, United Kingdom.

2:30 PM EN05.09.04

Investigating Ionic Pathways to Map Motion within Multivalent Battery Cathodes [Megan Murphy](#); University of Illinois at Chicago, United States.

2:45 PM EN05.09.05

Probing Local Electrochemical Activity in MgV₂O₄ Using Atomic-Resolution Electron Microscopy [Francisco J. Lagunas Vargas](#)^{2,1}; ¹University of Illinois at Chicago, United States; ²Joint Center for Energy Storage Research, United States.

3:00 PM BREAK

3:20 PM MONDAY AND TUESDAY POSTER AWARDS ANNOUNCEMENT

3:30 PM *EN05.09.06

High-stiffness Electrodes and Separators for Structural Batteries and Capacitors [Jodie Lutkenhaus](#); Texas A&M University, United States.

4:00 PM EN05.09.07

WITHDRAWN 5/7/22 EN05.09.07 Microemulsions as Emerging Electrolytes for Redox Flow Batteries—The Effect of Structure on Electrochemical Response [Adam Imel](#); University of Tennessee, Knoxville, United States.

4:15 PM EN05.09.08

Tuning Intermolecular Interactions of Molecular Crowding Electrolyte for High Performance Aqueous Batteries [Dejian Dong](#); The Chinese University of Hong Kong, Hong Kong.

4:30 PM EN05.09.09

Electroless Pb Monolayer Deposition on Carbide and Nitrides for Energy Conversion Reactions [Joesene Soto-Perez](#)^{1,3}; ¹University of Puerto Rico, Río Piedras, United States; ³Brookhaven National Laboratory, United States.

4:45 PM EN05.09.10

High Performance Organic Pseudocapacitors via Molecular Contortion [Xavier Roy](#); Columbia University, United States.

5:00 PM EN05.09.11

Structural, Morphological and Interfacial Changes in H₂V₃O₈ Upon Mg²⁺ Intercalation—A Post-Mortem Investigation [Yuri Surace](#); AIT Austrian Institute of Technology GmbH, Austria.

SESSION EN05.10: Poster Session IV: Emerging Energy Storage Materials—New Technologies

Session Chairs: Thomas Barrera, Matthieu Dubarry and Loraine Torres-Castro

Tuesday Afternoon, May 10, 2022

5:00 PM - 7:00 PM

Hawai'i Convention Center, Level 1, Kamehameha Exhibit Hall 2 & 3

EN05.10.01

Ferroelectric P(VDF-TrFE)/BaTiO₃ Layer Coated Zinc-Ion Batteries Toward Dendrite-Free Zinc Anodes [WooJun Seol](#); Gwangju Institute of Science and Technology, Korea (the Republic of).

EN05.10.02

Conducting Polymer-Intercalated Vanadate System for High-Performance Aqueous Zinc-Ion Batteries [Heejoon Ahn](#); Hanyang University, Korea (the Republic of).

EN05.10.03

Effect of Mn Content in Co_{1-x}Mn_xFe(CN)₆ as Cathode Material for Rechargeable Aqueous Zinc-Ion Batteries [Federico Lissandrello](#); Politecnico di Milano, Italy.

EN05.10.04

Stabilizing Zn Anode with Porous Functional Polymer Coating for Zn Metal Batteries [Rong Kou](#); Pennsylvania State University, United States.

EN05.10.05

Oxygen Vacancies Rich CoFe-CoFe₂O_{4-x} Embedded in N-Doped Hollow Carbon Sphere as a Highly Efficient Electrocatalyst for Zinc-Air Battery [Yohan Go](#); Inha university, Korea (the Republic of).

EN05.10.06

CoFe Alloy Nanoparticles Embedded in N-doped Carbon Supported on Highly Defective Ketjenblack for Rechargeable Zn Air Battery [Kyutae Kim](#); Inha University, Korea (the Republic of).

EN05.10.07

Effect of Membranes on the Performance of Symmetric V(acac)₃ Based Non-Aqueous Redox Flow Batteries [Sergio Diaz-Abad](#)^{1,2}; ¹University of Castilla- La Mancha, Spain; ²Los Alamos National Laboratory, United States.

EN05.10.08

A High Voltage Aqueous Zinc-Based Acidic and Alkaline Hybrid Redox Flow Battery [Minjoon Park](#)^{1,2,3}; ¹Pusan National University, Korea (the Republic of); ²Pusan National University, Korea (the Republic of); ³Pusan National University, Korea (the Republic of).

EN05.10.09

WITHDRAWN 5/9/22 EN05.10.09 Electrochemistry of Eutectic Quinone Electrolytes [Emily Penn](#); Stanford University, United States.

EN05.10.10

Temperature Tolerant, Anti-Drying Supercapacitor Based on Organohydrogel Electrolyte [Gyusung Jung](#); Korea university, Korea (the Republic of).

EN05.10.11

Novel Bimetallic Co-W-Se Derived from Metal-Organic Frameworks for Highly Stable Electrochemical Supercapacitors [Aya M. Mohamed](#); Cairo University, Egypt.

EN05.10.12

Zeolitic Imidazolate Frameworks Encapsulated with Vanadium-Substituted Phosphomolybdic Acid for Highly Stable Asymmetric Supercapacitors [Aya M. Mohamed](#);

Cairo University, Egypt.

EN05.10.13

ALD Deposited LiPON as Electrolyte for Electrochemical Supercapacitors [Kunal Ahuja](#); University of Maryland, United States.

EN05.10.14

Ultrathin Flexible Gel-Polymer Electrolytes Supercapacitors [Hamidreza Fallahrafti](#); University of Houston, United States.

EN05.10.16

Design of Conducting Polymer-Based Supercapacitors Towards Ultralong Lifespan [Xueying Chang](#)^{1, 2}; ¹University of California, Los Angeles, United States; ²California NanoSystems Institute, United States.

EN05.10.17

Facile Fabrication of Multivalent VO₂/Graphene Nanocomposite Electrodes for High-Energy-Density Symmetric Supercapacitors [Helen Huang](#); California State University, Los Angeles, United States.

EN05.10.18

Ultra-Fast, High-Energy Supercapacitor for Wireless Electronics [Lulu Yao](#); University of California, San Diego, United States.

EN05.10.19

Densification and Co-Doping of Laser-Induced Graphene for Boosting Electrochemical Performance of Flexible Supercapacitors [Jung Bin In](#); Chung-Ang University, Korea (the Republic of).

EN05.10.20

The Interplay of Quantum Capacitance with van der Waals Forces, Intercalation, Co-Intercalation and the Number of MoS₂ Layers [Yasmine I. Mesbah](#); American University in Cairo, Egypt.

EN05.10.21

Solvent and Anion Controlled Ionic Clustering in Halide Containing Electrolytes for use in Rechargeable Magnesium Batteries [Nikhil Medhekar](#); Monash University, Australia.

EN05.10.22

Electrochemically Produced High Rate, High Capacity Iron Electrodes for Use in Iron-Air Batteries [Yigit Aziz Durmus](#); Hochschule Ruhr West (Ruhr West University of Applied Sciences), Germany.

EN05.10.23

Structural Topologies to Enable Exploitation of Grothuss Diffusion for Fast Proton Ion Batteries [Alex Greaney](#); University of California, Riverside, United States.

EN05.10.25

Electrochemistry of Vacancy-Decorated α -MnO₂: Improved Ion Diffusion and Capacity Retention via Li₂O Incorporation [Yong-Jie Hu](#); Drexel University, United States.

EN05.10.26

Nickel/Vulcan XC-72R Nanocatalysts via the Rotating Disk Slurry Electrodeposition (RoDSE) Method as Electrocatalyst for the Oxygen Evolution Reaction (OER) in Alkaline Medium [Pedro Trinidad-Perez](#); University of Puerto Rico, Rio Piedras Campus, United States.

EN05.10.27

Functionalized 2D Silicate-Based Films for Energy Applications [Suvash Ghimire](#); University of Central Florida, United States.

EN05.10.28

Core-Shell Structured NiCo@NiCoP Nanorod on Ni Foam as an Efficient Bifunctional Electrocatalyst for Overall Water Splitting [Yeeun Lee](#); Inha university, Korea (the Republic of).

EN05.10.29

“Water-in-Polyelectrolyte Salt” for Scalable High Power Sustainable Lignin Batteries [Divyaratan Kumar](#)^{1,2}; ¹Linköping University, Sweden; ²Linköping University, Sweden.

EN05.10.30

WITHDRAWN 5/10/22 EN05.10.30 Understanding The Effects of Different ECS Supports on the Sintering Processes of Pt Nanoparticles [Richard Andres Ortiz Godoy](#); University of Connecticut, United States.

EN05.10.31

Ruthenium Doped LSCF Based Cathode for Enhanced Performance of Solid Oxide Fuel Cells [Abid Ullah](#); Korea Institute of Energy Research, University of Science and Technology South Korea, Korea (the Republic of).

EN05.10.32

Synthesis of MnO₂ Carbon Nanotubes Catalyst with Enhanced Oxygen Reduction Reaction [Abid Ullah](#); Korea Institute of Energy Research, University of Science and Technology South Korea, Korea (the Republic of).

EN05.10.33

Ultra-Small, Pyramidal Platinum Nanoparticles for High Stability Fuel Cell Oxygen Reduction [Emanuele Magliocca](#); University College London, United Kingdom.

EN05.10.34

Fe-, N-, and S-Tridoped Carbon Hollow Spheres as Highly Active Electrocatalysts for Oxygen Reduction Reaction [Hyelin An](#); Inha university, Korea (the Republic of).

EN05.10.35

Bottom-up Fabrication of Oxygen Reduction Electrodes with Atomic Layer Deposition for High-Power-Density PEMFCs [Samuel Dull](#); Stanford University, United States.

EN05.10.37

High-Performance Fiber Electrodes for Wearable Micro-Supercapacitors [Sung-Kon Kim](#); Jeonbuk National University, Korea (the Republic of).

EN05.10.39

A Rechargeable Al-CO₂ Battery for CO₂ Capture/Conversion and Electricity Storage [Shuya Wei](#); The University of New Mexico, United States.

EN05.10.40

“Turbocharging” the Potassium-Oxygen Battery—The Influence of Oxygen Pressure on Discharge Performance [Jannis N. Küpper](#); RWTH Aachen University, Germany.

EN05.10.41

COMSOL Modeling of Ion Transport Within Pattern-Imprinted Electrodes for Lithium-Ion Batteries [Anand Vinubhai Patel](#); Rutgers, The State University of New Jersey, United States.

EN05.14.10

Improved Degradation Behaviour of Mixed Carbon Nanotube and Graphene PEM Fuel Cells [Theo Suter](#); University College London, United Kingdom.

SESSION EN05.11: Characterizing Battery Degradation and Failure Modes

Session Chairs: Randy Shurtz and Loraine Torres-Castro

Wednesday Morning, May 11, 2022

Hawai'i Convention Center, Level 3, Emalani Theater 320

8:00 AM EN05.11.01

Path Dependence of Li-Ion Battery Degradation During Cycling to 80% Capacity [Reed Wittman](#); Sandia National Laboratories, United States.

8:15 AM EN05.11.02

Evaluation of Degradation Processes in Lithium-Based Thick Film Electrodes by Laser-Induced Breakdown Spectroscopy [Peter Smyrek](#); Karlsruhe Institute of Technology, Germany.

8:30 AM EN05.11.03

Imaging Lithium-Ion Battery Aging Induced by Manufacturing Defects with Open-Hardware Scanning Acoustic Microscopy [David Wasylowski](#); RWTH Aachen University, Germany.

8:45 AM EN05.11.04

Calibration-Free Quantitative Analysis of Lithium-Ion Battery (LiB) Electrode Materials Using Laser-Induced Breakdown Spectroscopy (LIBS) [Dibyendu Mukherjee](#)^{1,2}; ¹The University of Tennessee, Knoxville, United States; ²The University of Tennessee, Knoxville, United States.

9:00 AM EN05.11.05

Resolving Chemical and Spatial Heterogeneities at Complex Electrochemical Interfaces in Li-Ion Batteries [Julia C. Hestenes](#); Columbia University, United States.

9:15 AM EN05.11.06

Understanding Aging-Related Cell Degradation in Commercial Li Primary Batteries [Eric Deichmann](#); Sandia National Laboratories, United States.

9:30 AM BREAK

10:00 AM EN05.11.07

Effect of Crystalline Property and Morphology of Ni-Rich NMC-811 Cathodes on the Cycling Performance of Li-Ion Batteries [Meltiani Belekoukia](#); WMG, University of Warwick, United Kingdom.

10:15 AM EN05.11.08

How Dynamic Thermal Evaluation of Battery Electrodes and Materials Better Replicate In-Service Operating Conditions [Corey T. Love](#); U.S. Naval Research Laboratory, United States.

10:30 AM EN05.11.09

In Situ Infrared Spectroscopy for High-Nickel Lithium-Ion Battery Cathodes: Elucidating the Relationships Between Vibrational Signatures and Cathode-Electrolyte Interphase Phenomena [Sang-Don Han](#); National Renewable Energy Laboratory, United States.

10:45 AM EN05.11.10

Study of Electrolyte Decomposition and Its Contribution Towards Stable SEI Formation for High-Performance Li-Metal Anode [Donghai Wang](#); The Pennsylvania State University, United States.

11:00 AM EN05.11.11

Using Resistance as a Surrogate to Lithium Consumed During Formation for Cell Life Prediction [Andrew Weng](#); University of Michigan—Ann Arbor, United States.

11:15 AM EN05.11.12

Combining *In Situ* X-Ray Tomography with Quantitative Algorithms for Ni-Rich Particle Defects Sustained During High Voltage Operation [Aaron Wade](#)^{1,2}; ¹UCL, United Kingdom; ²Faraday Institution, United Kingdom.

11:30 AM EN05.11.13

In Situ Electrochemical Dilatometry Study of Lithiation-Induced Giant Buckling Deformations in Monolithic Nanoporous Metal Films Used as Lithium-Ion Battery Electrodes [Lin Wang](#); University of Pennsylvania, United States.

11:45 AM EN05.11.14

Understanding and Mitigating Mechanical Degradation in Lithium-Sulfur Batteries—Additive Manufacturing of Li₂S Composites and Nanomechanical Particle Compressions [Max Saccone](#); California Institute of Technology, United States.

SESSION EN05.12: Fast Charging I

Session Chairs: Daniel Abraham and Donal Finegan

Wednesday Afternoon, May 11, 2022

Hawai'i Convention Center, Level 3, Emalani Theater 320

1:30 PM *EN05.12.01

Enabling Fast Charging of Lithium-Ion Batteries with 3-D Anode Architectures [Neil P. Dasgupta](#); University of Michigan, United States.

2:00 PM *EN05.12.02

Modeling and Testing Considerations for Electrolytes that Enable Extreme Fast Charging of Lithium-ion Cells [Sangwook Kim](#); Idaho National Laboratory, United States.

2:30 PM BREAK**2:50 PM WEDNESDAY POSTER AWARDS ANNOUNCEMENT****3:00 PM *EN05.12.03**

Fast Charging of Lithium-Ion Cells—Polarization, Gradients, Plating and More [Daniel Abraham](#); Argonne National Laboratory, United States.

3:30 PM EN05.12.04

Operando Video Microscopy of Li Plating and Re-Intercalation on Graphite Anodes During Fast Charging [Yuxin Chen](#); University of Michigan, United States.

3:45 PM EN05.12.05

Correlating Wavelength Dependence in LiMn₂O₄ Cathode Photo-Accelerated Fast Charging with Deformations in Local Structure [Yuanyuan Ma](#); New York University, United States.

4:00 PM EN05.12.06

Enabling 4C Fast Charging of Lithium-Ion Batteries by Coating Graphite with a Solid-State Electrolyte [Eric Kazzyak](#); University of Michigan–Ann Arbor, United States.

4:15 PM EN05.12.07

Effects of Stack Pressure on Capacity Fade in Extreme Fast Charging Lithium-Ion Batteries [Elizabeth K. Allan-Cole](#); University of Colorado Boulder, United States.

SESSION EN05.13: Poster Session V: Interphase/Interfaces
Session Chairs: Thomas Barrera, Matthieu Dubarry and Loraine Torres-Castro
Wednesday Afternoon, May 11, 2022
5:00 PM - 7:00 PM
Hawai'i Convention Center, Level 1, Kamehameha Exhibit Hall 2 & 3

EN05.13.01

An Alkyl Halide Nucleophile Exchange for Controlling Lithium Surface for Lithium Metal Anode [JungHun Lee](#); Sungkyunkwan Univ, Korea (the Republic of).

EN05.13.02

Stable Artificial Solid Electrolyte Interphase with Lithium Chloride and Lithium Selenide for Dendrite-Free Lithium Metal Batteries [Yongmin Jung](#); Hanyang University, Korea (the Republic of).

SESSION EN05.14: Poster Session VI: Characterizing Battery Degradation and Failure Modes
Session Chairs: Thomas Barrera, Matthieu Dubarry and Loraine Torres-Castro
Wednesday Afternoon, May 11, 2022
5:00 PM - 7:00 PM
Hawai'i Convention Center, Level 1, Kamehameha Exhibit Hall 2 & 3

EN05.14.01

A Combined Computational and Imaging Approach to Understanding Degradation Mechanisms in Energy Materials Research [Robin White](#); Carl Zeiss Microscopy, United States.

EN05.14.02

Characterizing Dynamic Structures in Battery Electrodes by Time-Resolved Cryo-TEM [Nikita S. Dutta](#); National Renewable Energy Laboratory, United States.

EN05.14.03

Understanding the Effect of Disorder on the Electrochemical Properties of LiMn₂O₄ Spinel [Tina Chen](#)^{1,2}; ¹University of California, Berkeley, United States; ²Lawrence Berkeley National Laboratory, United States.

EN05.14.04

A Novel Approach of Micro-Si Anode Characterization and Optimization Using *In Situ* Atomic Force Microscopy (AFM) [Jian Liu](#); Ohio State University, United States.

EN05.14.05

Potassium Fluoride and Carbonate Lead to Cell Failure in Potassium-Ion Batteries [Andrew Ells](#); Columbia University, Afghanistan.

EN05.14.06

Understanding of Capacity Decay of High Voltage KVPO₄F Cathode [Haegyem Kim](#); Lawrence Berkeley National Laboratory, United States.

EN05.14.07

Quantifying Loss Mechanisms in Zinc Metal Anodes with *Operando* XRD [Lacey Roberts](#); University of Colorado Boulder, United States.

EN05.14.08

TEM Observation Revealing Oxygen Ion Accumulation and Pore Evolution Mechanism in LSM/YSZ/LSM Cells Under SOEC Operation [Hyejung Chang](#)^{1,4}; ¹Korea Institute of Science and Technology, Korea (the Republic of); ⁴Korea University of Science and Technology, Korea (the Republic of).

EN05.14.09

Redox on Anions as a Potential Pathway to Minimizing Chemical Expansion in Fuel Cell Electrodes [Adrian Xiao Bin Yong](#); University of Illinois at Urbana-Champaign, United States.

EN05.14.11

Effects of Mesoporosity on Catalyst Layer Degradation Mechanisms in PEM Fuel Cells [Timothy Goh](#); Stanford University, United States.

EN05.14.12

Quantifying the Dependence of Battery Rate Performance on Common Physical Parameters [Dominik V. Horvath](#); Trinity College Dublin, Ireland.

EN05.14.13

Investigation, Definition and Review of the State of Energy for Range Prediction [Katharina L. Quade](#)^{1,3}; ¹RWTH Aachen University, Germany; ³JARA-Energy, Germany.

EN05.14.14

Combined Effects of the Cyclable Lithium Loss and Electrolyte Depletion on the Performance Degradation of a Lithium-Ion Battery [Dongcheul Lee](#); Ajou University, Korea (the Republic of).

SESSION EN05.15: Interphase and Interfaces
Session Chairs: Scott McClary and Loraine Torres-Castro
Thursday Morning, May 12, 2022
Hawai'i Convention Center, Level 3, Emalani Theater 320

8:15 AM *EN05.15.01

Design and Understanding of Cathode-Solid Electrolyte Interfaces for High Voltage Stability in All-Solid-State Batteries [Linda F. Nazar](#); University of Waterloo, Canada.

8:45 AM EN05.15.03

Probing Interfacial Reactivity in Li Batteries with *Operando* Nuclear Magnetic Resonance Techniques [Lauren Marbella](#); Columbia University, United States.

9:00 AM EN05.15.04

Investigating the Effects of Alloy Interfacial Layers on the Electrochemical Behavior of Lithium Metal Anodes with *Operando* Optical Microscopy [Stephanie E. Sandoval](#); Georgia Institute of Technology, United States.

9:15 AM EN05.15.05

Selective NMR Observation of the SEI-Metal Interface by Dynamic Nuclear Polarisation from Lithium Metal [Michael A. Hope](#)^{1,2}; ¹EPFL, Switzerland; ²University of Cambridge, United Kingdom.

9:30 AM EN05.15.06

***In Situ* Investigation of Interfacial Degradation Mechanisms in Next-Generation Batteries** [Manuel Weiß](#)^{1,2}; ¹Justus Liebig University Giessen, Germany; ²Justus Liebig University Giessen, Germany.

9:45 AM OPEN DISCUSSION

10:00 AM BREAK

10:30 AM EN05.15.08

LiF Rich-Polymer Composite Layer Formation on Lithium-Metal by Simple Roll-Press Processing for Lithium-Metal Batteries [Seungcheol Myeong](#); Hanyang University, Korea (the Republic of).

10:45 AM EN05.15.09

Decoupling Bulk and Interfacial Contributions to Performance in Localized High Concentration Electrolytes for Li Metal Batteries [Richard May](#); Columbia University, United States.

11:00 AM EN05.15.11

Designing High-Voltage Cathode and Electrolyte Interphase (CEI) with *In Situ* Formation, Passivation and Self-Healing Mechanisms [Jung-Hyun Kim](#); The Ohio State University, United States.

11:15 AM EN05.13.03

Solid-Electrolyte Interphase Engineering for Multivalent-Ion Batteries [Scott A. McClary](#); Sandia National Laboratories, United States.

11:30 AM EN05.15.13

Metallic 1T Phase MoS₂ as Sulfur Cathode Host for Lithium-sulfur Batteries [Zhuangnan Li](#); University of Cambridge, United Kingdom.

11:45 AM EN05.13.04

A Consistent and Interactive Protocol for Generating an Atomistically Resolved Solid Electrolyte Interphase (SEI) Passivating Layer in Li-Ion Batteries [Paolo De Angelis](#); Politecnico di Torino, Italy.

SESSION EN05.16: Diagnostics and Prognostics
Session Chairs: David Beck and Matthieu Dubarry
Thursday Afternoon, May 12, 2022
Hawai'i Convention Center, Level 3, Emalani Theater 320

1:30 PM EN05.16.01

Diagnostics for Thermal Runaway Detection [Loraine Torres-Castro](#); Sandia National Laboratories, United States.

1:45 PM EN05.16.02

Big Data for Li-Ion Diagnosis and Prognosis [Matthieu Dubarry](#); University of Hawaii at Manoa, United States.

2:00 PM EN05.16.03

Developing an *Ab Initio*-Kinetic Model for the Prediction of Corrosion Behavior [Rachel Gorelik](#); Arizona State University, United States.

2:15 PM EN05.16.04

Correlative Electrochemical Acoustic Time-of-Flight Spectroscopy and X-Ray Imaging to Monitor the Performance of Single-Crystal and Polycrystalline NMC811/Graphite Lithium-Ion Batteries [Harry Michael](#)^{1,2}; ¹University College London, United Kingdom; ²The Faraday Institution, United Kingdom.

2:30 PM BREAK

SESSION EN05.17: Safety and Reliability I
Session Chairs: Alex Bates and Andrew Kurzwski
Thursday Afternoon, May 12, 2022
Hawai'i Convention Center, Level 3, Emalani Theater 320

3:15 PM EN05.17.02

Intra-Particle Diffusion-Limited Thermal Runaway Predictions in Lithium-Ion Systems [Andrew Kurzwski](#); Sandia National Laboratories, United States.

3:30 PM EN05.17.03

Investigation of Fiber Optic Temperature Measurements in Lithium-Ion Cells [Florian Krause](#)^{1,4}; ¹RWTH Aachen, Germany; ⁴JARA-Energy, Germany.

3:45 PM EN05.17.05

Development of Safe Electrolytes for Lithium Ion Batteries [Wu Xu](#); Pacific Northwest National Laboratory, United States.

4:00 PM EN05.17.06

Safety and Stability of High Energy NMC811 Cathode Containing Lithium-Ion Traction Batteries [Katja Froehlich](#); AIT Austrian Institute of Technology GmbH, Austria.

4:15 PM EN05.17.07

Lithium Titanate Battery Durability and Reliability Under Electric Utility Grid Operations [Matthieu Dubarry](#); University of Hawaii at Manoa, United States.

4:30 PM EN05.17.08

Competitive Reactions and Heat Transfer Effects Applicable to Thermal Runaway Onset in Lithium-Ion Batteries [Randy Shurtz](#); Sandia National Laboratories, United States.

SESSION EN05.18: Thermal Characterization of Energy Storage Materials and Devices III
Session Chairs: Thomas Barrera and Andreas Pfrang
Monday Morning, May 23, 2022
EN05-Virtual

8:00 AM *EN05.18.01

How Calorimetry Can Help in Battery Research [Carlos Ziebert](#); KIT, Germany.

8:30 AM *EN05.18.02

On-Line Gas Detection During the Thermal Runaway of Li-Ion Cells by ARC-MS [Thomas Waldmann](#); Zentrum für Sonnenenergie- und Wasserstoff-Forschung Baden-Württemberg (ZSW), Germany.

9:00 AM *EN05.18.03

Use of Thermal Analysis to Elucidate Irreversibility and Degradation in Lithium Based Batteries [Esther S. Takeuchi](#)^{1,2}; ¹Stony Brook University, United States; ²Brookhaven National Laboratory, United States.

9:30 AM EN05.18.04

Investigation of Thermal Properties of Lithium-Ion Batteries [Kunal Dixit](#); Binghamton University, United States.

9:45 AM EN05.15.12

3D Nanoscale Morphology and Local Physical Properties of Li/Na-Ion-Battery Solid-Electrolyte-Interphase via Scanning Probe 3D *Operando* Nanorheology [Yue Chen](#)^{1,2}; ¹Lancaster University, United Kingdom; ²Faraday Institution, United Kingdom.

SESSION EN05.19: Emerging Energy Storage Materials I
Session Chairs: Thomas Barrera and Matthieu Dubarry
Monday Morning, May 23, 2022
EN05-Virtual

10:30 AM *EN05.19.01

Concentrated Mixed Cation “Water-in-Salt” Solutions as Low Cost High Voltage Electrolytes for Aqueous Batteries [Maria Lukatskaya](#); ETH Zürich, Switzerland.

11:00 AM EN05.19.02

Magnetron Sputtering of Metal Oxide Thin Films on Sulfur Cathodes for Suppressing the Shuttle Effect in Li-S Batteries [Ruoxu Shang](#); University of California Riverside, United States.

11:15 AM EN05.19.03

Electrochemical Stability of Bis(trifluoromethanesulfonyl)imide Anions at Oxide Based Cathode in Multivalent Batteries [Dan Thien Nguyen](#)^{1,2}; ¹Pacific Northwest National Laboratory, United States; ²Joint Center for Energy Storage Research, United States.

11:30 AM EN05.19.04

Multimodal Spectroscopic Investigation of AlCl₃ Additive on Initial SEI Layer Evolution in Mg Metal Batteries [Dan Thien Nguyen](#)^{1,2}; ¹Pacific Northwest National Laboratory, United States; ²Joint Center for Energy Storage Research, United States.

11:45 AM EN05.19.05

Sulfur Cathode Design Strategies Enabled by Stereolithography Technique and Oxidative Chemical Vapor Deposition [Yuxuan Zhang](#); Purdue University, United States.

12:00 PM EN05.19.06

Nitrogen Doped Graphene Oxide Based Nanomaterials Engineering for Energy Storage System [Rimjhim Yadav](#); CSIR-National Physical Laboratory, New Delhi, India.

12:05 PM EN05.19.07

Enhanced Performance of Ultra-Microporous Hard Carbon Spheres as Anode in Half /Full Cells for Sodium-Ion Batteries Through Optimized Carbonate Ester Electrolytes [Nagmani](#); Indian Institute of Technology Kharagpur, India.

12:10 PM EN05.19.08

Water Chestnut Husks-Derived Nanoporous Carbons as Electrode Materials for Microbial Fuel Cells [Lin Yi-Chu](#); National Tsing Hua University, Taiwan.

12:15 PM EN05.19.09

Jute-Based Porous Hard Carbon Anode for Cheaper, Sustainable Non-Aqueous Sodium-Ion Batteries [Nagmani](#); Indian Institute of Technology Kharagpur, India.

12:20 PM EN05.19.10

Chromium Tetrphosphide (CrP₄) as a Promising Anode Material for Lithium-Ion and Sodium-Ion Batteries [Jongwon Lee](#); Seoul National University, Korea (the Republic of).

12:25 PM EN05.19.11

WITHDRAWN 5/17/22 EN05.19.11 Multiphysics Modeling of High-Performance Electrodes for Li-Ion and Na-Ion Batteries [Akshay Pakhare](#); Michigan State University, United States.

12:30 PM EN05.10.15

Supercapattery Electrode Materials by Design: Plasma-Induced Defect Engineering of Bimetallic Oxyphosphides for Energy Storage [Nageh K. Allam](#); American University in Cairo, Egypt.

SESSION EN05.20: Fast Charging II

Session Chairs: Andreas Pfrang and Loraine Torres-Castro

Tuesday Morning, May 24, 2022

EN05-Virtual

8:00 AM *EN05.20.01

Enhancing Safety and Performance of Li-Ion Batteries Under Fast Charge Conditions [Said Al-Hallaj](#)^{1,2}; ¹University of Illinois at Chicago, United States; ²AllCell Technologies, LLC, United States.

8:30 AM *EN05.20.02

A New Lithium-Ion Battery Management Method and System [Rachid Yazami](#); KVI Pte Ltd, Singapore.

9:00 AM EN05.20.03

WITHDRAWN 5/11/22 EN05.20.03 Failure Mechanism and Optimization Study of Fast-Charging on Oxide- and Sulfide-Based Solid Lithium-Ion Batteries [Yi Ma](#); University of California Riverside, United States.

SESSION EN05.21: Safety and Reliability II

Session Chairs: Andreas Pfrang and Loraine Torres-Castro

Tuesday Morning, May 24, 2022

EN05-Virtual

10:30 AM *EN05.21.01

Data-Driven Battery Health Diagnosis in Real-World Applications [David Howey](#); University of Oxford, United Kingdom.

11:00 AM *EN05.21.02

Acoustic Methods to Explore Thermophysical Abuse Couplings in Batteries—Connecting Lab Studies to Field Events [Daniel Steingart](#); Columbia University, United States.

11:30 AM *EN05.21.03

Characterization of Fire and Smoke for Li-Ion Cells of Different Chemistries, Capacities and SOC [Judith Jeevarajan](#); Underwriters Laboratories, United States.

12:00 PM EN05.21.04

Uncertainty-Aware and Explainable Machine Learning for Early Prediction of Battery Cell Degradation [Laura H. Rieger](#); Technical University of Denmark, Denmark.

12:15 PM EN05.17.01

Degradation Characterization and Thermal Management of Li-Ion Batteries for Low-Temperature Applications [Amani Alhammedi](#); Khalifa University, United Arab Emirates.

SESSION EN05.22: Characterizing Degradation and Failure Modes

Session Chairs: Thomas Barrera and Loraine Torres-Castro

Tuesday Afternoon, May 24, 2022

EN05-Virtual

1:00 PM *EN05.22.01

In-situ and Operando Approaches for Distinguishing Productive and Parasitic Processes in Electrochemical Energy Storage Materials and Systems [Amy Marschilok](#)^{1,2}; ¹Stony Brook University, United States; ²Brookhaven National Laboratory, United States.

1:30 PM EN05.22.02

Identifying Limitations of the Lithium Metal Anode through Laser Plasma Focused Ion Beam Cross-Sectional Imaging [Laura C. Merrill](#); Sandia National Laboratories, United States.

1:45 PM EN05.22.03

Coupled Impact of Nickel Content and Charge Rate on Lithiation Mechanisms for Various Layered Materials of Li-Ion Batteries [Thibaut Jousseume](#); CEA, France.

2:00 PM EN05.22.04

Insights in Solid Electrolyte Interphase Evolution on Alkali Metals with Liquid and Solid Electrolytes [Jelena Popovic](#); Max Planck Institute for Solid State Research, Germany.

2:15 PM EN05.22.05

Suppressing Volume Change in the Li Metal Anode via Three-Dimensional Current Collector Construction for Anode-Free Batteries [Yazhou Zhou](#); Stevens Institute of Technology, United States.

2:30 PM EN05.22.06

In Depth Investigation of Methyl Viologen Dichloride Fade Rate. Advancing the *In Situ* Compositionally Symmetric Unbalanced Flow Cell Cycling Technique with SOC Monitoring and Complementing the Technique with *Ex Situ* Amperometric SOH Measurement. [Ivan A. Volodin](#); FSU Jena, Germany.

2:35 PM EN05.22.07

Precursor-Derived C-Rich SiOC as Self-Supporting Electrodes [Shakir Bin Mujib](#); Kansas State University, United States.

2:40 PM EN05.22.08

Energy Storage Applications of Sucrose-Nitrate Foamed Graphite [William C. Coley](#); University of California Riverside, United States.

2:45 PM EN05.22.09

Titania in Amorphous Silicon Oxycarbide Phase as a Competent Anode Material [S S Lokesh Vendra](#)^{1,2}; ¹Indian Institute of Technology Madras, India; ²Kansas State University, United States.

2:50 PM EN05.22.10

Insights into Electrochemical Cycling and Ageing of Bimetallic Oxyphosphides Nanowires Using Multivariate Statistical Analyses for Stable and High Energy Density Supercapacitors [Amina Saleh](#); The American University in Cairo, Egypt.

2:55 PM EN05.22.11

WITHDRAWN 5/17/22 EN05.22.11 Quantifying the Binder/Active Material Interface Failure for High Energy Density Electrodes [Akshay Pakhare](#); Michigan State University, United States.

3:00 PM EN05.22.12

Reaction Mechanism of Na-Ion Intercalation in Transition Metal Silicates [Hao Liu](#); Binghamton University, The State University of New York, United States.

SESSION EN05.23: Emerging Energy Storage Materials II
Session Chairs: Andreas Pfrang and Loraine Torres-Castro
Tuesday Afternoon, May 24, 2022
EN05-Virtual

9:00 PM EN05.23.01

Enhanced Electrochemical Properties and Reaction Mechanism of NiTi₂S₄ Ternary Metal Sulfide as an Anode for Lithium-Ion Battery [Hyung-Ho Kim](#); Seoul National University, Korea (the Republic of).

9:15 PM EN05.23.02

Exploring the Pore Distribution Changes in Hard Carbon Anodes Using *Ex Situ* Small-Angle X-Ray Scattering [Luis Kitsu Iglesias](#); University of Colorado Boulder, United States.

9:30 PM EN05.23.03

Augmenting the Rate Capability and Efficiency of Battery Anodes by Fabrication of MoSe₂/SiOC Self-Supported Structure [Sonjoy Dey](#); Kansas State University, United States.

9:35 PM EN05.23.04

First Intuition of Rate Capability Performance of Multiphase SiOC/C/NbC/Nb₂O₅ Anode Material for Battery Applications [S S Lokesh Vendra](#)^{1,2}; ¹Indian Institute of Technology Madras, India; ²Kansas State University, United States.

9:40 PM EN05.10.24

Sulfur and Carbon Nano Tube Composite Cathode Coupled with Highly Polarized Doped BiFeO₃ for the High-Rate Performance of Li-S Batteries [Rajesh K. Katiyar](#); University of Puerto Rico-San Juan, United States.

SYMPOSIUM EN06

Solid-State Batteries—From Electro-Chemo Mechanics to Devices
May 9 - May 25, 2022

Symposium Organizers

Neil Dasgupta, University of Michigan
Xin Li, Harvard University
Matthew McDowell, Georgia Institute of Technology
Hong Zhu, Shanghai Jiao Tong University

* Invited Paper

SESSION EN06.01: General Session I
Session Chairs: Neil Dasgupta and Xin Li
Monday Morning, May 9, 2022
Hawai'i Convention Center, Level 3, 323A

10:30 AM *EN06.01.01

The Pros and Cons of Solid vs Liquid Electrolytes in Lithium Batteries [M. Stanley Whittingham](#); Binghamton University, United States.

11:00 AM *EN06.01.02

Enabling High Energy Density All-Solid Batteries [Timothy S. Arthur](#); Toyota Research Inst, United States.

SESSION EN06.02: Superionic Conductors
Session Chairs: Xin Li and Matthew McDowell
Monday Afternoon, May 9, 2022
Hawai'i Convention Center, Level 3, 323A

1:30 PM *EN06.02.01

What are the Structural Features That Lead to High Li-Ion Conductivity? [Gerbrand Ceder](#); University of California, Berkeley/Lawrence Berkeley National Laboratory, United States.

2:00 PM *EN06.02.02

Design of Alkali Superionic Conductors with Machine Learning [Shyue Ping Ong](#); University of California, San Diego, United States.

2:30 PM EN06.02.03

Characterizing Sub-Diffusive Transport in Fast-Ion Conducting Solid Electrolytes [Andrey Poletayev](#)^{1,3,2}; ¹Stanford University, United States; ³SLAC National Accelerator Laboratory, United States.

2:45 PM BREAK

SESSION EN06.03: Interface Stability
Session Chairs: Neil Dasgupta and Xin Li
Monday Afternoon, May 9, 2022
Hawai'i Convention Center, Level 3, 323A

3:00 PM *EN06.03.01

The Stability and Kinetics of the Li/Solid Electrolyte Interface [Jeff Sakamoto](#)^{1,3,2}; ¹University of Michigan - Ann Arbor, United States; ²University of Michigan–Ann Arbor, United States; ³Zakuro, Inc., United States.

3:30 PM *EN06.03.02

Mechanistic Underpinnings of Interfaces and Crosstalk in Solid-State Batteries [Partha P. Mukherjee](#); Purdue University, United States.

4:00 PM EN06.03.03

Design Dynamic Stability for Lithium Metal Solid-State Batteries [Luhan Ye](#); Harvard University, United States.

4:15 PM EN06.03.04

Mesoscale Analysis of Interface Stability in Solid-State Batteries [Bairav Sabarish Vishnugopi](#); Purdue University, United States.

4:30 PM EN06.03.05

Phase Stability of Garnet Solid-Electrolyte Interfacing with Various Cathodes in All-Solid-State Batteries [Jung-Hyun Kim](#); The Ohio State University, United States.

SESSION EN06.04: Poster Session I: Solid-State Batteries—From Electro-Chemo Mechanics to Devices I

Session Chairs: Xin Li and Luhan Ye

Monday Afternoon, May 9, 2022

5:00 PM - 7:00 PM

Hawai'i Convention Center, Level 1, Kamehameha Exhibit Hall 2 & 3

EN06.04.01

Predicting Transport Limitations in Lithium Metal Anodes [Jeong Seop Yoon](#); University of Michigan, United States.

EN06.04.02

High Ionic Conductivity PEO-Based Solid Polymer Electrolyte for All-Solid-State Li-Metal Batteries Through a Fast and Scalable Process [Luca Bertoli](#); Politecnico di Milano, Italy.

EN06.04.03

In Situ Spatially-Resolved Thermal Conductivity Mapping of Battery Cell Degradation [Milena Milich](#); University of Virginia, United States.

EN06.04.04

Attempt Frequencies for Solid-State Ionic Conductivity from Statistical Analyses of Steady-State and Biased Molecular Dynamics Simulations [Andrey Poletayev](#)^{1,2}; ¹Stanford University, United States; ²SLAC National Accelerator Laboratory, United States.

EN06.04.05

Flexible and Safe Additives-Based Zinc-Binder-Free-Hierarchical MnO₂-Solid Alkaline Polymer Battery for Potential Use in Wearable Applications [Deepa Madan](#); University of Maryland, United States.

EN06.04.06

WITHDRAWN 5/6/22 EN06.04.06 Life-Time Prediction for Flexible Lithium-Ion Batteries Using Accelerated Testing Models [Banafsheh Hekmatnia](#); University of Houston, United States.

EN06.04.08

Solution Synthesis of Ternary Solid-State Electrolytes for Sodium-Ion Batteries [Saeed Ahmadi Vaselebadji](#); Colorado School of Mines, United States.

EN06.04.09

3D Printed Carbon Nanostructures Based Electrodes in Capacitive Deionization Devices for Seawater Desalination [Hui Ying Yang](#); Singapore University of Technology and Design, Singapore.

EN06.04.10

Fabrication of Efficient Anode by Integrating Transition Bimetallic Oxide with Carbon Nanotubes for Lithium-Ion Battery [Abid Ullah](#); Korea Institute of Energy Research, University of Science and Technology South Korea, Korea (the Republic of).

EN06.04.11

Investigating Dry Room Compatibility of Sulfide Solid-State Electrolytes for Scalable Manufacturing [Yu-Ting Chen](#); University of California, San Diego, United States.

SESSION EN06.05: Li Metal Anode in Solid-State Batteries

Session Chairs: Xin Li and Matthew McDowell

Tuesday Morning, May 10, 2022

Hawai'i Convention Center, Level 3, 323A

8:30 AM *EN06.05.01

Phase-Field Method of Li-Metal Plating and Stripping in Solid-State Li-Ion Batteries [Long-Qing Chen](#); The Pennsylvania State University, United States.

9:00 AM EN06.05.02

The Stripping Behavior of Thin Li on Li₇La₃Zr₂O₁₂ as a Function of Current Density and Thickness [Kiwoong Lee](#); University of Michigan–Ann Arbor, United States.

9:15 AM EN06.05.03

The Effect of Aspect Ratio on Creep Behavior of Lithium Metal in Relevant Solid-State Battery Configuration [Catherine Haslam](#); University of Michigan, United States.

9:30 AM BREAK

10:00 AM *EN06.05.04

A Proposed General Solution to the Dendrite Penetration Problem [Stephen J. Harris](#); Lawrence Berkeley National Laboratory, United States.

10:30 AM *EN06.05.05

Ion Conduction and Dendrite Formation in Solid-State Batteries [Yan-Yan Hu](#)^{1,2}; ¹Florida State University, United States; ²The National High Magnetic Field Laboratory, United States.

11:00 AM EN06.05.06

Phase-Field Simulation of Mechanical Inhibition of Li Dendrite Growth in Li-Metal Batteries [Ye Cao](#); The University of Texas at Arlington, United States.

SESSION EN06.06: Interface in Solid-State Batteries

Session Chairs: Neil Dasgupta, Partha Mukherjee and Shyue Ping Ong

Tuesday Afternoon, May 10, 2022

Hawai'i Convention Center, Level 3, 323A

2:00 PM *EN06.06.01

Understanding Interfacial Phenomena in All-Solid-State Batteries Y. Shirley Meng; University of California, San Diego, United States.

2:30 PM EN06.06.02

Stabilizing the Interface Between Polymer Electrolyte and Lithium by Concentration Polarization-Induced Phase Transformation Yuan Yang; Columbia University, United States.

2:45 PM BREAK

3:15 PM *EN06.06.03

Understanding Solid Electrolyte-Lithium Interfaces via *Operando* Multiscale Characterizations Yan Yao; University of Houston, United States.

3:45 PM EN06.06.04

Probing Interfaces in Solid-State Batteries Using *Operando* X-Ray Tomography John Lewis; Georgia Institute of Technology, United States.

4:00 PM EN06.06.05

Electro-Chemo-Mechanical Evolution of Sulfide Solid Electrolyte-LiMg Alloy Interfaces—Effect of Current, Temperature and Stacking Pressure Lihong Zhao; University of Houston, United States.

4:15 PM EN06.06.07

Nanoscale Interface Characterization in Battery Materials with Vibrational Spectroscopy in a Scanning Transmission Electron Microscope Kartik Venkatraman; Oak Ridge National Laboratory, United States.

SESSION EN06.07: Poster Session II: Solid-State Batteries—From Electro-Chemo Mechanics to Devices II

Session Chairs: Ye Cao and Neil Dasgupta

Tuesday Afternoon, May 10, 2022

5:00 PM - 7:00 PM

Hawai'i Convention Center, Level 1, Kamehameha Exhibit Hall 2 & 3

EN06.07.01

Revealing the Structure of Solid Electrolyte Thin Films to Enable Lithium Metal Batteries Pooja Vadhva; University College London, United Kingdom.

EN06.07.02

Free Energy Sampling to Explore Ion Solvation Environments and Understand Transport and Glass Transition in Solid-State Electrolytes for Battery Materials Siddharth Sundararaman; Lawrence Berkeley National Laboratory, United States.

EN06.07.04

Synergistic Optimization of $\text{LiNi}_{0.5}\text{Mn}_{1.5}\text{O}_4$ Thin Films Deposited by RF Reactive Sputtering at Various Ar/O₂ Flow Ratios for High Performance All-Solid-State Thin-Film Battery Jong Heon Kim; Chungnam National University, Korea (the Republic of).

EN06.07.05

Design Principles for Grain Boundaries in Solid-State Lithium-Ion Conductors James A. Quirk; Newcastle University, United Kingdom.

EN06.07.06

Calculation and Validation Measurement of Salt Loading in MOFs Chisang Park^{1,3}; ¹University of Michigan–Ann Arbor, United States; ³The University of Texas at Austin, United States.

EN06.07.07

Can We Utilise Phonons to Enhance Li-Ion Diffusion? Benjamin A. Williamson; Norwegian University of Science and Technology, Norway.

EN06.07.08

Dimensionality Control of Li⁺ Transport by MOFs-Based Quasi-Solid to Solid-State Electrolytes (Q-SSEs) Manuel Salado; BC Materials, Spain.

EN06.07.09

CO₂ Reactive Laser Sintering of Garnet-Type Li-Ion Conductors Erika Ramos; Lawrence Livermore National Laboratory, United States.

EN06.07.10

Interactions Between Laser and Solid-State Lithium Battery Materials Jianchao Ye; Lawrence Livermore National Lab, United States.

EN06.07.11

Designing a Li-N-H Based Solid Electrolyte Jeremy Lowen; University of Birmingham, United Kingdom.

EN06.07.12

Generating Solid-State Polymeric Electrolytes via *i*CVD for Macroscale 3D All Solid-State Ag–Zn Batteries Megan B. Sassin; U.S. Naval Research Laboratory, United States.

SESSION EN06.08: Sulfide Electrolyte

Session Chairs: Xin Li, Matthew McDowell and Yan Yao

Wednesday Morning, May 11, 2022

Hawai'i Convention Center, Level 3, 323A

9:00 AM EN06.08.01

Amphiphathic Binder Integrating Ultrathin and Highly Ion-Conductive Sulfide Membrane for Cell-Level High Energy Density All-Solid-State Batteries Hongli Zhu;

Northeastern University, United States.

9:15 AM EN06.08.02

High Performance All-Solid-State Li-S Battery Enabled by Interfacial Modification [Minjeong Shin](#)^{1,2}; ¹Sungshin Women's University, Korea (the Republic of); ²University of Illinois at Urbana-Champaign, United States.

9:30 AM BREAK

10:00 AM EN06.08.03

Understanding Ion Transport and Interfacial Stability in Fluorine Containing Lithium Argyrodite Electrolytes for Solid-State Lithium-Sulfur Batteries [Badri Narayanan](#); University of Louisville, United States.

10:15 AM EN06.08.04

Sulfide Solid-State Electrolytes with Li₂S Synthesized via Room Temperature Metathesis [William Smith](#); Colorado School of Mines, United States.

10:30 AM EN06.08.05

Low-Cost Scalable Synthesis of Sulfide Solid Electrolytes by Wet Chemical Cascade Reaction [Yoon-Cheol Ha](#); Korea Electrotech Res Inst, Korea (the Republic of).

10:45 AM EN06.14.03

Composite Cathode Architectures for High Performance All-Solid-State Lithium Sulfur Batteries [Yi Lin](#); NASA Langley Research Center, United States.

SESSION EN06.09: Oxide Related Electrolyte
Session Chairs: Minjeong Shin, Yuan Yang and Hongli Zhu
Wednesday Afternoon, May 11, 2022
Hawai'i Convention Center, Level 3, 323A

2:00 PM EN06.09.01

Design Principles for Fast Oxide Lithium-Ion Conductors [KyuJung Jun](#); UC Berkeley, United States.

2:15 PM EN06.09.02

First-Principles Evaluation of Dopant Impact on Structural Deformability of LLZO Solid-State Electrolyte—Towards Realization of Co-Sintering with High-Energy Cathodes [Liwen Wan](#); Lawrence Livermore National Laboratory, United States.

2:30 PM BREAK

3:00 PM EN06.09.04

Electro-Chemo-Mechanical Evaluation of Garnet Surface Treatments [Edward Barks](#); Stanford University, United States.

3:15 PM EN06.09.05

Working Thin-Film Solid-State Batteries Designed in a Multilayered Stack to Enhance Energy Density [Victoria Castagna Ferrari](#); University of Maryland, United States.

3:30 PM EN06.09.06

Co-Sintered Solid Electrolyte/Cathode Interfaces in Solid-State Batteries [Marissa Wood](#); Lawrence Livermore National Lab, United States.

3:45 PM EN06.09.07

Plasma Enhanced Atomic Layer Deposition of Sodium Phosphorous Oxynitride [Daniela Fontecha](#); University of Maryland at College Park, United States.

SESSION EN06.10: Poster Session III: Solid-State Batteries—From Electro-Chemo Mechanics to Devices III
Session Chairs: Matthew McDowell and Luhan Ye
Wednesday Afternoon, May 11, 2022
5:00 PM - 7:00 PM
Hawai'i Convention Center, Level 1, Kamehameha Exhibit Hall 2 & 3

EN06.10.01

Mathematical Design of Energy Materials [Delin Zhang](#);

EN06.10.02

Polyacrylonitrile Nanofiber-Reinforced Flexible Single-Ion Conducting Polymer Electrolyte for High-Performance, Room-Temperature All-Solid-State Li-Metal Batteries [Hui Cheng](#); North Carolina State University, United States.

EN06.10.03

Nanostructured Li₂Se as a Protective Layer for All-Solid-State Lithium Metal Batteries [Joonhyeok Park](#); Hanyang University, Korea (the Republic of).

EN06.10.04

Effect of Asymmetric Loading and Fracture on Polymorphism and Transport Properties in La₃Li₇Zr₂O₁₂ (LLZO) [Scott Q. Monismith](#); Tufts University, United States.

EN06.10.05

Photo-Assisted Li-Se Solid-State Batteries [Moritz H. Futscher](#); Empa-Swiss Federal Laboratories for Materials Science and Technology, Switzerland.

EN06.10.07

Methodology for Mechanical Pillar Array Indentation of Alkali Metals [Thomas S. Marchese](#); Georgia Institute of Technology, United States.

EN06.10.08

Highly Reduced Interfacial Resistance All-Solid-State Battery via a Continuous Process [Kwangmo Go](#); Chungnam National University, Korea (the Republic of).

EN06.10.10

First Principles Design and Investigation of Two-Dimensional Si Doped Carbon Lattices for Anode in Na-Ion Batteries [Neha Yadav](#); Indian Institute of Technology Ropar, India.

SESSION EN06.11: Advanced Characterization
Session Chairs: Xin Li and Yingzhi Sun
Thursday Morning, May 12, 2022
Hawai'i Convention Center, Level 3, 323A

9:15 AM EN06.11.01

Lattice Dynamics in the NASICON $\text{NaZr}_2(\text{PO}_4)_3$ Electrolyte Revealed from Temperature-Dependent Neutron, NMR and *Ab Initio* Computational Studies [Emily E. Morgan](#)^{1,3}; ¹University of California, Santa Barbara, United States; ³University of California, Santa Barbara, United States.

9:30 AM EN06.11.02

Understanding Ion Transport in Block Copolymer Electrolytes Using X-Ray Photon Correlation Spectroscopy [Emma Antonio](#); CU Boulder, United States.

9:45 AM BREAK

10:15 AM EN06.11.03

Understanding Coupled Electro-Chemo-Mechanics During *In Situ* Li Metal Anode Formation in Anode-Free Solid-State Batteries [Eric Kazyak](#); University of Michigan–Ann Arbor, United States.

10:30 AM EN06.11.04

Characterization of NaSICON Solid Electrolytes Exposed to Thermal and Electrochemical Cycling in Molten Sodium Environment [Ryan C. Hill](#); University of Kentucky, United States.

10:45 AM EN06.11.05

The Effect of Aluminum Concentration on the Structure, Microstructure and Electrochemical Properties of $\text{Li}_{7-3x}\text{Al}_x\text{La}_3\text{Zr}_2\text{O}_{12}$ [Alexandra C. Moy](#); University of Michigan, United States.

11:00 AM EN06.11.06

***In Situ* Strain Distributions in 3D Solid-State Battery Electrodes** [Haotian Wang](#); University of Maryland, United States.

11:15 AM EN06.11.07

A Lithium Dendrite Inhibiting Strategy by Metallic Coatings in Solid Electrolytes via *Operando* Study [Xin Xu](#); Stanford University, United States.

SESSION EN06.12: Cathode in Solid-State Batteries
Session Chairs: Eric Kazyak and Xin Li
Thursday Afternoon, May 12, 2022
Hawai'i Convention Center, Level 3, 323A

1:30 PM *EN06.12.01

Cathode Design for All-Solid-State Lithium Batteries [Jagjit Nanda](#); Oak Ridge National Laboratory, United States.

2:00 PM EN06.12.02

Constructing Favorable Microstructures in Solid-State Organic Cathodes via Mechanical Property Manipulation [Zhaoyang Chen](#); University of Houston, United States.

2:15 PM EN06.12.03

Unlocking Stable Multi-Electron Cycling in NMC811 Thin Films Between 1.5 – 4.7 V [Abdessalem Aribia](#); Empa - Swiss Federal Laboratories for Materials Science and Technology, Switzerland.

2:30 PM BREAK

SESSION EN06.13: New Solid Electrolytes
Session Chairs: Eric Kazyak and Xin Li
Thursday Afternoon, May 12, 2022
Hawai'i Convention Center, Level 3, 323A

3:00 PM EN06.13.01

Hybrid Halide Solid Electrolytes and Bottom-Up Cell Assembly Enable High Voltage Solid-State Lithium Batteries [Benjamin Zehri](#); University of Illinois at Urbana-Champaign, United States.

3:15 PM EN06.13.02

Interplay of Synthesis and Ionic Conduction in Halide-Based Solid Electrolytes [Elias Sebt](#)^{1,3}; ¹University of California, Santa Barbara, United States; ³University of California, Santa Barbara, United States.

3:30 PM EN06.13.03

Investigation of Li^+ Migration in Monoclinic $\text{Li}_{2+x}\text{Zr}_{1-x}\text{M}_x\text{Cl}_6$ (M = Sc, In) [Hiram Kwak](#); Yonsei University, Korea (the Republic of).

3:45 PM EN06.13.04

Novel Superionic Conductors with Pseudo-Halogen Substitution [Yingzhi Sun](#); UC Berkeley, United States.

4:00 PM EN06.13.05

Solid-State Calcium-Ion Diffusion in $\text{Ca}_{1.5}\text{Ba}_{0.5}\text{Si}_5\text{O}_3\text{N}_6$ [Yu Chen](#)^{1,2}; ¹University of California, Berkeley, United States; ²Lawrence Berkeley National Laboratory, United States.

4:15 PM EN06.13.06

Highly-Conducting Alluaudite-Type Nanocrystallized Glass-Ceramics for Sodium-Ion Batteries [Tomasz K. Pietrzak](#); Warsaw Univ. of Technology, Poland.

SESSION EN06.15: Simulation for Solid-State Batteries

Session Chairs: Xin Li and Qingsong Tu

Friday Morning, May 13, 2022

Hawai'i Convention Center, Level 3, 323A

10:00 AM EN06.15.01

Large-Scale Molecular Dynamics Simulations of Electrolytes Enabled by Active Learning and Equivariant Neural Networks [Boris Kozinsky](#); Harvard University, United States.

10:15 AM EN06.15.02

High-Throughput Discovery of Solid-State Fluoride-Ion Conductors and Generalized Heuristics for Ion Transport [Jack D. Sundberg](#); University of North Carolina, United States.

10:30 AM EN06.15.03

Construction of Solid-State Electrolyte Optimization Pareto Fronts with Machine Learning-Based Models [Austin Sendek](#); Aionics, United States.

10:45 AM EN06.15.05

Electronic Properties and Ionic Conductivity of Doped Garnet Type Solid Electrolyte [Santosh KC](#); San Jose State University, United States.

11:00 AM EN06.15.06

Fast Na Diffusion and Anharmonic Phonon Dynamics in Superionic Na_3PS_4 [Olivier Delaire](#); Duke University, United States.

11:15 AM EN06.15.07

Predicting the Nucleation and Formation of Secondary Phases in All Solid-State Lithium Batteries [Liwen Wan](#); Lawrence Livermore National Laboratory, United States.

SESSION EN06.16: Fabrication and Process of Solid-State Batteries

Session Chairs: Eric Kazyak, Qingsong Tu and Luhan Ye

Friday Afternoon, May 13, 2022

Hawai'i Convention Center, Level 3, 323A

1:45 PM EN06.16.01

The Buffer Layer for Anode-Free Architecture in Solid-State Batteries [Qingsong Tu](#); Rochester Institute of Technology, United States.

2:00 PM EN06.16.02

Development of a Fabrication Process for Antiperovskite Li_3OCl Thin Films [Stephen J. Turrell](#); University of Oxford, United Kingdom.

2:15 PM EN06.16.03

WITHDRAWN 5/10/22 EN06.16.03 Low-Temperature Synthesis and Sintering of Al-Stabilized Garnet (LLZO) Solid Electrolyte for ASSBs [George P. Demopoulos](#); McGill University, Canada.

2:30 PM EN06.16.04

Sputtered Amorphous Carbon Interlayers for Homogeneous Lithium Plating and Stripping [Moritz H. Futscher](#); Empa-Swiss Federal Laboratories for Materials Science and Technology, Switzerland.

2:45 PM BREAK

3:15 PM EN06.16.05

Forthcoming High Performance All-Solid-State Pouch Cell [Fatima N. Ajjan](#); AIT Austrian Institute of Technology GmbH, Austria.

3:30 PM EN06.16.07

Layer-by-Layer Assembly with Lithiophilic and Electrophobic Interlayer for Dendrite-Free Lithium-Metal Solid-state Batteries [Sunyoung Lee](#); Seoul National University, Korea (the Republic of).

3:45 PM EN06.16.08

Tuning the Diffusion and Mechanical Properties of the Lithium Metal Anode by Mixing with Carbon-Nanotubes for Use in Solid-State Batteries [Till Fuchs](#); Institute of Physical Chemistry / Justus-Liebig-University Giessen, Germany.

4:00 PM EN06.16.09

In Situ Impedance Study on All-Solid-State Lithium-Ion Batteries Fabricated by Screen-Printing [Masayuki Itagaki](#); Tokyo University of Science, Japan.

SESSION EN06.17: General Session II

Session Chairs: Neil Dasgupta and Xin Li

Tuesday Afternoon, May 24, 2022

EN06-Virtual

1:00 PM *EN06.17.01

WITHDRAWN 5/6/22 EN06.17.01 Transport Limitations in Li-S Solid-State Batteries [Wolfgang Zeier](#); University of Muenster, Germany.

1:30 PM EN06.17.02

In the Search for the Best Solid Electrolyte-Layered Oxide Pairing for Assembling Practical All-Solid-State Batteries [Tuncay Koc](#)^{1,2,3}; ¹College de France, France; ²Sorbonne Université, France; ³Reseau sur le Stockage Electrochimique de l'Energie (RS2E), France.

1:45 PM *EN06.17.03

High-Performance Solid-State Electrolytes—Ultra-Fast High Temperature Sintering (UHS) Oxides and Expanded Cellulose [Liangbing Hu](#)^{1,2}; ¹University of Maryland College Park, United States; ²University of Maryland College Park, United States.

SESSION EN06.18: General Session III
Session Chairs: Xin Li and Matthew McDowell
Wednesday Morning, May 25, 2022
EN06-Virtual

8:00 AM *EN06.18.01

The Influence of Temperature on Li Plating/Stripping at Metal/Oxide Solid Electrolyte Interfaces [Munekazu Motoyama](#); Nagoya University, Japan.

8:30 AM *EN06.18.02

Factors Influencing the Critical Current in Lithium Anode Ceramic Electrolyte Solid-State Batteries [Peter Bruce](#); University of Oxford, United Kingdom.

9:00 AM EN06.18.03

Soft Matter Electrolytes for Li-Ion and Beyond Li-Ion Rechargeable Batteries [Aninda J. Bhattacharyya](#); Indian Institute of Science, India.

9:15 AM EN06.18.04

Developing New Polymer Nanocomposite (PNCs)-Based Electrolytes with Higher Ionic Conductivity Using Non-Linear Poly(ethylene oxide) Topologies [Recep Bakar](#); Koc University, Turkey.

9:30 AM *EN06.18.05

Lithium Hydroxide Halide Antiperovskites—An Ideal Model System to Understand Solid-State Batteries [Mauro Pasta](#); University of Oxford, United Kingdom.

SESSION EN06.19: General Session IV
Session Chairs: Xin Li and Hong Zhu
Wednesday Morning, May 25, 2022
EN06-Virtual

10:30 AM EN06.19.01

Unification of Bulk Storage and Supercapacitive Storage [Chuanlian Xiao](#); Max Planck Institute for Solid State Research, Germany.

10:45 AM EN06.19.02

Thermal and Electrochemical Interface Compatibility Between Hydroborate Solid Electrolytes and High-Voltage Cathodes for All-Solid-State Batteries [Ryo Asakura](#); Empa - Swiss Federal Laboratories for Materials Science and Technology, Switzerland.

11:00 AM EN06.19.03

Building a Better Li-Garnet Solid Electrolyte/Metallic Li Interface with Antimony [Kostiantyn Kravchuk](#)^{1,2}; ¹ETH Zurich, Switzerland; ²Empa–Swiss Federal Laboratories for Materials Science and Technology, Switzerland.

11:15 AM EN06.19.04

Operando Monitoring of Internal Li-Driven Stress in Solid-State and Liquid Battery Electrodes Enabled by Optical Sensing [Laura Alberio Blanquer](#)^{1,2}; ¹Collège de France, France; ²Sorbonne Université, France.

11:30 AM EN06.10.11

Lithium Metal Diffusion in a Li-Mg Alloy by SIMS [Marco Siniscalchi](#); University of Oxford, United Kingdom.

SESSION EN06.20: General Session V
Session Chairs: Xin Li and Matthew McDowell
Wednesday Afternoon, May 25, 2022
EN06-Virtual

1:00 PM *EN06.20.01

Design and Manufacture of Solid State Batteries towards Low Cost [Jennifer L. Rupp](#); Technical University of Munich, Germany.

1:30 PM EN06.20.02

Sodium-Ion Conduction and Interfacial Stability in Multivalent Cation Doped Sulfide Electrolytes [Varun Shreyas](#); University of Louisville, United States.

1:45 PM EN06.20.03

Universal Cathode Design Strategies to Engineer Cathode Electrolyte Interfaces for High Performance All-Solid-State Batteries [Yuxuan Zhang](#); Purdue University, United States.

2:00 PM EN06.20.04

Local Structural Characterization of Metal Oxides Nanocomposites for Electro-Chemo-Mechanical (ECM) Devices [Junying Li](#); Stony Brook University, The State University of New York, United States.

2:05 PM EN06.20.05

Ferroelectric and Multiferroics Materials being Incorporated into Lithium-Sulfur Batteries to Promote Efficient High-Performance [Claudia C. Zuluaga Gomez](#); university

of Puerto Rico, Rio Piedras Campus, Puerto Rico.

SESSION EN06.21: General Session VI
Session Chairs: Neil Dasgupta and Xin Li
Wednesday Afternoon, May 25, 2022
EN06-Virtual

4:00 PM *EN06.21.01

Differentiate the Intrinsic and Extrinsic Interface Resistance in All-Solid-State Li-Ion Batteries [Yue Qi](#); Brown University, United States.

4:30 PM EN06.21.02

Mixed-Domain Charge Transport in S-Se Alloys as a Li-S Battery Cathode Material [Junsoo Park](#); NASA Ames Research Center, United States.

4:45 PM EN06.16.06

Stress Engineering for Dendrites-Suppressing Solid Electrolytes [Chunmei Ban](#); University of Colorado Boulder, United States.

SESSION EN06.22: General Session VII
Session Chairs: Neil Dasgupta and Xin Li
Wednesday Afternoon, May 25, 2022
EN06-Virtual

6:30 PM *EN06.22.01

Detection of Chemo-Mechanical Transformations in Solid-State Batteries from Nano-to-Meso Scale [Kelsey B. Hatzell](#); Princeton University, United States.

7:00 PM EN06.22.02

Tailoring Electrolyte to Enable High-Safety High-Performance Flexible Rechargeable Batteries [Ying Wang](#); Louisiana State University, United States.

7:15 PM *EN06.22.03

Probing Degradation Mechanisms and Structural Analysis of Solid Electrolytes by Diverse Analyses Including Cryogenic Electron Microscopy [Hyun-Wook Lee](#); Ulsan National Institute of Science and Technology, Korea (the Republic of).

7:45 PM *EN06.22.04

Challenges of ASSB for Future Electric Vehicle Application [Toshikazu Kotaka](#); Nissan Motor Co Ltd, Japan.

8:15 PM EN06.22.05

Millisecond Ion-Transport Simulations of Mixed Polyanion Solid Electrolytes [Zeyu Deng](#); National University of Singapore, Singapore.

SESSION EN06.23: General Session VIII
Session Chairs: Xin Li and Hong Zhu
Wednesday Afternoon, May 25, 2022
EN06-Virtual

9:00 PM *EN06.23.01

Component Regulation and Performance Optimization of PVDF-Based Polymer Electrolytes [Liangliang Li](#); Tsinghua University, China.

9:30 PM EN06.23.02

Fabrication and Evaluation of Pouch-Type All-Solid-State Lithium-Ion Batteries [Yong Bae Song](#); Yonsei University, Korea (the Republic of).

9:45 PM EN06.23.03

Wet-Slurry Fabrication Using PVdF-HFP Binder with Sulfide Electrolytes for All-Solid-State Batteries [Kyu Tae Kim](#); Yonsei University, Korea (the Republic of).

10:00 PM EN06.23.04

Versatile Wet-Chemical Synthesis of Sulfide Solid Electrolytes Using Cosolvents for All-Solid-State Batteries [Jehoon Woo](#); Yonsei University, Korea (the Republic of).

10:05 PM EN06.23.05

Tailoring the Performance of an Mg²⁺-Conducting NASICON-type Solid Electrolyte: Anisotropic Thermal Expansion and Ionic Conductivity [Cem E. Özbilgin](#)^{1,2}; ¹Waseda University, Japan; ²National Institute for Materials Science, Japan.

10:10 PM *EN06.23.06

Design Factors for New Halide Superionic Conductors for All-Solid-State Batteries [Yoon Seok Jung](#); Yonsei University, Korea (the Republic of).

SYMPOSIUM EN07

Sustainable Polymeric Materials by Green Chemistry—Degradability and Resilience
May 9 - May 24, 2022

Symposium Organizers

Anna Finne Wistrand, KTH Royal Institute of Technology
Rainhard Machatschek, Helmholtz Zentrum Hereon
Keiji Numata, RIKEN Inst
Ying Yang, University of Nevada, Reno

* Invited Paper

SESSION EN07.01: Polymers from Sustainable, Natural Building Blocks
Session Chairs: Rainhard Machatschek and Ying Yang
Monday Morning, May 9, 2022
Hawai'i Convention Center, Level 3, 323C

10:45 AM *EN07.01.01

Harnessing the Diversity of Biomass in the Design of Performance-Advantaged, Polymeric Materials [LaShanda Korley](#); University of Delaware, United States.

11:15 AM EN07.01.02

Sustainable Sanitary Products from Cellulose/Protein Composites—Challenges and Approaches [Antonio J. Capezza](#); KTH, Sweden.

11:30 AM EN07.01.03

Biobased and Biodegradable Vitrimers from Vegetable Oils and Their Applications [Arkadiusz Zych](#); Istituto Italiano di Tecnologia, Italy.

11:45 AM EN07.01.04

Valorization of Vegetable Biomass as Moldable Biocomposites [Giovanni Perotto](#); Italian Inst of Technology, Italy.

SESSION EN07.02: Sustainability by Molecular Design
Session Chairs: LaShanda Korley and Rainhard Machatschek
Monday Afternoon, May 9, 2022
Hawai'i Convention Center, Level 3, 323C

1:45 PM *EN07.02.01

Sustainable Polymer Network Designs Using Robust Dynamic Covalent Bonds [Zhibin Guan](#); University of California, Irvine, United States.

2:15 PM *EN07.02.02

Molecular Engineering in Four Dimensions—A Mechanistic Approach to Reprocessable Elastomers [Julia Kalow](#); Northwestern University, United States.

2:45 PM EN07.02.03

Long Term Evolution of Morphology, Melting and Crystal-Crystal Transitions Facilitated by Dynamic Bond Exchange in Ethylene Dynamic Networks [Bhaskar Soman](#); University of Illinois Urbana Champaign, United States.

3:00 PM BREAK

3:30 PM *EN07.02.04

Self-Healable Copolymers Based on Dipolar and Coulombic Interactions [Marek W. Urban](#); Clemson University, United States.

4:00 PM EN07.02.05

Manufacturing of Materials with Regenerative Capabilities [Julian Cooper](#); UIUC, United States.

4:15 PM EN07.02.06

Tuning the Degradation Lifetimes of Degradable Imine-Based Polymer Semiconductors by Molecular Design [Jerika A. Chiong](#); Stanford University, United States.

4:30 PM EN07.02.07

Polybutadiene Elastomers with Degradation Profiles Programmed by Microencapsulation and Controlled Release of Metathesis Catalysts [Brad H. Jones](#); Sandia National Labs, United States.

SESSION EN07.03: New Routes for De- and Repolymerization
Session Chairs: Hang (Jerry) Qi and Natalia Tarazona

Tuesday Morning, May 10, 2022
Hawai'i Convention Center, Level 3, 323C

8:30 AM EN07.03.01

Potential of Singlet-Oxygen-Driven Polymer Photodegradation in Remediation of Disposed Plastics [Kaan Kalkan](#); Oklahoma State University, United States.

8:45 AM EN07.03.02

Recyclable Epoxies Through Depolymerization Using Photothermal Nanoparticles [Youngmin Lee](#); New Mexico Tech, United States.

9:00 AM EN07.03.03

Fabrication of PHB-Based Biodegradable Bioplastic Films Comparable to Current Plastic for Packaging Applications [Kwan-Soo Lee](#); Los Alamos National Laboratory, United States.

9:15 AM EN07.03.04

Assessing Polymer Sustainability at End-of-Life—Linking Quality to Polymeric Waste Treatment Processes [Basuhi Ravi](#); Massachusetts Institute of Technology, United States.

9:30 AM EN07.03.05

Homogenous Gold Catalysis—A Versatile Platform for the Upcycling of Commodity Aromatic Polymers [Samuel B. Hunt](#); University of Southern Mississippi, United States.

9:45 AM EN07.03.06

Evaluation of Post-Consumer Recycled (PCR) Plastics in Consumer Electronics System [Rashed A. Islam](#); Google LLC., United States.

10:00 AM BREAK

10:30 AM *EN07.03.07

Synthesis of Sustainable Polymeric Materials from Biobased Building-Blocks and Their Recycling or Reprocessing [Karin Odellius](#); KTH Royal Institute of Technology, Sweden.

11:00 AM EN07.03.08

Nanofiber-Based Biodegradable Textiles for Decreased Microfiber Pollution [James Dolgin](#); Materic Group, United States.

11:15 AM EN07.03.09

A Comparative Framework for Plastic-to-Plastic Recycling Technologies [Taylor Uekert](#); National Renewable Energy Laboratory, United States.

11:30 AM EN07.03.10

Enzymes Immobilized Nanocarriers for the Selective Degradation of Synthetic Polymers [Michael Wilhelm](#); University of Cologne, Germany.

SESSION EN07.04: Synthesis and Processing of Green and Sustainable Polymers
Session Chairs: Anna Finne Wistrand and Brent Sumerlin
Tuesday Afternoon, May 10, 2022
Hawai'i Convention Center, Level 3, 323C

3:00 PM EN07.04.02

Resilient Degradable Poly(α -Hydroxy Acids) with Improved Strength and Ductility via Scalable Stereosequence-Controlled Ring-Opening Polymerization [Rong Tong](#); Virginia Tech, United States.

3:15 PM EN07.04.03

3D-Printability of PPG-Poly(hydroxyurethane) Elastomers Using Thermal or UV Curing Processes [Anna Pierrard](#); University of Liège, Belgium.

3:30 PM EN07.04.04

Improvement of Photocatalytic Power and Dimensional Stability via *In Situ* Synthesis of Carbon Dot on Cellulose Nanofiber [Jungbin Ahn](#); Konkuk Univ., Korea (the Republic of).

3:45 PM EN07.04.05

Tunable Naphthalene-Based Microporous Polyimide Networks for CO₂ Capture and Conversion [Basiram Narzary](#); University of Bristol, United Kingdom.

4:00 PM EN07.04.06

Poster Spotlight: Mechanochemical Modification of High-Melt-Viscosity Polymers via Solid-State Shear Pulverization—Appropriate Levels of Degradation and Enhanced Properties in Specialty Polyethylenes [Katsuyuki Wakabayashi](#); Bucknell Univ, United States.

4:05 PM EN07.04.07

Poster Spotlight: Characterization of a Conductive Wax-Based Ink for 3D Printed Microbial Activity Sensors [John-Baptist Kauzya](#); University of Colorado Boulder, United States.

SESSION EN07.05: Poster Session: Sustainable Polymeric Materials by Green Chemistry—Degradability and Resilience
Session Chairs: Anna Finne Wistrand, Rainhard Machatschek and Ying Yang
Tuesday Afternoon, May 10, 2022
5:00 PM - 7:00 PM
Hawai'i Convention Center, Level 1, Kamehameha Exhibit Hall 2 & 3

EN07.05.02

Poster Spotlight: Characterization of a Conductive Wax-Based Ink for 3D Printed Microbial Activity Sensors [John-Baptist Kauzya](#); University of Colorado Boulder, United States.

EN07.05.03

Poster Spotlight: Mechanochemical Modification of High-Melt-Viscosity Polymers via Solid-State Shear Pulverization—Appropriate Levels of Degradation and Enhanced Properties in Specialty Polyethylenes [Katsuyuki Wakabayashi](#); Bucknell Univ, United States.

EN07.05.04

Controlling Reductive Reaction Pathways for Conversion of Lignin Model Compounds on Noble Metals [Julian Schmid](#); Pacific Northwest National Laboratory, United States.

EN07.05.05

Elastic Properties of Bio Based Polyamide (PA) Materials [Rashed A. Islam](#); Google LLC., United States.

EN07.05.06

Chemical Modification of Cellulose Fibres Using Fluorine Promoted Esterification (FPE) Chemistry via Carbonyldiimidazole (CDI) [Faridah Namata](#)^{1,2}; ¹KTH Royal Institute of Technology, Sweden; ²KTH Royal Institute of Technology, Sweden.

EN07.05.08

Oil-Based Polyurethane Nanocomposites for Application as a Coating in the Slow and Controlled Release of Soluble Fertilizers [Ricardo Bortoletto-Santos](#); University of São Paulo State–UNESP, Brazil.

EN07.05.10

Revealing the Foaming Process of Gluten-Based Materials by Extrusion—Towards the Production of Sustainable Porous Plastics [Mercedes Bettelli](#); KTH Royal Institute of Technology, Sweden.

EN07.05.11

Fully Organic and Flexible Biodegradable Emitter for Global Energy-Free Cooling Applications [Youngjae Yoo](#); Chung-Ang University, Korea (the Republic of).

EN07.05.12

The Surface Modification of Cellulose Fibers for Design of Bio-Based Flame Retardant Composites [Jun Hyuk Lee](#); Inha university, Korea (the Republic of).

EN07.05.13

Enhanced Thermal Stability of Tunicate Cellulose Nanofibers by Inorganic Nanocomposites [Hong YeongBeom](#); Inha University, Korea (the Republic of).

EN07.05.15

Chemical Modification of Glycolipids with Polymerizable Acrylate Groups and Their Incorporation into Hydrogels [Vidula Lokugama](#); The University of Arizona, United States.

EN07.05.16

Biodegradable Pressure Sensitive Hot Melt Adhesive [Amelia Heiner](#); University of Utah, United States.

EN07.05.17

Hydrolytic Degradation of Cannabinoid-Derived Materials with Tunable Service Temperatures [John M. Toribio](#); University of Connecticut, United States.

EN07.05.18

Biomolecule-Functionalized Polymeric Ultrafiltration Membranes for the Removal and Degradation of Contaminants and Toxins [Misael A. Romero-Reyes](#)^{1,2}; ¹Hanover College, United States; ²Emory University, United States.

EN07.05.19

Synthesis and Characterization of Materials Properties of a Biological Superabsorbent Polymer for Single-Use Consumer Product Applications [Kaylon Draney](#); The University of Utah, United States.

EN07.05.20

Novel Ductile Composites of Polyphenols with Poly(butylene succinate) as Eco-Friendly Bioplastics [Maninder Singh](#); JAIST, Japan.

SESSION EN07.07: Fundamental Properties of Resilient and Functional Polymers

Session Chairs: Karin Odelius and Ying Yang

Wednesday Afternoon, May 11, 2022

Hawai'i Convention Center, Level 3, 323C

1:30 PM EN07.07.01

Electrohydrodynamic 3D Printing of Aqueous Solutions [Ander Reizabal](#)^{1,2}; ¹Phil and Penny Knight Campus for Accelerating Scientific Impact, University of Oregon, United States Minor Outlying Islands; ²BCMaterials - Basque Center for Materials, Applications and Nanostructures, Spain.

1:45 PM *EN07.07.02

Good Solvent Assisted Recycling of Thermosetting Polymers with Dynamic Bonds [Hang \(Jerry\) Qi](#); Georgia Inst of Technology, United States.

2:15 PM EN07.07.03

Redox-Active Polymers Designed for the Circular Economy of Energy Storage Devices [Alexander Giovannitti](#); Stanford University, United States.

2:30 PM BREAK

3:00 PM *EN07.07.04

Seven Simple Dynamic Covalent Chemistries to Transform Crosslinked Thermosets into Thermoplastics: Sustainable Chemical Recycling of Traditionally Non-Recyclable Materials [John M. Torkelson](#); Northwestern University, United States.

3:30 PM EN07.07.05

Sorption and Permeation of H₂S, CO₂, CH₄, and N₂ in Amine-Functionalized Microporous Polymers [Katherine Mizrahi Rodriguez](#); Massachusetts Institute of Technology,

United States.

3:45 PM EN07.07.06

Tunability and Mixing Rules in PDMS Vitrimers [Laura Porath](#); University of Illinois, United States.

4:00 PM EN07.07.07

Decreasing the Glass Transition Temperature (T_g) of Poly(Ethylene Terephthalate) Films at the Air-Water Interface by Reducing Sample Dimensions [Natalia Tarazona](#); Helmholtz-Zentrum Hereon, Germany.

4:15 PM EN07.07.08

Refractory Plasmonic Nanoparticles for Visible Light Mediated Recycling of Epoxy [Kavon Mojtabai](#); New Mexico Institute of Mining and Technology, United States.

SESSION EN07.08: Functional, Bio-Based Polymers
Session Chairs: Anna Finne Wistrand and Rainhard Machatschek
Thursday Morning, May 12, 2022
Hawai'i Convention Center, Level 3, 323C

8:45 AM EN07.08.01

Keratin Extraction, Iso-Electric Precipitation and Micro-Pattern Preparation for Cellular Contact Guidance [Dagmara J. Trojanowska](#)^{1,3}; ¹Italian Institute of Technology, Italy; ³University of Milano-Bicocca, Italy.

9:00 AM EN07.08.02

Poly(Cannabinoid)s, Natural Polymers Fit for Green Chemistry [Gregory A. Sotzing](#)^{1,2}; ¹University of Connecticut, United States; ²University of Connecticut, United States.

9:15 AM EN07.08.04

Photoinduced Degradation of Polymeric Chains [Dmitri Kilin](#); North Dakota State University, United States.

9:30 AM EN07.08.05

Naturally-Derived Sustainable Hydrogel Materials Based on Slide-Ring and Triblock Copolymer Topologies [Ching Pang](#); Texas A&M University, United States.

SESSION EN07.09: Polymer Degradation and Recycling I
Session Chairs: Rainhard Machatschek and Ying Yang
Monday Afternoon, May 23, 2022
EN07-Virtual

6:30 PM *EN07.09.01

Novel Design for Degradable Vinyl Polymers by Radical Copolymerization [Kotaro Satoh](#); Tokyo Institute of Technology, Japan.

7:00 PM *EN07.09.03

Mesoscopic Coarse-Grained Modeling for the Effect of Polymer Degradation on Rheological Properties [Takashi Uneyama](#); Nagoya University, Japan.

7:30 PM EN07.09.04

Photodegradation Studies of Pristine and Microencapsulated Thermochromic Coatings for Energy Savings in Outdoor Applications [Sushant Madhukar Nagare](#); University of South Florida, United States.

7:35 PM *EN07.09.05

Lifetime Prediction of Polyhydroxyalkanoates in the Natural Environment [Bronwyn Laycock](#); The University of Queensland, Austria.

8:05 PM EN07.09.06

Modified Physical Properties of Thermoplastic Polyurethane Composites with Chemically Modified Microcrystalline Cellulose [Seoku Lee](#); Inha university, Korea (the Republic of).

SESSION EN07.10: Polymer Degradation and Recycling II
Session Chairs: Rainhard Machatschek and Ying Yang
Monday Afternoon, May 23, 2022
EN07-Virtual

9:00 PM *EN07.10.01

Green Polymeric Materials: Photodegradable Polymers to Lignin Based Polymers [Kei Saito](#); Kyoto University, Japan.

9:30 PM EN07.10.02

A Novel and Green Method of Polymerizing Plant-Based Fatty Acids [David A. Stone](#); Iron Shell Materials LLC, United States.

9:45 PM *EN07.10.03

Tri-Branched Gels—Rubbery Materials with the Lowest Branching Factor Approach the Ideal Elastic Limit [Takamasa Sakai](#); The University of Tokyo, Japan.

10:15 PM EN07.10.04

Studies on the Chemical Synthesis and the Solution Structures of Proline-Containing Cyclic Peptides [Taichi Kurita](#); Kyoto University, Japan.

10:20 PM EN07.10.05

WITHDRAWN 5/18/22 EN07.10.05 From Renewable Building Blocks to Biodegradable Polymer Membranes with Solvent-Resistant Properties [Gyorgy Szekely](#); KAUST, Saudi Arabia.

10:35 PM EN07.10.06

Synthesis of Poly (Citric Acid - Aspartic Acid) Copolymer as an Eco-Friendly and Biodegradable Inhibitor in Water-Based Drilling Fluid Mulya M. Nur; King Fahd University of Petroleum and Minerals, Saudi Arabia.

SESSION EN07.11: Polymer Degradation and Recycling III

Session Chair: Rainhard Machatschek

Tuesday Morning, May 24, 2022

EN07-Virtual

10:30 AM *EN07.11.01

Non-Isocyanate Polyurethanes (NIPUs)—From Synthesis Towards Biomaterials Christine Jerome; Univ de Liege, Belgium.

11:00 AM *EN07.04.01

Synthetic Strategies to Sustainable Di-Block Polyesters—Sequential Polymerization of Lactones and Lactides and Chemoselective ter-Polymerization of Macrolactones, Epoxides and Anhydrides Daniela Pappalardo; Università del Sannio, Italy.

11:30 AM EN07.09.02

Upcycling of Used Face Masks Sustainably Joyce Cavalcante; KAUST, Saudi Arabia.

SYMPOSIUM EQ01

Ultra-Wide Bandgap Materials and Devices
May 9 - May 23, 2022

Symposium Organizers

Srabanti Chowdhury, Stanford University
Robert Kaplar, Sandia National Laboratories
Yoshinao Kumagai, Tokyo University of Agriculture and Technology
Julien Pernot, University of Grenoble Alpes

* Invited Paper

SESSION EQ01.01: Computational Approaches to UWBGs
Session Chair: Sukwon Choi
Monday Morning, May 9, 2022
Hawai'i Convention Center, Level 3, 318B

10:30 AM *EQ01.01.01

GW-BSE Workflows for High-Throughput Study of Ultra-Wide Band Gap Materials [Arunima K. Singh](#); Arizona State University, United States.

11:00 AM EQ01.01.02

Computational Discovery of Ultra-Wide Band Gap Semiconductors for Radio Frequency Applications [Emily McDonald](#)^{2, 1}; ¹National Renewable Energy Laboratory, United States; ²Colorado School of Mines, United States.

11:15 AM EQ01.01.03

Discovering the Extreme Limits to Semiconductor Band Gaps [Sicun Chae](#); University of Michigan, United States.

11:30 AM EQ01.01.04

Computational Fermi Level Engineering and Doping-Type Conversion of Ga₂O₃ via Three-Step Processing [Stephan Lany](#); National Renewable Energy Laboratory, United States.

SESSION EQ01.02: Thermal Aspects of UWBGs
Session Chair: Robert Kaplar
Monday Afternoon, May 9, 2022
Hawai'i Convention Center, Level 3, 318B

1:30 PM *EQ01.02.01

Deep-Ultraviolet Thermoreflectance Imaging of Ultra-Wide Bandgap Semiconductor Devices [Sukwon Choi](#); The Pennsylvania State University, United States.

2:00 PM EQ01.02.02

Material Properties for High Thermal Interface Conductance [Samreen Khan](#); University of California, Riverside, United States.

2:15 PM EQ01.02.03

Anisotropic Thermal Conductivity in Boron Doped Diamond [Frank Angeles](#); University of California, Riverside, United States.

SESSION EQ01.03: Poster Session: Ultra-Wide Bandgap Materials and Devices
Session Chair: Robert Kaplar
Monday Afternoon, May 9, 2022
5:00 PM - 7:00 PM
Hawai'i Convention Center, Level 1, Kamehameha Exhibit Hall 2 & 3

EQ01.03.01

Magneto-Optical Spectroscopy of Cr³⁺ and Red Emission in β -Ga₂O₃ [Irina A. Buyanova](#); Linkoping University, Sweden.

EQ01.03.04

Effects of Electrical Characteristics on Undoped and Li-Doped NiO Interlayers Embedded Ni/ β -Ga₂O₃ Schottky Barrier Diodes [Jiyoung Min](#); Sejong University, Korea (the Republic of).

EQ01.03.05

Cubic Boron Nitride's High-Field Electron Transport [Stephen K. O'Leary](#); University of British Columbia, Canada.

EQ01.03.06

High Performance β -Ga₂O₃ Schottky Barrier Transistors with Large Work Function TMD Gate of NbS₂ and TaS₂ [Ki-Tae Kim](#); Yonsei University, Korea (the Republic of).

EQ01.03.07

An Ultrawide Bandgap Transparent Conductor for Deep Ultraviolet—A-Doped Sn_{1-x}Ge_xO₂ Thin Films [Yo Nagashima](#); The University of Tokyo, Japan.

EQ01.03.08

High Performance of MOCVD Grown β -Ga₂O₃ Based Solar-Blind Photodetectors for High Temperature Applications [Hardhyan Sheoran](#); Indian Institute of Technology Delhi, India.

EQ01.03.09

Phase Engineering of Ga₂O₃ Hetero- and Homo- Epitaxial Growth by Mist Chemical Vapor Deposition [Joonhui Park](#); Sejong university, Korea (the Republic of).

EQ01.03.10

Efficient Ultraviolet-C AlGa_N Quantum-Well Light-Emitting Diodes Grown on Nano-Patterned Substrates [Sharif M. Sadaf](#); Institut National de la Recherche Scientifique, Canada.

EQ01.03.12

Comparative Study in the Synthesis of Carbon Doped 2D Hexagonal Boron Nitride Films [Eoin O'Sullivan](#); University of Oxford, United Kingdom.

SESSION EQ01.04: Diamond I

Session Chairs: Timothy Grotjohn and Julien Pernot

Tuesday Morning, May 10, 2022

Hawai'i Convention Center, Level 3, 318B

8:30 AM *EQ01.04.01

Diamond and Ultra-Wide Bandgap Semiconductors for Power Electronics [Robert J. Nemanich](#); Arizona State University, United States.

9:00 AM *EQ01.04.02

Vertical Diamond p-FETs with Normally-Off Operation for Complementary High Power and High Speed Inverters [Hiroshi Kawarada](#); Waseda University, Japan.

9:30 AM EQ01.04.03

Methane Influence on Diamond Schottky Barrier Diode Performance [Ken Haenen](#)^{1,2}; ¹Hasselt University, Belgium; ²IMEC vzw, Belgium.

9:45 AM EQ01.04.04

Photo-Induced Phase Transition of Diamond—A Nonadiabatic Quantum Molecular Dynamics Study [Shogo Fukushima](#)^{1,2}; ¹University of South Carolina, United States; ²Kumamoto University, Japan.

10:00 AM BREAK

10:30 AM EQ01.04.06

Diamond FET Technology for Power Electronics [Etienne Gheeraert](#)^{1,2}; ¹University Grenoble Alpes, France; ²Centre National de la Recherche Scientifique, France.

10:45 AM EQ01.04.07

Polycrystalline Diamond Micro/Nano-Electro-Mechanical Systems [Oliver A. Williams](#); Cardiff University, United Kingdom.

SESSION EQ01.05: Diamond II

Session Chairs: Hiroshi Kawarada and Robert Nemanich

Tuesday Afternoon, May 10, 2022

Hawai'i Convention Center, Level 3, 318B

1:30 PM *EQ01.05.01

Diamond Growth by Microwave Plasma CVD for Electronic Devices [Timothy A. Grotjohn](#); Michigan State University, United States.

2:00 PM *EQ01.05.02

Space Charge Region Visualization Under Diamond Schottky Diode by Electron Beam Induced Current and Correlation with Defects Observed by Cathodoluminescence [David Eon](#)^{1,2}; ¹Institut Neel, France; ²University Grenoble Alpes, France.

2:30 PM *EQ01.05.03

Optimization of NV/N, Ratio of CVD Single Crystal Diamond for Quantum Applications [Jocelyn Achard](#); LSPM-CNRS, France.

SESSION EQ01.06: Nitrides I

Session Chair: Alan Doolittle

Wednesday Morning, May 11, 2022

Hawai'i Convention Center, Level 3, 318B

8:30 AM EQ01.06.01

Substantial P-Type, N-Type and Homojunction Diode Functionality Using the Highest Bandgap Semiconductor Ever Demonstrated [Alan Doolittle](#); Georgia Institute of Technology, United States.

8:45 AM EQ01.06.02

Molecular Beam Homoepitaxy of N-Polar AlN on Bulk AlN Substrates [Jashan Singhal](#); Cornell University, United States.

9:00 AM EQ01.06.03

Design of Transverse Quasi-Phase-Matched Non-Polar/AlN Waveguides for 230-nm Far-UV Second Harmonic Generation [Hiroto Honda](#); Osaka University, Japan.

9:15 AM EQ01.06.04

Molecular Beam Homoepitaxy of N-Polar AlN—The Enabling Role of Aluminum-Assisted Surface Cleaning [Zexuan Zhang](#); Cornell University, United States.

9:30 AM EQ01.06.05

Thermal and Electrical Properties of Wide Bandgap Nitride Thin Films Deposited at Low Temperatures for Heterogeneous Integration [Michelle Chen](#); Stanford University, United States.

9:45 AM BREAK**10:15 AM EQ01.06.07**

TaC Virtual Substrates for AlGaIn Epitaxy [Dennice M. Roberts](#); National Renewable Energy Laboratory, United States.

10:30 AM EQ01.06.08

Controllable N-Type Doping in Ultra-Wide Bandgap AlN By Chemical Potential Control [Pegah Bagheri](#); North Carolina State University, United States.

10:45 AM EQ01.06.09

Increasing the Power-Electronics Figure of Merit of AlGaIn with Atomically Thin Superlattices [Nick Pant](#); University of Michigan, United States.

SESSION EQ01.07: Nitrides II

Session Chairs: Srabanti Chowdhury and Robert Kaplar

Wednesday Afternoon, May 11, 2022

Hawai'i Convention Center, Level 3, 318B

1:30 PM *EQ01.07.01

Selective Area Regrowth of p-type GaN and AlGaIn for Power Diodes [A. A. Allerman](#); Sandia National Laboratories, United States.

2:00 PM EQ01.07.02

Growth and Characterization of N-Polar AlGaIn/AlGaIn HEMTs with Varying Al Mole Fractions [Maliha Noshin](#); Stanford University, United States.

2:15 PM EQ01.07.03

Electrical Characteristics of Ag-Pd-Cu Alloy Schottky Contacts on n-Type Al_{0.6}Ga_{0.4}In [Keebaek Sim](#); Korea University, Korea (the Republic of).

2:30 PM EQ01.07.04

MOCVD Development of Thick GaN for Vertical High Power Devices [Yuxuan Zhang](#); The Ohio State University, United States.

2:45 PM BREAK**3:15 PM EQ01.07.06**

High Dielectric Constant (111)-Oriented Sr_{1-x}Ca_xTiO₃ Epitaxial Layers Integrated on AlGaIn/GaN Heterostructures [Eric N. Jin](#); U.S. Naval Research Laboratory, United States.

3:30 PM EQ01.07.07

Vertical GaN P-N Power Diodes with over 5 kV Breakdown Voltage [Vishank Talesara](#); The Ohio State University, United States.

3:45 PM EQ01.07.08

Determination of Mn Charge State in Bulk GaN:Mn Through Magnetization Steps [Katarzyna Gas](#); Institute of Physics Polish Academy of Sciences, Poland.

4:00 PM EQ01.06.10

Growth and Characterization of High-Temperature, High-Quality, Nitrogen-Polar InAlN Films Using Plasma Assisted Molecular Beam Epitaxy [Majid Aalizadeh](#); University of Michigan—Ann Arbor, United States.

SESSION EQ01.08: Oxides I

Session Chair: Hongping Zhao

Thursday Morning, May 12, 2022

Hawai'i Convention Center, Level 3, 318B

8:30 AM *EQ01.08.01

Progress in Ga₂O₃ Growth and Devices for High Voltage Switching Applications [Marko Tadjer](#); Naval Research Laboratory, United States.

9:00 AM EQ01.08.02

An 8-nm-Thick Sn-Doped β -Ga₂O₃ MOSFET with a Normally-Off Operation [Youngbin Yoon](#); Korea Aerospace University, Korea (the Republic of).

9:15 AM EQ01.08.03

β -Ga₂O₃ Heterojunction Field-Effect Transistors Prepared via UV Laser-Assisted p-Doping of WSe₂ [Sanghyun Moon](#); Seoul National University, Korea (the Republic of).

9:30 AM EQ01.08.04

Realization of Highly Rectifying Schottky Barrier Diodes and pn-Heterojunctions on κ -Ga₂O₃ [Max Kneiß](#); Universität Leipzig, Germany.

9:45 AM BREAK**10:15 AM EQ01.08.05**

Design Study of Enhancement-Mode β -(Al_xGa_{1-x})₂O₃/Ga₂O₃ HEMT for Multi-kV Power Electronic Applications [Alexander Senckowski](#); University of Massachusetts

Lowell, United States.

10:30 AM EQ01.08.06

NiO/ β -Ga₂O₃ p-n Heterojunction for Improved High Temperature Performance [Marshall B. Tellekamp](#); National Renewable Energy Lab, United States.

SESSION EQ01.09: Oxides II

Session Chairs: Robert Kaplar and Julien Pernot

Thursday Afternoon, May 12, 2022

Hawai'i Convention Center, Level 3, 318B

1:30 PM *EQ01.09.01

Status of MOCVD Development of UWBG Ga₂O₃, AlGaO and Heterostructures [Hongping Zhao](#); The Ohio State University, United States.

2:00 PM EQ01.09.02

Strategy for Achieving Optimal Electronic Performance in Group-IV Doped Ga₂O₃ [Joe Willis](#)^{1,2}; ¹University College London, United Kingdom; ²Diamond Light Source, United Kingdom.

2:15 PM EQ01.09.03

Thermal Stability of HVPE-Grown α -Ga₂O₃ on Sapphire Substrate in Different Environments [Zhuoqun Wen](#); University of Michigan, United States.

2:30 PM EQ01.09.04

Optimized Annealing for Activation of Implanted Si in β -Ga₂O₃ [Katie R. Gann](#); Cornell University, United States.

2:45 PM BREAK

3:15 PM EQ01.09.05

Comparison of Group-IV Donor Elements for Tailoring of Electrical Properties of α -Ga₂O₃ Grown by Pulsed Laser Deposition [Sofie Vogt](#); Universität Leipzig, Germany.

3:30 PM EQ01.09.06

Improved Phase Stability of Orthorhombic κ -Ga₂O₃ Grown by Mist CVD [Roy B. Chung](#); Kyungpook National University, Korea (the Republic of).

SESSION EQ01.10: Oxides III

Session Chair: Srabanti Chowdhury

Friday Morning, May 13, 2022

Hawai'i Convention Center, Level 3, 318B

8:30 AM *EQ01.10.01

Optically Detected Defect Levels in Ga₂O₃ [Mary Ellen Zvanut](#); University of Alabama-Birmingham, United States.

9:00 AM EQ01.10.02

WITHDRAWN 5/10/22 EQ01.10.02 Gallium Vacancy Energetics in Gallium Oxide Extracted from the Radiation Phenomena and Diffusion Experiments [Andrei Kuznetsov](#); Univ of Oslo, Norway.

9:15 AM EQ01.10.03

Atomic Scale Investigation of Point and Extended Defects in Ion Implanted β -Ga₂O₃ [Hsien-Lien Huang](#); The Ohio State University, United States.

9:30 AM BREAK

10:00 AM EQ01.10.04

In Situ MOCVD Growth of Dielectric Al₂O₃ on β -(Al_xGa_{1-x})₂O₃: Interfaces and Band Offsets [A F M Anhar Uddin Bhuiyan](#); The Ohio State University, United States.

10:15 AM EQ01.10.05

High RT Mobility 2DEGs in a Modulation-Doped BaSnO₃/SrSnO₃ Heterostructure [Hanjong Paik](#)^{1,4}; ¹Cornell University, United States; ⁴Platform for the Accelerated Realization, Analysis, and Discovery of Interface Materials (PARADIM), United States.

10:30 AM EQ01.10.06

MOCVD Growth of High-Quality β -(Al_xGa_{1-x})₂O₃ / β -Ga₂O₃ Heterostructures and Superlattices Doped in a Wide Range of Electron Concentrations [Fikadu Alema](#); Agnitron Technology Incorporated, United States.

10:45 AM EQ01.10.07

Characterization of κ -([Al,In]_xGa_{1-x})₂O₃ Interfaces and Quantum Wells via X-Ray Photoelectron Spectroscopy and a Potential Application for Quantum-Well Infrared Photodetectors [Thorsten Schultz](#)^{1,2}; ¹Humboldt-Universität zu Berlin, Germany; ²Helmholtz-Zentrum Berlin für Materialien und Energie, Germany.

11:00 AM EQ01.10.08

Strain States and Relaxation for α -(Al_xGa_{1-x})₂O₃ Thin Films on Prismatic Planes of α -Al₂O₃ in the Full Composition Range [Max Kneiß](#); Universität Leipzig, Germany.

SESSION EQ01.11: Oxides IV

Session Chairs: Jack Flicker and Robert Kaplar

Friday Afternoon, May 13, 2022

Hawai'i Convention Center, Level 3, 318B

1:30 PM EQ01.11.01

Long-Lived Metastable AlScO₃ Perovskite—A Ultrawide Bandgap Hole Conductor with Low Ionization Energy of Small Hole Polarons [Cheng-Wei Lee](#)^{1,2}; ¹Colorado

School of Mines, United States; ²National Renewable Energy Laboratory, United States.

1:45 PM EQ01.11.02

Bragg Reflector Micro- and Nanowire Optical Cavities Based on Gallium Oxide—Exploring Light Confinement by Atomic Layer Deposition as an Alternative to Focused Ion Beam Patterning [Manuel Alonso-Orts](#)^{1,2}; ¹University of Bremen, Germany; ²Universidad Complutense de Madrid, Spain.

2:00 PM EQ01.11.03

3D Imaging of β -Ga₂O₃ Crystal Using Multiphoton-Excitation Photoluminescence [Tomoka Nishikawa](#); Osaka University, Japan.

2:15 PM EQ01.11.04

Exploring In₂O₃-Ga₂O₃ Alloys as a Transparent Conducting Oxides (TCO) for CdTe Thin Film Photovoltaics [Aniruddha M. Dive](#)^{2,1}; ¹Washington State University, United States; ²Lawrence Livermore National Laboratory, United States.

2:30 PM BREAK

3:00 PM EQ01.11.05

High Aspect Ratio β -Ga₂O₃ FinFETs with Near-Zero Hysteresis and Low On-Resistance by Metal-Assisted Chemical Etching [Xiuling Li](#)^{2,1}; ¹University of Illinois Urbana-Champaign, United States; ²The University of Texas at Austin, United States.

3:15 PM EQ01.11.06

Atomic Layer Deposition of Aluminium Doped Zn_{1-x}Mg_xO as Highly Transparent Conducting Films [Poorani Gnanasambandan](#); Luxembourg Institute of Science and Technology, Luxembourg.

SESSION EQ01.12: Diamond III

Session Chair: Julien Pernot

Monday Morning, May 23, 2022

EQ01-Virtual

8:00 AM *EQ01.12.01

Diffusion-Related Lifetime of Photoexcited Carriers in Ultrapure Diamond [Nobuko Naka](#); Kyoto University, Japan.

8:30 AM *EQ01.12.02

High-Mobility P-Channel Wide Bandgap Transistors Based on Hydrogen-Terminated Diamond and Hexagonal Boron Nitride [Yamaguchi Takahide](#); NIMS, Japan.

9:00 AM *EQ01.12.03

Optimal Design of Diamond Field Effect Transistors Towards a Key Milestone for Diamond Power Electronics [Nicolas Rouger](#); CNRS, Laplace, Univ. Toulouse, France.

9:30 AM EQ01.12.04

Design of a Source Field-Plated Deep-Depletion Diamond MOSFETs [Marine Couret](#); Université Toulouse, Laplace, France.

9:45 AM EQ01.12.05

A Comparative Study of Structural and Electronic Properties of Group-IV Terminated Diamond (100) and (111) Surfaces [Mahesh R. Neupane](#)^{1,2}; ¹U.S. Army Research Laboratory, United States; ²University of California, Riverside, United States.

SESSION EQ01.13: Nitrides/Oxides

Session Chair: Robert Kaplar

Monday Morning, May 23, 2022

EQ01-Virtual

10:30 AM *EQ01.13.01

Surface Chemistry of Diamond for Quantum Applications [Anke Krueger](#)^{1,2}; ¹Julius-Maximilians-Universität Würzburg, Germany; ²Universität Stuttgart, Germany.

11:00 AM *EQ01.13.02

Nanoscale and Quantum Engineering of III-Nitride Heterostructures for High Efficiency UV-C and Far UV-C Optoelectronics [Zetian Mi](#); University of Michigan, United States.

11:30 AM EQ01.13.03

Shallow Donor and DX State in Si Doped AlN Nanowires [Remy Vermeersch](#)^{2,1}; ¹CEA, France; ²Centre National de la Recherche Scientifique, France.

11:45 AM EQ01.13.04

Comparative Spectroscopic Study of Aluminum Nitride Grown by MOCVD in Hydrogen and Nitrogen Reaction Environment [Samiul Hasan](#); University of South Carolina, United States.

12:00 PM EQ01.13.05

Tackling Disorder in γ -Ga₂O₃ [Laura Ratcliff](#); Imperial College London, United Kingdom.

12:15 PM EQ01.13.06

Investigation of Low-Frequency Noise Characteristics of GaN Vertical PIN Diodes at Elevated Temperatures [Subhajit Ghosh](#); University of California, Riverside, United States.

SESSION EQ01.14: Ultra-Wide Bandgap Materials and Devices I

Session Chair: Yoshinao Kumagai

Monday Afternoon, May 23, 2022

EQ01-Virtual

1:00 PM *EQ01.14.01

AlGa_N Channel HEMTs for High Voltage Applications [Farid Medjdoub](#); IEMN-CNRS, France.

1:30 PM EQ01.14.02

Defect Mediated and Diode Degradation in Wide Band-Gap AlGa_N Electronics [Nicholas Baldonado](#); New Mexico State University, United States.

1:45 PM EQ01.14.03

Ultrawide Bandgap β -Ga₂O₃/p-GaN Heterojunction Barrier Schottky Rectifiers for Efficient Power Electronic Applications [Dinusha Herath Mudiyanse](#); Iowa State University, United States.

2:00 PM EQ01.14.04

Comprehensive Design and Simulation of E-Mode β -Ga₂O₃ Current-Aperture Vertical Electron Transistors [Dawei Wang](#); Iowa State University, United States.

2:15 PM EQ01.14.06

Post-synthesis Control of Oxygen Vacancy Concentrations in Metal Oxides via Exposure to Liquid Water [Edmund G. Seebauer](#); University of Illinois at Urbana-Champaign, United States.

2:30 PM EQ01.03.02

Large Band Gap of Insulator Clay Nanosheets [Barbara Pacakova](#); Norwegian University of Science and Technology, Norway.

2:35 PM *EQ01.04.05

Progress in Inversion Channel Diamond MOSFET Technologies [Norio Tokuda](#); Kanazawa Univ, Japan.

SESSION EQ01.15: Ultra-Wide Bandgap Materials and Devices II

Session Chair: Yoshinao Kumagai

Monday Afternoon, May 23, 2022

EQ01-Virtual

6:30 PM *EQ01.15.01

Development of Surface-Activated Bonding Technologies to Compensate for Shortcomings of Ga₂O₃ Devices [Masataka Higashiwaki](#); National Institute of Information & Comm Tech, Japan.

7:00 PM EQ01.15.02

Effects of Dislocation on Carrier Transport in α -Ga₂O₃ on M-Plane Sapphire Substrate [Hitoshi Takane](#); Kyoto University, Japan.

7:15 PM EQ01.15.03

MOVPE-Grown β -Ga₂O₃ Lateral Power Transistors with V_{BR} Exceeding 4 kV [Arkka Bhattacharyya](#); The University of Utah, United States.

7:30 PM EQ01.15.04

Influence of HCl Support on the α -Ga₂O₃ Thin Film Properties Growth by Mist Chemical Vapor Deposition [Tatsuya Yasuoka](#); Kochi University of Technology, Japan.

7:45 PM *EQ01.15.05

Reduction of Threshold Current Density in UV-C LDs Fabricated on AlN Substrates [Maki Kushimoto](#); Nagoya University, Japan.

8:15 PM EQ01.07.05

Contacting p-GaN Efficiently—Why the Same Metal Stacks Give Different Results? [Mona A. Ebrish](#)^{1,2}; ¹U.S. Naval Research Laboratory, United States; ²National Research Council, United States.

SESSION EQ01.16: Ultra-Wide Bandgap Materials and Devices III

Session Chair: Yoshinao Kumagai

Monday Afternoon, May 23, 2022

EQ01-Virtual

9:00 PM *EQ01.16.01

Crystal Growth of β -Ga₂O₃ for Application in Power Electronic Devices [Kohei Sasaki](#); Novel Crystal Technology, Inc., Japan.

9:30 PM EQ01.16.02

Fabrication of Highly-Oriented Wide-Bandgap Oxide Thin Films on the Surface-Modified Polymer Substrates by Room-Temperature UV Laser/Light Processes [Tomoaki Oga](#); Tokyo Institute of Technology, Japan.

9:45 PM EQ01.16.03

Effect of Off-Axis Angle of C-Plane Sapphire Substrate for Cubic In₂O₃(111) Single-Crystal Layer Growth by Halide Vapor Phase Epitaxy [Ken Goto](#); Tokyo University of Agriculture and Technology, Japan.

10:00 PM *EQ01.16.04

Fabrication of High-Quality Templates by Face-to-Face Annealing of Sputtered AlN for Deep UV LEDs [Hideto Miyake](#); Mie University, Japan.

10:30 PM EQ01.16.05

Demonstration of Dual-Polarity Photocurrent in p-n Nanowires [Danhao Wang](#); University of Science and Technology of China, China.

10:45 PM EQ01.16.06

Growth Mechanism of 2-Inch High-Quality Heteroepitaxial Diamond Free-Standing Wafers on Sapphire for High-Power Diamond FETs [Makoto Kasu](#); Saga University, Japan.

VIRTUAL PRESENTATIONS ARE LISTED IN EASTERN TIME

Last Updated 5/18/22

SYMPOSIUM EQ02

Harnessing Functional Defects in Energy and Electronic Materials
May 9 - May 23, 2022

Symposium Organizers

Carmela Aruta, National Research Council
Panchapakesan Ganesh, Oak Ridge National Laboratory
Hua Zhou, Argonne National Laboratory
Yuanyuan Zhou, Hong Kong Baptist University

* Invited Paper

SESSION EQ02.01: Harvesting Functional Defects in Light Harvesting I
Session Chairs: Junwoo Son and Hua Zhou
Monday Morning, May 9, 2022
Hawai'i Convention Center, Level 3, 319A

10:30 AM *EQ02.01.01

Defect Engineering and Doping Control in Halide Perovskite Materials [David B. Mitzi](#); Duke University, United States.

11:00 AM *EQ02.01.02

Ionic Defects in Halide Perovskite Solar Cells [Carsten Deibel](#); Institut für Physik, Chemnitz University of Technology, Germany.

11:30 AM EQ02.01.03

Electrochemical Doping of Halide Perovskites by Interstitial Au⁺ and Ag⁺ Sourced from Metal Contacts [Ross Kerner](#); National Renewable Energy Laboratory, United States.

11:45 AM EQ02.01.04

Defects Evolution in the Degradation of Metal Halide Perovskite Solar Cells Under Reverse-Bias and Illumination [Zhenyi Ni](#); University of North Carolina at Chapel Hill, United States.

SESSION EQ02.02: Functional Defects in Metal Oxide Thin Films and Nanostructures I
Session Chairs: Carmela Aruta and In Chung
Monday Afternoon, May 9, 2022
Hawai'i Convention Center, Level 3, 319A

1:30 PM *EQ02.02.01

Emerging Functionalities by Reversibly Controllable Defects Across Oxide Interfaces [Junwoo Son](#); Pohang University of Science and Technology, Korea (the Republic of).

2:00 PM EQ02.02.02

Reversible Control of In-Gap States from Surface Oxygen Vacancies in Perovskite Stannates with Ultraviolet Light [Yujeong Lee](#); Pohang University of Science and Technology, Korea (the Republic of).

2:15 PM EQ02.02.03

Control of Surface Cation Enrichment in Perovskite-Type Oxides for Energy Conversion Devices [Bonjae Koo](#); Sungshin Women's University, Korea (the Republic of).

2:30 PM EQ02.02.04

Polyamorphism in Photodeposited Amorphous Metal Oxy(hydroxides) Electrocatalysts and Semiconductors [Simon Trudel](#); University of Calgary, Canada.

2:45 PM EQ02.02.05

Perfect is Not Always Better—Oxygen Vacancy-Rich Metal-Oxides and Their Use for the Additive Manufacturing of Sunlight-Activated Photocatalytic Cells and Other Complex Device Architectures [Sylvain G. Cloutier](#); Ecole de Technologie Supérieure, Canada.

SESSION EQ02.03: Harvesting Functional Defects in Light Harvesting II
Session Chairs: Hua Zhou and Yuanyuan Zhou
Tuesday Morning, May 10, 2022
Hawai'i Convention Center, Level 3, 319A

8:30 AM *EQ02.03.01

Detecting Defects Evolution in Operational Perovskite Solar Cells [Jinsong Huang](#); University of North Carolina-Chapel Hill, United States.

9:00 AM *EQ02.03.02

Controlling Surface and Interface Defects in Halide Perovskite Semiconductors [David S. Ginger](#); University of Washington, United States.

9:30 AM EQ02.03.04

Impact of Metastable Defect Structures on Carrier Recombination in Solar Cells [Seán R. Kavanagh](#)^{1,2}; ¹University College London, United Kingdom; ²Imperial College London, United Kingdom.

9:45 AM BREAK

SESSION EQ02.04: Functional Defects in Metal Oxide Thin Films and Nanostructures II

Session Chair: Rajeev Ahuja

Tuesday Morning, May 10, 2022

Hawai'i Convention Center, Level 3, 319A

10:30 AM *EQ02.04.01

Optimizing Nanoscale Defects for Enhanced Vortex-Pinning in High-Temperature Superconducting Wires [Amit Goyal](#); SUNY-Buffalo, United States.

11:00 AM *EQ02.04.02

Oxygen Vacancies at CeO₂ Surfaces and Catalysis for Environmental Applications [Maria Veronica Ganduglia-Pirovano](#); Institute of Catalysis and Petrochemistry-CSIC, Spain.

11:30 AM EQ02.04.03

Comparison of Positron Lifetimes Across Oxide Chemistry, Structure and Charge [Alejandro Lopez-Bezanilla](#); Los Alamos National Laboratory, United States.

SESSION EQ02.05: Functional Defects for Energy and Environmental Sustainability I

Session Chairs: Maria Veronica Ganduglia-Pirovano and Amit Goyal

Tuesday Afternoon, May 10, 2022

Hawai'i Convention Center, Level 3, 319A

1:30 PM *EQ02.05.01

Materials Informatics as the Fourth Paradigm—An Industrial Perspective [Chen Ling](#); Toyota Research Institute of North America, United States.

2:00 PM EQ02.05.02

Locating Anion and Cation Point Defects in Doped Ceria Materials [Mai Tan](#); Arizona State University, United States.

2:15 PM EQ02.05.03

The Effect of Geometric Crowding by Defects on Fast Ionic Conductivity [Andrey Poletayev](#)^{1,2}; ¹Stanford University, United States; ²SLAC National Accelerator Laboratory, United States.

2:30 PM EQ02.05.04

Site-Selective Doping Mechanisms for the Enhanced Photocatalytic Activity of Tin Oxide Nanoparticles [Woo-Sung Jang](#); Sungkyunkwan University, Korea (the Republic of).

2:45 PM EQ02.05.05

Dynamic Z-Scheme-Driven Heterojunction Photocatalyst Design for Hydrogen Production from Water Splitting [Valeriia Poliukhova](#)^{1,2}; ¹Korea Institute of Science & Technology, Korea (the Republic of); ²Korea University of Science and Technology, Korea (the Republic of).

3:00 PM BREAK

3:30 PM *EQ02.05.06

Role of Defects and Catalysts in Energy Storage Materials [Rajeev Ahuja](#); Uppsala University, Sweden.

4:00 PM EQ02.05.07

Stabilization of Ir-Based Catalysts During the Oxygen Evolution Reaction by Oxygen-Rich Metal Oxide Supports [Gyu Rae Lee](#); Korea Advanced Institute of Science and Technology, Korea (the Republic of).

4:15 PM EQ02.05.08

Improved Durability of Pt/C for Oxygen Reduction via Trapping at Graphene Defect Sites [Matthew Sweers](#); Northwestern University, United States.

4:30 PM EQ02.05.09

Effects of H₂O Interaction with Defective Graphene Under Strain [Julia T. Hatoum](#); University of Delaware, United States.

4:45 PM EQ02.05.10

Non-microbial Enhanced Nitrate Abatement with SnO₂/Graphene/Graphene Oxide [Marcel Grau](#); University of Puerto Rico-Rio Piedras, United States.

SESSION EQ02.06: Poster Session I: Functional Defects I

Session Chairs: Hua Zhou and Yuanyuan Zhou

Tuesday Afternoon, May 10, 2022

5:00 PM - 7:00 PM

Hawai'i Convention Center, Level 1, Kamehameha Exhibit Hall 2 & 3

EQ02.06.01

Comparative Study of Carbon Doping in 2D Hexagonal Boron Nitride Films [Eoin O'Sullivan](#); University of Oxford, United Kingdom.

EQ02.06.02

Signature of Many-Body Localization of Phonons in Strongly Disordered Superlattices [Thanh Nguyen](#); Massachusetts Institute of Technology, United States.

EQ02.06.03

Enhancement Performance and Reliability Using Defect Control for PEMFC [Ji Hyeok Choi](#); Gachon University, Korea (the Republic of).

EQ02.06.04

Design of Single-Layer Graphene over Cobalt Nanoparticles and Insight into Active Sites for Efficient Oxygen Evolution [Jong-Sung Yu](#); Daegu Gyeongbuk Institute of Science and Technology (DGIST), Korea (the Republic of).

EQ02.06.05

Synthesis of Single-Atom and Dual-Atom Catalyst Using N-Defective C₃N₄ [Sang yong Shin](#); KAIST (Korea Advanced Institute of Science and Technology), Korea (the Republic of).

EQ02.06.06

Ultra-Fast Visible Light Photodection with α -Fe₂O₃ Grown on p-Silicon [David McIlroy](#); Oklahoma State University, United States.

SESSION EQ02.07: Functional Defects for Electronic and Optoelectronic Materials I

Session Chairs: Carmela Aruta and Weimin Chen

Wednesday Morning, May 11, 2022

Hawai'i Convention Center, Level 3, 319A

8:30 AM *EQ02.07.01

Spatial Defects and Metal Contacts Nanoengineering for Bipolar Conductivity in 2D Materials [Elisa Riedo](#); New York University, United States.

9:00 AM EQ02.07.02

Graph Neural Network and Tight Binding Approaches for Fast and Accurate Predictions of Defect Energetics [Kamal Choudhary](#); National Institute of Standards and Technology, United States.

9:15 AM EQ02.07.03

Functional Adsorption Mechanisms in Hybrid 2-D TiXene-WSe₂ Materials [Lia Stanciu](#); Purdue University, United States.

9:30 AM EQ02.07.04

Impact of Site Disorder on Electronic Properties in ZnGeN₂ [Jacob Cordell](#)^{1,2}; ¹Colorado School of Mines, United States; ²National Renewable Energy Laboratory, United States.

9:45 AM BREAK

SESSION EQ02.08: Functional Defects for Energy and Environmental Sustainability II

Session Chairs: Carmela Aruta and Weimin Chen

Wednesday Morning, May 11, 2022

Hawai'i Convention Center, Level 3, 319A

10:15 AM *EQ02.08.01

Defect Engineering in the Crystal Lattice for Higher Thermoelectric Performance [In Chung](#)^{1,2}; ¹Seoul National University, Korea (the Republic of); ²Institute for Basic Science, Korea (the Republic of).

10:45 AM EQ02.08.02

Ordered-Vacancy Chalcogenides—New N-Type Dopable Diamond-Like Semiconductors with High Thermoelectric Performance [Jiaxing Qu](#); University of Illinois at Urbana Champaign, United States.

11:00 AM EQ02.08.03

Determination of the Cr Charge State in Thermoelectric PbTe:Cr Through Direct Magnetometry [Maciej Sawicki](#); Institute of Physics Polish Academy of Sciences, Poland.

11:15 AM EQ02.08.04

Effects of Nitrogen Functionalities and Dopants in Defect Engineered Carbon Nano-Catalysts on Carbon Dioxide Electroreduction [Soumyabrata Roy](#); Rice University, United States.

SESSION EQ02.09: Functional Defects for Electronic and Optoelectronic Materials II

Session Chairs: Elisa Riedo and Junwoo Son

Wednesday Afternoon, May 11, 2022

Hawai'i Convention Center, Level 3, 319A

1:30 PM *EQ02.09.01

Spin Functional Defects Enable Room-Temperature Electron Spin Polarization Exceeding 90% in an Opto-Spintronic Semiconductor Nanostructure [Weimin M. Chen](#); Linköping University, Sweden.

2:00 PM EQ02.09.02

Charge-Generating Mid-Gap Trap States Limiting Organic Electronic Devices [Ardalan Armin](#); Swansea University, United Kingdom.

2:15 PM EQ02.09.03

Oxygen Defects Alter the Optical and Electronic Properties of Epitaxially Grown Zinc Nitride Layers [Elise I. Sirotti](#); Technische Universität München, Germany.

2:30 PM BREAK**3:00 PM *EQ02.09.04**

Machine Learning Defect Properties of Semiconductors [Arun Kumar Mannodi Kanakkithodi](#); Purdue University, United States.

3:30 PM EQ02.09.05

Defect-Enhanced Recovery Processes for Heterogeneous Integration of Ge on Si [Eveline Postelnicu](#); Massachusetts Institute of Technology, United States.

3:45 PM EQ02.09.06

Small Defects, Big Deal—Using Point Defects to Control Giant Opto-Mechanical Effects and to Engineer New Resistive Switches [Rafael Jaramillo](#); Massachusetts Institute of Technology, United States.

4:00 PM EQ02.09.07

Covalent Defects in Carbon Nanotubes—Dependence of Exciton Energy on Defect-Defect Couplings and Configurations [Svetlana V. Kilina](#); North Dakota State University, United States.

SESSION EQ02.10: Poster Session II: Functional Defects II

Session Chairs: Hua Zhou and Yuanyuan Zhou

Wednesday Afternoon, May 11, 2022

5:00 PM - 7:00 PM

Hawai'i Convention Center, Level 1, Kamehameha Exhibit Hall 2 & 3

EQ02.10.01

Enhancing N-Type Thermoelectric Performance in Bi₂Te₃-Based System Through Structural Modulation by Incorporating Excess Alkali Metal and Chalcogen Atoms [Hyungsook Lee](#)^{1, 2}; ¹Seoul National University, Korea (the Republic of); ²Institute for Basic Science, Korea (the Republic of).

EQ02.10.02

Ultra-Low Pt Catalyst Supported on Block Copolymer-Based Carbon with Connected Channels for High-Performance PEMFCs [Hee-Eun Kim](#); Korea Advanced Institute of Science and Technology, Korea (the Republic of).

EQ02.10.03

A Novel Method for Imparting Specific Nitrogen Functional Groups to Carbon Materials Using Polymers with Controlled Molecular Weight and Application to Energy Devices [Jong Ho Won](#); Kookmin University, Korea (the Republic of).

EQ02.10.04

Surface Characterization of the Structural Defects in MoS₂ Atomic Layers Formed by Lithium Intercalation [Haydee Pacheco](#); Rutgers, The State University of New Jersey, United States.

EQ02.10.05

Controlling Formation and Energetics of Chemically Reactive Schottky Defects in Multinary Oxides [Eli Nygren](#); University of California, Santa Cruz, United States.

SESSION EQ02.11: Functional Defects in Halide Perovskites

Session Chairs: Panchapakesan Ganesh and Hua Zhou

Monday Morning, May 23, 2022

EQ02-Virtual

10:30 AM *EQ02.11.01

Defects and Halide Perovskites—Tautology, Oxymoron, or ... *How Do They Get Along?* [David Cahen](#); Weizmann Institute and Bar-Ilan University, Israel.

11:00 AM *EQ02.11.02

Octahedral Tilt Prevents Formation of Nanoscale Trap Clusters in Halide Perovskite Semiconductors that Otherwise Limit Performance and Cause Instabilities [Samuel D. Stranks](#); University of Cambridge, United Kingdom.

11:30 AM *EQ02.11.03

How Scientific Machine Learning and High-Throughput Experimentation Can Help Elucidate Defect Dynamics [Tonio Buonassisi](#); Massachusetts Institute of Technology, United States.

12:00 PM *EQ02.11.04

Perovskite Interface Microstructures—On and Beyond Grain Boundaries [Yuanyuan Zhou](#); Hong Kong Baptist University, China.

12:30 PM EQ02.11.05

Tuning Thermoelectric Transport in Ag Modified Sb₂Te₃ Through Band-Structure Modifications and Carrier Filtering [Abhishek Ghosh](#); IIT Delhi, India.

SESSION EQ02.12: Functional Defects in Energy and Electronic Materials

Session Chairs: Carmela Aruta and Yuanyuan Zhou

Monday Afternoon, May 23, 2022

EQ02-Virtual

1:00 PM *EQ02.12.01

Highly Defective Oxides—The Next Generation of Electromechanical Materials [Nini Pryds](#); Technical University of Denmark, Denmark.

1:30 PM *EQ02.12.02

Synthesis and Advanced Characterization of Quantum Materials by Synchrotron Techniques—An All-*In Situ* Open-Access Platform [Pasquale Orgiani](#); CNR-IOM Tasc laboratory, Italy.

2:00 PM *EQ02.12.03

Engineering Defect Formation in Functional Oxide Thin Films and Heterostructures [Regina Dittmann](#); Forschungszentrum Jülich GmbH, Germany.

2:30 PM EQ02.12.04

High-Throughput Search for Potential Plasmonic Spinel Oxides [Steven T. Hartman](#); Los Alamos National Laboratory, United States.

2:45 PM EQ02.12.05

Function and Electronic Structure of Defects in the SnO₂ Buffer Layer Between the α -Fe₂O₃ Water Oxidation Photoelectrode and the Transparent Conducting Oxide Current Collector [Artur Braun](#); Empa, Switzerland.

SESSION EQ02.13: Harnessing Functional Defects in Energy and Electronic Materials

Session Chairs: Panchapakesan Ganesh, Hua Zhou and Yuanyuan Zhou

Monday Afternoon, May 23, 2022

EQ02-Virtual

4:00 PM *EQ02.13.01

Defect Chemistry, Structure and Property Evolution During Amorphous-to-Crystalline Transformation of Mixed Conducting Oxides [Nicola H. Perry](#); University of Illinois at Urbana-Champaign, United States.

4:30 PM *EQ02.13.02

Understanding and Controlling Materials Atom-by-Atom [David Lingerfelt](#); Oak Ridge National Laboratory, United States.

5:00 PM EQ02.13.03

Investigations of Interactions Between Thin Metal Catalyst Films and α -TiO₂ Photoelectrode Protection Layers Through Synchrotron [Wen-Hui Cheng](#)^{1,2}; ¹National Cheng Kung University, Taiwan; ²California Institute of Technology, United States.

5:15 PM EQ02.13.04

Ferroelectrics Meet Ionics in the Land of van der Waals [Petro Maksymovych](#); Oak Ridge National Laboratory, United States.

5:30 PM EQ02.13.05

Harvesting Oxygen Vacancies in Cobaltites for Low Power Neuromorphic Devices [Shenli Zhang](#); University of Chicago, United States.

5:45 PM EQ02.13.06

Characterization of Defect Populations and Evolution in Complex Oxides Using Atom Probe Tomography and Isotopic Tracers [Kayla H. Yano](#); Pacific Northwest National Laboratory, United States.

SYMPOSIUM EQ03

Next Generation Organic Semiconductors—Materials, Fundamentals and Applications
May 9 - May 25, 2022

Symposium Organizers

Oana Jurchescu, Wake Forest University
Emanuele Orgiu, Université du Québec/Institut National de la Recherche Scientifique
Natalie Stingelin, Georgia Institute of Technology
Yutaka Wakayama, NIMS

* Invited Paper

SESSION EQ03.01: Devices I
Session Chair: Beatrice Fraboni
Monday Morning, May 9, 2022
Hawai'i Convention Center, Level 3, 316B

10:30 AM *EQ03.01.01

High-Performance Organic Electronics [Karl Leo](#); IAPP, Germany.

11:00 AM *EQ03.01.02

Using Ions to Control Conduction in Semiconducting Polymers [Michael L. Chabinye](#); University of California, Santa Barbara, United States.

11:30 AM *EQ03.01.03

Conjugated Polyelectrolytes for Organic Electrochemical Transistors [Thuc-Quyen Nguyen](#); University of California, Santa Barbara, United States.

SESSION EQ03.02: Organic Field-Effect Transistors
Session Chair: Eleni Stavrinidou
Monday Afternoon, May 9, 2022
Hawai'i Convention Center, Level 3, 316B

1:30 PM EQ03.02.01

Reconfigurable Organic Logic Circuits Based on a Dual-Gate Antiambipolar Transistor [Ryoma Hayakawa](#); National Institute for Materials Science, Japan.

1:45 PM EQ03.02.02

Photopatternable Control of Threshold Voltage in Organic Transistors for Ultraflexible Complementary Circuits [Koki Taguchi](#)^{1, 2, 3}; ¹Osaka University, Japan; ²Osaka University, Japan; ³National Institute of Advanced Industrial Science and Technology, Japan.

2:00 PM EQ03.02.03

Charge Transport Investigation in Solution Processed Organic Field-Effect Transistors Based on sp-Hybridized Cumulenic Carbon Wires [Stefano Pecoraro](#)^{1, 2}; ¹Istituto Italiano di Tecnologia, Italy; ²Politecnico di Milano, Italy.

2:15 PM EQ03.02.04

A Pathway to Enable Efficient Performance in Organic Field-Effect Transistors with Low-Cost, Scalable Contacts [Matthew Waldrip](#); Wake Forest University, United States.

2:30 PM *EQ03.02.05

High-Performance and Reliable Lead-Free Layered-Perovskite Transistors [Yong-Young Noh](#); Pohang University of Science and Technology, Korea (the Republic of).

3:00 PM BREAK

SESSION EQ03.03: Material Design and Synthesis
Session Chair: Jason Azoulay
Monday Afternoon, May 9, 2022
Hawai'i Convention Center, Level 3, 316B

3:30 PM EQ03.03.02

Reimagining Synthetic Approaches and Architectures for Semiconducting Polymers [Barry C. Thompson](#); University of Southern California, United States.

3:45 PM EQ03.03.03

Photoactivation Properties of Self-N-Doped Organic Semiconductors—Concentration-Dependent Radical and Biradical Formation [Luisa L. Whittaker-Brooks](#); University

of Utah, United States.

4:00 PM EQ03.20.04

Attaining Infrared Detection in Devices with Narrow Bandgap Conjugated Polymers [Jasmine Lim](#); The University of Southern Mississippi, United States.

4:15 PM EQ03.20.03

Synthetic Nuances to Maximize N-Type Organic Electrochemical Transistor and Thermoelectric Performance in Fused Lactam Polymers [Adam Marks](#)^{2,1}; ¹Stanford University, United States; ²University of Oxford, United Kingdom.

4:30 PM EQ03.20.06

Bridging Molecules and Polymer Semiconductor Device Performance [Chad R. Snyder](#); National Institute of Standards and Technology, United States.

SESSION EQ03.04: Poster Session I: Next Generation Organic Semiconductors—Materials, Fundamentals and Applications I

Session Chair: Maryam Alsufyani

Monday Afternoon, May 9, 2022

5:00 PM - 7:00 PM

Hawai'i Convention Center, Level 1, Kamehameha Exhibit Hall 2 & 3

EQ03.04.01

The Signatures of Polarons and Bipolarons in the Raman Spectrum of Molecularly P-Doped poly(3-hexylthiophene-2,5-diyl) [Ahmed E. Mansour](#)^{1,2}; ¹Helmholtz-Zentrum Berlin für Materialien und Energie, Germany; ²Humboldt-Universität zu Berlin, Germany.

EQ03.04.02

Improvement of Efficiency in Inverted Green and Blue Phosphorescent Organic Light-Emitting Diodes Using Red Dye-Doped Hole Transport Layers [Hyunkoo Lee](#); Sookmyung Women's University, Korea (the Republic of).

EQ03.04.03

High-Efficiency Organic Light-Emitting Devices Involving Au(I) Complexes as Singlet Exciton Sensitizers [Seunga Heo](#); Ewha Womans University, Korea (the Republic of).

EQ03.04.04

Efficient Coupling of Heavy Atom Effects and Orbital Angular Momentum Towards Fast and Efficient Metal-Free Organic Phosphors [Wenhao Shao](#); University of Michigan, United States.

EQ03.04.05

Naphthalene Diimide-Based Conjugated Polymers as Promising Organocatalysts for Photocatalytic CO₂ Reaction [Lee Yih Wang](#); National Taiwan University, Taiwan.

EQ03.04.06

Design and Synthesis of Molecular Semiconductors Tailored to Couple with Vacuum Field [Rahul Meena](#); Universite Libre Du Bruxelles, Belgium.

EQ03.04.07

Tuning Thermoelectric Properties in an Organic Electrochemical Transistor Through Side Chains Engineering of Conducting Polymers [Soonjong Lee](#); Korea University, Korea (the Republic of).

EQ03.04.08

Study of the Bulk Polymorphism of Best Performing Molecular Semiconductors [Priya Pandey](#)^{3,1}; ¹University of Bologna, Italy; ³PolyCrystalLine SPA, Italy.

EQ03.04.09

Solution-Processed N-Type Perylene Diimide Based Molecular Semiconductors for Air-Stable OFET Operations [Eunkyung Park](#); University of Calgary, Canada.

EQ03.04.10

Study of Bulk and Thin-Film Polymorphism of NDI Derivatives—Annealing and Deposition Procedures to Access Elusive Polymorphs [Inês de Oliveira Martins](#)^{1,2}; ¹Polycrystalline SPA, Italy; ²Università di Bologna, Italy.

EQ03.04.11

Electron- and Ion-Transporting Fluorinated Conjugated Polymers for High-Transconductance Organic Electrochemical Transistors [Seongmin Heo](#); Pohang University of Science and Technology, Korea (the Republic of).

EQ03.04.12

Highly Efficient and Stable Hyperfluorescence Device Using Organo Boron Materials [Hyuna Lee](#); Kyung Hee University, Korea (the Republic of).

EQ03.04.13

Operational Lifetime Improvement of Deep Blue Boron Emitter [Hye In Yang](#); Kyung Hee University, Korea (the Republic of).

EQ03.04.14

Self-Assembly Enables Simple Structure Organic Photovoltaics via Green-Solvent and Open-Air-Printing—Closing the Lab-to-Fab Gap [Hua Tang](#); King Abdullah University of Science and Technology, Saudi Arabia.

EQ03.04.15

Study on Thermoelectric Properties and Charge Transport Behaviors of Side-chain Engineered Conjugated Polymers via Electrochemical Doping [Woojin Choi](#); Kookmin University, Korea (the Republic of).

EQ03.04.16

Organic Detectors Sensing the SWIR and MWIR Wavelengths [Ning Li](#); University of California San Diego, United States.

EQ03.04.17

Toward Water-Processable and Self-Doped Conducting Polymers via Direct (Hetero)arylation Polymerization [Catherine Beaumont](#); Laval University, Canada.

EQ03.04.18

Synthesis of a Si-Containing Gradient Block Copolymer and Its Application to EUV Lithography by Aspect Ratio Enhancement [Yemin Park](#); Korea Advanced Institute of Science and Technology, Korea (the Republic of).

EQ03.04.19

On the Study of the Excitonic Properties in Polymeric and Small Molecular Photovoltaic Materials [Liu Taili](#); City University of Hong Kong, China.

EQ03.04.20

Molecular Doping of Solution-Mixed Conjugated Polymers for Improving Thermoelectric Properties [Jaeyoung Jang](#); Hanyang University, Korea (the Republic of).

EQ03.04.21

Exciton-Harvested Electroluminescence Using Organic Hosts Capable of Exergonic Triplet Exciton Conversion [SeonJu Kim](#); Ewha Womans University, Korea (the Republic of).

EQ03.04.22

Electronic Physically Unclonable Functions Based on Organic Thin-Film Transistors with Organic Semiconductor Microstructures Fingerprint for Highly Strong Encryption Technology [Jung Ah Lim](#); Korea Institute of Science and Technology, Korea (the Republic of).

EQ03.04.23

Impact of Dynamic Disorder on Thermoelectric Transport in Organic Semiconductors [Shantonio W. Birch](#); University of Michigan, United States.

EQ03.04.25

Organic Antiambipolar Transistors for High Performance and Optically Tuneable Ternary Logic Circuits [Debdatta Panigrahi](#); National Institute for Materials Science, Japan.

EQ03.04.26

Mono- and bis(triazolo)triazine Emitters for Blue Thermally Activated Delayed Fluorescence Organic Light-Emitting Diodes [Celine Leonhardt](#); KIT, Germany.

EQ03.04.27

Unprecedented Rearrangement: Investigation and OLED Application of a Novel Class of Carbazolophanes [Jasmin T. Seibert](#); Karlsruhe Institute of Technology (KIT), Germany.

EQ03.04.28

Design and Synthesis of Novel Dinuclear Cu(I)-TADF-Complexes as Emitting Materials for Application in OLEDs [Clara Adam](#); Karlsruhe Institute of Technology, Germany.

EQ03.04.29

Semiconducting Polymers for Functionally Graded Organic Thermoelectrics [Shrayesh Patel](#); Univ of Chicago, United States.

EQ03.04.30

Strategic Doping by Solid-State Diffusion for Enhancing Charge Injection Properties and Doping Stability in Organic Field-Effect Transistors [Keehoon Kang](#); Seoul National University, Korea (the Republic of).

EQ03.04.31

Emerging Hole-Selective Monolayers for Optoelectronic Applications [Artiom Magomedov](#); Kaunas Univeristy of Technology, Lithuania.

EQ03.04.32

Patterning of Poly(3-Hexylthiophene) For Organic Field-Effect Transistors [Ankit Malik](#); Indian Institute of Science, India.

EQ03.04.33

Polyaniline and Aniline Oligomers—Materials and Chemistry [Cheng-Wei Lin](#); University of California, Los Angeles, United States.

EQ03.04.34

Minimization of Contact Resistance in Organic Field-Effect Transistor by Introducing Buried Electrode Structure [Giheon Choi](#)^{1, 2}; ¹Hanyang University, Korea (the Republic of); ²BK21 FOUR ERICA-ACE Center, Hanyang University, Korea (the Republic of).

EQ03.04.35

High Thermoelectric Performance from Optimization of Doping Methods for Donor-Donor Polymers [Changhwa Jung](#); Kookmin university, Korea (the Republic of).

EQ03.04.36

Engineering Morphology of One-Dimensional Organic Semiconductor for Uniaxially Aligned Molecules Toward Efficient Charge Transport [Keon Joo Park](#); Korea Maritime and Ocean University, Korea (the Republic of).

EQ03.04.37

Improving Charge Carrier Injection in Nanoscale Organic and Polymer Thin-Film Transistors [Calla M. McCulley](#); The University of Texas at Austin, United States.

EQ03.04.38

Metal-Organic Complexes for Multistate Memory [Yonatan Hamo](#); Weizmann Institute of Science, Israel.

SESSION EQ03.05: Molecular Crystals

Session Chair: Adam Moule

Tuesday Morning, May 10, 2022

Hawai'i Convention Center, Level 3, 316B

8:30 AM EQ03.05.01

Specific Phonon-Phonon Coupling in Organic Semiconductors—A Raman Spectroscopy Study [Maor Asher](#); Weizmann Institute of Science, Israel.

8:45 AM EQ03.05.02

Variation of Crystalline Polymorphs of Dinaphthothienothiophene—From Monolayer to Bulk [Nobutaka Shioya](#); Kyoto University, Japan.

9:00 AM EQ03.05.03

Single-Crystalline Polymorphs of Charge-Transfer Complexes Give Insight into Donor-Acceptor Interactions in Organic Semiconductors [Katelyn P. Goetz](#); National Institute of Standards and Technology, United States.

9:15 AM *EQ03.05.04

Crystal Engineering of Acene-Based Semiconductors and the Delicate 'Brickwork' [1]-Stack [John Anthony](#); University of Kentucky, United States.

9:45 AM EQ03.18.01

Molecular Triplet Exciton Control via Spin-Exchange Coupling with Lanthanides [Lars van Turnhout](#); University of Cambridge, United Kingdom.

10:00 AM BREAK

SESSION EQ03.06: Devices II
Session Chair: Pietro Rossi
Tuesday Morning, May 10, 2022
Hawai'i Convention Center, Level 3, 316B

10:30 AM *EQ03.06.01

14 GHz Schottky Diodes Using Organic Semiconductors [Thomas D. Anthopoulos](#); King Abdullah University of Science and Technology, Saudi Arabia.

11:00 AM EQ03.06.02

Improving Operational Stability in Organic Semiconductors—OFF-State Bias Focus [Malgorzata Nguyen](#); Cambridge University, United Kingdom.

11:15 AM EQ03.06.03

Thermodynamics of Organic Electrochemical Transistors [Matteo Cucchi](#); TU Dresden, Germany.

11:30 AM EQ03.06.04

Effect of Additives on the Performance of a P-Type Organic Semiconductor [Tania C. Hidalgo Castillo](#); King Abdullah University of Science and Technology, Saudi Arabia.

SESSION EQ03.07: Doping
Session Chair: Alexandra Paterson
Tuesday Afternoon, May 10, 2022
Hawai'i Convention Center, Level 3, 316B

1:30 PM EQ03.20.09

Temperature-Dependent Transient Charge Delocalization in High-Mobility Organic Molecular Semiconductors [Marco Bardini](#); Université de Mons, Belgium.

1:45 PM EQ03.20.01

Label-Free, Sub-Picomolar Detection of Neurofilament Light Chain with Electrolyte-Gated Organic Field-Effect Transistor-Based Biosensors [Kateryna Solodka](#); University of Modena and Reggio Emilia, Italy.

2:00 PM EQ03.07.02

The Splitting of Singly-Occupied Molecular Orbitals Holds the Key to Double Doping of Organic Semiconductors [Ross Warren](#); Humboldt-Universität zu Berlin, Germany.

2:15 PM EQ03.07.03

N-Type Polymer Thermoelectrics Realized Through Heavy P-Doping of π -Conjugated Polymers [Kenneth R. Graham](#); University of Kentucky, United States.

2:30 PM BREAK

SESSION EQ03.08: Organic Mixed Ionic-Electronic Conductors
Session Chair: Alexander Giovannitti
Tuesday Afternoon, May 10, 2022
Hawai'i Convention Center, Level 3, 316B

3:00 PM *EQ03.18.05

Improving the Performance of Light-Emitting Devices with Polaritonics [Konstantinos Daskalakis](#); Turku University, Finland.

3:30 PM *EQ03.08.01

Doping at the Extremes Enables Large Gap p-i-n Homojunction Diode [Antoine Kahn](#); Princeton University, United States.

4:00 PM EQ03.08.02

Chemical Doping of Organic Mixed Ionic Electronic Conductors for Tunable Threshold Voltage in Organic Electrochemical Transistors [Siew Ting Melissa Tan](#); Stanford University, United States.

4:15 PM EQ03.08.03

General Observation of an Insulator-Metal Transition in Polymer Electrochemical Transistors [Dionisius Hardjo Lukito Tjhe](#); University of Cambridge, United Kingdom.

4:30 PM EQ03.19.03

Structural and Dynamic Disorder, Not Ionic Trapping, Controls Charge Transport in Highly Doped Conducting Polymers [Ian Jacobs](#); University of Cambridge, United Kingdom.

Kingdom.

SESSION EQ03.09: Composition and Microstructure

Session Chair: Katelyn Goetz

Wednesday Morning, May 11, 2022

Hawai'i Convention Center, Level 3, 316B

8:30 AM EQ03.09.01**Self-Assembly in Solid-State Intra-Molecular Singlet Fission Materials** [David J. Jones](#); University of Melbourne, Australia.**8:45 AM EQ03.09.02****Does Structure Really Matter? Influence of Structural 'Perfectness' of Conjugated Polymers on Their Optoelectronic Properties and Device Performance** [Jochen Vanderspikken](#)^{1,2,3}; ¹Hasselt University, Belgium; ²imec, Belgium; ³Energyville, Belgium.**9:00 AM EQ03.09.03****Quantifying Exciton Annihilation Effects in Thermally Activated Delayed Fluorescence Materials** [Theun Sebastiaan v. van der Zee](#); Max Planck Institute for Polymer Research, Germany.**9:15 AM EQ03.09.04****Morphological Understanding of the Effect of the Elastomer's Molecular Weight in Conjugated Polymer/ Elastomer Blends** [Ammahir Pena-Alcantara](#); Stanford University, United States.**9:30 AM *EQ03.09.05****Tuning the Performance of Conjugated Polymers by Post-polymerisation Modification** [Martin Heeney](#); Imperial College London, United Kingdom.**10:00 AM BREAK**

SESSION EQ03.10: Material Synthesis and Processing

Session Chair: Kenneth Graham

Wednesday Morning, May 11, 2022

Hawai'i Convention Center, Level 3, 316B

10:30 AM EQ03.10.01**Narrow Bandgap Conjugated Polymers with Strong Correlations and Open-Shell Electronic Structures—Towards New Phenomena and Emergent Technologies** [Jason D. Azoulay](#); University of Southern Mississippi, United States.**10:45 AM EQ03.10.02****Systematic Control of Nanostructure via External Processing Parameters in Organic Functional Thin Films** [Fabian Eller](#); Dynamics and Structure Formation - Herzig Group, Physikalisches Institut, Universität Bayreuth, Germany.**11:00 AM EQ03.10.03****Solution N-Doping with Benzimidazole Compounds—A New Derivative for Improved Thermoelectric Performances** [Pietro Rossi](#)^{1,2}; ¹Istituto Italiano di Tecnologia, Italy; ²Politecnico di Milano, Italy.**11:15 AM *EQ03.10.04****Star-Shaped Organic Semiconductors with HBC and Other Fused Cores Towards Higher Levels of Bulk Charge Transport** [Peter Skabara](#); University of Glasgow, United Kingdom.

SESSION EQ03.11: Organic Electrochemical Transistors

Session Chair: Konstantinos Daskalakis

Wednesday Afternoon, May 11, 2022

Hawai'i Convention Center, Level 3, 316B

1:30 PM *EQ03.11.01**Microstructure and Properties of Conjugated Polymers—Linking XRD, TEM and Spectroscopy to Gain Fundamental Insights into Charge Transport Mechanisms** [Alberto Salleo](#); Stanford University, United States.**2:00 PM EQ03.11.02****pH Dependent Stability of Organic Electrochemical Transistors Made from Carboxylic Acid Functionalized Polythiophenes** [Lucas Flagg](#); NIST, United States.**2:15 PM EQ03.11.03****Mixed Electron- and Ion- Conduction in Radical Polymer-Based Blends** [Siddhartha Akkiraju](#); Purdue University, United States.**2:30 PM BREAK**

SESSION EQ03.12: Optoelectronic Devices

Session Chair: Aman Anand

Wednesday Afternoon, May 11, 2022

Hawai'i Convention Center, Level 3, 316B

3:30 PM *EQ03.12.01

Controlling Charge Recombination in Organic Photovoltaics and Photodetectors for Near-Infrared Light Conversion [Nicola Gasparini](#); Imperial College London, United Kingdom.

4:00 PM EQ03.12.02

High Detectivity Near-Infrared Organic Photodetectors with the Cross-Linked Electron Blocking Layer Using a Novel Photoinitiator [Do Young Kim](#); Oklahoma State University, United States.

4:15 PM EQ03.12.03

On the Origin of the Intrinsic Detectivity Limits of Near-Infrared Organic Photodetectors [Sam Gielen](#)^{1,2}; ¹Hasselt University, Belgium; ²Imec, Belgium.

4:30 PM EQ03.18.02

Optical Outcoupling in Efficient Single-Layer TADF Organic Light-Emitting Diodes [Gert-Jan Wetzelaer](#); Max Planck Institute for Polymer Research, Germany.

SESSION EQ03.13: Poster Session II: Next Generation Organic Semiconductors—Materials, Fundamentals and Applications II

Session Chair: Giorgio Ernesto Bonacchini

Wednesday Afternoon, May 11, 2022

5:00 PM - 7:00 PM

Hawai'i Convention Center, Level 1, Kamehameha Exhibit Hall 2 & 3

EQ03.13.01

Design and Synthesis of Novel Hole Transport Materials for Emerging Active Layers [Steffen Otterbach](#); Karlsruhe Institute of Technology, Germany.

EQ03.13.02

Optimizing Blend Morphology and Voltage Loss of High-Performance Solar Cells Through Pairing the Terminal Group of Polymer Donor and Small-Molecule Acceptor [Huan Li](#); Gyeongsang National University, Korea (the Republic of).

EQ03.13.03

Short-range Conductivity Increase with Dielectric Constant—THz Spectroscopy on Doped Polythiophenes [Eva Röck](#); University of Bern, Switzerland.

EQ03.13.04

Synthesis and Characterization of Tetradentate Pt(II) Complex as Deep Blue Phosphorescent Material for OLED [Ji Hyun Lee](#); Gyeongsang National University, Korea (the Republic of).

EQ03.13.05

High-Performance Diketopyrrolopyrrole(DPP)-based Donor-Acceptor Copolymers for Organic Thin-Film Transistors(OTFT) [Jin Wook Jang](#); Gyeongsang National University, Korea (the Republic of).

EQ03.13.06

A Novel Isomer-Free and Low-Lying Energy Level Quinoidal Conjugated Polymer Employing Planar Thiophene Derivative Core [Yeonsu Choi](#); Gwangju Institute of Science and Technology, Korea (the Republic of).

EQ03.13.07

Exploring the Recombination Zone of Blue Organic Light-Emitting Diodes from Various Thickness of Emitting Layer Without Sensing Layer [Tae Wook Kim](#); Korea University, Korea (the Republic of).

EQ03.13.08

Synthesis and Characterization of Phosphine Oxides and Triazine Derivative for Enhanced Mobility and Restricted Traps in Electron Transporting Layers [Do-yeong Choi](#); Gyeongsang National University, Korea (the Republic of).

EQ03.13.09

Synthesis and Characterization of Novel Structure via Donor-Acceptor Tuning for Green Selective OPD with Absorption Wavelength Selectivity [Choi ChangEun](#); Gyeongsang National University, Korea (the Republic of).

EQ03.13.10

Organic Salts—A Route to Improve Performance and Stability of N-Type Conjugated Polymers at the Electrolyte Interface [David Ohayon](#); King Abdullah University of Science and Technology, Saudi Arabia.

EQ03.13.11

Synthesis and Characterization of Y5 Based All-Polymer Solar Cells Enhanced Thermal and Mechanical Properties with High Molecular Compatibility [KwangPyo Hong](#); Gyeongsang National University, Korea (the Republic of).

EQ03.13.12

Synthesis and Characterization of opD IN NIR Spectral Absorption Region [Jun-yeong Park](#); Gyeongsang National University, Korea (the Republic of).

EQ03.13.13

Singlet-Triplet Inversion in Organic Photoactive Molecules [Piotr de Silva](#); Technical University of Denmark, Denmark.

EQ03.13.14

Time-Temperature Integrating Sensors Based on Gradient Mixtures of Binary Colloidal Crystals [Marius Schoettle](#); University of Bayreuth, Germany.

EQ03.13.15

Fluorinated Dibenzo[a,c]-phenazine-Based Green to Red Thermally Activated Delayed Fluorescent OLED Emitters [Gloria Hong](#); Karlsruhe Institute of Technology, Germany.

EQ03.13.16

Organic Electrochemical Transistors—Vogel-Tamman-Fulcher and the Three Step Model [Loren G. Kaake](#); Simon Fraser University, Canada.

*EQ03.13.17

Synthesis of Amphiphilic Block Copolymers for OSCs [David J. Jones](#); University of Melbourne, Australia.

EQ03.13.18

Structure-Property-Processing Relationships for Electrospun poly(3-hexylthiophene) Fibers [Santanu Kundu](#); Mississippi State University, United States.

EQ03.13.19

Chemical Doping of Well-Dispersed P3HT Nanowire Networks [Song Guo](#); Univ of Southern Mississippi, United States.

EQ03.13.20

Synthesis and Characterization of New ITIC Acceptor For Organic Solar Cell [Ji Eun Lee](#); Gyeongsang National University, Korea (the Republic of).

EQ03.13.21

Mixed Conduction in an N-Type Organic Semiconductor in the Absence of Hydrophilic Side-Chains [Tania C. Hidalgo Castillo](#); King Abdullah University of Science and Technology, Saudi Arabia.

EQ03.13.22

Emulating Organic Ion Reservoirs for Synaptic Applications [Dongshin Kim](#); Pohang University of Science and Technology, Korea (the Republic of).

EQ03.13.23

Tailored Enhanced Halide Perovskite Memory Performance by Oxide Grain Passivation in Resistive Switching Memory [SangMyeong Lee](#); Sungkyunkwan University, Korea (the Republic of).

EQ03.13.24

Synthesis and Characterization of Indacenodithiophene Based Small Molecule Acceptors for OPV [Yeong Heon Jeong](#); Gyeongsang National University, Korea (the Republic of).

EQ03.13.25

WITHDRAWN 5/7/22 EQ03.13.25 Novel Approaches and Ideas in Stretchable Semiconductor Design [Michal L. Gala](#); Stanford University, United States.

EQ03.13.26

Understanding How P3HT Crystallinity Controls Anion Exchange and Chemical Doping [Charlene Z. Salamat](#); University of California, Los Angeles, United States.

EQ03.13.27

Applied Bias and Frequency Dependent CHnPc Flexible OFET Characteristics and Device Modelling with Improved Performance for Attenuator Applications [Leon Hamui](#); Anahuac University, Mexico.

EQ03.13.28

Oxidant Effects on the Morphology and Properties of Oxidatively-Polymerized Polythiophenes [Jenna L. Sartucci](#); U.S. Naval Research Laboratory, United States.

EQ03.13.29

Unusual Aspects of the Novel Phenazine-Based TADF Emitters, Singlet-Triplet Shift and Inversion [Przemyslaw Data](#); Silesian University of Technology, Poland.

EQ03.13.30

Organic Field-Effect Transistors Based on Solution Sheared Thin films of DNTT and BTBT Derivatives [Lamiaa Fijahi](#); Institut de Ciència de Materials de Barcelona (ICMAB-CSIC), Spain.

EQ03.13.31

Dopant Dependency of Homojunction Field-Effect Transistors with Selectively Doped Conductive Polymer Electrode [Yoonjoo Lee](#); Korea University, Korea (the Republic of).

EQ03.13.32

An N-Annulated Perylene Butyl Tetra Ester for Use in Organic Field-Effect Transistors as the Active Material Layer [Kathryn M. Wolfe](#); University of Calgary, Canada.

EQ03.13.33

Perylene Diimide Based Polymer with Oligo Ethylene Glycol Side Chain and Their Applications in Organic Thermoelectric Devices [Sang Young Jeong](#); Korea University, Korea (the Republic of).

EQ03.13.34

Design and Synthesis of Chiral Molecular Semiconductors for Spintronic Applications [Martina Volpi](#); Université Libre de Bruxelles, Belgium.

EQ03.13.36

Dramatic Effects of Electrode Metal on Tunnel Junction Based Molecular Spintronic Devices [Pawan Tyagi](#); University of District of Columbia, United States.

EQ03.13.37

Tuning Optoelectronic Properties of Nanomaterials via Surface Engineering Using Luminescent Organic Molecules [Arya Karappilly Rajan](#); University of California, Merced, United States.

EQ03.13.38

Study of Polymorph Tuning at the Surfaces in an Organic Semiconductor [Ann M. James](#); Graz University of Technology, Austria.

8:30 AM EQ03.14.01

Enhancing the Backbone Coplanarity of N-Type Copolymers for Organic Electrochemical Transistors [Sophie Griggs](#); University of Oxford, United Kingdom.

8:45 AM EQ03.14.02

Direct Detection of 5-MeV Protons by Flexible Thin-Film Devices Based on Organic Semiconductors [Beatrice Fraboni](#)^{1,2}; ¹Department of Physics and Astronomy, University of Bologna, Italy; ²National Institute for Nuclear Physics, Italy.

9:00 AM EQ03.14.03

Semiconducting Polymer X-Ray Detectors with Non-Fullerene Acceptors for Enhanced Stability—Towards Printable Flexible, and Tissue Equivalent Devices [Jessie Posar](#)^{1,2}; ¹University of Sydney, Australia; ²University of Wollongong, Australia.

9:15 AM EQ03.14.04

Introducing New Highly Soluble High Electron Affinity Molecular Dopants [Adam J. Moule](#); University of California, Davis, United States.

9:30 AM *EQ03.14.05

Beyond Copper(I) Thiocyanate—Development of Semiconductors and Devices [Pichaya Pattanasattayavong](#); Vidyasirimedhi Institute of Science and Technology, Thailand.

10:00 AM BREAK

SESSION EQ03.15: Bioelectronics
Session Chair: Pichaya Pattanasattayavong
Thursday Morning, May 12, 2022
Hawai'i Convention Center, Level 3, 316B

10:30 AM EQ03.15.01

Next-Generation Polymeric Organic Semiconductors for Electrochemical Application in Aqueous Electrolytes [Alexander Giovannitti](#); Stanford University, United States.

10:45 AM EQ03.15.02

Potentiometric Adsorption Isotherm Analysis of Protein Sensing Competing Two EGOT Architectures [Pamela A. Manco Urbina](#); University of Modena and Reggio Emilia, Italy.

11:00 AM EQ03.15.03

Organic Bioelectronics for Real Time Monitoring and Dynamic Regulation of Plant Physiology [Eleni Stavrinidou](#); Linköping University, Sweden.

11:15 AM EQ03.15.04

New Opportunities for Organic Mixed Ion-Electron Conductors in Microwave Applications [Giorgio Ernesto Bonacchini](#)^{1,2}; ¹Stanford University, United States; ²Istituto Italiano di Tecnologia, Italy.

SESSION EQ03.16: Organic and Hybrid Photovoltaics
Session Chair: Keiki Fukumoto
Thursday Afternoon, May 12, 2022
Hawai'i Convention Center, Level 3, 316B

1:30 PM *EQ03.16.01

Understanding Structure, Composition and Performance Relationships in Perovskite Solar Cells [Martyn A. McLachlan](#); Imperial College London, United Kingdom.

2:00 PM EQ03.16.02

Fano-Resonance and Effortless Charge Generation from Charge Transfer to Charge Separated States in Organic Solar Cells [Harald Hoppe](#)^{1,2}; ¹Laboratory of Organic and Macromolecular Chemistry (IOMC), Friedrich Schiller University Jena, Germany; ²Center for Energy and Environmental Chemistry Jena (CEEC Jena), Friedrich Schiller University Jena, Germany.

2:15 PM EQ03.16.03

Highly Efficient Modulation Doping Towards Superior Organic Thermoelectric Devices [Shu-Jen Wang](#); TU Dresden, Germany.

2:30 PM EQ03.16.04

The Interfacial Energetic Landscape in Non-Fullerene Acceptor Organic Solar Cells and Its Impact on Charge Generation and Recombination [Julien F. Gorenflot](#); King Abdullah University of Science and Technology, Saudi Arabia.

2:45 PM EQ03.18.04

An Intermediate Model For Fitting Triplet-Triplet Annihilation In Phosphorescent Organic Light Emitting Diode Materials [Paul Niyonkuru](#); Colorado School of Mines, United States.

3:00 PM BREAK

SESSION EQ03.17/EQ04.14: Joint Keynote Session
Session Chair: Oana Jurchescu
Thursday Afternoon, May 12, 2022
Hawai'i Convention Center, Level 3, 316B

3:30 PM *EQ03.17/EQ04.14.01

Device Design for Organic Mixed Ionic-Electronic Conductor Performance [Alexandra F. Paterson](#); The University of Kentucky, United States.

4:00 PM *EQ03.17/EQ04.14.02

Designing Organic Semiconducting Polymers for Mixed Conduction [Iain McCulloch](#)^{1,2}; ¹University of Oxford, Saudi Arabia; ²KAUST, Saudi Arabia.

4:30 PM *EQ03.17/EQ04.14.03

Keynote: Flexible Arrays of Printed Devices and Their Use in Wearable Medical Devices [Ana C. Arias](#); University of California, Berkeley, United States.

SESSION EQ03.18: Light-Emitting Devices
Session Chair: Yutaka Wakayama
Friday Morning, May 13, 2022
Hawai'i Convention Center, Level 3, 316B

8:30 AM EQ03.18.03

Device Operation of Organic Light-Emitting Diodes Based on Thermally Activated Delayed Fluorescence [Theun Sebastiaan v. van der Zee](#); Max Planck Institute for Polymer Research, Germany.

8:45 AM EQ03.20.02

Uncovering the Mechanism by Which Wheland-Type Complexes Act as P-Dopants to Improve the Performance of Organic Semiconducting Polymers [Connor Ganley](#); Johns Hopkins University, United States.

9:00 AM EQ03.20.05

Multi-State Heterojunction Transistors Based on Field-Effect Tunneling–Transport Transitions [Dong Un Lim](#); Yonsei University, Korea (the Republic of).

9:15 AM EQ03.20.07

High Mobility Solution Processed Organic Semiconducting Blends for Ultra-High Frequency Operation [Tommaso Losi](#); Center for Nano Science and Technology @PoliMi, Istituto Italiano di Tecnologia, via Pascoli 70/3, 20133 Milano, Italy, Italy.

9:30 AM EQ03.20.08

Direct Observation of Rapid Triplet Harvesting by Radical Emitters [Sebastian Gorgon](#); University of Cambridge, United Kingdom.

9:45 AM BREAK

SESSION EQ03.19: Charge Transport in Organic Devices
Session Chair: Ingo Salzmann
Friday Morning, May 13, 2022
Hawai'i Convention Center, Level 3, 316B

10:30 AM EQ03.19.01

A Study for Charge Transport and Spin-Magnetic Properties of Open-Shell and Closed-Shell Quinoidal Conjugated Polymers [Yunseul Kim](#); Gwangju Institute of Science and Technology, Korea (the Republic of).

10:45 AM EQ03.19.02

Recent Advancements in Organic Photovoltaics [Arthur D. Hendsbee](#); Brilliant Matters Organic Electronics, Canada.

11:00 AM *EQ03.19.04

Imaging Electron Motion in Organic Semiconductors Using Femtosecond Photoemission Electron Microscopy [Keiki Fukumoto](#); High Energy Accelerator Research Organization (KEK), Japan.

SESSION EQ03.20: Emerging Devices II
Session Chairs: Ilaria Bargigia and Laura Basiricò
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SESSION EQ03.21: Next Generation Organic Semiconductors—Materials, Fundamentals and Applications I
Session Chair: Ingo Salzmann
Tuesday Morning, May 24, 2022
EQ03-Virtual

8:00 AM *EQ03.21.01

Vertical Stratification in Sequentially Deposited Organic Solar Cells [Yana Vaynzof](#); Technical University Dresden, Germany.

8:30 AM EQ03.21.02

A Flexible Piezoelectric PVDF-TiO₂ Nanofibrous Membrane for Intelligent Photocatalytic Performance [Jiayi Yin](#); University of Padova, Italy.

8:45 AM EQ03.21.03

Homoconjugated Poly(Phenylene Methylene)s—A Case Study of Light Emission Enabled by Through-Space Conjugation [Aleksandr Perevedentsev](#)^{1,2}; ¹Karlsruhe Institute of Technology, Germany; ²Institute of Materials Science of Barcelona (ICMAB-CSIC), Spain.

9:00 AM EQ03.21.04

Multifunctional Fabric Devices for Oil/Water Separation and Metallic Ion Detection [Michael Clevenger](#); Purdue University, United States.

9:15 AM EQ03.21.05

Effects of Dopant Counterion Size on Polaron Characteristics in Chemically Doped Conjugated Polymers [Joel H. Bombile](#); UNIVERSITY OF KENTUCKY, United States.

9:30 AM EQ03.21.06

The Influence of Ionic and Electronic Interaction in Single- and Dual-Gate Organic Electrochemical Transistors and Circuits [Hsin Tseng](#); Technische Universität Dresden, Germany.

9:35 AM *EQ03.21.07

Influence of Side Chain Composition and Polarity of the Environment on the Electrochemical Doping Mechanism in Poly(3-hexylthiophene) and Dioxythiophene Derivatives [Ilaria Bargigia](#); Wake Forest University, United States.

SESSION EQ03.22: Next-Generation Organic Semiconductors—Materials, Fundamentals and Applications II

Session Chair: Luisa Whittaker-Brooks

Tuesday Afternoon, May 24, 2022

EQ03-Virtual

9:00 PM *EQ03.22.01

Recent Developments in Organic-Based Stretchable Electronics for Health Monitoring [Jong Won Chung](#); Samsung Advanced Institute of Technology, Korea (the Republic of).

9:30 PM EQ03.22.02

Effect of Dopants on Optical and Electrical Characteristics of PEDOT:PSS for Hybrid Solar Cell Devices [Aditya Saha](#); IFS, Tohoku University, Japan.

9:45 PM EQ03.22.03

Carrier Transport in Junctions Between Molecules and 2D Materials [Bhartendu Papnai](#)^{1,2}; ¹Academia Sinica, Taiwan; ²National Tsing Hua University, Taiwan.

10:00 PM *EQ03.22.04

Crystallization Kinetics and the Influences on Organic Semiconducting Devices [Liyang Yu](#); Sichuan University, China.

10:30 PM *EQ03.22.05

Unraveling the Mechanisms of Electron Injection into Organic Semiconductors by Fabricating Ultralow-Work-function Electrodes [Hirohiko Fukagawa](#); NHK S&T Res Labs, Japan.

SESSION EQ03.23: Next-Generation Organic Semiconductors—Materials, Fundamentals and Applications III

Session Chair: Emanuele Orgiu

Wednesday Morning, May 25, 2022

EQ03-Virtual

8:00 AM *EQ03.23.01

Interface Energetics and Chemical Modification of Graphitic Carbon Nitride Film [Akaike Kouki](#); National Institute of Advanced Industrial Science and Technology, Japan.

8:30 AM EQ03.23.02

Organic Photodiodes with Ultralow Dark Current Reveal the Sub-Bandgap Trap States in Organic Semiconductors [Xiao Ma](#); Technische Universiteit Eindhoven, Netherlands.

8:45 AM EQ03.23.03

A Newly Developed Atropine Imprinted Copolymer and Its Functionalized Organic Transistor-Based Sensor [Qi Zhou](#); The University of Tokyo, Japan.

8:50 AM EQ03.23.04

Control of Luminescence Mechanism of Ultra-Deep Blue Emitter via Donor Engineering in Solution-Processed OLEDs [Jinhyo Hwang](#); Korea University, Korea (the Republic of).

8:55 AM EQ03.23.05

Energy State Adjustment of Multi-Carbazole TADF Emitter by Ortho-Biphenyl Substitution [Jingwan Kim](#); Gyeong-sang National University, Korea (the Republic of).

9:00 AM EQ03.23.06

Synthesis and Characterization of Boron Based Efficient and Pure Blue TADF Materials for Organic Light Emitting Diodes [Hyung Jin Cheon](#); Gyeongsang National University, Korea (the Republic of).

9:05 AM EQ03.23.07

A Thienothiophene Based Reliable and Low Driving Near-Infrared Organic Light-Emitting Diodes(OLEDs) [Gyeong Seok Lee](#); Gyeongsang National University, Korea (the Republic of).

9:10 AM EQ03.23.08

Visualization of Nanoscale Multi-Orientational Ordering in Thin Films of Polymer/Non-Fullerene Acceptor Blend [Urvashi Bothra](#)^{1,2}; ¹Indian Institute of Technology Bombay, India; ²Monash University, Australia.

SYMPOSIUM EQ04

Advanced Soft Materials and Processing Approaches for Flexible and Printed Optoelectronic Devices
May 9 - May 24, 2022

Symposium Organizers

Gerardo Hernandez-Sosa, Karlsruhe Institute of Technology
Do Hwan Kim, Soongsil University
Tse Nga Ng, University of California, San Diego
Yong-Young Noh, Pohang University of Science and Technology

* Invited Paper

SESSION EQ04.01: Materials Design and Electronic Properties I

Session Chair: Yong-Young Noh
Monday Morning, May 9, 2022

Hawai'i Convention Center, Level 3, 315

10:30 AM *EQ04.01.01

Maintaining High Mobility Charge Transport in Organic Semiconductors at High Charge Carrier Concentrations [Henning Sirringhaus](#); Cambridge University, United Kingdom.

11:00 AM EQ04.01.02

Comparative Study of Charge-Transport Behaviour of Edge-on- and Face-on-Oriented Diketopyrrolopyrrole-Based Conjugated Copolymers Bearing Chalcogenophene Units [Jiyoul Lee](#); Pukyong National University, Korea (the Republic of).

11:15 AM EQ04.01.03

Optimized Charge Transport in Molecular Semiconductors by Control of Fluid Dynamics and Crystallization in Meniscus-Guided Coating [Tomasz Marszalek](#)^{2, 1}; ¹Max Planck Institute for Polymer Research, Germany; ²Lodz University of Technology, Poland.

SESSION EQ04.02: Materials Design and Electronics Properties II

Session Chair: Barbara Stadlober
Monday Afternoon, May 9, 2022

Hawai'i Convention Center, Level 3, 315

1:30 PM *EQ04.02.01

Reduction of Charge-Carrier Trapping by Molecular Design [Paul W. Blom](#); Max-Planck-Institute for Polymer Research, Germany.

2:00 PM EQ04.02.02

Donor Polymer Conformation Determines Processing Resilience of Printed Organic Solar Cells [Azzaya Khasbaatar](#); University of Illinois at Urbana-Champaign, United States.

2:15 PM EQ04.02.03

The Role of Transient Heat and Mass Transfer in Controlling the Photovoltaic Properties of Solution-Processed Cu(In,Ga)Se₂ [Kyle Weideman](#); Purdue University, United States.

SESSION EQ04.03: Materials Processing

Session Chair: Do Hwan Kim
Tuesday Morning, May 10, 2022

Hawai'i Convention Center, Level 3, 315

8:15 AM EQ04.03.01

High Speed-Laser Speckle Imaging to Unravel Pico-Liter Droplets to Substrate Interactions [Riccardo Antonelli](#); Wageningen University & Research, Netherlands.

8:30 AM EQ04.03.02

Sub-Micrometer Photothermal Patterning of Polymer Semiconductors Using Cleanroom Lithography Equipment [Adam J. Moule](#); University of California, Davis, United States.

8:45 AM EQ04.03.03

Super-Resolution Photothermal Patterning in Conductive Polymers Enabled by Thermally Activated Solubility [Ian Jacobs](#)^{1, 2}; ¹University of Cambridge, United Kingdom; ²University of California, Davis, United States.

SESSION EQ04.04: Printed Flexible Sensors and Systems I

Session Chair: Sungjune Jung
Tuesday Morning, May 10, 2022
Hawai'i Convention Center, Level 3, 315

9:45 AM *EQ04.04.01

Making Printed Organic Electronics Thin, Fast and Edible [Mario Caironi](#); Istituto Italiano di Tecnologia, Italy.

10:15 AM *EQ04.04.02

Bias-Stress Free Organic Transistors for Radiation Dosimeters Used in Cancer Treatment [Oana D. Jurchescu](#); Wake Forest University, United States.

10:45 AM EQ04.04.03

Selectively Oxidized Tungsten Oxide Photocatalytic Layer on Indium-Gallium-Zinc-Oxide-Based Phototransistors for Visible Light Detection [Jong Bin An](#); Yonsei University, Korea (the Republic of).

SESSION EQ04.06: Printed Flexible Sensors and Systems II

Session Chairs: Paul Blom and Mario Caironi
Tuesday Afternoon, May 10, 2022
Hawai'i Convention Center, Level 3, 315

1:30 PM *EQ04.06.01

Flexible and Printed 3D Organic Integrated Circuits and Active-Matrix Sensor Arrays [Sungjune Jung](#); Pohang University of Science and Technology, Korea (the Republic of).

2:00 PM EQ04.06.02

Customizable Soft Vertical Interconnect Access Utilizing Micro-Perforated Elastomer Membrane for Stretchable Multi-Layered Circuits [Jiseok Seo](#)^{1,2}; ¹Seoul National University, Korea (the Republic of); ²Inter-university Semiconductor Research Center, Korea (the Republic of).

2:15 PM EQ04.06.03

Integration of High Performance, Fully Printed Organic Photodiodes onto Flexible Arrays of Solution Processed Organic Thin-Film Transistors [Luis A. Ruiz-Preciado](#)^{1,2}; ¹Karlsruhe Institute of Technology, Germany; ²InnovationLab, Germany.

2:30 PM EQ04.06.04

Printable, Flexible and Tissue Equivalent Wearable X-Ray Detectors—A New Biomedical Frontier for Solution Processable Organic Semiconductors [Matthew J. Griffith](#); The University of Sydney, Australia.

2:45 PM BREAK

3:15 PM *EQ04.06.05

New Architecture of Fiber-Shaped Organic Electronic Devices for Advanced Flexible and Wearable Applications [Jung Ah Lim](#); Korea Institute of Science and Technology, Korea (the Republic of).

3:45 PM EQ04.06.06

Environmental Monitoring with Additively Manufactured Tattoo-Based Bioelectronics [Elliot Strand](#); University of Colorado, United States.

4:00 PM EQ04.06.07

Wearable Active-Matrix Pressure Sensor Arrays for Spatiotemporal Measurement of Human Vital Signs [Sanghoon Back](#)^{1,2,3}; ¹Karlsruhe Institute of Technology, Germany; ²Innovationlab GmbH, Germany; ³Pohang University of Science and Technology, Korea (the Republic of).

4:15 PM EQ04.06.08

Aerosol Jet Printing Process Considerations for Radio Frequency Packaging Applications [Georg Gramlich](#); Karlsruhe Institute of Technology, Germany.

4:30 PM *EQ04.06.09

Skin-Inspired Deformable Devices for Artificial Skins and Health Care [Unyong Jeong](#); Pohang University of Science and Technology, Korea (the Republic of).

SESSION EQ04.07: Poster Session I: Advanced Soft Materials and Processing Concepts for Flexible Printed Optoelectronic Devices and Sensors I

Session Chairs: Gerardo Hernandez-Sosa and Tse Nga Ng
Tuesday Afternoon, May 10, 2022
5:00 PM - 7:00 PM
Hawai'i Convention Center, Level 1, Kamehameha Exhibit Hall 2 & 3

EQ04.07.01

Device Characteristics of Semiconducting/ Insulating Polymer Blended Organic Field Effect Transistors with Variable Insulating Polymer's Molecular Weight [Amnahir Pena-Alcantara](#); Stanford University, United States.

EQ04.07.02

Seamlessly Integrated Flexible Supercapacitor for Minimizing the Interfacial Resistance Using Quick Gelation of Agarose Hydrogels [Jong Sik Kim](#); Ajou University, Korea (the Republic of).

EQ04.07.03

Effects of the Processing Solvent on Azobenzene Self-Assembled Layer for Efficient Photochromic Switching Performance [Seong Hoon Yu](#); Pohang University of Science and Technology (POSTECH), Korea (the Republic of).

EQ04.07.04

Photolithography-Compatible Organic Light-Emitting Semiconductors for High-Resolution RGB OLEDs [Hyukmin Kweon](#); Hanyang University, Korea (the Republic of).

EQ04.07.05

Selective Thiol-Based Polymerizations for Two-Stage Holographic Materials [John Rynk](#); University of Colorado Boulder, United States.

EQ04.07.06

Ultra-Thin AR Sticker via Optimization of Materials, Structure and Fabrication Method to Effectively Enhance Efficiency of Perovskite Solar Devices [Seongmin Kang](#); Chungnam National University, Korea (the Republic of).

EQ04.07.07

Inkjet Printed Cellulose Nanofiber/Carbon Nanotube-Based Thin-Film Transistor for Deformation Sensor [Joonyoup Kim](#)^{1,2}; ¹Seoul National University, Korea (the Republic of); ²Seoul National University, Korea (the Republic of).

EQ04.07.08

High-Performance Thin-Film Transistors with Wire Bar-Coated Semiconducting Polymer Film [Doyeon Kim](#); Pukyong National University, Korea (the Republic of).

EQ04.07.09

Inkjet-Printing-Based Density and Purity Modulated Single-Walled Carbon Nanotube Thin-Film Transistors for Conformable High-On/Off-Performance and Its Display Applications [Hyunuk Oh](#); Seoul National University, Korea (the Republic of).

EQ04.07.10

High Performance N-Type Doped Semiconducting Carbon Nanotube Field Effect Transistors (CNT-FETs) on Flexible Substrate [Dongseong Yang](#); Gwangju Institute of Science and Technology, Korea (the Republic of).

EQ04.07.11

Extremely Stretchable Fiber Transistors Based on the Programmable Inflow and Outflow of Semiconducting Fiber to an Ionic Liquid Phase [Hoichang Yang](#); Inha University, Korea (the Republic of).

EQ04.07.12

Strain-Response Sensors Based on In-Drop Spooling of Conducting Micro Fibers into a Liquid Phase [Hoichang Yang](#); Inha University, Korea (the Republic of).

EQ04.07.13

Green Solvent-Processed, High-Performance Organic Solar Cells Achieved by Outer Side-Chain Selection of Selenophene-Incorporated Y-Series Acceptors [Xuyao Song](#); Gyeongsang National University, Korea (the Republic of).

EQ04.07.14

Patterning 1D Polymer Nanostructures with High Region Selectivity for Integrated Logic Circuits [Chae Won Kim](#); Korea Maritime and Ocean University, Korea (the Republic of).

EQ04.07.15

The Analysis of Ink Jetting and Uniform Thin Film Through Ink Formulation for Inkjet-Printed Optoelectronic Devices [Woo Jin Jeong](#); Gyeongsang National University, Korea (the Republic of).

EQ04.07.17

Chemically Tunable, Flexible and Functionalizable Organic Dielectric Layer on Various TFT Devices Based on Poly(para xylylene) Derivatives [Kyung Jin Lee](#); Chungnam National University, Korea (the Republic of).

EQ04.07.19

Comparison of Ternary Additive Loading when Processing Large Area Organic Photovoltaics by Spin- versus Blade-Coating Methods [Chithiravel Sundaresan](#)^{3, 1}; ¹National Research Council of Canada, Canada; ³University of Ottawa, Canada.

EQ04.07.20

Pure Electroactive β -Polymorph Formation in Polyvinylidene Fluoride via One-Step *In Situ* Approach [Dongseong Lee](#); Sungkyunkwan University, Korea (the Republic of).

EQ04.07.21

Liquid Metal Based Stretchable/Self-Healing Electrode for Soft Machine [Dong Jin Han](#); Korea University, Korea (the Republic of).

SESSION EQ04.08: Printed Flexible Sensors and Applications I

Session Chairs: Unyong Jeong and Tse Nga Ng

Wednesday Morning, May 11, 2022

Hawai'i Convention Center, Level 3, 315

8:30 AM EQ04.08.01

Sensor Design and Circuit Implementation Using Organic Process Design Kit [Palak Gupta](#)^{2, 3}; ²Karlsruhe Institute of Technology, Germany; ³University of Heidelberg, Germany.

8:45 AM EQ04.08.02

Printing and Mechanism Modelling of Nanocomposites Strain Sensors [James Garcia](#); Trinity College Dublin, Ireland.

9:00 AM BREAK

9:30 AM *EQ04.08.03

Imperceptible Strain Sensors Based on Ultraflexible or Stretchable Ferroelectric Polymer Transducers [Barbara Stadlober](#); Joanneum Research Forschungsgesellschaft mbH, Austria.

10:00 AM EQ04.08.04

Quantifying the Piezoresistive Mechanism in High Performance Flexible Printed Graphene Strain Sensors [Eoin Caffrey](#); Trinity College Dublin, Ireland.

10:15 AM EQ04.08.05

Inkjet-Printed Transparent Temperature Sensors based on Organic Thermoelectrics for High Temporal Resolution Temperature Sensing in Optical Neural Stimulation Junhee Lee; Daegu Gyeongbuk Institute of Science and Technology (DGIST), Korea (the Republic of).

SESSION EQ04.09: Printed Flexible Sensors and Applications II

Session Chair: Paddy K. L. Chan
Wednesday Afternoon, May 11, 2022
Hawai'i Convention Center, Level 3, 315

1:30 PM EQ04.09.01

Fully Printed High-Density Temperature Sensor Array Robert Huber; Karlsruhe Institute of Technology, Germany.

1:45 PM EQ04.09.02

Development of Easily Integrable, Cheap, Flexible, 4x4 and 8x12 Arrays of Organic Water-Gated Transistors for Biosensing Applications Francesco Modena^{1,2}; ¹Istituto Italiano di Tecnologia (IIT), Italy; ²Politecnico di Milano, Italy.

2:00 PM EQ04.09.03

Manufacturing Hierarchical Multifunctional Architectures Regina Ragan; University of California, Irvine, United States.

SESSION EQ04.10: Poster Session II: Advanced Soft Materials and Processing Concepts for Flexible Printed Optoelectronic Devices and Sensors II

Session Chairs: Do Hwan Kim and Yong-Young Noh
Wednesday Afternoon, May 11, 2022
5:00 PM - 7:00 PM

Hawai'i Convention Center, Level 1, Kamehameha Exhibit Hall 2 & 3

EQ04.10.01

Strategic Approach for Enhancing Sensitivity of Ammonia Gas Detection Byeong M. Oh; Ajou University, Korea (the Republic of).

EQ04.10.02

The Ultra-High External Quantum Efficiency of Photomultiplication-Type Organic Photodiodes Induced by Interfacial Electrostatic Interactions Juhee Kim; Pohang University of Science and Technology (POSTECH), Korea (the Republic of).

EQ04.10.03

Photomultiplication in Organic Photodiodes Realized by Tuning Charge Blocking Layers Chanho Shin; University of California, San Diego, United States.

EQ04.10.04

Fabrication of Tattoo Paper-Based SERS Devices and Pesticides Sensing on Fruit Surfaces Daejong Yang^{1,2}; ¹Kongju National University, Korea (the Republic of); ²Kongju National University, Korea (the Republic of).

EQ04.10.05

Biocompatible Ionic Conductor-Based Neural Interface for Implantable Bioelectronics Joo Sung Kim; Hanyang University, Korea (the Republic of).

EQ04.10.06

Molecular-Switch-Embedded Organic Photodiode with Autonomous Transition of Operation Mode Mingyun Kang; Pohang University of Science and Technology, Korea (the Republic of).

EQ04.10.07

Highly Deformable, Underwater Self-Healable Tactile Sensor for Breathing Monitoring Dong Jun Kim; Hanyang University, Korea (the Republic of).

EQ04.10.08

Visco-Poroelastic Electrochemiluminescence Skin Devices with Piezo-Ionic Effect Hanbin Choi; Hanyang University, Korea (the Republic of).

EQ04.10.09

Development of PDMS-Based Ink for 3D Printing Applications Kwan-Soo Lee; Los Alamos National Laboratory, United States.

EQ04.10.10

Thermally Stable Vertical μ LED Patch for Facilitating Hair Growth Jaehee Lee; Korea Advanced Institute of Science and Technology, Korea (the Republic of).

EQ04.10.11

Electrohydrodynamic Printing of Quantum Dot/Polymer Composite for Color-Conversion Micro-Structure on Flexible Platform Geonhee Kim^{1,2}; ¹Seoul National University, Korea (the Republic of); ²Inter-university Semiconductor Research Center, Korea (the Republic of).

EQ04.10.12

Stretchable Polymer Light-Emitting Diodes with Mercaptosilane-Assisted Mechanically Reliable Ag Electrodes Sujin Jeong^{1,2}; ¹Seoul National University, Korea (the Republic of); ²Inter-university Semiconductor Research Center, Korea (the Republic of).

EQ04.10.13

Molecular Design and Development of Materials with Second-Harmonic Generation (SHG) Through Self-Assembly of Supramolecular Systems Hannes F. Kuehner; Karlsruhe Institute of Technology (KIT), Germany.

EQ04.10.14

Flexible Laser-Patterned Carbon Coatings for Sensing and Energy Applications Benjamin Butz; University of Siegen, Germany.

EQ04.10.15

Inkjet-Printed Tin Oxide as Hole Blocking Layer for Organic Photodiodes [Peter Krebsbach](#)^{2,1}; ¹InnovationLab, Germany; ²Karlsruhe Institute of Technology, Germany.

EQ04.10.16

Biocompatible Nanotransfer Printing for Smart Textile and Smart Contact Lens [Jiwoo Ko](#)^{1,2}; ¹Korea Advanced Institute of Science and Technology, Korea (the Republic of); ²Korea Institute of Machinery & Materials, Korea (the Republic of).

EQ04.10.17

Direct Handwriting of High-Performance Perovskite/Polymer Composite-Based Optoelectronic Devices on Paper, Textile, Metals and Other Unconventional Substrates [Junyi Zhao](#); Washington University in St. Louis, United States.

EQ04.10.18

Mechanical Auxetic-Structured Substrates with Negative Poisson's Ratio [Beomgil Ha](#); Korea University, Korea (the Republic of).

EQ04.10.19

Modulating Non-Iridescent Structural Colors by Controlling Shell Thickness of Inverse Opal Photonic Glasses with Atomic Layer Deposition Inspired by Avian Feathers [Jihun Kang](#)^{1,2}; ¹Yonsei University, Korea (the Republic of); ²Yonsei University, Korea (the Republic of).

EQ04.10.20

Enhancement of Electrical Conductivity and Optoelectronic Characteristics of PEDOT Thin Film Grown by Water-Assisted Oxidative Chemical Vapor Deposition [Meysam Heydari Gharahcheshmeh](#)^{1,2}; ¹University of Mississippi, United States; ²Massachusetts Institute of Technology, United States.

EQ04.10.21

Electrical Conductivity Improvement of ITO Powder Surface-Modified with Ni Particles for Spin Coating Process [Jeong Hye Jo](#); Gachon University, Korea (the Republic of).

EQ04.10.22

Design of Cellular Architecture and Development of Cu₂Se-Based 3D Printing Inks for High Durability and Efficient Power Generation [Seungjun Choo](#); Ulsan National Institute of Science and Technology, Korea (the Republic of).

EQ04.10.23

Aerosol-Jet Printed Donor Blocking Layer and Spray-Coated Stretchable Platforms for Organic Photodiode Applications [Mervin Seiberlich](#)^{1,2}; ¹Karlsruhe Institute of Technology, Germany; ²InnovationLab, Germany.

SESSION EQ04.11: Printed Photonic Devices and Systems I

Session Chair: Gerardo Hernandez-Sosa

Thursday Morning, May 12, 2022

Hawai'i Convention Center, Level 3, 315

8:30 AM *EQ04.11.01

Architecting Energy Storage Materials with Additive Manufacturing [Corie L. Cobb](#); University of Washington, United States.

9:00 AM *EQ04.11.02

Ultra-Flexible Organic Light Emitting Diode for Optical Stimulation [Tomoyuki Yokota](#); The University of Tokyo, Japan.

9:30 AM EQ04.11.03

Flexible Vertical GaN MicroLEDs for Transparent Biomedical Stimulator [Sang Hyun Park](#); Korea Advanced Institute of Science and Technology, Korea (the Republic of).

9:45 AM EQ04.11.04

Highly Stretchable Phosphorescence Organic Light Emitting Diodes [Je-Heon Oh](#); Yonsei University, Korea (the Republic of).

10:00 AM BREAK

10:30 AM EQ04.11.05

Roll-to-Roll Optical Manufacture of Mechano-Responsive Photonic Sheets [Benjamin Miller](#); Massachusetts Institute of Technology, United States.

10:45 AM EQ04.11.06

Electrothermally Driven Paintable Photonic Devices for Large-Area Flexible Optoelectronic Applications [Arne Froyen](#); Eindhoven University of Technology, Netherlands.

11:00 AM EQ04.11.07

Bioinspired Dynamic Camouflage from Colloidal Nanocrystals Embedded Electrochromics [Ke Chen](#); Purdue University, United States.

SESSION EQ04.12: Printed Photonic Devices and Systems II

Session Chair: Sanghoon Baek

Thursday Afternoon, May 12, 2022

Hawai'i Convention Center, Level 3, 315

1:30 PM EQ04.12.01

Flexible, Colored Spectrally Segmented Covert Infrared Display Based on Hybrid Planar-Plasmonic Structure [Joo Hwan Ko](#); Gwangju Institute of Science and Engineering, Korea (the Republic of).

1:45 PM EQ04.12.02

Optical Rotation-Based Color Tuning with Engineered Cholesteric Liquid Crystal for Tunable Color Filter [Yun-Seok Choi](#); Korea Advanced Institute of Science and Technology, Korea (the Republic of).

2:00 PM EQ04.12.03

Design of Interactive Meta-Holographic Sensor Using Liquid Crystallinity [Youngki Kim](#); Pohang University of Science and Technology, Korea (the Republic of).

2:15 PM EQ04.12.04

Tailoring of Selective Responsiveness Liquid Crystals for Chemical Targets via Organic Ionics [Jin-Kang Choi](#); Pohang University of Science and Technology, Korea (the Republic of).

2:30 PM BREAK

SESSION EQ04.13: Advanced Soft Materials and Processing Concepts for Flexible Printed Optoelectronic Devices and Sensors I

Session Chair: Gerardo Hernandez-Sosa

Monday Morning, May 23, 2022

EQ04-Virtual

8:00 AM *EQ04.13.01

High-Resolution Gravure Printing of Electronics—Materials, Processes and Devices [Vivek Subramanian](#)^{2,1}; ¹University of California, Berkeley, United States; ²Ecole polytechnique Federale de Lausanne, Switzerland.

8:30 AM EQ04.13.02

Inkjet-Printed Functional Surface Enhanced Raman Scattering (SERS) Sensors for Aerosol Detection [Li-lin Tay](#); National Res Council Canada, Canada.

8:45 AM EQ04.13.03

Highly Sensitive Screen-Printed Thermocouples Based on Novel Graphene Ink [Christian Willig](#); InnovationLab GmbH, Germany.

9:00 AM EQ04.13.04

A Computation-Assisted Approach to Defining the Optimal Processing Window for Meniscus-Guided Coating of Organic Semiconductors [Jasper Michels](#); Max Planck Institute, Germany.

9:15 AM EQ04.13.05

Highly Sensitive, Fully Screen-Printed Sensor Matrix Based on a PTC Material for Sensing Thermal Energy Flow [Rainer Bäuerle](#); Ruprecht-Karls-Universität Heidelberg, Germany.

9:30 AM *EQ04.13.06

Photonic Nanostructures by Inkjet Printing [Ulrich Lemmer](#); Karlsruhe Inst of Technology, Germany.

SESSION EQ04.14: Advanced Soft Materials and Processing Concepts for Flexible Printed Optoelectronic Devices and Sensors II

Session Chair: Tse Nga Ng

Monday Morning, May 23, 2022

EQ04-Virtual

10:30 AM *EQ04.14.01

Functionalized Semiconducting Carbon Nanotube Networks for Sensing [Jana Zaumseil](#); University of Heidelberg, Germany.

11:00 AM EQ04.14.02

R2R Manufacturing of Stretchable Soft Electronics for Biosensing [Jukka Hast](#); VTT Technical Research Centre of Finland Ltd., Finland.

11:15 AM EQ04.14.03

Ethylene-Vinyl Acetate—A Promising Alternative to Polydimethylsiloxane for Stretchable Electronics [Pariya Nazari](#); Ruprecht-Karl Universität Heidelberg, Germany.

11:30 AM EQ04.14.04

Fully-Printed Single Channel P(VDF-TrFE) Transducer for Ultrasound Applications [Kirill Keller](#); Graz University of Technology, Austria.

11:45 AM EQ04.14.05

Ultrasensitive Flexible Broadband Photodetectors Based on Three-Dimensional Graphene [Shirin Movaghghamezhad](#); George Mason University, United States.

11:50 AM EQ04.14.06

Fully Printed Ionic Polymer-Metal Composite Soft Microactuator [Ji Zhang](#); University of Cambridge, United Kingdom.

12:05 PM EQ04.14.07

Polarized Photodetectors Based on Oriented Organic Semiconductors—Fabrication, Dark-Current Suppression and Applications [Aleksandr Perevedentsev](#)^{1,2}; ¹Karlsruhe Institute of Technology, Germany; ²InnovationLab, Germany.

SESSION EQ04.15: Advanced Soft Materials and Processing Concepts for Flexible Printed Optoelectronic Devices and Sensors III

Session Chair: Yong-Young Noh

Monday Afternoon, May 23, 2022

EQ04-Virtual

6:30 PM *EQ04.15.01

Making Printed 2D Crystal-Based Gas Sensors Smarter—From Materials Synthesis to Computational Algorithms [Tawfique Hasan](#); Cambridge University, United Kingdom.

7:00 PM EQ04.15.02

Facile Fabrication of Extremely Wet Surface Harnessing 5nm-thick Gallium Oxide on Liquid Metal [Kazi Zihan Hossain](#); University of Nevada, Reno, United States.

7:15 PM EQ04.15.03

Diffuse Solar Micro-Concentrators Using Dielectric Total Internal Reflection with Tunable Side and Top Profiles [Lulin Li](#); Johns Hopkins University, United States.

7:20 PM EQ04.15.04

Stability and Temporal Decay of Nanopatterned Tribocharge on Nanotextured Soft Polymeric Surfaces [Myunggi Ji](#); Iowa State University, United States.

SESSION EQ04.16: Advanced Soft Materials and Processing Concepts for Flexible Printed Optoelectronic Devices and Sensors IV

Session Chair: Do Hwan Kim

Monday Afternoon, May 23, 2022

EQ04-Virtual

9:00 PM *EQ04.16.01

Silk-Nanocarbon Hybrid Materials for Soft Electronics [Yingying Zhang](#); Tsinghua University, China.

9:30 PM *EQ04.16.02

Printable Flexible Electroactive Composite Materials and Devices [Pooi See Lee](#); Nanyang Technical University, Singapore.

10:00 PM EQ04.16.03

A Wirelessly Pressure Monitoring 3D Integrated Insole [Taeil Kim](#); Simon Fraser University, Canada.

10:15 PM *EQ04.16.04

Self-Healing and Stretchable Optoelectronic Devices [Benjamin C. Tee](#); National University of Singapore, Singapore.

SESSION EQ04.17: Advanced Soft Materials and Processing Concepts for Flexible Printed Optoelectronic Devices and Sensors V

Session Chair: Gerardo Hernandez-Sosa

Tuesday Morning, May 24, 2022

EQ04-Virtual

8:00 AM *EQ04.17.01

Flexible Printed Organic Sensors and Their Applications [Shizuo Tokito](#); Yamagata University, Japan.

8:30 AM *EQ04.17.02

Molecular Structural and Environmental Origins of Charge Trapping and Their Effects on Operational Stability of Organic Field-Effect Transistors [Kilwon Cho](#); Pohang University of Science and Technology, Korea (the Republic of).

9:00 AM EQ04.17.03

Enhanced Piezocapacitive Response in Zinc Oxide tetrapod-poly(dimethylsiloxane) Composite Dielectric Layer for Flexible and Ultrasensitive Pressure Sensor [Gen-Wen Hsieh](#); National Yang Ming Chiao Tung University, Taiwan.

9:15 AM EQ04.17.04

Influence of Corona Poling to PVDF-Based Dielectric Layers on Charge Transport of Organic Field-Effect Transistor with Dielectric Bilayer [Yina Moon](#); Gwangju Institute of Science and Technology, Korea (the Republic of).

9:30 AM *EQ04.17.05

Monolayer Organic Transistors—From Fabrications to Applications [Paddy K. L. Chan](#); University of Hong Kong, Hong Kong.

SYMPOSIUM EQ05

Semiconductor Physics of Halide Perovskites—From Fundamentals to Devices
May 9 - May 25, 2022

Symposium Organizers

Do Young Kim, Oklahoma State University
Jovana Milic, University of Fribourg
Aditya Mohite, Rice University
Stephen Sai-Wing Tsang,

* Invited Paper

SESSION EQ05.01: Thin-Film Processing, Characterization, Properties I
Session Chairs: Do Young Kim and Barry Rand
Monday Morning, May 9, 2022
Hawai'i Convention Center, Level 3, 316A

10:30 AM EQ05.01.02

Monitoring the Transition from Molecular Surface Passivation to 2D Layer Formation on 3D Perovskite Films [Tim Kodalle](#); Lawrence Berkeley National Laboratory (LBNL, LBL), United States.

10:45 AM EQ05.01.03

Increasing the Reverse Bias Breakdown Potential of Perovskite Solar Cells with a Conformal SnOx Barrier Layer [Isaac Gould](#)^{1,2}; ¹CU Boulder, United States; ²National Renewable Energy Laboratory, United States.

11:00 AM EQ05.01.04

Relationship Between Annealing Temperature and the Presence of PbI₂ Platelets at the Surfaces of Triple-Halide Perovskite Films [Dan R. Wargulski](#); Helmholtz-Zentrum Berlin für Materialien und Energie, Germany.

11:15 AM *EQ05.01.05

Two-Dimensional Organic-Perovskite Hybrid Materials and Heterostructures [Letian Dou](#); Purdue University, United States.

SESSION EQ05.02: Thin-Film Processing, Characterization, Properties II
Session Chairs: Biwu Ma and Aditya Mohite
Monday Afternoon, May 9, 2022
Hawai'i Convention Center, Level 3, 316A

1:30 PM EQ05.02.01

Enhanced Visible Light Absorption in Layered Cs₃Bi₂Br₉ Through Mixed-Valence Sn(II) / Sn(IV) Doping [Seán R. Kavanagh](#)^{2,3,1}; ¹CDT-ACM, United Kingdom; ²University College London, United Kingdom; ³Imperial College London, United Kingdom.

1:45 PM EQ05.02.03

Fully Roll-to-Roll Fabricated Perovskite PV Modules with Printed Carbon Electrodes [Luke Sutherland](#); CSIRO Manufacturing, Australia.

2:00 PM *EQ05.02.04

Metal Halide Perovskite Interfaces—Role in Doping and Degradation [Barry P. Rand](#); Princeton University, United States.

2:30 PM BREAK

3:00 PM EQ05.02.05

Universal Current Losses in Perovskite Solar Cells Due to Mobile Ions [Jarla Thiesbrummel](#); University of Potsdam, Germany.

3:15 PM EQ05.02.06

Light-Activated Interlayer Contraction in 2D Perovskites for High-Efficiency Solar Cells [Wenbin Li](#)^{8,1}; ¹Rice University, United States; ⁸Rice University, United States.

3:30 PM EQ05.02.07

Toward Scalable Fabrication of High-Quality Metal Halide Perovskite Films Through Confined-Volume Printing [Adam Printz](#)^{1,2}; ¹The University of Arizona, United States; ²The University of Arizona, United States.

3:45 PM EQ05.02.08

Post 10-Month MISSE 13 Space Flight Testing of Encapsulated MAPI Thin Film [William G. Delmas](#); University of California, Merced, United States.

4:00 PM EQ05.02.09

Doping Organic Interlayers in Perovskite Solar Cells with Carbon Dioxide [Jason A. Röhr](#); New York University, United States.

SESSION EQ05.03: Poster Session I: Semiconductor Physics of Halide Perovskites—From Fundamentals to Devices I

Session Chairs: Do Young Kim and Aditya Mohite

Monday Afternoon, May 9, 2022

5:00 PM - 7:00 PM

Hawai'i Convention Center, Level 1, Kamehameha Exhibit Hall 2 & 3

EQ05.03.01

Gas Sensing Properties at Room Temperature of Halide Perovskite Cs_2SnI_6 Thin Film Grown by Chemical Vapor Deposition Method [Hyojun Lim](#); School of Materials Science and Engineering, Kyungpook National University, Korea (the Republic of).

EQ05.03.02

Strategy for Highly Efficient Perovskite Solar Cell—The Ratio of Precursor with GBL:DMF:DMSO Mixing Solution [Dong Hyun Kim](#); Korea University, Korea (the Republic of).

EQ05.03.03

Compositional Engineering Triple-Cation Tin-Lead Iodides for Narrow-Band-Gap Perovskite Solar Cells [Sung Woong Yang](#); Kyungpook National University, Korea (the Republic of).

EQ05.03.04

Efficient Self-Powered Lead-Free Perovskite Based Broadband Photodetectors with High Environmental Stability [Amreen A. Hussain](#); Institute for Plasma Research, India.

EQ05.03.05

WITHDRAWN 5/5/22 E05.03.05 Perovskite Solar Cells with Efficiency Exceeding 25% via Enhanced Carrier Management [Seong Sik Shin](#); Korea Research Institute of Chemical Technology, Korea (the Republic of).

EQ05.03.06

Visualizing Current Flow In Solar Cell Electrodes [Greyson Christoforo](#); University of Oxford, United Kingdom.

EQ05.03.07

Direct Observation of Photoinduced, Non-Equilibrium Phase Transition in $\text{CH}_3\text{NH}_3\text{PbI}_3$ via Time-Resolved X-Ray Diffraction [Shobhana Panuganti](#); Northwestern University, United States.

EQ05.03.08

Energetics of π – Conjugated Surface Ligands on Metal Halide Perovskites and Their Influence on Interfacial Charge Transfer and Photovoltaic Performance [Harindi R. Atapattu](#); University of Kentucky, United States.

EQ05.03.09

Ultra-Stable and Robust Response to X-Rays in 2D Layered Perovskite Micro-Crystalline Films Directly Deposited on Flexible Substrate [Matteo Verdi](#)^{1,2}; ¹University of Bologna, Italy; ²National Institute for Nuclear Physics-INFN, Italy.

EQ05.03.11

Photoinduced Changes in Crystallinity in Two-Dimensional Layered Perovskites [Shelby Cuthriell](#); Northwestern University, United States.

EQ05.03.12

Optimizing Substrate Chemistry and Perovskite Composition for Reproducible Manufacturing of Efficient and Stable Perovskite Solar Cells [Annikki L. Santala](#); Swift Solar Inc., United States.

EQ05.03.13

Interfacial Strategies for Efficient and Stable Spray-Coated Perovskite Solar Cells in Open Air [Mathilde Fievez](#); Stanford University, United States.

EQ05.03.14

Machine Learning for Automatic, Accelerated Semiconductor Characterization from Time-Resolved Photoluminescence (TPRL) via Iterated Bayesian Inferencing—Case of $\text{CH}_3\text{NH}_3\text{PbI}_{3-x}\text{Cl}_x$ [Charles J. Hages](#); University of Florida, United States.

SESSION EQ05.04: Thin-Film Processing, Characterization, Properties III

Session Chairs: Kenneth Graham and Adam Printz

Tuesday Morning, May 10, 2022

Hawai'i Convention Center, Level 3, 316A

8:30 AM EQ05.04.01

Ultra-Thin Transition Metal Dichalcogenide Photovoltaics for Space Applications [Peter Bermei](#); Purdue University, United States.

8:45 AM EQ05.04.02

Pressure-Dependent Structural and Optical Properties of Dion-Jacobson and Ruddlesden-Popper Layered Hybrid Perovskites [Algirdas Ducinkas](#)^{2,3}; ²École Polytechnique Fédérale de Lausanne, Switzerland; ³Max Planck Institute for Solid State Research, Switzerland.

9:00 AM EQ05.04.03

Diverging Expressions of Anharmonicity in Halide Perovskites [Adi Cohen](#); Weizmann institute of Science, Israel.

9:15 AM EQ05.04.04

From 2D to 3D—A Green Solvent System for Templated Sequential Deposition of Efficient and Stable Perovskite Solar Cells [Benjamin Gallant](#); University of Oxford, United Kingdom.

9:30 AM BREAK**10:00 AM EQ05.04.05**

2D Surface Engineering for Efficient and Stable Perovskite Solar Cells [Kai Zhu](#); National Renewable Energy Laboratory, United States.

10:15 AM EQ05.04.06

Is Synthesis Complexity Responsible for Defect Formation in Wide Bandgap Halide Perovskites? [Carolyn M. Sutter-Fella](#); Lawrence Berkeley National Laboratory, United States.

10:30 AM *EQ05.04.07

Integrated Halide Perovskite Photoelectrodes for High-Efficiency and Durable Solar Water-Splitting [Aditya D. Mohite](#); Rice University, United States.

SESSION EQ05.05: Synthesis and Structural Characterization

Session Chairs: Aditya Mohite and Bayram Saparov

Tuesday Afternoon, May 10, 2022

Hawai'i Convention Center, Level 3, 316A

1:30 PM EQ05.05.01

Vertically Aligned Two-Dimensional Halide Perovskite as Artificial Synapses Toward Neuromorphic Computing [Seung Ju Kim](#); Seoul National University, Korea (the Republic of).

1:45 PM EQ05.05.02

A Selenophene-Containing Conjugated Organic Ligand for Two-Dimensional Halide Perovskite [Zitang Wei](#); Purdue University, United States.

2:00 PM EQ05.05.03

Induced Chirality in Halide Perovskite Clusters Through Surface Chemistry [Aaron Forde](#)^{2,3}; ²Los Alamos National Laboratory, United States; ³Los Alamos National Laboratory, United States.

2:15 PM EQ05.05.04

Intermediate-Phase Engineering via Dimethylammonium as Excess Cation for Stable Perovskite Solar Cells [Philippe J. Holzhay](#)^{2,1}; ¹Adolphe-Merkel Institute, Switzerland; ²University of Oxford, United Kingdom.

2:30 PM *EQ05.05.05

Molecular Dopants—Tools to Control the Electronic Structure of Metal Halide Perovskite Interfaces [Antoine Kahn](#); Princeton University, United States.

3:00 PM BREAK**3:30 PM EQ05.05.06**

WITHDRAWN 5/6/22 EQ05.05.06 Tailoring Phase Composition of Layered Ruddlesden-Popper Hybrid Perovskites for Broad Band Emission in Efficient Lighting Applications [Anna Stadlbauer](#); Walter Schottky Institut - Technical University Munich, Germany.

3:45 PM *EQ05.05.07

Alloying Metals in Halide Perovskites [Hemamala Karunadasa](#)^{1,2}; ¹Stanford University, United States; ²SLAC National Accelerator Laboratory, United States.

4:15 PM EQ05.05.08

WITHDRAWN 5/7/22 EQ05.05.08 Tailoring circular dichroism in One-Dimensional Hybrid Perovskites Using Chiral Amino Acids [Markus W. Heindl](#); Technische Universität München, Germany.

4:30 PM EQ05.05.09

Defects Activity in Wide Bandgap Metal Halide Perovskite Semiconductors [Annamaria Petrozza](#); Istituto Italiano di Tecnologia, Italy.

SESSION EQ05.06: Poster Session II: Semiconductor Physics of Halide Perovskites—From Fundamentals to Devices II

Session Chairs: Do Young Kim and Aditya Mohite

Tuesday Afternoon, May 10, 2022

5:00 PM - 7:00 PM

Hawai'i Convention Center, Level 1, Kamehameha Exhibit Hall 2 & 3

EQ05.06.01

Intact 2D/3D Halide Junction Perovskite Solar Cells via Solid-Phase In-Plane Growth (SIG) [Yeoun-Woo Jang](#)^{1,2}; ¹Seoul National University, Korea (the Republic of); ²Seoul National University, Korea (the Republic of).

EQ05.06.02

Probing the Stability and Degradation of 2D Perovskites Using *In Situ* Infrared Spectroscopy [Robert Balow](#); U.S. Naval Research Laboratory, United States.

EQ05.06.03

Preparation of (CH₃NH₃)₃Bi₂I₉ Thick Film via Mist Deposition Method for X-Ray Detection [Mioko Kawakami](#); Kyoto University, Japan.

EQ05.06.04

Halide Segregation in Ruddlesden-Popper Perovskites [Alessandro Caiazzo](#); TU Eindhoven, Netherlands.

EQ05.06.05

Demonstrating Metal Halide Perovskite Reversible Glass Transition via *In Situ* X-Ray Scattering [Damara G. Dayton](#); University of Colorado Boulder, United States.

EQ05.06.06

Universal Charge Transfer p-Doping Approach for Developing Intrinsic Properties of Perovskite Films [Youjin Reo](#); Pohang University of Science and Technology, Korea

(the Republic of).

EQ05.06.07

Illuminating Structure-Property Relationships of Methylammonium-Free Lead Halide Perovskites Through Advanced Characterization Studies of Halide- and Phase-Segregation [Diana K. LaFollette](#); Georgia Institute of Technology, United States.

EQ05.06.08

Doped Lead Halide Perovskites for Ionizing Radiation Detection [Ashley Conley](#); University of Virginia, United States.

EQ05.06.09

Incorporating 0D Perovskite Nanocrystals into 3D Matrix- Strong Enhancement of Photoluminescence/Electroluminescence [Riya Bose](#); The University of Texas at Dallas, United States.

EQ05.06.11

A Facile Surface Passivation for Thermally Stable Planar Perovskite Solar Cells by Using a Novel IDTT-Based Small Molecule Additive [Hyuntae Choi](#); Pohang University of Science and Technology, Korea (the Republic of).

EQ05.06.13

Highly Efficient Solar Cells Using Monodisperse Perovskite Quantum Dots [Seyeong Lim](#); Pohang University of Science and Technology, Korea (the Republic of).

EQ05.06.14

A General Interface Strategy for Stable Perovskite Solar Cell [Ke Ma](#); Purdue University, United States.

EQ05.06.15

Strongly Anharmonic Octahedral Tilting in 2D Hybrid Halide Perovskites [Matan Menahem](#); Weizmann Institute of Science, Israel.

EQ05.06.16

Improved Stability of Efficient Perovskite Solar Cells with Transition Metal Oxides (V, Mo, and Ti Oxides) as Versatile Charge Transporting Layers by Low-Temperature Atomic Layer Deposition [Seonghwa Jeong](#); Sungkyunkwan University, Korea (the Republic of).

EQ05.06.17

CsPbBr₃ Thin Film Grown by Dual-Source Evaporation for PeLED [Sung hoon Bac](#); Kyungpook National University, Korea (the Republic of).

SESSION EQ05.07: Photo-Physics, Spin, Photonics I

Session Chairs: Deep Jariwala and Kai Zhu

Wednesday Morning, May 11, 2022

Hawai'i Convention Center, Level 3, 316A

8:30 AM EQ05.07.01

Study of Synthesis Parameters on the Formation and Physical Properties of 2D/3D Hybrid Halide Perovskite Heterostructures for Solar Cells [Thomas Campos](#)^{1,2}; ¹Light, Material and Interfaces Laboratory (LuMI), France; ²Institut Photovoltaïque d'Ile-de-France (IPVF), France.

8:45 AM EQ05.07.02

Phase Segregation in Mixed-Halide Perovskites Impacts Charge-Carrier Dynamics While Preserving Mobility [Silvia G. Motti](#); University of Oxford, United Kingdom.

9:00 AM *EQ05.07.03

Emission Recovery of Photoquenched Perovskite Quantum Dots [William Yu](#); Louisiana State University Shreveport, United States.

9:30 AM EQ05.07.04

Understanding and Suppressing Non-Radiative Losses in Methylammonium-Free Wide Bandgap Perovskite Solar Cells [Robert Oliver](#); University of Oxford, United Kingdom.

9:45 AM *EQ05.07.05

Intrinsic Nanostructure and Halide Segregation in Metal Halide Perovskites [Laura Herz](#); University of Oxford, United Kingdom.

10:15 AM BREAK**10:45 AM EQ05.07.06**

Understanding the Photophysics of Layered Lead Halide Perovskites [Eelco K. Tckelenburg](#); University of Groningen, Netherlands.

11:00 AM EQ05.07.07

Strain Modified Carrier Dynamics in 2D Perovskites [Daniel Ratchford](#); Naval Research Laboratory, United States.

11:15 AM *EQ05.07.08

Scalable, Template Driven Formation of Highly Crystalline Lead-Tin Halide Perovskite Films [Maria Antonietta Loi](#); University of Groningen, Netherlands.

SESSION EQ05.08: Photo-Physics, Spin, Photonics II

Session Chairs: Letian Dou and Laura Herz

Wednesday Afternoon, May 11, 2022

Hawai'i Convention Center, Level 3, 316A

1:30 PM EQ05.08.01

Effect of Sub-Bandgap States in 2D Halide Perovskite Photodetector [Eunyoung Choi](#); University of New South Wales, Australia.

1:45 PM EQ05.08.02

Energy Cascade in Ruddlesden-Popper Lead Halide Perovskites—Exciton Delocalization and the Role of Organic Spacer [Sankaran Ramesh](#)^{1,2}; ¹Nanyang Technological University, Singapore; ²Energy Research Institute@NTU, Singapore.

2:00 PM *EQ05.08.03

Atomic Imaging of Octahedral Tilting in Two-dimensional Ruddlesden-Popper Perovskites [Kian Ping Loh](#); National University of Singapore, Singapore.

2:30 PM BREAK

3:00 PM EQ05.08.04

Perovskite Solar Cells with Enhanced Mechanical Reliability [Min Chen](#)^{2,1}; ¹Brown University, United States; ²National Renewable Energy Laboratory, United States.

3:15 PM EQ05.08.05

First-Principles Characterization of Surface Phonons of Halide Perovskite CsPbI₃ and Their Role in Stabilization [Ruoxi Yang](#); Lawrence Berkeley National Laboratory, United States.

3:30 PM EQ05.08.06

Investigating Excited State Coherence and Coupling in Engineered Spin-Cast Superlattices of 2D Halide Perovskites [Bogdan Dryzhakov](#); University of Tennessee Knoxville, United States.

3:45 PM EQ05.08.07

Energy Transfer in Stability-Optimized Perovskite Nanocrystals [Andreas Singldinger](#); Ludwig-Maximilians-Universität München, Germany.

4:00 PM EQ05.08.08

Chiral Induced Spin Selectivity in Halide Perovskites Enables Room Temperature Spin Light-Emitting Diodes [Young-Hoon Kim](#)^{1,2}; ¹Hanyang University, Korea (the Republic of); ²National Renewable Energy Laboratory, United States.

4:15 PM EQ05.08.09

In Operando, Photovoltaic, Microscopic Evaluation of Recombination Centers in Halide Perovskite-Based Solar Cells [Arava Zohar](#)^{2,1}; ¹Weizmann Inst, Israel; ²University of California, Santa Barbara, United States.

SESSION EQ05.09: Poster Session III: Semiconductor Physics of Halide Perovskites—From Fundamentals to Devices III

Session Chairs: Do Young Kim and Aditya Mohite

Wednesday Afternoon, May 11, 2022

5:00 PM - 7:00 PM

Hawai'i Convention Center, Level 1, Kamehameha Exhibit Hall 2 & 3

EQ05.09.01

Enhancing Moisture Stability of Alumina Passivated Inverted (p-i-n) Structure Perovskite Solar Cells Using SiO₂ Encapsulation [Tamanna Mariam](#); University of Toledo, United States.

EQ05.09.02

Ultralow Dark Current in Near-Infrared Perovskite Photodiodes by Reducing Charge Injection and Interfacial Charge Generation [Riccardo Ollearo](#); Eindhoven University of Technology, Netherlands.

EQ05.09.03

The A-Site Cation Effect on the Structural Dynamics of Lead-Bromide Perovskites [Guy Reuveni](#); Weizmann Institute of Science, Israel.

EQ05.09.04

Molecular Engineering of Interfacial Materials to Afford Perovskite Solar Cells and Modules with Improved Efficiency and Stability [Kasparas Rakstys](#); Kaunas University of Technology, Lithuania.

EQ05.09.05

Time to Go Bifacial—A Commercialization Pathway for Perovskite Photovoltaics [Zhaoning Song](#); University of Toledo, United States.

EQ05.09.06

Large-Scale Room Temperature One-Pot Synthesis of Perovskite Nanoplatelets for Blue Light-Emitting Diodes [Ju-Hyun Yoo](#); Yonsei University, Korea (the Republic of).

EQ05.09.07

Room Temperature Superfluorescence [Melike Biliroglu](#); North Carolina State University, United States.

EQ05.09.08

2D/3D Perovskite Heterojunction and Passivation with Amorphous TiO₂ for Efficient and Stable Perovskite Solar Cells^{1,2} [Seonghwa Jeong](#); Sungkyunkwan University, Korea (the Republic of).

EQ05.09.09

Solution-Processed Li Doped NiO_x as a Hole Transport Layer for Pb-Sn Mixed Low Bandgap Perovskite Solar Cells [You Jin Ahn](#); Seoul National University, Korea (the Republic of).

EQ05.09.11

Surface Engineering of Self-Assembled Monolayer for Strong Interlayer Contact in Perovskite Photovoltaics [Devthade Vidyasagar](#); Kyungpook National University, Korea (the Republic of).

EQ05.09.12

Space-Charge-Limited Electron and Hole Transport in Methyl Ammonium Lead Iodide Perovskites [Gert-Jan Wetzelaer](#); Max Planck Institute for Polymer Research, Germany.

EQ05.09.13

Entropy-Driven Stabilization of the Cubic Phase of MaPbI_3 Below Room Temperature [Jose A. Souza](#); Federal University of ABC, Brazil.

EQ05.09.14

Identification of Chemical Composition in Halide Perovskite Film Based on Scanning Transmission X-Ray Microscopy [Haeyeon Jun](#)^{1,2}; ¹LPICM, CNRS, Ecole Polytechnique, Institut Polytechnique de Paris, France; ²Synchrotron SOLEIL, L'Orme des Merisiers Saint-Aubin, France.

EQ05.09.15

Investigation of the Interactions Between Photo-Generated Charge Carriers and Defects in Perovskite Solar Cells by Photoluminescence Spectroscopy [Zhihua Xu](#); University of Minnesota-Duluth, United States.

EQ05.09.16

Room-Temperature NO_2 Gas Sensor Based on Cs_2TeI_6 Thin Film Under Blue-Light Illumination [Hyojun Lim](#); School of Materials Science and Engineering, Kyungpook National University, Korea (the Republic of).

SESSION EQ05.10: Photo-Physics, Spin, Photonics III
Session Chairs: Gerd Bacher and Maria Antonietta Loi
Thursday Morning, May 12, 2022
Hawai'i Convention Center, Level 3, 316A

8:00 AM *EQ05.10.01

Room Temperature Macroscopic Quantum Phenomena in Hybrid Perovskites [Kenan Gundogdu](#); North Carolina State University, United States.

8:30 AM EQ05.10.02

X-Ray Induced Modification of the Photophysical Properties of MAPbBr_3 Single Crystals [Giovanni Armaroli](#); Department of Physics and Astronomy, University of Bologna, Italy.

8:45 AM EQ05.10.03

Quantification of Efficiency Losses Due to Mobile Ions in Perovskite Solar Cells via Fast-Hysteresis Measurements [Martin Stolterfoht](#); University of Potsdam, Germany.

9:00 AM EQ05.10.04

Optoelectronic Properties of Tin-Based Narrow-Bandgap Halide Perovskites [Isabella Polj](#); Istituto Italiano di Tecnologia, Italy.

9:15 AM *EQ05.10.05

Preparation of High-Efficiency Light Emitters Based on Copper and Silver Halides [Bayram Saparov](#); University of Oklahoma, United States.

9:45 AM BREAK

10:15 AM EQ05.10.06

The Halogen Exchange Equilibrium in Halide Perovskites—Halide Diffusion, Spontaneous Electronic Doping, and Implications Towards Stability [Julian A. Vigil](#); Stanford University, United States.

10:30 AM EQ05.10.07

Lattice Configuration and Crystal Orientation of Single CsPbBr_3 Nanoplatelets Probed by Optical Spectroscopy [Gerd Bacher](#); Univ Duisburg-Essen, Germany.

SESSION EQ05.11: Devices, Stability Sustainability I
Session Chairs: Peter Bermel and Franziska Muckel
Thursday Afternoon, May 12, 2022
Hawai'i Convention Center, Level 3, 316A

1:30 PM *EQ05.11.01

Strong Light-Matter Coupling in Two-Dimensional Halide Perovskites [Deep Jariwala](#); University of Pennsylvania, United States.

2:00 PM EQ05.11.03

2D Perovskites for Wavelength-Selective Photodetectors [Franziska E. Muckel](#); University Duisburg-Essen, Germany.

2:15 PM *EQ05.11.04

Understanding the Influence of Defects, Light and Ion Conduction in Metal Halide Perovskites for Stability [Jinsong Huang](#); University of North Carolina-Chapel Hill, United States.

2:45 PM BREAK

3:15 PM EQ05.11.05

Open-Circuit and Short-Circuit Loss Management in Inverted Wide-Gap Perovskite *pin* Solar Cells [Pietro Caprioglio](#); University of Oxford, United Kingdom.

3:30 PM EQ05.11.06

Thermoelectric Performance of Two-Dimensional Halide Perovskites Featuring Conjugated Ligands [Sheng-Ning P. Hsu](#); Purdue University, United States.

3:45 PM EQ05.11.07

Dynamic Structural Fluctuations and Strongly Anharmonic Phonons in Inorganic Halide Perovskites [Olivier Delaire](#); Duke University, United States.

4:00 PM EQ05.11.08

Long-Range Carrier Transport and Recombination in All-Back-Contact Perovskite Solar Cells [Kevin J. Prince](#)^{1,2}; ¹National Renewable Energy Laboratory, United States; ²Colorado School of Mines, United States.

SESSION EQ05.12: Devices, Stability, Sustainability II
Session Chairs: Kenan Gundogdu and Jinsong Huang
Friday Morning, May 13, 2022
Hawai'i Convention Center, Level 3, 316A

8:30 AM EQ05.12.01

WITHDRAWN 5/8/22 EQ05.12.01 High-Performance Inorganic Metal Halide Perovskite Transistors [Ao Liu](#); Pohang University of Science and Technology, Korea (the Republic of).

8:45 AM EQ05.12.03

Understanding Charge Transport in Lead-Tin Perovskite Field Effect Transistors with Superior Performance [Krishanu Dey](#); University of Cambridge, United Kingdom.

9:00 AM *EQ05.12.04

Towards Spectrally Stable Blue Perovskite Light Emitting Diodes [Biwu Ma](#); Florida State University, United States.

9:30 AM EQ05.12.05

Controlled Ion Transport in Metal Halide Perovskites for Field-Effect Transistors Working at Room-Temperature [Beomjin Jeong](#); Pusan National University, Korea (the Republic of).

9:45 AM BREAK

10:15 AM EQ05.12.06

Exploiting Perovskites Multidimensionality for High Performance Photodiodes [Alessandro Caiazzo](#); TU Eindhoven, Netherlands.

10:30 AM EQ05.12.07

WITHDRAWN (EQ05.12) Radiation Tolerance, Self-Healing and Stability of Perovskite Solar Cells [Hadi Afshari](#); University of Oklahoma, United States.

10:45 AM EQ05.12.08

3D/2D Hybrid Perovskite Heterostructures for Thin-Film Field-Effect Transistors [Amita Ummadisingu](#); University of Cambridge, United Kingdom.

11:00 AM EQ05.12.09

Highly Efficient Perovskite-CIS Monolithic Tandem Solar Cells [Marco A. Ruiz Preciado](#)^{1,2}; ¹Karlsruhe Institute of Technology, Germany; ²Karlsruhe Institute of Technology, Germany.

SESSION EQ05.13: Devices, Stability, Sustainability III
Session Chairs: Charles Hages and In Soo Kim
Friday Afternoon, May 13, 2022
Hawai'i Convention Center, Level 3, 316A

1:30 PM *EQ05.13.01

Suppression of Defects and Ion-Migration for Efficient Perovskite Emitters and Light-Emitting Diodes [Tae-Woo Lee](#); Seoul National University, Korea (the Republic of).

2:00 PM EQ05.13.02

Self-Healing Polymer-Based Encapsulation for Lead-Sealed, Submersible, Stretchable and Scalable Modular Perovskite-Based Optoelectronics [In Soo Kim](#); Korea Institute of Science and Technology, Korea (the Republic of).

2:15 PM EQ05.13.03

High Sensitivity Flexible X-Ray Detectors Based on Printed Perovskite Inks [Matteo Verdi](#); University of Bologna, Italy.

2:30 PM EQ05.13.04

The Influence of Intrinsic Semiconductor Properties and Device Architecture on the Temperature Coefficients of Single Junction and Multi-Junction Perovskite Photovoltaics [Jay Patel](#)^{2,1}; ¹University of Colorado, United States; ²National Renewable Energy Laboratory, United States.

2:45 PM BREAK

3:15 PM EQ05.13.05

Mighty Morphin' Power of Perovskites [Lance M. Wheeler](#); National Renewable Energy Laboratory, United States.

3:30 PM EQ05.13.06

High-Current Bifacial Perovskite/Silicon Tandem Solar Cells via Shape-Controlled Two-Dimensional Perovskite Passivation [Esma Ugur](#); King Abdullah University of Science and Technology, Saudi Arabia.

3:45 PM EQ05.13.07

Highly Transparent, Scalable and Stable Perovskite Photovoltaics without Compromising Aesthetics [Tianran Liu](#); Princeton University, United States.

4:00 PM EQ05.13.08

Rapid Spray Plasma Processing for High-Throughput, Multi-Modal Curing of Perovskite Solar Modules [Austin Flick](#); Stanford University, United States.

SESSION EQ05.14: Semiconductor Physics of Halide Perovskites—From Fundamentals to Devices I
Session Chair: Jovana Milic
Wednesday Morning, May 25, 2022
EQ05-Virtual

8:00 AM *EQ05.12.02

Strategies for Efficient Inverted Architecture Devices [Yana Vaynzof](#); Technical University Dresden, Germany.

8:30 AM EQ05.14.03

Are Space Charges at Interfaces Between Halide Perovskites and Charge Carrier Transporting Layers Ionically or Electronically Induced? [Mina Jung](#); Max Planck Institute for Solid State Research, Germany.

8:45 AM EQ05.14.04

Photo De-Mixing in Two-Dimensional Dion-Jacobson Mixed Halide Perovskites [Ya-Ru Wang](#); Max Planck Institute for Solid State Research, Germany.

9:00 AM EQ05.14.05

A-Site Cation Influence on the Conduction Band of Lead Bromide Perovskites and Its Connection to Slow Hot Carrier Cooling [Gabriel J. Man](#); Uppsala University, Sweden.

9:15 AM EQ05.14.06

Luminescence Imaging of Perovskite Solar Cells [Akash Dasgupta](#); University of Oxford, United Kingdom.

9:30 AM EQ05.14.07

Quasi-2D Hybrid Organic-Inorganic Perovskites: DFT Modeling Approach [Omar A. Allam](#)^{1,2}; ¹Georgia Institute of Technology, United States; ²Georgia Institute of Technology, United States.

9:35 AM EQ05.14.08

Accessing Radiation-Matter Interactions in Perovskite Photovoltaics for Space Applications—*Readying the Launch* [Ahmad R. Kirmani](#); National Renewable Energy Laboratory, United States.

SESSION EQ05.15: Semiconductor Physics of Halide Perovskites—From Fundamentals to Devices II

Session Chair: Jovana Milic

Wednesday Morning, May 25, 2022

EQ05-Virtual

10:30 AM EQ05.15.01

Enhanced Self-Assembled Monolayer Surface Coverage by ALD NiO in p-i-n Perovskite Solar Cells [Nga Phung](#); TU Eindhoven, Netherlands.

10:45 AM EQ05.15.02

On the Equilibrium Electrostatic Potential and Light-Induced Charge Redistribution in Halide Perovskite Structures [Davide Regalado](#)^{1,2,3}; ¹Institut Photovoltaïque d'Île-de-France, France; ²Université Paris-Saclay, CentraleSupélec, CNRS, Laboratoire de Génie Electrique et Electronique de Paris, France; ³Sorbonne Université, CNRS, Laboratoire de Génie Electrique et Electronique de Paris, France.

11:00 AM EQ05.15.03

Tailoring Interfacial Energetics to Minimize Voltage Losses in FASnI₃ [Vesta Zhelyaskova](#); University of Colorado Boulder, United States.

11:05 AM EQ05.15.04

An Accurate Description of Excitonic Absorption in GaAs and Tri-Halide Perovskites (MAPbX₃) by Combining the Sommerfeld Enhancement Factor and Bands Fluctuations [Kevin Lizarraga](#); Pontificia Universidad Católica del Perú, Peru.

11:10 AM EQ05.15.05

Anomalous Charge Transport in Lead Halide Perovskite Field-Effect Transistors [Youcheng Zhang](#)^{1,2}; ¹Cavendish Laboratory, Department of Physics, University of Cambridge, United Kingdom; ²University of Cambridge, United Kingdom.

11:25 AM EQ05.15.06

Monolithic All-Perovskite Tandem Solar Cells with Minimal Optical and Energetic Losses [Junke Wang](#); Eindhoven University of Technology, Netherlands.

11:40 AM EQ05.15.07

Study of Energetic Distribution of Traps in Perovskite Solar Cell With Iron Pyrite as a Hole Transport Layer [Punit Sharma](#); Indian Institute of Technology Delhi, India.

11:45 AM EQ05.15.08

Quantitatively Assessing Hybrid Perovskite Degradation Using Spectroscopic Ellipsometry [Alvaro Tejada Esteves](#)^{1,2}; ¹Helmholtz-Zentrum Berlin für Materialien und Energie GmbH, Germany; ²Pontificia Universidad Católica del Perú, Peru.

11:50 AM EQ05.14.02

Exploring Carrier-Driven Exciton Formation in Upconverting Perovskite/Rubrene Bilayers Using Drift-Diffusion Simulations [Rowan MacQueen](#); Helmholtz-Zentrum Berlin für Materialien und Energie, Germany.

12:05 PM EQ05.14.01

WITHDRAWN 5/18/22 EQ05.14.01 Hysteresis of Perovskite Solar cells in the Spotlight; Scrutinizing the Contribution of Electron Transport Layer to EIS Spectra and Charge Carrier Dynamics [Rana Yekani](#); McGill University, Canada.

SESSION EQ05.16: Semiconductor Physics of Halide Perovskites—From Fundamentals to Devices III

Session Chair: Stephen Sai-Wing Tsang

Wednesday Afternoon, May 25, 2022

EQ05-Virtual

9:00 PM *EQ05.16.01

Strategic Approaches for Achieving High-Power Perovskite Solar Cells Under Indoor Light Conditions—Defect Control by Interface Engineering [Jong Hyun Kim](#); Ajou University, Korea (the Republic of).

9:30 PM *EQ05.16.02

Ligand-Engineered Bandgap Stability in Mixed-Halide Perovskite LEDs [Bo Ram R. Lee](#); Pukyong National University, Korea (the Republic of).

10:00 PM EQ05.16.03

Hole Selective Monolayers Directing to the Efficiency More Than 23% in Tin-Lead Mixed Perovskite Solar Cells [Gaurav Kapiil](#)^{1,2}; ¹The University of Electro-communications, Japan; ²The University of Tokyo, Japan.

10:15 PM EQ05.16.04

High Efficiency Tin-Lead Mixed Halides Perovskite Solar Cells via Additive Engineering with Enhanced Electronic Properties and Stability [Shahrir Razey Sahamir](#); The University of Electro-Communications, Japan.

10:30 PM EQ05.16.05

Visualizing Defects in Charge Transport Layers of Halide Perovskite-Based Solar Cells by Fluorescence Quenching Microscopy [Hannah Kwon](#); Korea Institute of Science and Technology (KIST), Korea (the Republic of).

SYMPOSIUM EQ06

Surfaces and Interfaces in Electronics and Photonics
May 8 - May 24, 2022

Symposium Organizers

Silvia Armini, IMEC
Santanu Bag, Air Force Research Laboratory
Mandakini Kanungo, Corning Incorporated
Hong Zhao, Virginia Commonwealth University

* Invited Paper

SESSION EQ06.01: Area Selective Deposition I
Session Chairs: Silvia Armini and Santanu Bag
Sunday Morning, May 8, 2022
Hawai'i Convention Center, Level 3, 314

8:30 AM *EQ06.01.01

Nanoscale Chemically Self-Aligned Thin Films Using Simultaneous Adjacent Deposition and Etching [Gregory N. Parsons](#); North Carolina State Univ, United States.

9:00 AM EQ06.01.02

Area-Selective Deposition of Titanium Oxide and Titanium Nitride for Nanoscale Patterning Solutions Based on Self-Aligned Tone Reversal Scheme [Silvia Armini](#); IMEC, Belgium.

9:15 AM EQ06.01.03

Plasma-assisted Atomic Layer Deposition of Monolayer AlO_x on GaN for Surface Functionalization and Low-Resistance Contacts [Alex Henning](#); Technical University of Munich, Germany.

9:30 AM BREAK

10:00 AM EQ06.01.04

ALD- and CVD-Based Nanolayers for Germanium Surface Passivation [Willem-Jan Berghuis](#); Eindhoven University of Technology, Netherlands.

10:15 AM EQ06.01.05

The Importance of the Metal-Adjacent Atom in Hybrid Metal/Organic Vapor Deposition [Jacqueline Lewis](#); Stanford University, United States.

10:30 AM EQ06.01.07

Integrating ALD with Anion Exchange Chemistry to Tune p-type CuO_xS₂ Semiconductors with Atomic Precision [Julia D. Leneff](#); University of Michigan–Ann Arbor, United States.

10:45 AM *EQ06.01.08

Control of Interfacial Grain Structure for Deposition of III-V Nitrides with RF Bias Atomic Layer Annealing [Andrew Kummel](#); University of California, San Diego, United States.

SESSION EQ06.02: Interface Engineering
Session Chairs: Silvia Armini and Jane Chang
Sunday Afternoon, May 8, 2022
Hawai'i Convention Center, Level 3, 314

1:30 PM EQ06.02.01

Surface Functionalization for Selective Mid-Infrared On-Chip Gas Sensing [Diana Al Husseini](#); Texas A&M University, United States.

1:45 PM EQ06.02.02

Extremely Scaled Hetero-Junction Channel TFT for Advanced Electronics [Sonu Devi](#); National University of Singapore, Singapore.

2:00 PM *EQ06.02.04

Atomic Layer Processing for Engineering Interfaces in Functionally Enhanced Complex Materials [Jane P. Chang](#); University of California, Los Angeles, United States.

2:30 PM EQ06.02.05

Electron Scattering at Rh and Ir Surfaces and Grain Boundaries [Atharv Jog](#); Rensselaer Polytechnic Institute, United States.

2:45 PM BREAK

3:15 PM EQ06.02.06

Enhanced Light Emission by Engineering Random Strain Fields at the Interface Between Crystalline-Si and Rare-Earth Doped Silica [Sufian Abedrabbo](#); Khalifa University of Science and Technology, United Arab Emirates.

3:30 PM EQ06.02.07

Customising Material Properties Through Interfacial Patterning [Shane G. Davies](#); University of Exeter, United Kingdom.

3:45 PM EQ06.02.08

Magnetic Tunnel Junction based Molecular Spintronics Devices—A Method of Harnessing Exotic Properties of Molecular Nanostructure [Pawan Tyagi](#); University of District of Columbia, United States.

4:00 PM EQ06.02.09

Enhanced Efficiency of Inverted Triple Cation Perovskite Solar Cells Assisted by Antisolvent Crystallization with PEDOT:PSS as the Hole Transport Layer [Banashree Gogoi](#); Arizona State University, United States.

SESSION EQ06.03: Interfaces in Wearable Electronics

Session Chairs: Santanu Bag, Mandakini Kanungo and Rebecca Kramer-Bottiglio

Monday Morning, May 9, 2022

Hawai'i Convention Center, Level 3, 314

10:30 AM *EQ06.03.01

Are Liquid Metals Bulk Conductors? [Rebecca Kramer-Bottiglio](#); Yale University, United States.

11:00 AM EQ06.03.02

VTH Shift in n-MoS₂ and p-MoTe₂ FET Induced by Surface Charge Transfer from Organic Thin Film [Yongjae Cho](#); Yonsei University, Korea (the Republic of).

11:15 AM EQ06.03.03

Photoresponse on Cu-Cu₂O-Cu Flexible Photodetectors Fabricated Using Laser-Induced Digital Oxidation [Junil Kim](#); DGIST, Korea (the Republic of).

11:30 AM EQ06.03.04

Tuning the Surface Properties of Liquid Metal Particles via Non-Native Shells for Stimuli-Responsive Electronics [Wilson Kong](#)^{1,2}; ¹Air Force Research Laboratory, United States; ²National Research Council, United States.

11:45 AM EQ06.03.05

Pushing Electrochemical Transformations and Enhancing Carrier Doping in Functional Oxides by Electrolyte Gating [Hua Zhou](#); Argonne National Laboratory, United States.

SESSION EQ06.04: Interfaces in Energy Harvesting and Thin-film Devices

Session Chairs: Santanu Bag, Mandakini Kanungo and Tse Nga Ng

Monday Afternoon, May 9, 2022

Hawai'i Convention Center, Level 3, 314

1:30 PM *EQ06.04.01

Development of Energy Harvesting and Storage Structures through Printing Customizations [Tse Nga Ng](#); University of California, San Diego, United States.

2:00 PM EQ06.04.02

Improved Temperature Stability of Source-Gated IGZO Thin-Film Transistors via Insulating Contact Layers [Radu A. Sporea](#); University of Surrey, United Kingdom.

2:15 PM EQ06.04.03

Offset and Noise Reduction with Bridge Resistance Compensation in a Self-Balanced PHMR Sensor [Changyeop Jeon](#); DGIST, Korea (the Republic of).

2:30 PM EQ06.04.04

Role of Interfacial Layers in the Performance of EGO FETs and EGO FET-Biosensors [Larissa Huetter](#); Institute for Bioengineering of Catalonia, Spain.

2:45 PM EQ06.04.05

Interface Engineering of Potential Ruthenium Interconnect for Reduced Electrical Resistivity [Yu-Lin Chen](#); National Tsing Hua University, Taiwan.

3:00 PM BREAK

3:30 PM EQ06.04.06

Inorganic Nanoparticle Fillers for Electricity from Solar Energy Parks in Africa to European Cities [Richard T. Olsson](#); KTH Royal Institute of Technology, Sweden.

3:45 PM EQ06.04.07

Heterostructural Interface Atomic-Structure Predictions for SnO₂/CdTe with CdCl₂ Treatment in Photovoltaics [Stephan Lany](#); National Renewable Energy Laboratory, United States.

4:00 PM *EQ06.04.08

Carrier-Resolved Photo Hall Effect and the Parallel Dipole Line Hall System [Oki Gunawan](#); IBM Research, United States.

SESSION EQ06.05: Poster Session I: Surfaces and Interfaces I

Session Chairs: Silvia Armini, Santanu Bag and Mandakini Kanungo

Monday Afternoon, May 9, 2022

5:00 PM - 7:00 PM

Hawai'i Convention Center, Level 1, Kamehameha Exhibit Hall 2 & 3

EQ06.05.01

Preparation of Controlled Porphyrin Aggregate Layer on TiO₂ Surface for High Photocatalytic Activity [Junsik Nam](#); Gwangju Institute of Science and Technology, Korea (the Republic of).

EQ06.05.02

Effect of Graphene-Assisted Interface Engineering on Atomic Interdiffusion in Heterostructure System [Sunkyu Kim](#)^{1,2}; ¹Sejong University, Korea (the Republic of); ²Hybrid Materials Research Center (HMC), Korea (the Republic of).

EQ06.05.03

Long Term Anti-Corrosion Effect of Nitrogen-Doped Amorphous Carbon Film on Transparent and Deformable Ultrathin Copper Film [Chae-Eun Shim](#); Pohang University of Science and Technology, Korea (the Republic of).

EQ06.05.04

High-Definition Optophysical Image Construction Having Pixelated Wrinkles [Kitae Kim](#); Chungnam National University, Korea (the Republic of).

EQ06.05.06

Advanced Organic Transistor-Based Sensor utilizing Solvatochromic Medium with Twisted Intramolecular Charge-Transfer Behavior and Its Application to Ammonia Gas Detection [Seungtaek Oh](#)^{1,2}; ¹Hanyang University, Korea (the Republic of); ²Hanyang University, Korea (the Republic of).

EQ06.05.07

Manipulation of Mid-Infrared Emission via Metal Dielectric Metal Approaches [Qimeng Song](#); Bayreuth University, Germany.

EQ06.05.08

Metal-Insulator Phase Transitions in Vanadium Dioxide Nanobeams via Core-Shell Heterostructure-Enabled Stress Engineering [Ki Hoon Shin](#); Dongguk University, Korea (the Republic of).

EQ06.05.09

First-Principles Analysis of Electronic Characteristics of Bilayer Dicalcium Nitride (Ca₂N) with Point Defect [Jinwoong Chae](#); Sejong University, Korea (the Republic of).

EQ06.05.10

WITHDRAWN 5/9/22 EQ06.05.10 Controlling Angle Between Magnetic Moments of Adjacent Films [Erol Girt](#); Simon Fraser University, Canada.

EQ06.05.11

Area-Selective Chemical Vapor Polymerization—Multistage Growth and Temperature-Pressure Control of Deposition [Xiaoyang Zhong](#); University of Michigan—Ann Arbor, United States.

EQ06.05.12

Strain-Controlled Atomic Scale Distortions and Anti-Ferromagnetism at LaFeO₃/SrTiO₃ Interface [Menglin Zhu](#); Ohio State University, United States.

EQ06.05.13

Surface Chemical Composition and Thermal Stability of Ge/Ge_{1-x}Sn_x Co-Axial Heterostructures [Paul McIntyre](#); Stanford University, United States.

EQ06.05.14

Strain-Free Perovskite Hetero-Chalco-Epitaxy with Giant Lattice Constant Mismatch Enabled by Self-Assembled Surface Passivation Using Gas-Source MBE [Rafael Jaramillo](#); Massachusetts Institute of Technology, United States.

EQ06.05.15

WITHDRAWN 5/6/22 EQ06.05.15 Interface Strain Engineering in Ferroelectric AlScN Through Multilayer Structure [Pariasadat Musavigharavi](#); University of Pennsylvania, United States.

EQ06.05.17

High Tunneling-Electroresistance and Non-Linearity via Tunneling-Barrier Modulation in Ferroelectric Tunnel Junction [Hojin Lee](#); Sejong University, Korea (the Republic of).

EQ06.05.18

Surface Engineering with Monolayer Precision Using Atomic Layer Etching—Application to Superconducting Microwave Resonators [Haozhe Wang](#); California Institute of Technology, United States.

EQ06.05.19

Atomic Layer Deposition for Surface Modification of Various High Aspect Ratio 1D Nanomaterials [Jan M. Macak](#)^{1,2}; ¹Univ of Pardubice, Czechia; ²Brno University of Technology, Czechia.

EQ06.05.20

Hierarchically Designed Nanoparticles for High-Transparency, Self-Cleaning Surfaces [Jin-Woo Cho](#); Kyung Hee University, Korea (the Republic of).

EQ06.05.21

The Engineering of Heterojunctions in Core-Shell Heterostructures for Gas Sensing [Muhammad Hamid Raza](#); Humboldt-Universität zu Berlin, Germany.

EQ06.05.22

Surface Modification of TCOs(Transparent Conductive Oxides) for Colloidal-Ink Based Photoelectronic Devices [Yoolim Cha](#)^{1,2}; ¹Auburn University, United States; ²Gachon University, Korea (the Republic of).

EQ06.05.23

First-Principles Investigation of Crossover Between ALD and CVD in the Thin Film Deposition of Gold [Casey N. Brock](#); Schrödinger Inc, United States.

EQ06.05.24

Understanding Intercalation Kinetics and Structural Changes of Chevrel Phase Sulfides as a Function of Stoichiometric Control of Cu Intercalation in Aqueous

Environment via Electrochemical Methods Kabian Ritter; University of California, Davis, United States.

SESSION EQ06.06: Area Selective Deposition II
Session Chairs: Silvia Armini, Santanu Bag, Mandakini Kanungo and Adrie Mackus
Tuesday Morning, May 10, 2022
Hawai'i Convention Center, Level 3, 314

8:30 AM *EQ06.06.01

Surface Functionalization Using Small Molecule Inhibitors for Area-Selective Atomic Layer Deposition Adrie Mackus; Eindhoven University of Technology, Netherlands.

9:00 AM EQ06.06.02

Influence of Thickness and Surface Composition on the Stability of Ferroelectric Polarization in Ultrathin HfO₂ Adrian Acosta; University of California, Los Angeles, United States.

9:15 AM EQ06.06.03

Developing Hafnium Oxide Thin Films on Silicon with Robust Wet Chemical Etch Resistance Ailish Wratten; University of Warwick, United Kingdom.

9:30 AM BREAK

10:00 AM *EQ06.06.04

Guiding Area Selective Deposition by a Mechanistic Understanding of Surface Chemistry Stacey F. Bent; Stanford University, United States.

10:30 AM EQ06.06.05

Surface States Spectroscopic Characterization in GaN—From Bare Wafers to GaN HEMT Yury Turkulets; Ben Gurion University of the Negev, Israel.

10:45 AM EQ06.06.06

Surface Passivation by ALD and CVD Nanolayers for Electronics and Photonics Erwin Kessels; Eindhoven Univ of Technology, Netherlands.

11:00 AM EQ06.06.07

In Situ Characterization of Cleaning and Passivation of Cu Surface for Applications to Area Selective Atomic Layer Deposition Su Min Hwang; The University of Texas at Dallas, United States.

SESSION EQ06.07: Interface Characterization
Session Chairs: Silvia Armini, John Conley and Mandakini Kanungo
Tuesday Afternoon, May 10, 2022
Hawai'i Convention Center, Level 3, 314

1:30 PM EQ06.07.01

Exposing Dynamical Phase Transitions and Electro-Thermal Transport in TiTe₂ Thin Films Christopher Perez^{1,2}; ¹Stanford University, United States; ²Sandia National Laboratories, United States.

1:45 PM EQ06.07.02

Resistivity Size Effect in Thin Metal Films Computed with a Realistic Tight-Binding Model Patrick K. Schelling; Univ of Central Florida, United States.

2:00 PM *EQ06.07.03

Internal Photoemission (IPE) Spectroscopy Measurement of Energy Barriers at Interfaces in Metal/Insulator/Metal (MIM) Devices John F. Conley; Oregon State University, United States.

2:30 PM BREAK

3:00 PM EQ06.07.04

Theoretical Approach to the Catalytic and Photochemical Reactions on Semiconductor Surfaces Heechae Choi; University of Cologne, Korea (the Republic of).

3:15 PM *EQ06.07.05

In Operando XPS Study of Dry Etching of Metals Robert Opila; University of Delaware, United States.

SESSION EQ06.08: Poster Session II: Surfaces and Interfaces II
Session Chairs: Silvia Armini, Santanu Bag and Mandakini Kanungo
Tuesday Afternoon, May 10, 2022
5:00 PM - 7:00 PM
Hawai'i Convention Center, Level 1, Kamehameha Exhibit Hall 2 & 3

EQ06.08.01

Cu₂O Thin-Film Transistor with Enhanced Switching Characteristics by Controlling Deposition Condition and Annealing in N₂ Atmosphere Jae Hak Lee; Seoul National University, Korea (the Republic of).

EQ06.08.02

WITHDRAWN 5/10/22 EQ06.08.02 Fabrication of Polymer Dispersed Liquid Crystal based Switchable Glazing via Vacuum Coupling Naila Nasir; Sejong University, Korea (the Republic of).

EQ06.08.03

Galvanic Corrosion Inhibition of Copper Film for Ruthenium Barrier Film Chemical Mechanical Planarization Slurry Gangyu Lee; Hanyang University, Korea (the Republic of).

EQ06.08.04

High-Throughput Fabrication of Flexible LSPR Sensor Platforms Based on Roll-to-Roll Nanoimprinting and Controlled Angled Metal Deposition [Kwangjun Kim](#); Seoul National University of Science and Technology, Korea (the Republic of).

EQ06.08.05

Continuous and High-Precision Period-Programmable Micro- and Nanopatterning by the Mold-Free Piezo-Actuated One-Axis-Vibrational Patterning (POP) Principle [Minwook Kim](#); Seoul national university of science and technology, Korea (the Republic of).

EQ06.08.06

Investigation the Charge Transport Properties of Hetero-Nanojunction Gate of Defect-Rich nanofiber at Various Gas Environment [Yi-Ching Ou Yang](#); Tamkang University, Taiwan.

EQ06.08.07

Experimental Evaluation of Water Side Permeation in Thin-Film Encapsulation [Kangling Wu](#); Bertarelli Foundation Chair in Neuroprosthetic Technology, Laboratory for Soft Bioelectronic Interfaces, Institute of Microengineering, Institute of Bioengineering, Centre for Neuroprosthetics, École Polytechnique Fédérale de Lausanne, Switzerland.

EQ06.08.08

Perovskite Adhesion on Rigid Substrates Coated with Metallic Thin Films [Xavier T. Vorhies](#); Montana Technological University, United States.

EQ06.08.09

Hygroscopic Aqueous Film Assisted Detection of Hydrolysable Toxic Compounds Based on Carbon Nanotube Sensor [SeongWoo Lee](#); Ulsan National Institute of Science and Technology, Korea (the Republic of).

EQ06.08.10

Self-Stratifying Coatings Using Fluorinated Acrylic Copolymer / BPA Epoxy Depending on Difference in Surface Energy [Ho Sun Lim](#); Sookmyung Women's University, Korea (the Republic of).

EQ06.08.11

Plasma Etching Behavior of PVT and CVD SiC in Harsh Environments [Jongbeom Kim](#); Seoul National University, Korea (the Republic of).

EQ06.08.13

Thiol-ene Click Chemistry for Ligand-Crosslinking in Nanocrystal Solids [Inyoung Jeong](#); Hanyang University, Korea (the Republic of).

EQ06.08.15

Defect Controlling Nano-Junction Gate Devices Trigger by Gas Molecular with Multiple Wavelength Light [Guan Hong Wu](#); Tamkang University, Taiwan.

EQ06.08.16

Multi-Peak One-Dimensional Photonic Crystals via Hybrid Strategies [Samuel Wallaert](#); Karim Laboratory, United States.

EQ06.08.18

Interlayer Exciton-Driven Efficient Photocatalysis on Z-Scheme C_3N_3/C_3N_4 van der Waals Heterostructure [Nikhilesh Maity](#); Indian Institute of Science, India.

EQ06.08.19

ARTEMIS—A Tool for Interface Structural Prediction Aiding in the Exploration of Electronic and Optical Properties [Steven P. Hepplestone](#); University of Exeter, United Kingdom.

EQ06.08.20

Epitaxial and Clean Molybdenum Disulfide/Gallium Nitride Junctions—Low-Knee-Voltage Schottky-Diode Behavior at Optimized Interfaces [Ludwig Bartels](#); University of California, Riverside, United States.

EQ06.08.21

WITHDRAWN 5/10/22 EQ06.08.21 Tailored Illumination Inputs Effect Spontaneous Nanoscale Interface Shaping of Chalcogen Alloys [Azhar I. Carim](#); California Institute of Technology, United States.

SESSION EQ06.09: Surfaces and Interfaces in Electronics and Photonics I
Session Chairs: Mandakini Kanungo, Ephraim Suhir and Gilad Zorn
Monday Afternoon, May 23, 2022
EQ06-Virtual

8:55 PM EQ06.09.01

Single-Crystal-Like Ge(110) Layers for High-Performance Flexible Thin-Film Transistors [Takamitsu Ishiyama](#); University of Tsukuba, Japan.

9:10 PM EQ06.09.02

Analytical Modeling in Microelectronics Materials Reliability Problems—Its Role and Significance [Ephraim Suhir](#)^{1,2,3}; ¹ERS Co., United States; ²James Cook University, Mackay Institute of Research and Innovation, Australia; ³Portland State University, United States.

9:25 PM EQ06.09.03

Electrical Properties and Interfacial Characterization of NiSi₂ Nanostructures In Nanowires [Chia-Yi Wu](#); National Yang Ming Chiao Tung University, Taiwan.

9:40 PM EQ06.09.04

Surface Characterization of Cr/Ni and Ni/Cr Ohmic Contacts on n-Type 3C-SiC [Patrick W. Leech](#); RMIT University, Australia.

9:45 PM EQ06.09.05

Modulation of Electric Field in Metal Insulator Transition(MIT) of VO₂ Thin Film by Manipulating the Interface [Sooraj Kumar](#); Indian Institute of Technology Delhi, India.

9:50 PM EQ06.09.06

Tuning YSZ- and SiN_x-Based Granular Metal Conductivity by Controlling Island Morphology and Interface Interactions [Simeon Gilbert](#); Sandia National Laboratories, United States.

9:55 PM EQ06.09.07

Ni/(0001)InSe 2D Nanosystem on Cleaved Surface of InSe Layered Semiconductor Crystal Intercalated by Nickel [Volodymyr Dziuba](#); Ivan Franko Lviv National University, Ukraine.

10:00 PM EQ06.09.08

Root Cause Detection of Excursion—An Empirical Study for Semiconductor Manufacturing [Youjin Lee](#)^{1,2}; ¹Sungkyunkwan University, Korea (the Republic of); ²Samsung Electronics Co., Korea (the Republic of).

10:05 PM EQ06.09.09

Crystal Orientation Dependent Conductivity Improvement of Pure NiO Epitaxial Thin-Film Surface by Irradiation of Excimer Vacuum-ultraviolet Light [Kenta Kaneko](#); Tokyo Institute of Technology, Japan.

10:10 PM EQ06.09.10

An Economical Paper-Based SERS Approach Established by Chemically Synthesized Aluminum Nanoparticles [Chiao-Jung Su](#); National Tsing Hua University, Taiwan.

10:25 PM EQ06.09.11

WITHDRAWN 5/18/22 EQ06.09.11 Low Work-Function Cathode Enabled by Carbolong-Derived Complexes for High-Performance Perovskite Solar Cells [Jiantao Wang](#); University of North Carolina at Chapel Hill, United States.

10:40 PM EQ06.09.12

Palladium Selectivity for CMP of Packaging and Barrier Level Integration [John Langhout](#)^{2,4}; ²NSF Center for Particle and Surfactant Systems, United States; ⁴University of Florida, United States.

10:55 PM EQ06.08.12

Hydrophobic and Water-Repellent Modification of Polymeric Surfaces with Co-Curing of Silica Aerogel [Hyunsun Song](#); Korea Institute of Science and Technology, Korea (the Republic of).

SESSION EQ06.10: Surfaces and Interfaces in Electronics and Photonics II

Session Chairs: Stephanie Lacour and Chang-Yong Nam

Tuesday Morning, May 24, 2022

EQ06-Virtual

10:30 AM EQ06.10.01

Ge-Doped Sb₂Se₃ Thin-Film Solar Cells—Optical and Morphological Properties [Sanghyun Lee](#); Indiana State University, United States.

10:45 AM EQ06.10.02

Probing Buried Interfaces and Localised Defects Using Hard X-Ray Photoelectron Spectroscopy [Anna Regoutz](#); University College London, United Kingdom.

11:00 AM *EQ06.10.03

Approaches to Design, Grow and Assess Hermetic Hybrid Barrier Coatings for Flexible and Stretchable Electronics [Stephanie P. Lacour](#); Ecole Polytechnique Federale de Lausanne, Switzerland.

11:30 AM EQ06.10.04

High Spatial Photoluminescence Investigation of Nanostructures with Single-Molecule Sensitivity [Christian Oelsner](#); PicoQuant GmbH, Germany.

11:35 AM EQ06.10.05

Structural and Electronic Properties of In Double Layers on Si(111) $\sqrt{3}\times\sqrt{3}$ -B [Insung Seo](#); Tokyo Institute of Technology, Japan.

11:40 AM *EQ06.10.06

Vapor-Phase Infiltration (VPI)—An Emerging Hybrid Synthesis and Nanopatterning Method Derived from Atomic Layer Deposition (ALD) for Microelectronics Applications [Chang-Yong Nam](#); Brookhaven National Laboratory, United States.

12:10 PM EQ06.10.07

Variable-Energy XPS Characterisation of TiW/Cu Heterostructures in Power Semiconductor Devices [Curran Kalha](#); University College London, United Kingdom.

12:25 PM EQ06.10.08

Spin Pumping Study in Ion-Beam Sputtered β -W/C₀₂FeAl Heterostructures and Effects of Different Interlayers (Al, Mg, Ta, Mo) [Soumyarup Hait](#); Indian Institute of Technology Delhi, India.

SYMPOSIUM EQ07

Emerging Opto-Magnetic Materials—Advances, Trends and Challenges at the Interface Between Optics and Magnetism
May 11 - May 25, 2022

Symposium Organizers

Luis Carlos, University of Aveiro
Ana de Bettencourt-Dias, University of Nevada
Eva Hemmer, University of Ottawa
Fernando Sigoli, UNICAMP

* Invited Paper

SESSION EQ07.01: Optical Materials
Session Chairs: Eva Hemmer and Ute Resch-Genger
Wednesday Morning, May 11, 2022
Hawai'i Convention Center, Level 3, 314

10:30 AM *EQ07.01.01

Tapping into Molecular Cluster-Aggregate's Size to Fine-Tune the Magnetic and Luminescent Properties [Muralee Murugesu](#); University of Ottawa, Canada.

11:00 AM *EQ07.01.02

Luminescence Thermometry of Eu-Tb Mixed Metal-Organic Frameworks—Some Ways to Tune the Thermometric Performances [Helene Serier-Brault](#); Institut of Materials Jean Rouxel, University of Nantes, France.

11:30 AM EQ07.01.03

Design Your Own Nanothermometer—From Core-Shell Nanoparticles to Nanorattles, Nanoplatforms and Nanocomposites [Anna M. Kaczmarek](#); Ghent University, Belgium.

SESSION EQ07.02: Poster Session: Emerging Opto-Magnetic Materials and Molecules
Session Chair: Eva Hemmer
Wednesday Afternoon, May 11, 2022
5:00 PM - 7:00 PM
Hawai'i Convention Center, Level 1, Kamehameha Exhibit Hall 2 & 3

EQ07.02.01

Superparamagnetic Properties of Metal-Free Nitrogen Doped Graphene Quantum Dots Synthesized by Pulsed Laser Ablation [Muhammad Shehzad Sultan](#); University of Puerto Rico at Río Piedras, United States.

EQ07.02.02

Proximity-Mediated Spin Transport Through Transition Metal Dichalcogenide Interfaces [Derick C. DeTellem](#); University of South Florida, United States.

EQ07.02.03

Controlling the Nature of Exchange Interaction in Lanthanide-Based Single-Molecule Magnets [Juho Toivola](#); University of Jyväskylä, Finland.

EQ07.02.04

Yb (III) Single Molecule Magnet as a Liquid Quantum Cell for Magnetic Sensing [Ashley J. Shin](#); University of California Los Angeles, United States.

EQ07.02.05

Relating the Intricacies of Lanthanide Core-Loss EELS Features to 4f-Electron Behavior [Ellis Kennedy](#); University of California, Berkeley, United States.

SESSION EQ07.03: Single-Molecule Magnets
Session Chairs: Eva Hemmer and Muralee Murugesu
Thursday Morning, May 12, 2022
Hawai'i Convention Center, Level 3, 314

8:30 AM *EQ07.03.01

Predicting Magnetic Properties of Lanthanide-Based Single-Ion Magnets from *Ab Initio* Electronic Structure Calculations [Sergey A. Varganov](#); University of Nevada, Reno, United States.

9:00 AM *EQ07.03.02

Radical Approach to Lanthanide-Based Single-Molecule Magnets [Jani O. Moilanen](#)^{1,2}; ¹University of Jyväskylä, Finland; ²University of Jyväskylä, Finland.

9:30 AM BREAK

SESSION EQ07.04: Opto-Magnetic Materials and Hybrids I
Session Chair: Eva Hemmer
Thursday Morning, May 12, 2022
Hawai'i Convention Center, Level 3, 314

10:30 AM *EQ07.04.01

Magnetic Nanomaterials—From Unexpected Luminescence to Unexpected Magnetism [Simon Trudel](#); University of Calgary, Canada.

11:00 AM EQ07.04.03

Photoexcited Charge Carrier and Spin Dynamics in Methylammonium Lead Bromide Doped by Magnetic Transition Metals [Stanislav Bodnar](#); Technische Universität München, Germany.

11:15 AM EQ07.04.04

Novel Self-Assembled Two-Dimensional Layered Oxide Structure Incorporated with Au Nanoinclusions Towards Multifunctionalities [Di Zhang](#)^{1,2}; ¹Purdue University, United States; ²Los Alamos National Laboratory, United States.

SESSION EQ07.05: Opto-Magnetic Materials and Hybrids II
Session Chair: Eva Hemmer
Thursday Afternoon, May 12, 2022
Hawai'i Convention Center, Level 3, 314

1:30 PM *EQ07.05.01

Chemical and Biological Sensing Strategies Based on Upconversion, Metallic and Magnetic Nanoparticles and Their Assemblies [Andrea S. De Camargo](#)^{1,2}; ¹University of São Paulo, Brazil; ²Westfälische Wilhelms-Universität Münster, Germany.

2:00 PM EQ07.05.02

Giant Induced Magnetization by Inverse Faraday Effect in α -W Thin Films [Victor H. Ortiz](#); University of California, Riverside, United States.

2:15 PM EQ07.05.03

Spark Ablation—A Novel Technique for Generation and Self-Assembly of Multifunctional Magnetic Nanoparticles [Maria E. Messing](#); Lund University, Sweden.

SESSION EQ07.06: Emerging Opto-Magnetic Materials—Advances, Trends and Challenges at the Interface Between Optics and Magnetism I
Session Chairs: Luis Carlos and Eva Hemmer
Monday Morning, May 23, 2022
EQ07-Virtual

10:30 AM *EQ07.06.01

Cooperative Luminescence Upconversion in Yb/Tb Polynuclear Clusters in Solution [Loic J. Charbonniere](#)^{2, 1}; ¹Universite de Strasbourg, France; ²CNRS, France.

11:00 AM EQ07.06.02

Opto-Magnetic Nanomaterials—From Synthesis Design to Biomedical Applications [Nan Liu](#); University of Ottawa, Canada.

11:15 AM EQ07.06.03

WITHDRAWN 5/17/22 EQ07.06.03 Magnetic Assembly of Tetragonal Colloidal Crystals for Multicolor Photonic Pigments [Zhiwei Li](#); University of California, Riverside, United States.

11:30 AM *EQ07.06.04

Multifunctional Single-Molecule Magnets with Slow Relaxation of Magnetization, Luminescence and Ferroelectricity—The Quest for Cross-Coupling Between Properties [Jérôme Long](#)^{1,2}; ¹University of Montpellier, France; ²Institut Universitaire de France, France.

12:00 PM *EQ07.06.05

Organometallic Lanthanide Single-Molecule Magnets [Selvan Demir](#); Michigan State University, United States.

SESSION EQ07.07: Emerging Opto-Magnetic Materials—Advances, Trends and Challenges at the Interface Between Optics and Magnetism II
Session Chairs: Luis Carlos and Eva Hemmer
Wednesday Morning, May 25, 2022
EQ07-Virtual

8:00 AM *EQ07.07.01

Lanthanide-Doped Luminescent Colloidal Nanocrystals and Their Applications [V Mahalingam](#); IISER-Kolkata, India.

8:30 AM *EQ07.07.02

The Principles of Luminescence Thermometry—From Applications to Fundamental Questions [Markus Suta](#); Heinrich Heine University Düsseldorf, Germany.

9:00 AM EQ07.07.03

Effects of Rare-Earth and Multi-Elemental Dopants on the Material Properties of Carbon Films [Daniel Chua](#); National Univ of Singapore, Singapore.

9:15 AM EQ07.07.04

Observation of a High Magnetic Field-Induced Phase Transition in Frustrated Magnet Gadolinium Gallium Garnet [Junzhe Bao](#); Rice University, United States.

SESSION EQ07.08: Emerging Opto-Magnetic Materials—Advances, Trends and Challenges at the Interface Between Optics and Magnetism III

Session Chair: Eva Hemmer

Wednesday Morning, May 25, 2022

EQ07-Virtual

10:30 AM *EQ07.08.01

FERSC Based Spin-Computing Devices for Edge Artificial Intelligence [Riccardo Bertacco](#); Politecnico di Milano, Italy.

11:00 AM *EQ07.08.02

Studying Luminescent Lanthanide Nanoparticles at the Ensemble and Single Particle Level [Ute Resch-Genger](#); Federal Institute for Materials Research and Testing, Germany.

11:30 AM *EQ07.08.03

Luminescent Smart Labels for the New Generation of Optical Sensing and Internet of Things [Maria Rute Ferreira Andre](#); University of Aveiro, Portugal.

SYMPOSIUM EQ08

Quantum Dot Optoelectronics and Low-Dimensional Semiconductor Electronics
May 9 - May 25, 2022

Symposium Organizers

Robert Hoye, Imperial College London
Shinae Jun, Samsung Advanced Institute of Technology
Laura Schelhas, National Renewable Energy Laboratory
Byungha Shin, Korea Advanced Institute of Science and Technology

* Invited Paper

SESSION EQ08.01: Quantum Dots: Fundamental Properties I
Session Chairs: Robert Hoye and Byungha Shin
Monday Morning, May 9, 2022
Hawai'i Convention Center, Level 3, 317A

10:30 AM *EQ08.01.01

Advancing the Synthesis of Metal-Chalcogenide Quantum Dots to Achieve Upconversion Photochemistry via Nanocrystal-Sensitized Triplet Fusion Mark W. Wilson; University of Toronto, Canada.

11:00 AM *EQ08.01.02

Charged Colloidal Quantum Dots by Self-Doping Kwang Seob Jeong^{1,2}; ¹Korea University, Korea (the Republic of); ²Institute for Basic Science, Korea (the Republic of).

11:30 AM EQ08.01.03

Highly Efficient Spin-Exchange Carrier Multiplication in Mn-Doped Colloidal Quantum Dots Ho Jin^{1,2}; ¹Los Alamos National Laboratory, United States; ²The University of New Mexico, United States.

SESSION EQ08.02: Quantum Dots: Fundamental Properties II
Session Chairs: Laura Schelhas and Mark Wilson
Monday Afternoon, May 9, 2022
Hawai'i Convention Center, Level 3, 317A

1:30 PM *EQ08.02.01

Novel Surface Passivation Strategies for Colloidal Quantum Dot Solar Cells Shujuan Huang; Macquarie University, Australia.

2:00 PM EQ08.02.02

Interface Polarization in Heterovalent Core/Shell Nanocrystals Young-Shin Park; Korea Advanced Institute of Science and Technology, Korea (the Republic of).

2:15 PM EQ08.02.03

Solving Discrepancies in the Synthesis of Ligand-Capped BiI₃ Nanoparticles Ivana Aguiar; Universidad de la República, Uruguay.

2:30 PM EQ08.02.04

Mapping and Directing Strain Relaxation in Connected Quantum Dot Superlattices via *In Situ* Heating in the STEM Michelle A. Smeaton; Cornell University, United States.

SESSION EQ08.03: Quantum Dots: Device Applications
Session Chairs: Byungha Shin and Mark Wilson
Monday Afternoon, May 9, 2022
Hawai'i Convention Center, Level 3, 317A

3:15 PM *EQ08.03.01

Heavy Metal Free Blue Quantum Dots for Electroluminescence Displays Joon-Hyung Kim; Samsung Display, Korea (the Republic of).

3:45 PM EQ08.03.02

Highly Bright Top-Emitting Quantum Dot Light-Emitting Diodes Fabricated on Si Substrate Taesoo Lee; Seoul National University, Korea (the Republic of).

4:00 PM EQ08.03.03

Brightening InP Core and Effective Shelling Process by Combinational Precursor Chemistry [Seungki Shin](#); Hanyang University, Korea (the Republic of).

4:15 PM EQ08.03.04

VIS/NIR CdSe/HgS/CdS Quantum Dots with an Atomically Defined Emitting Interlayer [Zachary L. Robinson](#); Los Alamos National Laboratory, United States.

SESSION EQ08.04: Poster Session I: Quantum Dot Optoelectronics and Low-Dimensional Semiconductor Electronics

Session Chairs: Robert Hoye and Laura Schelhas

Monday Afternoon, May 9, 2022

5:00 PM - 7:00 PM

Hawai'i Convention Center, Level 1, Kamehameha Exhibit Hall 2 & 3

EQ08.04.01

Colloidal Superstructures Self-Organized from Oppositely Charged All-Inorganic Nanoparticles [Da Hwi Gu](#); Ulsan National Institute of Science and Technology, Korea (the Republic of).

EQ08.04.02

Synthesis of Anisotropic Semiconductor Nanoparticles Using Metal Nanoparticles as a Template [Ji Woong Chang](#); Kumoh National Institute of Technology, Korea (the Republic of).

EQ08.04.03

Thermodynamics Reveal Potential Ligand-Induced Surface Atom Rearrangement During the Exchange of Oleate for Dodecylphosphonic Acid on CdSe Quantum Dots [Sierra Hathaway](#); Mercer University, United States.

EQ08.04.04

Auto-Formation of Silicon Quantum Dots Embedded in a Silicon Nitride Matrix—The Role of the Substrate [Arturo Rodriguez-Gomez](#); Instituto de Física - Universidad Nacional Autónoma de México, Mexico.

EQ08.04.05

Affordable Determination of the Elemental Composition of Colloidal Quantum Dots with Portable X-Ray Fluorescence Spectroscopy [Joseph D. Keene](#); Mercer Univ, United States.

EQ08.04.06

Near-Atomistic Meso-Scale Tomographic Imaging of PbSe Quantum-Dot Super-Lattice Assemblies [Adam J. Moule](#); University of California, Davis, United States.

EQ08.04.07

The Transformation from Intraband Transition to Localized Surface Plasmon Resonance with Crystal Phase Change in Self-Doped Ag₂Se Nanocrystals [Haemin Song](#); Korea University, Korea (the Republic of).

EQ08.04.08

The Effect of Cd Incorporation on the Electronic Transport in HgTe Nanocrystal Films [Jungchul Noh](#); University of Texas at Austin, United States.

EQ08.04.09

Development of a High-Throughput Workflow for the Synthesis of CdSe Nanocrystals Using a Sonochemical Materials Acceleration Platform [Maria Politi](#); University of Washington, United States.

EQ08.04.10

Upconversion Photoluminescence Properties of High Quantum Yield Nitrogen Doped Graphene Quantum Dots Synthesized by Pulsed Laser Ablation [Muhammad Shehzad Sultan](#); University of Puerto Rico at Río Piedras, United States.

EQ08.04.11

Study on Enhanced Electron Field Emission Properties of Graphene Quantum Dots and Graphene/GQDs Composites [Muhammad Shehzad Sultan](#); University of Puerto Rico at Río Piedras, United States.

EQ08.04.12

Investigation of Germanium Quantum Dots in Photovoltaics and near-IR Detectors [Roy Sfadia](#); University of California, Santa Cruz, United States.

EQ08.04.13

The Effect of Graphene Quantum Dots on the Photoactive Response of Graphene Field Effect Transistor [Muhammad Shehzad Sultan](#); University of Puerto Rico - Río Piedras, United States.

EQ08.04.14

Synthesis of Direct Bandgap ZnS/GaP Colloidal Quantum Well [Hongjoo Shin](#); KAIST, Korea (the Republic of).

EQ08.04.15

Growth-Controlled Single-Crystalline InP Tetrapods [Seongmin Park](#); Sungkyunkwan University, Korea (the Republic of).

SESSION EQ08.05: Poster Session II: Transition Metal Dichalcogenide: Synthesis, Characterization and Devices

Session Chairs: Robert Hoye and Laura Schelhas

Monday Afternoon, May 9, 2022

5:00 PM - 7:00 PM

Hawai'i Convention Center, Level 1, Kamehameha Exhibit Hall 2 & 3

EQ08.05.01

Substantially Improved NO₂ Sensing Properties in Two-Dimensional SnS₂ Nanoflowers Enabled by Visible Light Illumination [Tae Hoon Eom](#); Seoul National University,

Korea (the Republic of).

SESSION EQ08.07: Low Dimensional Structures: Synthesis, Characterization and Devices

Session Chairs: Robert Hoye and David Munoz-Rojas

Tuesday Afternoon, May 10, 2022

Hawai'i Convention Center, Level 3, 317A

1:30 PM EQ08.07.01

Vacancy-Related Defect Characterization in Optoelectronic Ge/Ge-Sn Core/Shell Nanowires via Correlated Extended X-Ray Absorption Fine Structure Spectroscopy (EXAFS) and Single Wire Electrical Measurements [Paul McIntyre](#)^{1,2}; ¹Stanford University, United States; ²SLAC National Accelerator Laboratory, United States.

1:45 PM EQ08.07.02

WITHDRAWAL 5/7/22 EQ08.07.02 Parametric Longitudinal Coupling Between a High-Impedance Superconducting Resonator and a Semiconductor Quantum Dot Singlet-Triplet Spin Qubit [Charlotte Boettcher](#); Harvard University, United States.

2:00 PM EQ08.07.03

Stimulated Emission via Multi-Exciton Complexes in Colloidal 2D Materials [Pieter Geiregat](#); Ghent University, Belgium.

2:15 PM BREAK

2:45 PM *EQ08.07.04

Fast Open-Air Deposition of Nanometric Components for (Opto)Electronic Devices Through Spatial Atomic Layer Deposition [David Munoz-Rojas](#); LMGP Grenoble INP/CNRS, France.

3:15 PM EQ08.07.06

Laser-Driven Growth, Alignment, and Assembly of Semiconductor Nanowires in Solution [Vincent C. Holmberg](#); University of Washington, United States.

3:30 PM EQ08.07.07

Interrogating Local Order in Quantum-Dot-in-Perovskite Solids [Dylan Ladd](#); University of Colorado Boulder, United States.

SESSION EQ08.08: Low Dimensional Halide Perovskite

Session Chairs: Robert Hoye and Yun-Seong Lee

Wednesday Morning, May 11, 2022

Hawai'i Convention Center, Level 3, 317A

8:30 AM *EQ08.08.01

Science and Materials for a Sustainable World—Perspective from Editor at Nature Materials [Steven Lukman](#); Nature Materials, United Kingdom.

9:00 AM *EQ08.08.02

Halide Perovskite Nanoscale Heterojunctions for Next-Generation Optoelectronic Devices [Joseph Luther](#)^{1,2}; ¹National Renewable Energy Laboratory, United States; ²RASEI, United States.

9:30 AM EQ08.08.03

Inverse Temperature Crystallization for Inch-Scale, Phase-Pure Ruddlesden-Popper Perovskite Single Crystals [Young Chu](#); Seoul National University, Korea (the Republic of).

9:45 AM EQ08.08.04

Pure-Blue Light Emitting Diodes Based on Layer-Transferred Two-Dimensional, Single-Crystalline Ruddlesden-Popper Halide Perovskite [Joonyun Kim](#); Korea Advanced Institute of Science and Technology, Korea (the Republic of).

10:00 AM BREAK

10:30 AM *EQ08.08.05

Self-Assembly of Halide Perovskite Heterostructures [Hemamala Karunadasa](#)^{1,2}; ¹Stanford University, United States; ²SLAC National Accelerator Laboratory, United States.

11:00 AM EQ08.08.06

Direct Photopatterning of Perovskite Nanocrystals with Multi-Functional Zwitterionic Ligand [Sung Hoon Noh](#); Hanyang University, Korea (the Republic of).

11:15 AM EQ08.08.07

Efficient Pure-Blue Light Emitting Diodes with Phosphonate-Passivated CsPbBr₃ Nanoplatelets [Jinu Park](#); Korea Advanced Institute of Science and Technology, Korea (the Republic of).

11:30 AM EQ08.08.08

Lead-Free Heterometallic Halide Layered Double Perovskite Nanocrystals [Tong Cai](#); Brown University, United States.

SESSION EQ08.09: Low Dimensional Structures: Theory

Session Chairs: Joseph Luther and Laura Schelhas

Wednesday Afternoon, May 11, 2022

Hawai'i Convention Center, Level 3, 317A

1:30 PM *EQ08.09.01

Ligand-Surface Atomic Structure of Colloidal Quantum Dots [Yong-Hyun Kim](#); Korea Advanced Institute of Science and Technology, Korea (the Republic of).

2:00 PM EQ08.09.02

Engineering Exciton-Phonon Coupling in CdS/Se/Te Nanocrystals via Composition and Thickness—A First-Principles Study [Ruoxi Yang](#); Lawrence Berkeley National Laboratory, United States.

2:15 PM EQ08.09.03

The Underlying Mechanisms of Ultrahigh Carrier Mobility in Bi₂O₂Se Using Self-Consistent GW Methods [Benjamin A. Williamson](#); Norwegian University of Science and Technology, Norway.

SESSION EQ08.10: Poster Session III: Optoelectronics Based on Quantum Dots

Session Chairs: Yun-Seong Lee and Byungha Shin

Wednesday Afternoon, May 11, 2022

5:00 PM - 7:00 PM

Hawai'i Convention Center, Level 1, Kamehameha Exhibit Hall 2 & 3

EQ08.10.01

Modification of Zinc Oxide Electron Transport Layer for Highly Efficient and Stable Quantum-Dots Light Emitting Devices [Dong Seob Chung](#); University of Waterloo, Canada.

EQ08.10.02

Synthesis of Green Efficient InP/ZnSeS/ZnS Quantum Dots Using P(DEA)₃ as P Precursor [Suhyeon Kim](#); Kyonggi University, Korea (the Republic of).

EQ08.10.03

Synthesis of Blue InGaP Multishell Quantum Dots by Controlling the Length of Capping Ligands [Seungchul Shin](#); Kyonggi University, Korea (the Republic of).

EQ08.10.04

Chemically and Electronically Active Metal Ions on InAs Quantum Dots for Infrared Detectors [Seongchan Kim](#); Hanyang University, Korea (the Republic of).

EQ08.10.05

Non-Stoichiometric and Non-Toxic Silver Telluride Colloidal Nanocrystals in the Extended Near Infrared Region [Gahyeon Kim](#); Korea University, Korea (the Republic of).

EQ08.10.06

Enhanced Efficiency of InP-Based Quantum Dot Light-Emitting Diodes Using P-Type Inorganic Nanoparticles [Kwangkeun Lee](#); Seoul National University, Korea (the Republic of).

EQ08.10.07

Synthesis and Characteristics of Nickel Oxide Nanoparticles by Solution Process for the Hole Transport Layer of QLED [Hyojun Lim](#); School of Materials Science and Engineering, Kyungpook National University, Korea (the Republic of).

EQ08.10.08

Improving the Performance of InAs Colloidal Quantum Dot Photodetectors Through Zinc Doping [Daekwon Shin](#); Sungkyunkwan University, Korea (the Republic of).

EQ08.10.09

Comparison of Two Types of Quantum Dots Having Heterostructures to Understand the Charge Balance of Charge Carriers [Namyoun Gwak](#); Hanyang University, Korea (the Republic of).

EQ08.10.10

Facile Large-Scale Synthesis of CsPbI₃ Perovskite Quantum Dots for Solar Cells—Elucidation of Degradation Mechanism [Han Sol Yang](#); Hanyang University, Korea (the Republic of).

SESSION EQ08.11: Poster Session IV: Low Dimensional Structures: Synthesis and Characterization

Session Chairs: Yun-Seong Lee and Byungha Shin

Wednesday Afternoon, May 11, 2022

5:00 PM - 7:00 PM

Hawai'i Convention Center, Level 1, Kamehameha Exhibit Hall 2 & 3

EQ08.11.01

Assembly of 2D Nanomaterials in Cholesteric Liquid Crystals [Urice Tohgha](#)^{1,2}; ¹Azimuth Corporation, United States; ²Air Force Research Laboratory, United States.

EQ08.11.02

Formation of Bismuth Chalcogenide Nanorods Through a Self-Sacrificing Route and Study of Its Optical Properties for Application in Solar Cells [Maia Momburu](#); Facultad de Química, Universidad de la República, Uruguay.

EQ08.11.03

Seeded Growth of Mesoscale Quantum Confined Semiconductor Nanoplatelets [Stephanie Tenney](#); University of California, Los Angeles, United States.

EQ08.11.04

Experimental and Simulation Study on Electrical Properties of Oxidized CVD-Grown Graphene by an Acidic Solution [Seung Mun Back](#); Kumoh National Institute of Technology, Korea (the Republic of).

SESSION EQ08.12: Transition Metal Dichalcogenide: Synthesis, Characterization and Devices

Session Chairs: Jiwoong Park and Laura Schelhas

Thursday Morning, May 12, 2022

Hawai'i Convention Center, Level 3, 317A

8:30 AM *EQ08.12.01

Emergent Devices Enabled by van der Waals Contacts on 2D Transition Metal Dichalcogenides [Manish Chhowalla](#); University of Cambridge, United Kingdom.

9:00 AM *EQ08.12.02

Large Scale Atomically Thin Semiconductor Films for Electronics and Optoelectronics [Jiwoong Park](#); University of Chicago, United States.

9:30 AM *EQ08.12.03

Femtosecond Laser Synthesis and Functionalization of 2D Nanoparticles for Sustainability Applications [Kevin Musselman](#); University of Waterloo, Canada.

10:00 AM EQ08.12.04

Solution-Processed 2D-WSe₂ as a Hole Transport Material in PbS Quantum Dot Solar Cells [Arlene Chiu](#); Johns Hopkins University, United States.

10:15 AM EQ08.12.05

Unique Synthetic Approach to Low-Dimensional Semiconducting Metal-Sulfide Materials for (Photo)Electrochemical Energy Conversion by Molecular Building Blocks [Veronika Brune](#); University of Cologne, Germany.

SESSION EQ08.13: Quantum Dot Optoelectronics and Low-Dimensional Semiconductor Electronics I

Session Chairs: Jianbo Gao and Shinae Jun

Wednesday Morning, May 25, 2022

EQ08-Virtual

8:00 AM *EQ08.13.01

InP-Based Quantum Dots Toward Efficient Color Conversion Pixels [Tae-Gon Kim](#); Samsung Advanced Institute of Technology, Korea (the Republic of).

8:30 AM EQ08.13.02

Size-Dependent Assembly and Electronic Transport in Epitaxially-Connected Superlattices of Lead Sulfide Quantum Dots [Satria Z. Bisri](#)^{1,2}; ¹RIKEN Center for Emergent Matter Science, Japan; ²Tokyo Institute of Technology, Japan.

8:45 AM EQ08.13.03

Intraband Optical Gain in Colloidal Nanoplates [Benjamin T. Diroll](#); Argonne National Laboratory, United States.

9:00 AM *EQ08.13.04

Chiral Induced Spin Selectivity During Triplet Transfer Between Nanocrystals and Molecules [MingLee Tang](#); The University of Utah, United States.

9:30 AM EQ08.13.05

Exclusive Electron Transport in Core@Shell PbTe@PbS Colloidal Semiconductor Nanocrystal Assemblies [Satria Z. Bisri](#)^{1,2}; ¹RIKEN Center for Emergent Matter Science, Japan; ²Tokyo Institute of Technology, Japan.

9:45 AM EQ08.07.05

Compact Quantum-Dot Lasing Microbeads for Multiplexed Bio-Imaging [Kwon-Hyeon Kim](#)^{1,2}; ¹Harvard Medical School, United States; ²Massachusetts General Hospital, United States.

SESSION EQ08.14: Devices Based on 2D Semiconductors

Session Chairs: Tae-Gon Kim and MingLee Tang

Wednesday Morning, May 25, 2022

EQ08-Virtual

10:30 AM *EQ08.14.01

Recent Progress on 2D Transition-Metal Chalcogenide Semiconductor [Zheng Liu](#); Nanyang Technological University, Singapore.

11:00 AM *EQ08.14.02

Integrated Circuits Made of 2D Materials [Mario Lanza](#); King Abdullah University of Science and Technology, Saudi Arabia.

11:30 AM EQ08.14.03

Molecular Engineering of 2D Sn-Based Halide Perovskites for High-Performance Field-Effect Transistors [Yao Gao](#)^{1,2}; ¹Purdue University, United States; ²Huazhong University of Science & Technology, China.

11:45 AM *EQ08.14.04

In Situ Ultrafast Carrier Dynamics in Quantum Materials Devices [Jianbo Gao](#)^{1,2}; ¹Clemson University, United States; ²Berkeley Photonics LLC, United States.

SESSION EQ08.15: Quantum Dot Optoelectronics and Low-Dimensional Semiconductor Electronics II

Session Chairs: Robert Hoye and Shinae Jun

Monday Morning, May 23, 2022

EQ08-Virtual

8:00 AM *EQ08.15.01

Ink Formulations of 2D Materials for 3D Printed Energy Conversion Devices [Cecilia Mattevi](#); Imperial College London, United Kingdom.

8:30 AM EQ08.15.02

High Efficiency and Long Lifetime Inverted Red InP-Based Quantum Dot Light-Emitting Diodes by Enhancing the Charge Balance [Thuy Truong Thi](#); Kyung Hee University, Korea (the Republic of).

8:45 AM EQ08.15.03

Unraveling of Quantum Confinement Effect in Ultrasmall 2D SnS Sheets [Abdus S. Sarkar](#)^{1,2}; ¹Indian Institute of Technology Mandi, India; ²Indian Institute of Technology Mandi, India.

8:50 AM EQ08.15.04

Optical Property of Self-Doped PbSe Colloidal Quantum Dots [Sungmin Hong](#); Korea University, Korea (the Republic of).

8:55 AM EQ08.15.05

Quantum Confinement in Elliptical Graphene Quantum Dots [Shane Brown](#); University of Delaware, United States.

9:00 AM EQ08.15.06

Photodegradation in the Presence of Zinc Selenide Nanoparticles [Angelie M. Núñez Colón](#); University of Puerto Rico at Ponce, Puerto Rico.

9:05 AM EQ08.15.07

Identifying Defect-Induced Trion in Monolayer WS₂ [Riya Sebait](#)^{2,3}; ²Center for Integrated Nanostructure Physics (CINAP), Institute for Basic Science (IBS), Korea (the Republic of); ³Sungkyunkwan University, Korea (the Republic of).

9:10 AM *EQ09.04/EQ08.06.03

Expanding Chemical Versatility of Colloidal Quantum Dots [Dmitri V. Talapin](#); University of Chicago, United States.

SYMPOSIUM EQ09

Emerging Light Emitters for Photonics and Optoelectronics—Hybrid Perovskites and Other Low-Dimensional Emitters
May 9 - May 25, 2022

Symposium Organizers

Hanwei Gao, Florida State University
Maksym Kovalenko, ETH Zurich
Tae-Woo Lee, Seoul National University
Jiangeng Xue, University of Florida

* Invited Paper

SESSION EQ09.01: Low-Dimensional Perovskite Light-Emitting Materials and Optoelectronics I

Session Chairs: Maksym Kovalenko and Tae-Woo Lee

Monday Morning, May 9, 2022

Hawai'i Convention Center, Level 3, 317B

10:30 AM *EQ09.01.01

Luminescent Organic Metal Halide Hybrids Beyond Perovskites [Biwu Ma](#); Florida State University, United States.

11:00 AM *EQ09.01.02

Heterostructures of 3D/2D Perovskites with Sharp Interfaces for High-Performance Photovoltaics and Light Emitting Diodes [Aditya D. Mohite](#); Rice University, United States.

11:30 AM EQ09.01.03

Suppressing Phase Disproportionation in Quasi-Two-Dimensional Perovskite Light-Emitting Diodes [Kang Wang](#); Purdue University, United States.

11:45 AM EQ09.01.04

Orientation Controllable 2D Colloidal CsPbI₃ Perovskite Nanoplatelets Towards Spectra Stable Pure Red Light-Emitting Diodes with Polarized Light Emission [Junzhi Ye](#); University of Cambridge, United Kingdom.

SESSION EQ09.02: Low-Dimensional Perovskite Light-Emitting Materials and Optoelectronics II

Session Chairs: Maksym Kovalenko and Biwu Ma

Monday Afternoon, May 9, 2022

Hawai'i Convention Center, Level 3, 317B

1:30 PM *EQ09.02.01

Fundamental Studies and Applications of 2D Halide Perovskite Heterostructures [Song Jin](#); University of Wisconsin--Madison, United States.

2:00 PM EQ09.02.02

Low-Energy Photoluminescence in Layered Tin Halide Perovskites—Unravelling the Impact of Diammonium Cations on the Structure and Its Photophysics [Eelco K. Tekelenburg](#); University of Groningen, Netherlands.

2:15 PM EQ09.02.03

Enhancement of the Photoluminescence of Cs₂AgBiBr₆ Double Perovskite Film via Grain Size Regulation [Eojin Yoon](#); Seoul National University, Korea (the Republic of).

2:30 PM EQ09.02.04

Exploring Trends Between 4,4'-methylenedianiline Lead-Halide Hybrid Materials [Megan Cassingham](#); University of Southern California, United States.

2:45 PM EQ09.02.05

WITHDRAWN 5/9/22 EQ09.02.05 Low-Threshold Exciton Transport and Control in Atomically Thin Semiconductors [Hyeonwoo Lee](#); Ulsan National Institute of Science and Technology, Korea (the Republic of).

3:00 PM BREAK

SESSION EQ09.03: Photophysics of Low-Dimensional Perovskite Materials

Session Chairs: Song Jin and Biwu Ma

Monday Afternoon, May 9, 2022

Hawai'i Convention Center, Level 3, 317B

3:30 PM *EQ09.03.01

Origin of Broad Luminescence in Low-Dimensional Metal Halide Perovskites [Maria Antonietta Loi](#); University of Groningen, Netherlands.

4:00 PM EQ09.03.02

Rashba Exciton in a 2D Perovskite Quantum Dot [Michael W. Swift](#); U.S. Naval Research Laboratory, United States.

4:15 PM EQ09.03.03

Exciton Fine-Structure in Halide Perovskite Nanoplatelets [Alexander S. Urban](#); Ludwig-Maximilians-Universität München, Germany.

SESSION EQ09.04/EQ08.06: Joint Keynote Session

Session Chairs: Tae-Woo Lee and Byung-Ha Shin

Tuesday Morning, May 10, 2022

Hawai'i Convention Center, Level 3, 317B

8:30 AM *EQ09.04/EQ08.06.01

Keynote: Spin-Orbit Coupled Exciton-Polariton Condensates in Lead Halide Perovskites [Xiaoyang Zhu](#); Columbia University, United States.

9:00 AM *EQ09.04/EQ08.06.02

InAs Nanoclusters, Quantum Dots and Optoelectronic Applications [Sohee Jeong](#); Sungkyunkwan University, Korea (the Republic of).

9:30 AM BREAK

10:00 AM *EQ09.04/EQ08.06.04

Recent Progress Towards Colloidal Quantum Dot Laser Diodes [Victor I. Klimov](#); Los Alamos National Laboratory, United States.

10:30 AM *EQ09.04/EQ08.06.05

Ligand- and Cation-Exchanged Colloidal Quantum Dot Thin Films and Devices [Cherie R. Kagan](#); University of Pennsylvania, United States.

SESSION EQ09.05: Quantum Dot Emitting Materials and Lasers

Session Chairs: Maksym Kovalenko and Maria Antonietta Loi

Tuesday Afternoon, May 10, 2022

Hawai'i Convention Center, Level 3, 317B

1:30 PM EQ09.05.01

Disruptive Optical Gain Metrics in the Green and Near-Infrared Spectrum Using Weakly Confined CdX (X=S,Se,Te) Quantum Dots [Pieter Geiregat](#); Ghent University, Belgium.

1:45 PM EQ09.05.02

On-Demand, Room Temperature Single-Photon Generation with an Electrically-Pumped Colloidal Quantum Dot [Zachary L. Robinson](#); Los Alamos National Laboratory, United States.

2:00 PM EQ09.05.03

Two-Band Optically Pumped Amplified Spontaneous Emission in an Ultrahigh-Current-Density Colloidal Quantum Dot LED [Namyoung Ahn](#); Los Alamos National Laboratory, United States.

2:15 PM EQ09.05.05

Bilayer Luminescent Solar Concentrator with Enhanced Absorption and Efficiency for Agrivoltaic Applications [John W. Keil](#); University of Minnesota, United States.

2:30 PM BREAK

SESSION EQ09.06: Perovskite Lasers

Session Chairs: Letian Dou and Myoung Hoon Song

Tuesday Afternoon, May 10, 2022

Hawai'i Convention Center, Level 3, 317B

3:30 PM *EQ09.06.01

Toward Metal Halide Perovskite Laser Diodes [Barry P. Rand](#); Princeton University, United States.

4:00 PM EQ09.06.02

Highly Efficient PbS Colloidal Quantum Dot Short-Wave Infrared Laser Enabled by Suppression of Trap-Assisted Auger Recombination at Supra-Nanocrystalline Level [Nima Taghipour](#)^{1,3}; ¹ICFO – The Institute of Photonic Sciences, Spain; ³Barcelona Institute of Science and Technology, Spain.

4:15 PM EQ09.06.03

Amplified Spontaneous Emission in Single-Layered 2D Tin Perovskites [Daniele Cortecchia](#); Istituto Italiano di Tecnologia, Italy.

SESSION EQ09.07: Poster Session I: Emerging Light Emitters for Photonics and Optoelectronics—Hybrid Perovskites and Other Low-Dimensional Emitters

Session Chairs: Maksym Kovalenko and Tae-Woo Lee

Tuesday Afternoon, May 10, 2022

5:00 PM - 7:00 PM

Hawai'i Convention Center, Level 1, Kamehameha Exhibit Hall 2 & 3

EQ09.07.01

Improving Efficiency and Foldability of Perovskite Light-Emitting Diodes via Microlens Array Embedded Substrates [Junho Kim](#); Korea Advanced Institute of Science and Technology, Korea (the Republic of).

EQ09.07.03

Modulation of Copper-Based Perovskite Nanocrystals Using Different Chain-Length Ligands [Minjin Kim](#); Chonnam National University, Korea (the Republic of).

EQ09.07.04

Efficient Blue Perovskite Light-Emitting Diode Based on Dually Passivated Nanocrystals Using Thiocyanate and Neodymium Ions [Sung-Doo Baek](#); Yonsei University, Korea (the Republic of).

EQ09.07.05

Optimizing Charge Balance of Quantum-Dot Light Emitting Diodes via Controlling Hole/Electron Injection [Yiseul Kim](#); Seoul National University, Korea (the Republic of).

EQ09.07.06

Additive Assisted Optimization in Morphology and Optoelectronic Properties of Inorganic Mixed Sn-Pb Halide Perovskite [Rubaiya Murshed](#); University of Nevada Las Vegas, United States.

EQ09.07.07

Interpreting the Emission Anisotropy of Colloidal CsPbBr₃ Nanorods [Freddy A. Rodriguez Ortiz](#); Texas A&M University, United States.

EQ09.07.08

Synthesis and Characterization of Tetrapod-Shaped InP/ZnSe/ZnS Core/Shell/Shell Quantum Dots [Seongmin Park](#); Sungkyunkwan University, Korea (the Republic of).

EQ09.07.09

Comparison of Traditional Near-IR Dye Sensitisers for Lanthanide Doped Nanoparticles with Picolinic Based Bidentate Counterparts [Alasdair Tew](#); University of Cambridge, United Kingdom.

EQ09.07.10

Stretchable Wrinkled WSe₂ for Tunable Single Photon Emitters [Mary G. Pelzer](#)^{1,4,5}; ¹University of Illinois at Urbana-Champaign, United States; ⁴These authors contributed equally, United States; ⁵Co-presenters, United States.

EQ09.07.11

Hole Injection Mechanism of Quantum Dot Light-Emitting Diodes Through Adjustment of Various Hole Transport Layer [Hee Jung Kwak](#); Gyeongsang National University, Korea (the Republic of).

EQ09.07.12

Ligand-Free *In Situ* Synthesis of Stable Perovskite-Inorganic Polymer Composites [Jinwoo Park](#); Seoul National University, Korea (the Republic of).

EQ09.07.13

Low-Pressure Annealing of Hexagonal NaYF₄ to Achieve Highly Efficient Upconversion Luminescence [Byeong-Seok Moon](#); Sungkyunkwan University, Korea (the Republic of).

SESSION EQ09.08: Surface Passivation and Molecular Additives in Perovskite Light-Emitting Devices I

Session Chairs: Matthew Beard, Bin Hu, Maria Antonietta Loi and Barry Rand

Wednesday Morning, May 11, 2022

Hawai'i Convention Center, Level 3, 317B

8:30 AM *EQ09.08.01

Tailored Surface Defect Passivating Materials for Efficient and Metal Halide Perovskite Light-Emitting Diodes [Myoung Hoon Song](#); Ulsan National Institute of Science and Technology, Korea (the Republic of).

9:00 AM EQ09.08.02

Designer Zwitterionic Phospholipid Capping Ligands for Metal Halide Colloidal Nanomaterials [Viktorija Morad](#); ETH Zurich, Switzerland.

9:15 AM EQ09.08.03

Highly Efficient Thermally-Evaporated Perovskite Light-Emitting Diodes with an Electrically Conductive Poly-Ethylene Oxide Passivation Layer [Nakyung Kim](#); Korea Advanced Institute of Science and Technology, Korea (the Republic of).

9:30 AM BREAK**10:00 AM *EQ09.08.04**

Organic Semiconductor-Incorporated Perovskite (OSiP) Lighting-Emitting Devices [Lectian Dou](#); Purdue University, United States.

10:30 AM EQ09.08.05

Synthesis of Cu_{2-x}S/PbS Core/Shell and Cu₃Pb₂S Alloy Nanocrystals for Optoelectronics [Patrick Yee](#); U.S. Naval Research Laboratory, United States.

10:45 AM EQ09.08.06

Enhancing Light Emission from Lead Halide Perovskite Nanocrystals [Tassilo Naujoks](#); University of Augsburg, Germany.

11:00 AM EQ09.08.08

Composition-Dependent Phase Transitions and Superlattice Ordering in Lead-Iodide Perovskite Nanocrystals [Julian A. Vigil](#)^{1,3}; ¹Stanford University, United States; ³SLAC National Accelerator Laboratory, United States.

SESSION EQ09.09: Surface Passivation and Molecular Additives in Perovskite Light-Emitting Devices II
Session Chairs: Bin Hu and Yanfa Yan
Wednesday Afternoon, May 11, 2022
Hawai'i Convention Center, Level 3, 317B

1:30 PM EQ09.09.01

Mixed Donor and Acceptor Organic Molecules in Hybrid Lead-Halide Films [Yang Goh](#); University of Southern California, United States.

1:45 PM EQ09.09.02

Highly Luminescent Cs–Pb–Br Composite Perovskites Designed via Tracking the Phase Competition During Mechanochemical Synthesis [Keehoon Kang](#); Seoul National University, Korea (the Republic of).

2:00 PM EQ09.09.03

WITHDRAWN 5/6/22 EQ09.09.03 Efficient Perovskite Light-Emitting Diodes with Underlying Passivation [Jung-Min Heo](#); Seoul National University, Korea (the Republic of).

2:15 PM BREAK

SESSION EQ09.10: Perovskite Photovoltaics and Other Applications
Session Chair: Matthew Beard
Wednesday Afternoon, May 11, 2022
Hawai'i Convention Center, Level 3, 317B

3:30 PM EQ09.10.01

Flash Evaporation of Perovskite Powders—Angstrom-Precision Growth for Single-Source Solar Cell Fabrication [Nathan Rodkey](#); Universitat de València, Spain.

3:45 PM EQ09.10.02

Strong Linear Photoluminescence Modulation by an External Electric Field in Epitaxial Halide Perovskite Nanowires [Yahel Soffer](#); Weizmann Institute of Science, Israel.

4:00 PM EQ09.10.03

Electrospun Electroluminescent CsPbBr₃ Fibers—Flexible Perovskite Networks for Light-Emitting Application [Veronika Brune](#); University of Cologne, Germany.

4:15 PM EQ09.10.04

Highly Luminescent Platinum(II) Complex-Based Multifunctional Photon Downshifting Materials for Perovskite Solar Cells [Eunhye Hwang](#); Ulsan National Institute of Science and Technology, Korea (the Republic of).

4:30 PM EQ09.10.05

Tandem Cell Charge Transfer—Quantum Dots on Perovskite Thin Films [Jorge Arteaga](#); University of California, Merced, United States.

4:45 PM EQ09.10.06

Mixed-Cation Perovskite Nanoparticles for Photovoltaic Application [Seung Hyeon Jo](#); Seoul National University, Korea (the Republic of).

SESSION EQ09.11: Physics of Perovskite Materials
Session Chairs: Feng Gao, Tae-Woo Lee and Myoung Hoon Song
Thursday Morning, May 12, 2022
Hawai'i Convention Center, Level 3, 317B

8:30 AM *EQ09.11.01

Effects of Phonons on the Structural Stability and Light Emission Properties of Halide Perovskites [Yanfa Yan](#); University of Toledo, United States.

9:00 AM EQ09.11.02

WITHDRAWN 5/6/22 EQ09.11.02 Electrical Pulsing of Perovskite Light Emitting Diodes at Cryogenic Temperatures [Karim Elkhoully](#)^{1,2}; ¹imec, Belgium; ²KU Leuven, Belgium.

9:15 AM EQ09.11.03

A Dielectric Hybrid-Metasurface Supporting Lead-Halide Perovskite Exciton-Polaritons [Hendrik Utzat](#); Stanford University, United States.

9:30 AM BREAK

10:00 AM *EQ09.11.04

Controlling Charge, Spin and Light in Lead-Halide Inspired Hybrid Semiconductors [Matthew C. Beard](#); National Renewable Energy Lab, United States.

10:30 AM *EQ09.11.05

Orbit-Orbit Interaction Effects on Light-Emitting Properties Through Intrinsic Excitons and Artificially Engineered Charge-Transfer Excitons in Hybrid Perovskites [Bin Hu](#); University of Tennessee, United States.

11:00 AM EQ09.11.06

High Efficiency and Tunable Photoemission in Ternary Group 11 Halides [Ticlyr Creason](#); University of Oklahoma, United States.

11:15 AM EQ09.11.07

Enhanced Emission from the Bright Exciton and Locating the Dark Exciton in Strained CdSe/Cd_{1-x}Zn_xSe QDs [Igor Fedin](#); The University of Alabama, United States.

11:30 AM EQ09.11.08

Machine Learning and Ligand Modification Enhances the Optical Performance of Perovskite Nanoplatelets [Nina A. Henke](#); Ludwig Maximilian University of Munich,

Germany.

11:45 AM EQ09.11.09

Strong Spin-Dependent Interactions of Photoexcited Charge Carriers with Magnetic Transition Metal Dopants in MAPbBr₃ [Jonathan Zerhoch](#); Technische Universität München, Germany.

SESSION EQ09.12: Quantum Dots and Emerging Emitting Materials and Devices I

Session Chairs: Letian Dou, Myoung Hoon Song and Yanfa Yan

Thursday Afternoon, May 12, 2022

Hawai'i Convention Center, Level 3, 317B

1:30 PM EQ09.12.01

Absence of Intraband Phonon Bottleneck in Thick-Shell N-Type HgSe/CdS Core/Shell Quantum Dots [Ananth Kamath](#); University of Chicago, United States.

1:45 PM EQ09.12.03

Size-Tunable Synthesis of Metal-Organic Chalcogenolate Assemblies [Alexander C. Hernandez Oendra](#); ETH Zurich, Switzerland.

2:00 PM EQ09.12.04

Deeply Subwavelength NIR Imaging with Photon Avalanching Nanoparticles [Bruce E. Cohen](#); Lawrence Berkeley National Laboratory, United States.

2:15 PM BREAK

2:45 PM EQ09.12.06

Thickness Tuned Ultra-Strong Light-Matter Coupling and Self-Grouping of Exciton-Ensemble in Single Crystals of Metal-Organic Framework [Dileep Kottilil](#); National University of Singapore, Singapore.

3:00 PM EQ09.12.07

Highly Luminescent Hetero-Ligand MOF Nanocrystals with Engineered Stokes Shift for Photonic Applications [Angelo Monguzzi](#); Univeristà degli Studi Milano Bicocca, Italy.

3:15 PM EQ09.12.08

Achieving Bright, Low Voltage Emission Across the Spectrum with a Generic Electroluminescent Device [Vivian Wang](#); University of California, Berkeley, United States.

3:30 PM EQ09.12.09

Role of Fluorescent By-Products, Structure and Optical Properties of White Emitting Carbon Dots [Nasir Javed](#); Rutgers, The State University of New Jersey, United States.

3:45 PM EQ09.12.10

Structural and Optical Interplay in Ultrafast-Decay Alkaline-Earth Rare-Earth Fluoride Nanoparticles for Novel Gamma Ray Scintillators [Parivash Moradifar](#); Stanford University, United States.

SESSION EQ09.13: Quantum Dots and Emerging Emitting Materials and Devices II

Session Chairs: Maksym Kovalenko and Tae-Woo Lee

Friday Morning, May 13, 2022

Hawai'i Convention Center, Level 3, 317B

8:30 AM EQ09.13.01

Towards Natural White Luminescence: Synthesis Control of the Oxidation States of Europium in Glassy Matrices and Its Effect on Photoluminescence Spectra [Agata Jaroeka](#); Warsaw University of Technology, Poland.

8:45 AM EQ09.13.02

Untying the Cesium "Not:" Cesium-Iodoplumbate Complexation in Solution Has Implications for Perovskite Crystallization [Yannick Eatmon](#); Princeton University, United States.

9:00 AM EQ09.13.03

Tunable Luminescent Carbon Quantum Dots via Non-Thermal Plasma Synthesis [Sankhadeep Basu](#); Michigan State University, United States.

SESSION EQ09.14: Perovskite Light-Emitting Diodes and Lasing

Session Chairs: Maksym Kovalenko and Tae-Woo Lee

Monday Afternoon, May 23, 2022

EQ09-Virtual

9:00 PM *EQ09.14.01

Highly Efficient LEDs Featuring Solution-Processed Perovskite Nanocrystals [Zhengguo Xiao](#); University of Science and Technology of China, China.

9:30 PM *EQ09.14.02

Energy-Band Engineering for Efficient Blue Perovskite Light-Emitting Diodes [Jingbi You](#); Chinese Academy of Sciences, China.

10:00 PM *EQ09.14.04

Near-Infrared-II Light-Emitting Diodes Based on Heavy-Metal-Free Quantum Dots [Zhi Kuang Tan](#); National University of Singapore, Singapore.

SESSION EQ09.15: Low-Dimensional Perovskite Light-Emitting Materials and Devices
Session Chairs: Maksym Kovalenko and William Tisdale
Tuesday Morning, May 24, 2022
EQ09-Virtual

8:00 AM *EQ09.15.01

Progress in Reduced-Dimensional Perovskite Light-Emitting Materials and Devices [Edward H. Sargent](#); University of Toronto, Canada.

8:30 AM *EQ09.15.02

Excitons in Perovskite Nanostructures [Alexander L. Efros](#); Naval Research Laboratory, United States.

9:00 AM *EQ09.15.03

Highly Luminescent Lead Halide Perovskite Nanocrystals—From Synthesis Advancements to Multicomponent Superlattices [Maryna Bodnarchuk](#)^{2, 1}; ¹ETH Zürich, Switzerland; ²Empa—Swiss Federal Laboratories for Materials Science and Technology, Switzerland.

9:30 AM *EQ09.15.04

Nanoscale Interface @ Bulk Hybrid Perovskite [Angshuman Nag](#); Indian Institute of Science Education and Research Pune, India.

SESSION EQ09.16: Perovskite and Low-Dimensional Light-Emitting Materials and Devices I
Session Chairs: Tae-Woo Lee and Angshuman Nag
Wednesday Morning, May 25, 2022
EQ09-Virtual

8:00 AM *EQ09.16.01

Extraordinary Exciton Transport Phenomena in CsPbBr₃ Nanocrystal Solids [William Tisdale](#); Massachusetts Institute of Technology, United States.

8:30 AM *EQ09.16.02

Towards White Light Halide Perovskite Emitters [Samuel D. Stranks](#); University of Cambridge, United Kingdom.

9:00 AM EQ09.16.04

Light Emission in 2D Silver Phenylchalcogenides [Woo Seok Lee](#); Massachusetts Institute of Technology, United States.

9:15 AM EQ09.16.05

Synthetic and Structure-Property Tailoring of 2D Lead Iodide Perovskites with Trap-State Emission [Eugenia S. Vasileiadou](#); Northwestern University, United States.

9:30 AM EQ09.16.06

Investigating the Non-Ideal Optical Behaviour of Halide Perovskite Superlattices [Shaoni Kar](#)^{1, 2}; ¹Helio Display Materials, United Kingdom; ²University of Oxford, United Kingdom.

9:35 AM EQ09.12.05

Increased Optical Responsivity in MoS₂/Si Photodiode Using Chemically Exfoliated Nanoparticles [Ammar Nayfeh](#); Khalifa University of Science and Technology, United Arab Emirates.

9:50 AM *EQ09.14.03

Exciton Polariton Lasing and Condensates in All-Inorganic Perovskite Microcavities [Qihua Xiong](#); Tsinghua University, China.

SESSION EQ09.17: Perovskite and Low-Dimensional Light-Emitting Materials and Devices II
Session Chairs: Tae-Woo Lee and Jingbi You
Wednesday Afternoon, May 25, 2022
EQ09-Virtual

9:00 PM *EQ09.17.01

Photophysics of Low-Dimensional Halide Perovskites [Tze Chien Sum](#); Nanyang Technological University, Singapore.

9:30 PM EQ09.17.02

High-performance Perovskite-Nanocrystal Based Red Light Emitting Diodes with Long Operational Lifetime of 317 hours [Wallace C. Choy](#); University of Hong Kong, China.

9:45 PM EQ09.17.03

Blue-Emitting Colloidal Quantum Wells for Light-Emitting Diodes with Low Turn-on Voltage [Merve Izmir](#)^{1, 2}; ¹Nanyang Technological University, Singapore; ²Nanyang Technological University, Singapore.

10:00 PM EQ09.17.04

High-Optical Quality InGaN/GaN Nano-Porous Membrane Structures Fabricated by Combination Process of Hydrogen Environment Anisotropic Thermal Etching and AlInN Selective Wet Etching [Umuto Kurabe](#); Sophia University, Japan.

10:15 PM EQ09.17.05

Shape-, Size- and Composition-Controlled Lead Free Organic-Inorganic Halide Perovskites with Tunable Optical Properties [Puneet Siwach](#); Indian Institute of Technology Madras, India.

10:20 PM *EQ09.08.07

Molecular Additives in Perovskite LEDs—From Defect Passivation to Crystallization Manipulation [Feng Gao](#); Linköping Univ, Sweden.

VIRTUAL PRESENTATIONS ARE LISTED IN EASTERN TIME

Last Updated 5/18/22

SYMPOSIUM EQ10

Advances in Metasurfaces, Metamaterials and Plasmonics—Materials Design, Manufacturing, Applications and Industrial Aspects
May 8 - May 24, 2022

Symposium Organizers

Viktoriia Babicheva, University of New Mexico
Arseniy Kuznetsov, Data Storage Institute
Ho Wai (Howard) Lee, University of California, Irvine
Junsuk Rho, Pohang University of Science and Technology

* Invited Paper

SESSION EQ10.01: Plasmonic Sensing
Session Chairs: Viktoriia Babicheva and Ho Wai (Howard) Lee
Sunday Morning, May 8, 2022
Hawai'i Convention Center, Level 3, 316C

8:30 AM EQ10.01.01

Optical Characteristics of Plasmonic Nanoparticles and Its Application to Colorimetric Imaging of Histone in Senescence Cell [Yun Kim](#); Hanbat National University, Korea (the Republic of).

8:45 AM EQ10.01.02

An Achromatic and Polarization-Insensitive Metafiber at the Entire Telecommunication Wavelengths [Jaehyuck Jang](#); Pohang University of Science and Technology, Korea (the Republic of).

9:00 AM EQ10.01.03

Experimental Demonstration of Arbitrary Wave-Shaping with High Q Metasurfaces—A Route to Ultra-Efficient, High-Resolution Spatial-Light-Modulators [Mark Lawrence](#); Washington University in St. Louis, United States.

9:15 AM EQ10.01.04

Three-Dimensional Tomographic Mapping of Surface Plasmons of a Chiral Gold Nanoparticle Using STEM-EELS [Jaeyeon Jo](#); Seoul National University, Korea (the Republic of).

9:30 AM EQ10.01.05

Asymmetric Seed Passivation for the Synthesis of Bowl-Like Plasmonic Nanostructures [Zachary J. Woessner](#); Indiana University, United States.

9:45 AM BREAK

SESSION EQ10.02: Plasmonics/Metasurfaces
Session Chairs: Arseniy Kuznetsov and Ho Wai (Howard) Lee
Sunday Morning, May 8, 2022
Hawai'i Convention Center, Level 3, 316C

10:30 AM *EQ10.02.01

Estimating Spontaneous Photon Pair Generation Rates in Au Nanoantennas Using Stimulated Emission Tomography [Rupert F. Oulton](#); Imperial College London, United Kingdom.

11:00 AM EQ10.02.02

Conducting Polymers for Tuneable Structural Colours [Stefano Rossi](#); Linköping University, Sweden.

11:15 AM EQ10.02.03

High Quality Factor Metasurfaces for Real-Time Ocean Observation [Halleh Balch](#); Stanford University, United States.

11:30 AM EQ10.02.04

Lattice Resonances in Arrays of Finite Size and Lossy Nanoscaters [Viktoriia Babicheva](#); University of New Mexico, United States.

11:45 AM EQ10.02.05

Manipulation of Er³⁺-Ion Fluorescence by Controlled Modal Coupling on the Nanoscale [Nicholas A. Gusken](#)^{3,1}; ¹Imperial College London, United Kingdom; ³Stanford University, United States.

SESSION EQ10.03: Metasurfaces and Metamaterials I
Session Chairs: Viktoriia Babicheva and Ho Wai (Howard) Lee
Sunday Afternoon, May 8, 2022
Hawai'i Convention Center, Level 3, 316C

1:30 PM *EQ10.03.01

Nonlocal Metasurfaces [Andrea Alu](#); City University of New York, United States.

2:00 PM EQ10.03.02

Chiral Metasurface Synthesis by Circularly Polarized Light [Ji-Young Kim](#); University of Michigan, United States.

2:15 PM EQ10.03.03

Dynamic Color Tuning with Electrochemically Actuated TiO₂ Metasurfaces [Janna Eaves-Rathert](#); Vanderbilt University, United States.

2:30 PM EQ10.03.04

Dynamic Plasmonic Optics in Dense Nanorod Phases [Nicholas J. Greybush](#); U.S. Naval Research Laboratory, United States.

2:45 PM EQ10.03.05

InGaAsP/InP MQW All-Dielectric Active Metasurfaces at Telecommunications Wavelengths for Beam Steering Applications [Meir y. Grajower](#); California Institute of Technology, United States.

3:00 PM BREAK

SESSION EQ10.04: Plasmonic Applications I
Session Chairs: Andrea Alu and Ho Wai (Howard) Lee
Sunday Afternoon, May 8, 2022
Hawai'i Convention Center, Level 3, 316C

3:30 PM EQ10.04.01

Computational Discovery and Experimental Demonstration of Boron Phosphide for All-Dielectric Nanophotonics [Mark Kamper Svendsen](#); Technical University of Denmark, Denmark.

3:45 PM EQ10.04.02

Characterizing Transient Dynamics of Hot Carriers via Terahertz Spectroscopies [Mohammad Taghinejad](#); Stanford University, United States.

4:00 PM EQ10.04.03

Tunable Surface Gap Plasmon Devices with a Liquid Crystal Elastomer Gap [Anqi Ji](#); Stanford University, United States.

SESSION EQ10.05: Plasmonic Applications II
Session Chairs: Viktoriia Babicheva and Ho Wai (Howard) Lee
Monday Morning, May 9, 2022
Hawai'i Convention Center, Level 3, 316C

10:30 AM *EQ10.05.01

Surface Engineering and Applications of Plasmonic Nanoparticle Lattices [Teri W. Odom](#); Northwestern University, United States.

11:00 AM EQ10.05.02

High Quality Factor Silicon-on-Lithium Niobate Metasurfaces for Electro-Optic Modulation and Reconfigurable Beamsteering [Sahil Dagli](#); Stanford University, United States.

11:15 AM EQ10.05.03

Engineering Hyperbolic Resonances in CdO Superlattices [Angela Cleri](#); The Pennsylvania State University, United States.

11:30 AM EQ10.05.04

Maximum Electro-Momentum Coupling in Piezoelectric Metamaterials [Jeong-Ho Lee](#); University of California, Berkeley, United States.

11:45 AM EQ10.05.05

Plasmonic Nanocavities for Tailored Emission Spectrum of Vertical WS₂ LEDs [Viktoryia Shautsova](#)^{1,2}; ¹University of Oxford, United Kingdom; ²Stanford University, United States.

SESSION EQ10.06: Advances in Metasurfaces, Metamaterials and Plasmonics
Session Chairs: Andrei Faraon and Arseniy Kuznetsov
Monday Afternoon, May 9, 2022
Hawai'i Convention Center, Level 3, 316C

1:30 PM EQ10.06.01

WITHDRAWN 5/9/22 EQ10.06.01 Spectrometerless Instant Raman Identification with Tailored Metasurfaces-Enabled Guided-Mode Resonances (GMR) Filters [Amr A. Saleh](#); Cairo University, Egypt.

1:45 PM EQ10.06.02

A Generic Framework for Neural Networks Based Modeling and Design of Free-Form Manufacturable Metasurfaces [Ibrahim Tanriover](#); Northwestern University, United States.

2:00 PM *EQ10.06.03

Light Sailing with Metamaterials [Artur Davoyan](#); University of California, Los Angeles, United States.

2:30 PM EQ10.06.04

Sensitive and Multiplexed Genetic Analysis with High Quality Factor Metasurfaces [Jack Hu](#); Stanford University, United States.

2:45 PM EQ10.06.05

Resonant Ultraviolet Plasmonic Chirality Sensing of Biomolecular Films [Kevin McPeak](#); Louisiana State University, United States.

3:00 PM BREAK

SESSION EQ10.07: Plasmonic Applications III
Session Chairs: Arseniy Kuznetsov and Ho Wai (Howard) Lee
Monday Afternoon, May 9, 2022
Hawai'i Convention Center, Level 3, 316C

3:30 PM *EQ10.07.01

Volumetric Meta-Optics for Sorting Light By Color, Polarization and Angle of Incidence [Andrei Faraon](#); California Institute of Technology, United States.

4:00 PM EQ10.07.02

Harmonic Beam Switching Using Space-Time Modulated Metasurfaces [Prachi Thureja](#); California Institute of Technology, United States.

4:15 PM EQ10.07.03

Nanoparticle-Based 3D Optical Nanostructure for Resonance Manipulation [Geon Yeong Kim](#); Korea Advanced Institute of Science and Technology, Korea (the Republic of).

4:30 PM EQ10.07.04

Light Driven Alternative Plasmonic Catalysis for the Reduction of Heavy Metals in Solution [Chris Rudnicki](#); University of California, Riverside, United States.

SESSION EQ10.08: Poster Session I: Advances in Metasurfaces, Metamaterials and Plasmonics—Materials Design, Manufacturing, Applications and Industrial Aspects I
Session Chairs: Viktoriia Babicheva and Ho Wai (Howard) Lee
Monday Afternoon, May 9, 2022
5:00 PM - 7:00 PM
Hawai'i Convention Center, Level 1, Kamehameha Exhibit Hall 2 & 3

EQ10.08.01

SERS Nanoprobe Immunoassays for Non-Invasive Diagnosis of Early-Stage Alzheimer's Disease [In-Jun Hwang](#); Hanyang University, Korea (the Republic of).

EQ10.08.02

Optical and Electro-Optical Characterization of Hybrid Metal-Semiconductor Hybrid Metamaterials [David McIlroy](#); Oklahoma State University, United States.

EQ10.08.03

Gradient Colloidal Crystals via Infusion-Withdrawal Coating of Fluorescent Latex Particles [Marius Schoettle](#); Universität Bayreuth, Germany.

EQ10.08.04

Scalable Fabrication of Heat Tolerant Titanium Nitride Nanoring Structures with Multiple-Patterning Colloidal Lithography for Broadband Absorbers in the Visible to Near-Infrared [Myeongcheol Go](#); POSTECH, Korea (the Republic of).

EQ10.08.05

Optic Phonon Confinement for Modifying the Infrared Dielectric Function [Joseph R. Matson](#); Vanderbilt University, United States.

EQ10.08.07

Experimental Investigations into Unprecedented Electro-momentum Coupling [Kahraman G. Demir](#); University of California, Berkeley, United States.

EQ10.08.08

Switchable Waveguides for Novel Laser Displays and Scanners [Andreas Henkel](#); University of Wuppertal, Germany.

EQ10.08.09

A New Computational Approach for the Study of the Photonic Properties of Finite and Infinite Au Nanoparticle 3D-Superlattices. [Nicolas Large](#); The University of Texas at San Antonio, United States.

SESSION EQ10.09: Metasurfaces and Metamaterials II
Session Chairs: Arseniy Kuznetsov and Ho Wai (Howard) Lee
Tuesday Morning, May 10, 2022
Hawai'i Convention Center, Level 3, 316C

8:00 AM *EQ10.09.01

Electrically Controlled Reconfigurable Metasurfaces for High-Power Applications [Ruzan Sokhoyan](#); California Institute of Technology, United States.

8:30 AM EQ10.09.02

Plasmonic Current for Monitoring Excited-State Kinetics [Lahari Saha](#)^{2,1}; ¹University of Maryland, Baltimore County, United States; ²Institute of Fluorescence, United States.

8:45 AM EQ10.09.03

Passively Stabilized Dynamics of Flexible Metagrating-Based Laser-Propelled Lightsails [Ramon Gao](#); California Institute of Technology, United States.

9:00 AM EQ10.09.04

Dynamic Metasurfaces Based on a Tunable Material Resonance in High-Quality, Large-Area 2D Semiconductors [Fenghao Xu](#); Stanford University, United States.

9:15 AM BREAK

9:45 AM *EQ10.09.05

Metasurface Electrodes for Solar Cells and Display Technologies [Mark L. Brongersma](#); Stanford University, United States.

10:15 AM EQ10.09.06

Dual-Mode Anti-Counterfeiting System via Hydrogel-Based Reconfigurable Metasurfaces [Byoungsu Ko](#); Pohang University of Science and Technology, Korea (the Republic of).

10:30 AM EQ10.09.07

New Mode of Energy Propagation in Double Metallic Networks [Cédric Schumacher](#); Adolphe Merkle Institute, Switzerland.

10:45 AM EQ10.09.08

Plasmonics for High Energy Storage and Piezotronics [Dong Ha Kim](#); Ewha Womans University, Korea (the Republic of).

11:00 AM EQ10.09.09

Deep Learning-Based Programmable Design of Plasmonic Born-Kuhn Metasurface for Sensing Application [Jeong Hyun Han](#); Seoul National University, Korea (the Republic of).

11:15 AM EQ10.09.10

Hybrid Photonic-Plasmonic Bound States in Continuum [Maximilian Buchmueller](#); University of Wuppertal, Germany.

11:30 AM EQ10.09.11

Control of Electrochemical Reactions and Film Deposition with the Plasmonic Environment and Light Illumination [Paula Fortunato](#); Norfolk state university, United States.

SESSION EQ10.10: Zero-Index Photonics
Session Chairs: Mark Brongersma and Ho Wai (Howard) Lee
Tuesday Afternoon, May 10, 2022
Hawai'i Convention Center, Level 3, 316C

1:30 PM EQ10.10.02

Observation of Higher-Order Kerr Effect in Thin Epsilon-Near-Zero Films [Sudip Gurung](#)^{1,2,3}; ¹University of California, United States; ²Texas A&M University, United States; ³Baylor University, United States.

1:45 PM EQ10.10.03

Nonlinear Properties of ITO-Based ENZ Materials and Metasurfaces Throughout the Short-Wave Infrared [Evan M. Smith](#); KBR, Inc., United States.

2:00 PM EQ10.10.04

Ultrafast Characterization of Indium Tin Oxide Grating [Michele Guizzardi](#); Politecnico di Milano, Italy.

2:15 PM EQ10.10.05

Ultrafast Nonreciprocal Beam Steering and Frequency Conversion in Epsilon-Near-Zero Materials [Qingyuan Fan](#)^{1,2}; ¹Stanford University, United States; ²SLAC National Accelerator Laboratory, United States.

2:30 PM BREAK

SESSION EQ10.11: Plasmonic/Nanophotonic Applications
Session Chairs: Viktoriia Babicheva and Ruzan Sokhoyan
Tuesday Afternoon, May 10, 2022
Hawai'i Convention Center, Level 3, 316C

3:30 PM EQ10.11.01

Broadband Light-Trapping Antireflection Coatings for Ultrathin Solar Cells Based on Dense Arrays of Mie Resonators [Nayeun Lee](#); Stanford University, United States.

3:45 PM EQ10.11.02

Work-Function Studies of Constituents of Fabri-Perot Cavities and MIM Waveguides [Kanij Mehtanin Khabir](#); Norfolk State University, United States.

4:00 PM EQ10.11.03

Effect of Metal-Dielectric Environments on Photopolymerization of the [2,2'-bi-1H-indene]-1,1'-dione-3,3'-diylidheptanoatecarboxylate monomer [Leila Hesami](#); Norfolk State University, United States.

4:15 PM EQ10.08.06

Dynamic Mechanical Control of Gap Plasmons [Skyler P. Selvin](#); Stanford University, United States.

SESSION EQ10.12: Poster Session II: Advances in Metasurfaces, Metamaterials and Plasmonics—Materials, Design, Manufacturing, Applications and Industrial Aspects II
Session Chairs: Arseniy Kuznetsov and Ho Wai (Howard) Lee
Tuesday Afternoon, May 10, 2022
5:00 PM - 7:00 PM
Hawai'i Convention Center, Level 1, Kamehameha Exhibit Hall 2 & 3

EQ10.12.01

Distance Independence in Excitonic Transport Between Chromophores Facilitated by Plasmonic Nanorods [Albert B. Lamonda](#); Boston University, United States.

EQ10.12.02

Hierarchical PDMS-Based Metamaterial for Simultaneous Control of Visible, NIR and LWIR Wavebands [Injoong Chang](#); Yonsei University, Korea (the Republic of).

EQ10.12.03

Effect of Microsphere Size on Infrared Selective Emission of Hole-Structured Metamaterial [Juyeong Nam](#); Yonsei University, Korea (the Republic of).

EQ10.12.04

High-Index Nanowire Metasurfaces for Polarization-sensitive Light Detection [Jiho Hong](#); Stanford University, United States.

EQ10.12.05

Dipeptide-Directed Chiral Gold Nanoparticle and Its Evolution Pathway Analysis [Hyeohn Kim](#); Seoul National University, Korea (the Republic of).

EQ10.12.06

Influence of the Crystallographic Orientation of ITO on the Electrodeposition of Ag Nanoparticles [Yorick Bleijj](#); AMOLF, Netherlands.

EQ10.12.08

Collective Phonon-Polaritonic Modes in SiC Subarrays [Guanyu Lu](#); Vanderbilt University, United States.

SESSION EQ10.13: Metasurfaces and Metamaterials III
Session Chairs: Viktoriia Babicheva and Ruzan Sokhoyan
Wednesday Morning, May 11, 2022
Hawai'i Convention Center, Level 3, 316C

8:30 AM EQ10.13.01

Arbitrary Control of Ultrafast Complex Electric-Field Transients Enabled by Dielectric Metasurfaces [Lu Chen](#)^{1,2}; ¹National Institute of Standards and Technology, United States; ²University of Maryland, United States.

8:45 AM EQ10.13.02

Sensitive, Quantitative, Real-Time Detection of Protein-Based Biomarkers for Human-Health Diagnosis and Monitoring Using High Quality Factor Metasurfaces [Fareeha Safir](#); Stanford University, United States.

9:00 AM EQ10.13.03

High-Quality-Factor Metasurfaces for Rapid Identification and Classification of Mycobacterium Tuberculosis Using Surface-Enhanced Raman spectroscopy [Baba Ogunlade](#); Stanford University, United States.

9:15 AM EQ10.13.04

Gires-Tournois Immunoassay Platform for Label-Free Colorimetric Detection of SARS-CoV-2 [Young Jin Yoo](#); GIST, Korea (the Republic of).

9:30 AM BREAK**10:00 AM EQ10.13.05**

Ultrasensitive THz All-Dielectric Metasurface Biosensor Based on Bound States in the Continuum [Marie L. Georgiades](#); University College London, United Kingdom.

10:15 AM EQ10.13.06

Architecturally Tailorable Order-Disorder Transition in Ag/Si Layered Hyperbolic Metamaterials [Jose Luis Ocana Pujol](#); ETH Zurich, Switzerland.

10:30 AM EQ10.13.07

A Scaleable Manufacturing Approach for All-Inorganic Diffractive Optics, Lightguide Gratings and Metalenses Using Nanoimprint Lithography and High Refractive Index Nanoparticle Inks [James J. Watkins](#); University of Massachusetts, United States.

10:45 AM EQ10.13.08

Radiation Pressure Propulsion of Structurally Stable Lightsails with Embedded Payloads [Michael Kelzenberg](#); California Institute of Technology, United States.

11:00 AM *EQ10.13.09

Decoding Spectral Signatures of Bacterial Metabolism [Regina Ragan](#); University of California, Irvine, United States.

SESSION EQ10.14: Plasmonic Applications IV
Session Chairs: Viktoriia Babicheva and Ho Wai (Howard) Lee
Wednesday Afternoon, May 11, 2022
Hawai'i Convention Center, Level 3, 316C

1:30 PM *EQ10.14.01

High-Quality-Factor Phase Gradient Metasurfaces for Multiplexed Molecular Sensing and Modulation [Jennifer A. Dionne](#); Stanford University, United States.

2:00 PM EQ10.14.02

A-SHARC: Adaptive Solar Heating and Radiative Cooling by Electrochemically Reversible Plasmonic Selective Absorber [Po-Chun Hsu](#); Duke University, United States.

2:15 PM EQ10.14.03

Design of Chiral Kink Atoms on Single Gold Nanoparticle for the Efficient Electrocatalysis of Glucose [Seungwoo Choi](#); Seoul National University, Korea (the Republic of).

2:30 PM EQ10.14.05

WITHDRAWN 5/10/22 EQ10.14.05 Phase and Amplitude Control via Multidimensional Refractive Elements [Syed N. Qadri](#); Naval Research Laboratory, United States.

2:45 PM BREAK

SESSION EQ10.15: Metasurfaces and Metamaterials IV
Session Chairs: Jennifer Dionne and Ho Wai (Howard) Lee
Wednesday Afternoon, May 11, 2022
Hawai'i Convention Center, Level 3, 316C

3:45 PM EQ10.15.01

Nonlocal, High- Q Metasurfaces for Precise Control of Light Waves in Energy-Momentum Space [Jung-Hwan Song](#); Stanford University, United States.

4:00 PM EQ10.15.02

Rapid Acoustic Bioprinting for Label-Free, SERS Detection of Bloodstream Pathogens [Fareeha Safir](#); Stanford University, United States.

4:15 PM EQ10.15.03

Circularly-Polarized Stimulated Raman Scattering in a Doubly-Resonant Silicon Metasurface for Subwavelength Nonreciprocity [Jefferson Dixon](#); Stanford University, United States.

4:30 PM EQ10.15.04

WITHDRAWN 5/9/22 EQ10.15.04 Cow Manure-Derived Photonic Metamaterial as Recyclable Photothermal Evaporator for Solar-Driven Water Desalination [Yi Zheng](#); Northeastern University, United States.

SESSION EQ10.16: Poster Session III: Advances in Metasurfaces, Metamaterials and Plasmonics—Materials Design, Manufacturing, Applications and Industrial Aspects III
Session Chairs: Viktoriia Babicheva and Arseniy Kuznetsov
Wednesday Afternoon, May 11, 2022
5:00 PM - 7:00 PM
Hawai'i Convention Center, Level 1, Kamehameha Exhibit Hall 2 & 3

EQ10.16.01

Bulk Synthesis of Hyperbolic Metamaterials with Chemical Tunability [Eunsil Lee](#)^{1,4}; ¹KICET, Korea (the Republic of); ⁴Yonsei University, Korea (the Republic of).

EQ10.16.02

Liquid-Metal-Based Nanophotonic Surface-Enhanced Infrared Absorption Sensors [Peter Qiang Liu](#); State University of New York at Buffalo, United States.

EQ10.16.03

Enantioselective Sensing by Collective Circular Dichroism of 2D Helicoid Crystals [Ryeong Myeong Kim](#); Seoul National University, Korea (the Republic of).

EQ10.16.04

Long-Lived Hyperbolic Phonon Polaritons in Monoisotopic (¹⁰B) Hexagonal Boron Nitride [Georges Pavlidis](#)^{1,2}; ¹National Institute of Standards and Technology, United States; ²University of Connecticut, United States.

EQ10.16.05

ThermoMechanical Imaging and Discerning of Single Bacteria Cells by Optomechanical Spectroscopy [Daniel Ramos](#); CSIC, Spain.

EQ10.16.06

The High Optical Performance of a Polymeric Sulfur-Based Mid-Wavelength Infrared Linear Polarizer [Woongbi Cho](#); Inha University, Korea (the Republic of).

EQ10.16.07

Optical Properties of a Monolayer of Metallic Nanoparticles in a Thin-Film Stack [Marie-Caroline Solignac](#)^{1,2}; ¹Surface du Verre et Interfaces, UMR 125 CNRS/Saint-Gobain, France; ²LP2N, CNRS, Institut d'Optique Graduate School, Univ. Bordeaux, France.

SESSION EQ10.17: Nanophotonic/Plasmonic Applications
Session Chairs: Debashis Chanda and Arseniy Kuznetsov
Thursday Morning, May 12, 2022
Hawai'i Convention Center, Level 3, 316C

8:00 AM EQ10.17.01

Ultrathin Photothermal Percolating Metasurface to Combat Fogging [Iwan Haechler](#); ETH Zürich, Switzerland.

8:15 AM EQ10.17.02

Machine Learning Analysis of Spectral Data using Bacterial Metabolic Networks for Signal Amplification [Hong Wei](#); University of California, Irvine, United States.

8:30 AM EQ10.17.03

Hybrid Visible Imaging and Near-Infrared Optical Spectroscopy Using Bioinspired Nanostructures with Smartphone Image Sensors [Radwanul H. Siddique](#); Samsung Semiconductor, Inc., United States.

8:45 AM EQ10.17.04

Co-Design of Free-Space Metasurface Optical Neuromorphic Classifiers for High Performance [Francois Leonard](#); Sandia National Laboratories, United States.

9:00 AM EQ10.17.05

Synthetic Pathway for Chiral Gold Nanostructures with Spiral Geometries [Robert Hughes](#); University of Notre Dame, United States.

9:15 AM BREAK**9:45 AM *EQ10.17.06**

Tunable and Multifunctional Optoelectronic Devices [Debashis Chanda](#); University of Central Florida, United States.

10:15 AM EQ10.17.07

Nondestructive Characterization of the Structural and Mechanical Properties of Nanostructured Metalattices Using Coherent Extreme UV Scatterometry [Joshua Knobloch](#); STROBE, JILA, University of Colorado Boulder, United States.

10:30 AM EQ10.17.08

Neural Network Design of Broadband Epsilon-Near-Zero Perfect Absorbers [David Dang](#); University of California, Irvine, United States.

10:45 AM EQ10.17.09

Directional Raman Scattering Coupled into Plasmonic Waveguide with Near-Unity Couple Efficiency [Rupert F. Oulton](#); Imperial College London, United Kingdom.

11:00 AM EQ10.17.10

Graphene-Based Modulation and Enhancement of Near-Field Radiative Heat Transfer Rectification [Riccardo Messina](#); Laboratoire Charles Fabry, France.

SESSION EQ10.18: Lasing and Radiation Engineering
Session Chairs: Viktoriia Babicheva and Wenshan Cai
Thursday Afternoon, May 12, 2022
Hawai'i Convention Center, Level 3, 316C

1:30 PM *EQ10.18.01

Complete 2π Tunable Phase Modulation Using Avoided Crossing of Resonances [Min Seok Jang](#); Korea Advanced Institute of Science and Technology, Korea (the Republic of).

2:00 PM EQ10.18.02

Elucidating and Controlling the Coupling Between Plasmonic Nanostructures and 2D Semiconductors [Yan Joe Lee](#); Stanford University, United States.

2:15 PM EQ10.18.03

Tunable Nanophotonics Enabled by Defect-Engineering of VO₂ Using a Focused Ion Beam [Chenghao Wan](#); University of Wisconsin--Madison, United States.

2:30 PM EQ10.18.04

WITHDRAWN 5/11/22 EQ10.18.04 Metasurface-Integrated Perovskite Emitters [Zi Jing Wong](#); Texas A&M University, United States.

2:45 PM EQ10.18.05

A Monolayer Semiconductor Free-Space Optical Modulator [Qitong Li](#); Stanford University, United States.

3:00 PM BREAK

SESSION EQ10.19: Dimensional Photonics/Metamaterials
Session Chairs: Min Seok Jang and Arseniy Kuznetsov
Thursday Afternoon, May 12, 2022
Hawai'i Convention Center, Level 3, 316C

3:30 PM *EQ10.19.01

Inverse Meta-Design—Constructing Metasurfaces and Metasystems via Machine Learning [Wenshan Cai](#); Georgia Institute of Technology, United States.

4:00 PM EQ10.19.02

Two-Dimensional ITO for Gate-Tunable Optical Absorption [Christopher Gonzalez](#); University of California Irvine, United States.

4:15 PM EQ10.19.03

Atomic Layer Deposition as a Novel Technique for the Fabrication of Magnetoplasmonic Metasurfaces—Manufacturing and Characterization of Ferromagnetic Nickel Nanoarrays [Gabriele Botta](#)^{1,4}; ¹CIC nanoGUNE BRTA, Spain; ⁴FPI fellow (MINECO), Spain.

SESSION EQ10.20: Nanophotonics/Plasmonics
Session Chairs: Artur Davoyan and Arseniy Kuznetsov
Friday Morning, May 13, 2022
Hawai'i Convention Center, Level 3, 316C

8:00 AM EQ10.20.02

Zero-Index Material Enabled Hollow Core Optical Fiber [Leon Zhang](#); University of California, Irvine, United States.

8:15 AM EQ10.20.03

Real-Time Quantum Dynamics of Long-Range Electronic Excitation Transfer in Plasmonic Nanoantennas [Bryan M. Wong](#); University of California, Riverside, United States.

8:30 AM EQ10.20.04

Diamond Spin Microscopy on a Plasmonic Quantum Metasurface [Laura Kim](#); Massachusetts Institute of Technology, United States.

8:45 AM EQ10.20.05

Electrically Tunable Bifocal Metalenses Mediated by Liquid Crystals [Trevon Badloe](#); Pohang University of Science and Technology, Korea (the Republic of).

9:00 AM EQ10.20.06

Interdependent Hot-Carrier Transient Dynamics and Active Linear/Non-Linear Optical Response in a 1D Plasmonic Crystal [Andrew S. Kim](#); Georgia Institute of Technology, United States.

9:15 AM BREAK

9:45 AM *EQ10.20.07

Assembly of Large-Area Aligned Gold Trimers with Sub-5 nm Air-Filled Vertical Nanogaps [Svetlana Neretina](#); University of Notre Dame, United States.

10:15 AM EQ10.20.08

Efficient Nonlinear Modulation for Dynamic Wavefront Shaping with High Quality Factor Phase Gradient Metasurfaces [Elissa Klopfer](#); Stanford University, United States.

10:30 AM EQ10.20.09

Plasmon-Enhanced Photoemitters as Bright Ultrashort Electron Pulse Generators [Daniel B. Durham](#)^{1,3}; ¹University of California, Berkeley, United States; ³Lawrence Berkeley National Laboratory, United States.

10:45 AM EQ10.20.10

Cavity Enhanced Tellurium Photodetectors [Alexander D. White](#); Stanford, United States.

11:00 AM EQ10.20.11

Atomically Thin Electro-Optic Polarization Modulator [Souvik Biswas](#); California Institute of Technology, United States.

11:15 AM EQ10.20.12

Deterministic Inverse Design of Lithography-Free, Tamm Plasmon Thermal Emitters with Multi-Resonant Control [Mingze He](#); Vanderbilt University, United States.

SESSION EQ10.21: Lasing and Radiation Engineering
Session Chairs: Junghyun Park and Maxim Shcherbakov
Friday Afternoon, May 13, 2022
Hawai'i Convention Center, Level 3, 316C

1:30 PM *EQ10.21.01

Tunable Photonic Metasurfaces: Fundamentals and Applications [Maxim Shcherbakov](#); University of California, Irvine, United States.

2:00 PM EQ10.21.02

Exciton-Polariton Lasing from Topologically Protected States [Fabrizio Riminucci](#); Lawrence Berkeley National Laboratory, United States.

2:15 PM EQ10.21.04

Metaphotonics for Advanced Imaging Techniques—Electrically Tunable Varifocal Metalens and 3D Flash LiDAR [Inki Kim](#); Sungkyunkwan University, Korea (the Republic of).

2:30 PM EQ10.21.05

Manufacturing a Plasmonic Nanotemplate to Modify the Optical Response and Reinforce the Plasmon-Phonon Coupling in Silicon Dioxide [Maria C. Garcia Toro](#); Missouri University of Science and Technology, United States.

2:45 PM BREAK

3:15 PM *EQ10.21.06

Next Step of Tunable Metasurface—Time to Consider Efficiency and Purity [Junghyun Park](#); Samsung Advanced Institute of Technology, Korea (the Republic of).

3:45 PM EQ10.21.07

Reconfigurable Complex Photonic Systems for Secure Cryptographic Primitives [Sara Nocentini](#)^{1,2}; ¹National Institute for Metrological Research, Italy; ²European Laboratory for Nonlinear Spectroscopy, Italy.

4:00 PM EQ10.21.08

Engineering of Large-Scale Plasmonic Networks for Collective Emission [René Iseli](#); Adolphe Merkle Institut, Switzerland.

4:15 PM EQ10.21.09

Sensing Spatially Structured Non-Paraxial Light Fields [Eileen Otte](#)^{2,1,3}; ¹University of Muenster, Germany; ²Stanford University, United States; ³University of Muenster, Germany.

SESSION EQ10.22: Advances in Metasurfaces, Metamaterials and Plasmonics
Session Chairs: Arseniy Kuznetsov and Junsuk Rho
Monday Morning, May 23, 2022
EQ10-Virtual

8:00 AM *EQ10.22.01

Salient Features of Space-Time Metastructures [Nader Engheta](#); University of Pennsylvania, United States.

8:30 AM *EQ10.22.02

Non-Hermitian Topological Metasurfaces Based on Photonic-Plasmonic Hybrid Resonators [Guru V. Naik](#); Rice University, United States.

9:00 AM EQ10.22.03

Promoting Excitation of Triplet State of Molecule by Enhanced Magnetic Field of Dielectric Metasurfaces [Hiroshi Sugimoto](#); Kobe University, Japan.

9:15 AM EQ10.22.04

Broadband Electromagnetic Absorber Based on 3D Conical Helix Metamaterials [Eri Igarashi](#); Sony Group Corporation, Japan.

9:30 AM EQ10.22.05

Fundamental Thickness Bounds for Wide-Field-of-View Metalenses [Shiyu Li](#); University of Southern California, United States.

9:45 AM EQ10.22.06

Electron Transfer Kinetics Using GHz Scanning Tunnelling Electrochemical Microscope [Mohamed Awadein](#); Keysight Technologies, Austria.

SESSION EQ10.23: Active Control

Session Chairs: Viktoriia Babicheva and Ho Wai (Howard) Lee

Monday Morning, May 23, 2022

EQ10-Virtual

10:30 AM *EQ10.23.01

WITHDRAWN 5/17/22 EQ10.23.01 The Rise of Mie-Trionics [Yuri Kivshar](#)^{1,2}; ¹Australian National University, Australia; ²ITMO University, Russian Federation.

11:00 AM *EQ10.23.02

Light-Absorption in Nano-Antennas—From Self-Heating to Reconfigurable Metasurfaces [Giulia Tagliabue](#); École Polytechnique Fédérale de Lausanne, Switzerland.

11:30 AM EQ10.23.03

Tunable Metasurfaces Based on Charge Density Waves in 1T-TaS₂ [Guru V. Naik](#); Rice University, United States.

SESSION EQ10.24: Zero-Index Material

Session Chairs: Viktoriia Babicheva and Ho Wai (Howard) Lee

Monday Afternoon, May 23, 2022

EQ10-Virtual

1:00 PM *EQ10.24.01

Anomalous Electromagnetic Tunneling with Bianisotropic Zero Index Media [Shuang Zhang](#); The University of Hong Kong, Hong Kong.

1:30 PM EQ10.24.02

Phase Gradient Gap Surface Plasmon Metasurface for Anomalous Beam Steering and Surface Plasmon Polariton Coupling for Visible to the Infrared Spectrum with the Anisotropic Nanoantenna [Hosna A. Sultana](#); University of Alabama, United States.

1:45 PM EQ10.24.03

Magic-Angle Flat Bands and Light Localization in Bilayer Honeycomb Photonic Crystals with A Small Twist [Tiancheng Zhang](#)^{1,3}; ¹University of California, Berkeley, United States; ³Peking University, China.

2:00 PM EQ10.24.04

Self-Assembly of Colloidal Nanoparticles into Encapsulated Hollow Superstructures [Chaolumen Wu](#); University of California, Riverside, United States.

2:15 PM *EQ10.24.05

Metaoptics for Active Photonics [Federico Capasso](#); Harvard University, United States.

SESSION EQ10.25: Fundamental of Plasmonics and Metaphotonics

Session Chairs: Viktoriia Babicheva and Ho Wai (Howard) Lee

Monday Afternoon, May 23, 2022

EQ10-Virtual

4:00 PM *EQ10.25.01

Peptide Induced Chirality in Single Gold Nanoparticle [Ki Tae Nam](#); Seoul National University, Korea (the Republic of).

4:30 PM EQ10.25.03

Plasmonic Nanostructures for Photothermal Conversion [Yadong Yin](#); University of California, Riverside, United States.

4:45 PM EQ10.25.04

Template-Assisted Capillary-Assembly of Crystalline Silicon Nanoparticles for All-Dielectric Nanoantenna [Hidemasa Negoro](#); Kobe university, Japan.

5:00 PM EQ10.25.05

Fluorophore Induced Plasmonic Current (FIPC) Detection with Mixed Metal Nanoparticle Films [Dan Pierce](#)^{1,2}; ¹University of Maryland, United States; ²Institute of Fluorescence, United States.

5:15 PM EQ10.25.06

Active Plasmonic Color Tuning of Self-Assembled Ag Nanocube Monolayer [Ayana Mizuno](#)^{1,2}; ¹Shizuoka University, Japan; ²JSPS Research Fellow, Japan.

5:30 PM EQ10.25.07

Plasmon-Induced Hot Carriers for Photocatalytic CO₂ Reduction with Au/p-GaN Heterostructures [Wen-Hui Cheng](#)^{1,2}; ¹National Cheng Kung University, Taiwan; ²California Institute of Technology, United States.

5:45 PM *EQ10.20.01

Rapid Prototyping of Optical Fourier Surfaces and Volumes [Seungwoo Lee](#); Korea University, Korea (the Republic of).

SESSION EQ10.26: Metasurfaces and Metamaterials V
Session Chairs: Arseniy Kuznetsov and Junsuk Rho
Monday Afternoon, May 23, 2022
EQ10-Virtual

9:00 PM *EQ10.26.01

Ultrafast Pulse Compression and High-Purity Vortex Beam Generation with Dielectric Metasurfaces [Yao-Wei Huang](#)^{1,2}; ¹National Yang Ming Chiao Tung University, Taiwan; ²Harvard University, United States.

9:30 PM EQ10.26.02

Use of Si as Low-Loss Thermo-Optical Material for Spectrally Demanding Narrowband IR Devices [David Hernandez Pinilla](#); National Institute for Materials Science, Japan.

9:45 PM EQ10.26.03

Sodium Surface Lattice Plasmons [Ankun Yang](#); Oakland University, United States.

10:00 PM EQ10.26.04

Monosaccharide-Mediated Rational Synthesis of a Universal Plasmonic Platform with Broad Spectral Fluorescence Enhancement for High-Sensitivity Cancer Biomarker Analysis [Mengyao Liu](#); Sun Yat-sen University Cancer Center, China.

10:15 PM EQ10.26.05

Electrically-Tunable Active Metasurfaces and Plasmonic Devices Based on Phase Change Material VO₂ [Ruwen Peng](#); Nanjing University, China.

10:30 PM *EQ10.26.06

Optimal Polarization Conversion Using a Toroidal-Fano-Resonant Metasurface [Pin Chieh Wu](#); National Cheng Kung University, Taiwan.

SESSION EQ10.27: Advances in Metasurfaces, Metamaterials and Plasmonics—Materials Design, Manufacturing, Applications and Industrial Aspects I
Session Chair: Ho Wai (Howard) Lee
Tuesday Morning, May 24, 2022
EQ10-Virtual

8:00 AM *EQ10.27.01

Complex-Amplitude Metasurfaces for Orbital Angular Momentum Holography and Broadband Focusing [Stefan A. Maier](#)^{2,1}; ¹Imperial College London, United Kingdom; ²LMU Munich, Germany.

8:30 AM *EQ10.27.02

Plasmon-Enhanced Solar-Driven Hydrogen Evolution Using Transition Metal Nitride Metasurface Broadband Absorbers [Yu-Jung Lu](#)^{2,1}; ¹National Taiwan University, Taiwan; ²Academia Sinica, Taiwan.

9:00 AM *EQ10.27.03

Autonomous Sensing by Intelligent Meta-Lens Array [Din-Ping Tsai](#); City University of Hong Kong, Hong Kong.

9:30 AM EQ10.27.04

Plasmon-Enhanced Photoresponse of Monolayer MoS₂ Phototransistor Integrated with Refractory Metasurfaces [Wei-Ren Syong](#); Academia Sinica, Taiwan.

9:45 AM EQ10.27.05

Cellulose Janus Structure with Self-Adaptive Optical Heating and Drying [Subham Dastidar](#)^{1,2}; ¹Linköping University, Sweden; ²Linköping University, Sweden.

SESSION EQ10.28: Advances in Metasurfaces, Metamaterials and Plasmonics—Materials Design, Manufacturing, Applications and Industrial Aspects II
Session Chair: Ho Wai (Howard) Lee
Tuesday Morning, May 24, 2022
EQ10-Virtual

10:30 AM *EQ10.28.01

Metasurface-Embedded Ultracompact On-Chip Spectrometer for Mobile Applications [Young-Geun Roh](#); SAIT, Samsung Electronics, Korea (the Republic of).

11:00 AM EQ10.28.02

Development of Gap-Plasmon-Enhanced NbN Superconducting Photodetectors and Its Applications [Jingwei Yang](#); Academia Sinica, Taiwan.

11:15 AM EQ10.25.02

Spectrally-Selective Long Infrared Dielectric Meta-Absorber for Thermal Camouflage [Buket Akin](#)^{1,2}; ¹Istanbul Technical University, Turkey; ²Turkish Aerospace, Turkey.

11:30 AM *EQ10.14.04

Software Defined Meta-Optics [Arka Majumdar](#); University of Washington, Seattle, United States.

12:00 PM *EQ10.10.01

Applications of Epsilon-Near-Zero (ENZ) Materials to Quantum Devices [Jeremy N. Munday](#); University of California, Davis, United States.

SYMPOSIUM EQ11

Neuromorphic Computing and Biohybrid Systems—Materials and Devices for Brain-Inspired Computing, Adaptive Biointerfacing and Smart Sensing

May 9 - May 24, 2022

Symposium Organizers

Yiyang Li, University of Michigan

Francesca Santoro, Istituto Italiano di Tecnologia

Ilia Valov, Research Center Juelich

Yoeri van de Burgt, Technische Universiteit Eindhoven

* Invited Paper

SESSION EQ11.01: Novel Materials I

Session Chairs: Yiyang Li and Yoeri van de Burgt

Monday Morning, May 9, 2022

Hawai'i Convention Center, Level 3, 318A

10:30 AM *EQ11.01.01

Volatile and Nonvolatile Resistive Switching Devices for Spike-Based Sensing and Learning [Daniele Ielmini](#); Politecnico di Milano, Italy.

11:00 AM *EQ11.01.02

A Fully-RF Spintronic Neural Network [Julie Grollier](#); CNRS/Thales, France.

11:30 AM EQ11.01.03

Towards Metal Oxide Networks as Synaptic Materials [Alexandra Berg](#); University of Groningen, Netherlands.

SESSION EQ11.02: Novel Materials II

Session Chairs: Seyoung Kim, Yiyang Li and Ilia Valov

Monday Afternoon, May 9, 2022

Hawai'i Convention Center, Level 3, 318A

1:30 PM *EQ11.02.01

Recent Progress in Resistive Memory Device Technologies for AI Computations [Seyoung Kim](#); Pohang University of Science and Technology, Korea (the Republic of).

2:00 PM EQ11.02.02

Reconfigurable MoS₂ Memtransistors for Continuous Learning in Spiking Neural Networks [Stephanie Liu](#); Northwestern University, United States.

2:15 PM EQ11.02.03

Two-Dimensional Hetero-Memristors Based Stochastic Neurons for Temperature-Dependent Boltzmann Machine [Jiahui Ma](#); University of Southern California, United States.

2:30 PM EQ11.02.04

Stencil-Printed, Flexible Cyrene-Graphene Electrocardiography (ECoG) Arrays [Jia Hu](#); University of Minnesota Twin Cities, United States.

2:45 PM EQ11.02.05

Energy Efficient Bio-Compatible Graphene Artificial Synaptic Transistors for Accurate Neuromorphic Computing [Samuel Liu](#); The University of Texas at Austin, United States.

3:00 PM BREAK

3:30 PM *EQ11.02.07

Ion Tunable Electronic Materials Systems for Neuromorphic Computing [A. A. Talin](#); Sandia National Laboratories, United States.

4:00 PM EQ11.02.08

Ultra-Fast and Low Energy MoS₂ Dynamic Synapses with Programmable Spatio-Temporal Dynamics for High Precision Neuromorphic Computing [Mohammad Taghi Sharbati](#); University of Pittsburgh, United States.

4:15 PM EQ11.02.09

Memristively Programmable Transistors [Raphael D. Ahlmann](#); TU Dortmund University, Germany.

SESSION EQ11.03: Resistive Switching I
Session Chairs: Catherine Graves and Ilia Valov
Tuesday Morning, May 10, 2022
Hawai'i Convention Center, Level 3, 318A

8:30 AM *EQ11.03.01

Characterization of Memory Devices for Energy Efficient Analog In-Memory Neural Computing at the Edge [Matthew Marinella](#)^{1,2}; ¹Sandia National Laboratories, United States; ²Arizona State University, United States.

9:00 AM EQ11.03.02

Highly Improved Resistance Controllability in the Cu-Cone Structure Inserted Conductive Bridge Random Access Memory for Synaptic Device Application [Haejin Kim](#); Department of Materials Science and Engineering and Inter-University Semiconductor Research Center, Seoul National University, Korea (the Republic of).

9:15 AM EQ11.03.03

Controlling the Oxygen Ion Motion Using a Diffusion Barrier Layer in HfO_x-Based Analog Memory [Fabia Farlin Athena](#); Georgia Institute of Technology, United States.

9:30 AM EQ11.03.04

Monolithic Fabrication of 1S-1R Crossbar Array Using Single Ge_xTe_{1-x} Material by Controlling Composition Between Memory and Threshold Switching for Neuromorphic Application [Sang-Heon Park](#)^{1,2}; ¹Yonsei University, Korea (the Republic of); ²Yonsei University, Korea (the Republic of).

9:45 AM BREAK**10:15 AM *EQ11.03.05**

La₂NiO_{4+δ}—A New Mixed Conducting Oxide for Analogue Memristive Devices [Mónica Burriel](#); Univ. Grenoble Alpes, CNRS, Grenoble INP, LMGP, France.

10:45 AM EQ11.03.06

Enhanced Resistive Switching in Complex Oxide Interfacial Memristors by Device Downscaling [Anouk S. Goossens](#); University of Groningen, Netherlands.

11:00 AM EQ11.03.07

Vertically Stacked Memristor Configuration with Individual Half-Cell Tunability [Vasileios Manouras](#); University of Southampton, United Kingdom.

SESSION EQ11.04: Resistive Switching II
Session Chairs: Mónica Burriel and Yiyang Li
Tuesday Afternoon, May 10, 2022
Hawai'i Convention Center, Level 3, 318A

1:30 PM *EQ11.04.01

In-Memory Computing with Memristor Circuit Primitives [Catherine E. Graves](#); Hewlett Packard Laboratories, United States.

2:00 PM *EQ11.04.02

High-Performance Neuromorphic Optimization with Analog Nonvolatile Memory Circuits [Dmitri Strukov](#); University of California, Santa Barbara, United States.

2:30 PM EQ11.04.03

Visualizing Thermally Activated Memristive Switching in Percolating Networks of Solution-Processed 2D Semiconductors [Vinod K. Sangwan](#); Northwestern University, United States.

2:45 PM BREAK**3:00 PM EQ11.04.04**

Physical Modeling of Conductive Filament Growth and Resistive Switching Dynamics in Metal Oxide-Based RRAM [Ye Cao](#); The University of Texas at Arlington, United States.

3:15 PM EQ11.04.05

Fully-Printed Ag/TiO₂/Ag Electronic Synapses for Brain-Inspired Computing [Varvara Salonikidou](#)^{1,2}; ¹University of Surrey, United Kingdom; ²University of Cambridge, United Kingdom.

3:30 PM EQ11.04.06

Reset Condition Effects on the Analog Pulsing of HfO_x-Based Neuromorphic Devices [Matthew P. West](#); Georgia Institute of Technology, United States.

SESSION EQ11.05: Poster Session I: Neuromorphic Computing, Biointerfacing, and Smart Sensing I
Session Chairs: Yiyang Li and Ilia Valov
Tuesday Afternoon, May 10, 2022
5:00 PM - 7:00 PM
Hawai'i Convention Center, Level 1, Kamehameha Exhibit Hall 2 & 3

EQ11.05.01

Memristive Neuron Based on Silicon Oxide Nanorod Structure for Probabilistic Computing Applications [Sanghyeon Choi](#); Korea University, Korea (the Republic of).

EQ11.05.02

Accelerated Learning in Wide-Band-Gap Aluminum Nitride Artificial Photonic Synapse [Moonsang Lee](#); Inha University, Korea (the Republic of).

EQ11.05.03

Assessment of Charge Trap Memory for Synaptic Transistor Through Trap Time Control [Eunseo Jo](#); Sejong University, Korea (the Republic of).

EQ11.05.04

WITHDRAWN 5/7/22 EQ11.05.04 Magneto-Responsive Liquid Metal Gated Transistor for 3D Pattern Encryption [HoYeon Kim](#); Yonsei University, Korea (the Republic of).

EQ11.05.06

Investigation on Effect of Defective Interface Using Solution Process for IGZO Optical Synaptic Transistor [Jusung Chung](#); Yonsei University, Korea (the Republic of).

EQ11.05.08

Study of Synthesized Ge_xS_{1-x} Films for OTS Selector Application [Minkyu Lee](#); Yonsei University, Korea (the Republic of).

EQ11.05.09

Multi-Scale Modeling of Charge Dynamics in a Neuromorphic Device Based on PEDOT:PSS [Zhongquan Chen Chen](#)^{1,2}; ¹Eindhoven University of Technology, Netherlands; ²Technische Universiteit Eindhoven, Netherlands.

EQ11.05.10

Understanding Behavior of Oxygen Vacancies in Perovskite-Based Memristor [Sanghyo Lee](#); Seoul National University, Korea (the Republic of).

EQ11.05.11

Realization of Long-Term Plasticity in Ion-Gel Gated Monolayer Graphene Synaptic Transistor [Gyeong-Tak Go](#); Seoul National University, Korea (the Republic of).

EQ11.05.12

Liquid-Type Artificial Synaptic Devices with Low Power Consumption [Dongshin Kim](#); Pohang University of Science and Technology, Korea (the Republic of).

EQ11.05.13

Investigation of Resistive Switching Behaviors in LaCoO_x-Based Resistance Random Access Memory [Yen Jung Chen](#); National Yang Ming Chiao Tung University, Taiwan.

SESSION EQ11.06: Organic Materials and Biohybrid Approaches I

Session Chairs: Francesca Santoro and Yoeri van de Burgt

Wednesday Morning, May 11, 2022

Hawai'i Convention Center, Level 3, 318A

8:30 AM *EQ11.06.01

Recent Developments in Organic-Based Artificial Synapses—From Protons and Electrons to Robots [Alberto Salleo](#); Stanford University, United States.

9:00 AM *EQ11.06.02

Organic Neuromorphic Electronics [Paschalis Gkoupidenis](#); Max Planck Institute for Polymer Research, Germany.

9:30 AM EQ11.06.03

Evolvable Transistors for Machine Learning [Jennifer Gerasimov](#); Linköping University, Sweden.

9:45 AM EQ11.06.04

Towards Biomimetic Biohybrid Synapses—Investigating the Role of Artificial Biomembranes Fluidity on Neuromorphic Short-Term Plasticity [Claudia Lubrano](#)^{1,2}; ¹Istituto Italiano di Tecnologia, Italy; ²University of Naples Federico II, Italy.

10:00 AM BREAK

10:15 AM *EQ11.06.05

Simulation and Implementation of Multi-Gate OECT Reservoir Computing Circuits [Sean E. Shaheen](#); University of Colorado-Boulder, United States.

10:45 AM EQ11.06.06

Additive Manufacturing Organic Neuromorphic Devices and Neural Networks [Tanyaradzwa Mangoma](#)^{1,2}; ¹Institute for Manufacturing, University of Cambridge, United Kingdom; ²University of Cambridge, United Kingdom.

11:00 AM EQ11.06.07

An Organic Neuromorphic Spiking-Non Spiking Circuit Replicating Biological Heterogeneous Neural Networks for In-Sensor Computing [Giovanni Maria Matrone](#); Technische Universiteit Eindhoven, Netherlands.

11:15 AM EQ11.06.08

Pristine Leaf-Based Electrochemical Resistive Switching Device [Ramesh Adhikari](#); Colgate University, United States.

SESSION EQ11.07: Organic Materials and Biohybrid Approaches II

Session Chair: Paschalis Gkoupidenis

Wednesday Afternoon, May 11, 2022

Hawai'i Convention Center, Level 3, 318A

1:30 PM *EQ11.07.01

Organic Electrochemical Neurons and Synapses for Neuromorphic Applications [Simone Fabiano](#); Linköping University, Sweden.

2:00 PM EQ11.07.02

Bio-Implantable Mussel Protein-Based Flexible Neuromorphic Memristor [Sung Min Rho](#); Yonsei University, Korea (the Republic of).

2:15 PM EQ11.07.03

Droplet Based Microfluidic Crossbar Array for Biomolecular Memristors [Nicholas X. Armendarez](#); The Pennsylvania State University, United States.

2:30 PM BREAK

3:00 PM *EQ11.07.04

Employing the Non-Linear Properties of Organic Electrochemical Transistors to Build Brain-Inspired Artificial Intelligence [Hans Kleemann](#); Technische Universität Dresden, Germany.

3:30 PM EQ11.07.05

Functional Biomembranes in Organical Electrochemical Transistor—Analysis, Modelling and Working Regimes [Ugo Bruno](#)^{1,2}; ¹Italian Institute of Technology, Italy; ²Università degli Studi di Napoli Federico II, Italy.

SESSION EQ11.08: Poster Session II: Neuromorphic Computing, Biointerfacing, and Smart Sensing II

Session Chairs: Francesca Santoro and Yoeri van de Burgt

Wednesday Afternoon, May 11, 2022

5:00 PM - 7:00 PM

Hawai'i Convention Center, Level 1, Kamehameha Exhibit Hall 2 & 3

EQ11.08.01

Deep Learning-Based Flexible Piezoelectric Acoustic Sensors with Noise-Robust Voice Coverage for Speech Processing [Young Hoon Jung](#); Korea Advanced Institute of Science and Technology, Korea (the Republic of).

EQ11.08.02

Logic Application in Biological Crossbar Neuron Network Using STDP learning [Kyung-Hwa Yoo](#); Yonsei University, Korea (the Republic of).

EQ11.08.03

A Biohybrid Neural Interface—Human-Derived Supported Lipid Bilayers as a Biological Intermediary [Malak Kawan](#); University of Cambridge, United Kingdom.

EQ11.08.04

Neuromorphic Devices Based on Biocompatible and Biodegradable Silibinin from Milk Thistle Extracts for Implantable Bioelectronics [Dong Hyun Choi](#); Yonsei University, Korea (the Republic of).

EQ11.08.05

Artificial Broadband Light Perception by Optical Neuromorphic Transistor Based on Indium–Gallium–Zinc Oxide Using Bi₂Se₃ [Hyung Tae Kim](#); Yonsei University, Korea (the Republic of).

EQ11.08.06

WITHDRAWN 5/7/22 EQ11.08.06 Retina-Inspired Photonic Synapse with Structurally Tunable Synaptic Perovskite Nanocones [Kyuhoo Lee](#); Yonsei University, Korea (the Republic of).

EQ11.08.07

Navigating Through the Phase Diagram of a Mott Insulator by Substrate-Induced Strain [Eti Barazani](#); Technion, Israel.

EQ11.08.08

Patterning and Encapsulation of Organic Optoelectronic Devices for Interfacing Neurons [Sofia Drakopoulou](#); EMSE, France.

EQ11.08.09

Concurrent Optimization of Electrical and Thermal Performances of Ovonic Threshold Switching Si-Ge-Te-N Selector Device for Neuromorphic Applications [Chaebin Park](#)^{1,2}; ¹Yonsei University, Korea (the Republic of); ²Yonsei University, Korea (the Republic of).

SESSION EQ11.09: Phase-Change Memory

Session Chairs: Ilia Valov and Yoeri van de Burgt

Thursday Morning, May 12, 2022

Hawai'i Convention Center, Level 3, 318A

8:30 AM *EQ11.09.01

Developing analog hardware for cloud and edge computing [Stefano Ambrogio](#); IBM Almaden Research Ctr, United States.

9:00 AM EQ11.09.02

Novel Nanocomposite and Superlattice Materials Enabling Energy-Efficient Neuro-Inspired Phase Change Memory [Asir Intisar Khan](#); Stanford University, United States.

9:15 AM EQ11.09.03

Suppressed Electronic Contribution in Thermal Conductivity of Ge₂Sb₂Se₄Te [Kiumars Aryana](#); University of Virginia, United States.

9:30 AM EQ11.09.04

Effect of Ge-Incorporation on the Thermal Stability of Ge_xSb_yTe_z Phase Change Alloys for Neuromorphic Devices with Automotive Applications [Massimo Longo](#); CNR-IMM, Italy.

9:45 AM BREAK

SESSION EQ11.10: Novel Approaches

Session Chairs: Ilia Valov and Yoeri van de Burgt

Thursday Morning, May 12, 2022

Hawai'i Convention Center, Level 3, 318A

10:15 AM *EQ11.10.01

Material Learning with Dopant Network Processing Units [Wilfred G. van der Wiel](#)^{1,2}; ¹University of Twente, Netherlands; ²University of Münster, Germany.

10:45 AM EQ11.10.02

On-Site Trainable Biosensor and Locally Adaptive Sensing Based on Organic Neuromorphic Circuits [Eveline van Doremale](#)^{1,2}; ¹Technische Universiteit Eindhoven, Netherlands; ²Technische Universiteit Eindhoven, Netherlands.

11:00 AM EQ11.10.03

Integration of Spiking Neurons with Electrochemical Transistors Using a Photopatternable Solid Electrolyte [Anton Weissbach](#); Technische Universität Dresden, Germany.

11:15 AM EQ11.10.04

Conformable, Internal Ion-Gated Organic Electrochemical Transistor (IGT) - Based Multiplexer with Megahertz Operation [Claudia Cea](#); Columbia University, United States.

SESSION EQ11.11: Metal Insulator Transitions
Session Chairs: Yiyang Li and Yoeri van de Burgt
Thursday Afternoon, May 12, 2022
Hawai'i Convention Center, Level 3, 318A

1:30 PM *EQ11.11.01

Nanoelectronic Activation Neurons for Full Hardware Implementation of Neural Networks [Duygu Kuzum](#); University of California, San Diego, United States.

2:00 PM EQ11.11.02

Electronic Phase Transitions Induced Neuromorphic Functionalities in a Quasi-1D Chalcogenide BaTiS₃ [Huandong Chen](#); University of Southern California, United States.

2:15 PM EQ11.11.03

Investigation of Nb_xTi_{1-x}O₂ via EXAFS and Functional Correlation to Electrical Nanoscale Devices [Karsten Beckmann](#)^{1,2}; ¹NY CREATES, United States; ²SUNY Polytechnic Institute, United States.

2:30 PM EQ11.11.04

Dynamics of the Voltage-Triggered Insulator-to-Metal Transition [Javier del Valle](#); University of Geneva, Switzerland.

2:45 PM EQ11.11.05

Temperature Perturbations Causing Temporally Stable Current Density Localization in VO₂ [Adelaide Bradicich](#); Texas A&M University, United States.

3:00 PM BREAK

3:30 PM EQ11.11.06

Modification of the MIT via Anisotropic Transport in Epitaxial Irradiated VO₂ [Rebecca M. Gurrola](#); Texas A&M University, United States.

3:45 PM EQ11.11.07

Design and Modeling of Rare-Earth Nickelate Spiking Neurons for Neuromorphic Computing [Olivia Schneble](#)^{1,2}; ¹National Renewable Energy Laboratory, United States; ²Colorado School of Mines, United States.

4:00 PM EQ11.11.08

Epitaxial Stabilization (< 500°C) and Degradation Mechanism (> 500°C) of VO_x Films Grown on Y-Stabilised ZrO [Songhee Choi](#); Daegu Gyeongbuk Institute of Science and Technology, Korea (the Republic of).

SESSION EQ11.12: Ferroelectrics
Session Chair: Stefano Ambrogio
Friday Morning, May 13, 2022
Hawai'i Convention Center, Level 3, 318A

8:30 AM EQ11.12.01

HZO FTJ analog NVM with Synaptic Plasticity for In-Memory Computing [Nikitas Siannas](#)^{1,2}; ¹National Centre of Scientific Research Demokritos, Greece; ²National and Kapodistrian University of Athens, Greece.

8:45 AM EQ11.12.02

Resistive Switching in Epitaxial AlN and AlScN Thin Films on Si(111) [Andrew C. Meng](#); University of Pennsylvania, United States.

9:00 AM EQ11.12.03

Ferroelectric Analog Synaptic Transistors for Neuromorphic Applications [Ik-Jyae Kim](#); Pohang University of Science and Technology, Korea (the Republic of).

9:15 AM BREAK

SESSION EQ11.13: Sensors
Session Chair: Stefano Ambrogio
Friday Morning, May 13, 2022
Hawai'i Convention Center, Level 3, 318A

10:30 AM EQ11.13.01

Fabrication of Gas-Sensitive Memristive Devices [Raphael D. Ahlmann](#); TU Dortmund, Germany.

10:45 AM EQ11.13.02

Non von Neumann Multi-Input Spike Signal Processing Enabled by an Artificial Synaptic Multiplexer [Dong Hae Ho](#); Yonsei University, Korea (the Republic of).

11:00 AM EQ11.13.03

Machine Vision with Programmable Floating-Gate Phototransistor for Color-Mixed Image Recognition [Jun Tao](#); University of Southern California, United States.

11:15 AM EQ11.13.04

Heterostructure Optoelectronic Neuromorphic Devices with Multi-Spectral Light Modulated Synaptic Behaviors [Sung Soo Cho](#); Chung-Ang University, Korea (the Republic of).

11:30 AM EQ11.13.05

Memory Formation and Mechanosensing in Neuromorphic Mechanical Metamaterials [Andres F. Arrieta](#); Purdue University, United States.

11:45 AM EQ11.13.06

WITHDRAWN 5/10/22 EQ11.13.06 Comparison of Event-Based Cameras and Frame-Based Sensors in Object Detection Applications [Freddie Santiago](#); Naval Research Laboratory, United States.

SESSION EQ11.14: Neuromorphic Computing I
Session Chairs: Yiyang Li and Yoeri van de Burgt
Monday Morning, May 23, 2022
EQ11-Virtual

8:00 AM *EQ11.14.01

Computing-in-Memory with Memristor—From Material Exploration to Device-System Co-Design [Jianshi Tang](#); Tsinghua University, China.

8:30 AM *EQ11.14.02

Dynamic Memristors for Neuromorphic Computing [Yuchao Yang](#); Peking University, China.

9:00 AM EQ11.14.03

Reduction of the Operating Current Range of Analog Resistive Switching in Pt/TaO_x/Ta₂O₅/Pt Cells by Controlling the Supply of Oxygen Vacancies [Toshiki Miyatani](#); Kyoto University, Japan.

9:15 AM EQ11.14.04

Gradual Formation of Conductive Filaments in Resistive Switching Cells [Yusuke Nishi](#); National Institute of Technology, Japan.

9:30 AM EQ11.14.05

Observation of (N-1)/(ln2)^N Stable Coexisting Oscillations in Neuromorphic Central Pattern Generators [Alain Nogaret](#); Univ of Bath, United Kingdom.

9:45 AM EQ11.05.07

Relaxed Synaptic Device Specifications for Neural Network Training with Tiki-Taka Algorithm [Kyungmi Noh](#); Pohang University of Science and Technology, Korea (the Republic of).

SESSION EQ11.15: Neuromorphic Computing II
Session Chair: Yiyang Li
Monday Morning, May 23, 2022
EQ11-Virtual

10:30 AM *EQ11.15.01

“Lithionics” – On the Design of Lithium Oxides for Novel Neuromorphic Computing Functions [Jennifer L. Rupp](#); Technical University of Munich, Germany.

11:00 AM *EQ11.15.02

From Bio-Sensing to Neuromorphic Engineering with Electropolymerized PEDOT:PSS Iono-Electronic Materials [Fabien Alibart](#)^{2,1}; ¹IEMN-CNRS, France; ²LN2-3IT, Canada.

11:30 AM EQ11.15.03

Electrothermal Simulations of Synchronization Dynamics of Coupled Beyond-CMOS Vanadium Dioxide Oscillators for Neuromorphic Computing Applications [Stefania Carapezzi](#); LIRMM, University of Montpellier, CNRS, France.

11:45 AM EQ11.15.04

van der Waals Epitaxy of Ge-Sb-Te Alloys—A Powerful Way to Design 2D Heterostructures for Neuromorphic Applications [Fabrizio Arciprete](#)^{1,2}; ¹Univ of Rome-Tor Vergata, Italy; ²Paul-Drude-Institut für Festkörperelektronik, Germany.

12:00 PM EQ11.15.05

Scalability and Functionality of 2- and 3-Terminals Back-End-of-Line Compatible Ferroelectric Synaptic Weights [Laura Bégon-Lours](#); IBM Research-Zurich, Switzerland.

12:05 PM EQ11.15.06

A Phase Change Sb₂Te₃/Ge₂Sb₂Te₅/Ge Heterostructure for Neuromorphic Applications [Marco Bertelli](#); Consiglio Nazionale delle Ricerche, Italy.

SESSION EQ11.16: Neuromorphic Computing III
Session Chairs: Yiyang Li and Yoeri van de Burgt
Monday Afternoon, May 23, 2022
EQ11-Virtual

1:00 PM *EQ11.16.01

Towards Energy Efficient and Robust Neuromorphic Computing—Algorithm and Hardware Perspective [Priyadarshini Panda](#); Yale University, United States.

1:30 PM EQ11.16.02

Interface Formation During the Growth of Phase Change Materials Heterostructures Based on Ge-Rich Ge-Sb-Te Alloys [Flavia Righi Riva](#); University of Rome Tor Vergata, Italy.

1:45 PM EQ11.16.03

Transparent InGaZnO-Based Resistive Random Access Memory [Fei Qin](#); Purdue University, United States.

2:00 PM EQ11.16.04

Electric Field and Temperature Dependent Charge Transport in Stable Amorphous Ge₂Sb₂Te₅ [Md Tashfiq Bin Kashem](#); University of Connecticut, United States.

2:15 PM EQ11.16.05

Combinatorial Exploration of New Phase-Change Memory Materials with Enhanced Properties [Heshan Yu](#); University of Maryland, United States.

2:30 PM EQ11.16.06

Stopping Resistance Drift in Phase Change Memory Cells with Application of High Electric Field Stress at Cryogenic Temperatures [Ali Gokirmak](#); University of Connecticut, United States.

2:45 PM EQ11.16.07

Scalable Conductive Metal-Oxide/ fO₂-Based Bilayer ReRAMs for Analog In-Memory Computing [Tommaso Stecconi](#); IBM Research Europe Zurich, Switzerland.

SESSION EQ11.17: Neuromorphic Computing IV

Session Chairs: Yiyang Li and Ilia Valov

Tuesday Morning, May 24, 2022

EQ11-Virtual

8:00 AM *EQ11.17.01

Nanoionics Devices Enabling Various Performance, Such as Neuromorphic Functions [Kazuya Terabe](#); NIMS, Japan.

8:30 AM EQ11.17.03

A SiO_x Resistive Memory with Low Operating Voltages, Gradual Set/Reset Operation and High On-State Non-Linearity [Sourodeep Roy](#); Indian Institute of Technology Madras, India.

8:45 AM EQ11.17.04

Optoelectronic Synapses for Neuromorphic Computing Using ITO/Nb-doped SrTiO₃ Memristor [Yutaro Yamazaki](#); Tokyo University of Science, Japan.

8:50 AM *EQ11.02.06

Energy-Efficient Electrochemical Synapses Based on Proton and Oxygen Motion [Bilge Yildiz](#); Massachusetts Institute of Technology, United States.

9:20 AM *EQ11.17.02

Scaling Electronic skins with Neuromorphic Engineering [Benjamin C. Tee](#)^{1,2}; ¹National University of Singapore, Singapore; ²National University of Singapore, Singapore.

SESSION EQ11.18: Neuromorphic Computing V

Session Chairs: Yiyang Li and Ilia Valov

Tuesday Morning, May 24, 2022

EQ11-Virtual

10:30 AM *EQ11.18.01

Perspectives on Metal-Insulator Transitions in V₂O₃ Compounds and Their Potential Use in Resistive Switching and Neuromorphic Devices [Mariela Menghini](#)^{1,2}; ¹IMDEA Nanociencia, Spain; ²KU Leuven, Belgium.

11:00 AM *EQ11.18.02

Prospects and Challenges of Area-Dependent Memristive Devices for Neuromorphic Computing [Regina Dittmann](#); Forschungszentrum Jülich GmbH, Germany.

11:30 AM *EQ11.18.03

Soft Spiking Synaptic Circuits for Neural Interfaces [Robert A. Nawrocki](#); Purdue University, United States.

12:00 PM *EQ11.18.04

Timing Selector—Using Transient Switching Dynamics to Solve the Sneak Path Issue of Crossbar Arrays [J. Joshua Yang](#); University of Southern California, United States.

SYMPOSIUM MF01

Cutting-Edge Plasma Processes Contributing to Sustainable Development Goals
May 8 - May 23, 2022

Symposium Organizers

Jane Chang, University of California, Los Angeles
Masaharu Shiratani, Kyushu University
David Staack, Texas A&M University
Fumiyoshi Tochikubo, Tokyo Metropolitan University

* Invited Paper

SESSION MF01.02: Plasmas for Sustainable Energy and Pollution Control II

Session Chairs: Nozomi Takeuchi and Fumiyoshi Tochikubo

Monday Morning, May 9, 2022

Hawai'i Convention Center, Level 3, 319B

10:30 AM *MF01.02.01

Plasma Refinery—A New Breakthrough in the Chemical Industry in the Carbon-Neutral Era [Dae Hoon Lee](#)^{1,2}; ¹Korea Institute of Machinery and Materials, Korea (the Republic of); ²University of Science and Technology, Korea (the Republic of).

11:00 AM MF01.02.02

Selective Vibrational Excitation of Nitrogen Molecule with Non-Self-Sustaining DC Discharge Plasma Source Aimed for Nitrogen Fixation [Yuki Kunishima](#); Tohoku University, Japan.

11:15 AM MF01.02.03

Nonthermal Hydrogen Plasma Reduction of Iron Oxide Toward Carbon-Free Steel Production [Zichang Xiong](#); University of Minnesota Twin Cities, United States.

SESSION MF01.01: Plasmas for Sustainable Energy and Pollution Control I

Session Chairs: Fumiyoshi Tochikubo and Takayuki Watanabe

Sunday Afternoon, May 8, 2022

Hawai'i Convention Center, Level 3, 319B

1:45 PM MF01.01.01

Detailed Characterization of a Low-Temperature Plasma-Driven Ammonia Synthesis Process [Minseok Kim](#); University of California, Riverside, United States.

2:00 PM MF01.01.02

Comparison of Efficiency for Decomposition of Perfluorooctane Sulfonic Acid (PFOS) by Various Types of Plasma in Contact with Liquid [Nozomi Takeuchi](#); Tokyo Institute of Technology, Japan.

2:15 PM MF01.01.03

Removal of Metal Ions from Water Using Active Species in Oxygen Plasma [Sayma Khanom](#); Kyushu University, Japan.

2:30 PM MF01.01.04

Investigation of Plasma Sulfonation Mechanism with Dilute Sulfuric Acid [Siqi Deng](#); Tokyo institute of technology, Japan.

SESSION MF01.03: Plasmas for Semiconductor Processes

Session Chairs: Jane Chang and Nathan Marchack

Monday Afternoon, May 9, 2022

Hawai'i Convention Center, Level 3, 319B

1:30 PM *MF01.03.01

Towards Enhanced Sustainability in Future Plasma Processes [Nathan Marchack](#); IBM T.J. Watson Research Center, United States.

2:00 PM MF01.03.02

Transient Behaviors of Gaseous and Surface Reactions in a Cycle of Passivation and Etch Steps Using Ar-Based C₄F₈ and SF₆ Plasma [Kenji Ishikawa](#); Nagoya University, Japan.

2:15 PM *MF01.03.03

Achieving Angstrom-Level Control in Etch Processes to Enable Future Advanced Logic and Memory Technologies [Catherine Labelle](#); Intel Corporation, United States.

2:45 PM MF01.03.04

Bioinspired Multifunctional Nanopatterns Through Regenerative Secondary Mask Lithography [Martyna Michalska](#); University College London, United Kingdom.

3:00 PM BREAK**3:30 PM *MF01.03.05**

Plasma-Based (spatial) ALD for High-Volume, Low-Temperature Applications [Erwin Kessels](#); Eindhoven Univ of Technology, Netherlands.

4:00 PM MF01.03.06

High Capacitance MIM Capacitors with Crystallized TiO₂ Films by Plasma-Assisted Atomic Layer Annealing [Seunghyeon Lee](#); Seoul National University of Science and Technology, Korea (the Republic of).

4:15 PM MF01.03.07

Nanofabrication of an On-Chip Direct Write Evaporator for Scanning Near-Field 3D Deposition [Xella Doi](#)^{1,2}; ¹The University of Chicago, United States; ²Argonne National Laboratory, United States.

SESSION MF01.04: Plasmas for Materials Processing I

Session Chairs: Mark Kushner and David Staack

Tuesday Morning, May 10, 2022

Hawai'i Convention Center, Level 3, 319B

8:30 AM MF01.04.01

Stress Relaxation of Hydrogenated Amorphous Carbon Films by Incorporating Carbon Nanoparticles Using Plasma Chemical Vapor Deposition [Kazunori Koga](#)^{1,2}; ¹Kyushu Univ., Japan; ²National Institutes of Natural Sciences, Japan.

8:45 AM MF01.04.02

Time-Resolved Ion and Electron Energy Distributions in a HiPIMS Discharge with Cathode Voltage Reversal [David N. Ruzic](#); University of Illinois at Urbana Champaign, United States.

9:00 AM MF01.04.03

Amplitude Modulation Frequency Dependence of Ion Energy Distribution in Capacitively Coupled Discharge Plasma Studied by Particle-in-Cell/Monte Carlo Collision Method [Iori Nagao](#); Kyushu University, Japan.

9:15 AM MF01.04.04

2D Materials for the Investigation of Plasma-Surface Interaction [Lorenzo Mangolini](#); University of California, Riverside, United States.

9:30 AM MF01.04.05

Time Resolved Optical Emission Spectroscopy in Ar and Ar/Ne Capacitively Coupled Radio Frequency Plasma [Michihiro Otaka](#); Kyushu University, Japan.

9:45 AM BREAK**10:15 AM MF01.04.06**

Position Fluctuation of a Fine Particle Trapped with Laser Tweezers in Ar Plasma [Toma Sato](#); Kyushu University, Japan.

10:30 AM MF01.04.07

Silver Nanoparticle Production by Liquid-Flow Microwave Plasma Treatment Device [Hirotaka Toyoda](#)^{1,2,3}; ¹Nagoya Univ, Japan; ²Nagoya University, Japan; ³National Institute for Fusion Science, Japan.

10:45 AM MF01.04.08

Study on Plasma-Induced Liquid-Phase Reactions in a Droplet as Reaction Field [Fumiyoshi Tochikubo](#); Tokyo Metropolitan University, Japan.

11:00 AM MF01.04.09

Size Control of Silver Nanoparticles Driven by Low Pressure Plasma-Solution Interactions [Chi Xu](#); University of Minnesota, United States.

SESSION MF01.05: Plasmas for Materials Processing II

Session Chairs: Kazunori Koga and Fumiyoshi Tochikubo

Tuesday Afternoon, May 10, 2022

Hawai'i Convention Center, Level 3, 319B

1:30 PM MF01.05.01

In-Flight Coating of Magnesium Nanoparticles via Non-Thermal Plasma for Energetics [Brandon A. Wagner](#); University of California, Riverside, United States.

1:45 PM MF01.05.02

Atomically Precise Deposition of Multi-Element Metal Oxide Layered Crystals Alternating Digitally Processed DC Sputtering and Surface Oxidation [Hideo Isshiki](#); University of Electro-Communications, Japan.

2:00 PM MF01.05.03

Growth of High-In Content InGaN Layer by Molecular Beam Epitaxy Under High-Density Nitrogen Radical Irradiation [Hiroki Kondo](#); Nagoya University, Japan.

2:15 PM MF01.05.04

Structural Control of Hydrogenated Amorphous Carbon Films by Substrate Position and Gas Pressure in Plasma Chemical Vapor Deposition [Shinjiro Ono](#); Kyushu Univ., Japan.

2:30 PM MF01.05.05

Transformation of Fungal Mycelium into Novel Ultrananocrystalline Diamond Nanostructures via Microwave Plasma Pyrolysis [Ben E. Stein](#); The University of Texas at

Dallas, United States.

2:45 PM MF01.05.06

Effects of rf Frequency on Plasma Density in Capacitively Coupled Plasmas at Low Pressure Studied by Particle-in-Cell/Monte Carlo Collision Method [Toshiaki Arima](#); Kyushu-University, Japan.

3:00 PM BREAK

SESSION MF01.06: Plasmas for Medical and Agricultural Applications I

Session Chairs: Masaru Hori and Satoshi Uchida

Tuesday Afternoon, May 10, 2022

Hawai'i Convention Center, Level 3, 319B

3:30 PM *MF01.06.01

The Role of Plasma Surface Interactions in Achieving Sustainability Goals—Controlling Reactants and Activation Energy [Mark J. Kushner](#); University of Michigan, United States.

4:00 PM *MF01.06.02

Plasma-Enabled Virus Inactivation [Peter Bruggeman](#); University of Minnesota, United States.

4:30 PM MF01.06.03

Selective N₂O_s Synthesis Using Composite Air Plasma Reactors and Its Inactivation Effects on Bacteria and Virus [Toshiro Kaneko](#); Tohoku University, Japan.

SESSION MF01.07: Poster Session: Cutting-Edge Plasma Processes Contributing to Sustainable Development Goals

Session Chairs: Kenji Ishikawa and Fumiyoshi Tochikubo

Tuesday Afternoon, May 10, 2022

5:00 PM - 7:00 PM

Hawai'i Convention Center, Level 1, Kamehameha Exhibit Hall 2 & 3

MF01.07.01

Fluid Leak Detector for Cyclo-Olefin Polymer Microchannels Using Low-Temperature Bonding by Water Vapor Plasma [Masaaki Tsukamoto](#)^{1,2}; ¹Samco Inc., Japan; ²Kyoto University, Japan.

MF01.07.02

Improvement of Thermal Conduction to Control Performance Uniformity [Jinuk Park](#)^{1,2}; ¹Sungkyunkwan University, Korea (the Republic of); ²SamSung Institute of Technology, Korea (the Republic of).

MF01.07.03

ALD SiO₂ Trench Fill by Using VHF Plasma Source and Surface Inhibitor Treatment [Gyuhwan Ahn](#); Sungkyunkwan University, Korea (the Republic of).

MF01.07.04

Improving Low-Temperature SiO₂ Atomic Layer Deposition Characteristics Using Substrate Biasing at Capacitively Coupled Plasma [Yongki Lee](#); Sungkyunkwan University, Korea (the Republic of).

MF01.07.05

Epitaxial Growth of Single-Crystalline ZnO Films on Sapphire Substrates via Inverted Stranski-Krastanov Mode by Low-Power Magnetron Sputtering [Ryo Mitsuishi](#); Graduate School of Information Science and Electrical Engineering, Kyushu University, Japan.

MF01.07.06

Nano Aluminum Synthesis with Nonthermal Capacitively Coupled Plasma for Enhanced Yield and Size Control [Thomas J. Cameron](#); University of Minnesota, United States.

MF01.07.07

Changes in EL-4 T Cell Properties Due to Oxygen Plasma Irradiation [Reona Muto](#); Kyushu University, Japan.

SESSION MF01.08: Plasmas for Medical and Agricultural Applications II

Session Chairs: Peter Bruggeman and Masaharu Shiratani

Wednesday Morning, May 11, 2022

Hawai'i Convention Center, Level 3, 319B

8:45 AM *MF01.08.01

Creation of Plasma Biology by Seamless Radical Control in Gas Phase, Liquid Phase and Biological Systems [Masaru Hori](#); Nagoya University, Japan.

9:15 AM MF01.08.02

Gene Expression Analysis of Plasma Activated Ringer's Lactate Solution Treated Cells [Hiromasa Tanaka](#); Nagoya Univ, Japan.

9:30 AM *MF01.08.03

Numerical Investigation of the Permeation Characteristics of Reactive Oxygen and Nitrogen Species into Biological Membrane under Electric Field Using Classical Molecular Dynamics [Satoshi Uchida](#); Tokyo Metropolitan University, Japan.

10:00 AM BREAK

10:30 AM MF01.08.04

Electroporation-Like DBD Jet as Rapid FC Delivery Method for Plant Transformation [Min Huang](#); Texas A&M University, United States.

10:45 AM MF01.08.05

Evaluation of Short-Lived Reactive Species Decay Using High-Speed Water Flow in Contact with Atmospheric Pressure Plasma [Kazuki Takeda](#); Tohoku University, Japan.

11:00 AM MF01.08.06

Quantitative Evaluation Through LC-QqQ MS/MS for RONS Induced into Dry Seeds by Non-Thermal Plasma Irradiation [Takamasa Okumura](#); Kyushu University, Japan.

11:15 AM MF01.08.07

Calcium-Based Systemic Activation of Plant Defense Response by Exposure to N₂O₅ Gas Synthesized in Atmospheric-Pressure Plasma Technology [Hirotoshi Iwamoto](#); Tohoku University, Japan.

11:30 AM MF01.08.08

Growth Characteristics of Plant by Irradiation on Seed and Leaf with Active Oxygen Species [Sayma Khanom](#); Kyushu University, Japan.

SESSION MF01.09: General Session I
Session Chairs: Masaharu Shiratani and Fumiyoshi Tochikubo
Monday Morning, May 23, 2022
MF01-Virtual

8:00 AM *MF01.09.01

Effects of Low-Pressure Radiofrequency Capacitively Coupled Plasma Treatment of Thai Purple Glutinous Rice Seeds on Phenotypic and Genotypic Modifications [Kanta Sangwijit](#); University of Phayao, Thailand.

8:30 AM MF01.09.02

Pulsed Power Applications for Agriculture and Food Processing [Koichi Takaki](#)^{1,2}; ¹Iwate University, Japan; ²Agri-Innovation Center, Japan.

8:45 AM *MF01.09.03

Plasma Mediated Activation of Fungal Enzyme Secretion [Gyungsoon Park](#); Kwangwoon University, Korea (the Republic of).

9:15 AM MF01.09.04

Rapid Preparation of Low-Molecular-Weight Fucoidan Using a Plasma-Liquid Interface Process [Sayaka Yamamoto](#); Osaka City University, Japan.

9:30 AM *MF01.09.05

Plasma Catalytic Conversion of CO₂—An Emerging Decarbonizing Technology Towards a Sustainable Society [Tomohiro Nozaki](#); Tokyo Institute of Technology, Japan.

10:00 AM MF01.13.02

CO₂ Conversion Performance of Pulse Micro-Gap Dielectric Barrier Discharge Reactor [Primas Emeraldi](#); Gifu University, Japan.

10:15 AM MF01.09.06

Epitaxial Growth of Atomically Flat Single-Crystalline (ZnO)_x(InN)_{1-x} Films on O-Polar ZnO Substrates by Magnetron Sputtering [Ryota Narishige](#); Kyushu University, Japan.

SESSION MF01.10: General Session II
Session Chairs: Masaharu Shiratani and Fumiyoshi Tochikubo
Monday Morning, May 23, 2022
MF01-Virtual

10:30 AM *MF01.10.01

Electrical Discharges in a Bubble Column Reactor—A Novel High Throughput Reactor Design for Water Treatment [Selma Mededovic](#); Clarkson University, United States.

11:00 AM MF01.10.02

Precise Control of the Nanostructure of Ge Films by High-Pressure Plasma Sputtering for Li-Ion Battery with Super-High Capacity [Giichiro Uchida](#); Meijo University, Japan.

11:15 AM MF01.10.03

Silicon Surface Passivation with a-Si:H and epi-Si Layer—Effects of Plasma-induced Defects and Interface Structure [Shota Nunomura](#); AIST, Japan.

11:30 AM MF01.10.04

Atmospheric Plasma Assisted Deposition of Glass Corrosion Coating on Printed Electronics [Venkat Kasi](#); Purdue University, United States.

11:45 AM MF01.10.05

Plasmonic Plasma Process for Reduced Energy Costs of Ultra-Thin Silicon Oxide Films [Takeshi Kitajima](#); National Defense Academy, Japan.

12:00 PM MF01.10.06

Influence of Gas Species on Electrical Characteristics of High-Power Pulsed Sputtering [Taishin Sato](#); Iwate university, Japan.

12:05 PM MF01.10.07

Development of Measurement of Two-Dimensional Distribution of Strength of Electrical Field with High Spatial Resolution Using Optical Trapped Particle in Plasma [Kunihiro Kamataki](#); Kyushu University, Japan.

12:20 PM MF01.10.08

Pulsed Electron Beam Deposition of Zinc Oxide Thin Films [Magdalena Nistor](#); NILPRP - National Institute for Laser, Plasma and Radiation Physics, Romania.

SESSION MF01.11: General Session III
Session Chairs: Kunihiro Kamataki and Fumiyoshi Tochikubo
Monday Afternoon, May 23, 2022
MF01-Virtual

6:30 PM MF01.11.01

Surface Modification of Graphitic Carbon Nitride by Plasma in Hydroquinone Solution for Enhanced Selectivity and Durability of Visible Light CO₂ Reduction with a Ru(II)-Ru(II) Supramolecular Photocatalyst [Noritaka Sakakibara](#); Tokyo Institute of Technology, Japan.

6:45 PM MF01.11.02

Development of High Frequency-High Power Impulse Magnetron Sputtering Power Supply and Its Diamond-Like Carbon Film Properties [Hiroyuki Fukue](#); Okayama University of Science, Japan.

7:00 PM MF01.11.03

Charge-up of Metal Plate Treated by Low-Temperature Atmospheric Pressure Helium Plasma Jet [Tetsuji Shimizu](#); National Institute of Advanced Industrial Science and Technology, Japan.

7:15 PM MF01.11.04

Nonthermal Plasma Processes for Sustainable Synthesis of Metallic Titanium Nanoparticles [Qiaomiao Tu](#); University of Minnesota Twin Cities, United States.

7:30 PM MF01.11.05

Key Parameters for Single Crystalline ZnO Film Growth by Magnetron Sputtering via Inverted Stranski-Krastanov Mode [Naoto Yamashita](#); Kyushu University, Japan.

7:45 PM MF01.11.06

Functionalization of an Inner-Wall of Diamond-Like Carbon Coated Small-Diameter Long-Sized Tube by Oxygen Plasma Treatment [Yuichi Imai](#)^{1,2}; ¹STRAWB Inc., Japan; ²Okayama University of Science, Japan.

8:00 PM MF01.11.07

Two-Dimensional Particle-in-Cell Simulation of an Inductively Coupled Source Coupled with a Capacitive Dual-Frequency Bias [Heesung Park](#); Department of Electrical Engineering, Pusan National University, Korea (the Republic of).

8:05 PM MF01.11.08

Two-Dimensional Particle-in-Cell Simulation for Phase-Resolved Ion Energy and Angle Distributions in Dual-Frequency Capacitively Coupled Ar Plasmas [Ji Hyun Shin](#); Pusan National University, Korea (the Republic of).

8:10 PM MF01.11.09

Investigation of the Structure-Asymmetry Effects on Plasma Uniformity in a Capacitively Coupled Etching Reactor Using Two-Dimensional Particle-in-Cell and Fluid Simulations [Hwan Ho Kim](#); Pusan National University, Korea (the Republic of).

8:15 PM MF01.11.10

Electron Density Distribution of AC-GTA in Like Mars Atmosphere [Kai Aoyama](#); National Institute of Technology Kagawa College, Japan.

8:20 PM MF01.11.11

Numerical Investigation of Influencing Factors of Slag Transportation Process During Metal Active Gas Welding Using Particle Method [Takamasa Fukazawa](#); Joining and Welding Research Institute, Osaka University, Japan.

8:25 PM MF01.11.12

Analyses of Oxygen Concentration on Anode Surface in Gas Tungsten Arc Welding Using CO₂ Gas [Yuuki Asai](#); Joining and Welding Research Institute, Osaka University, Japan.

8:30 PM MF01.11.13

Experimental Study of Dominant Factors for Droplet Ejection from Electrode During AC TIG Welding [Kenta Iida](#); Joining and Welding Research Institute, Osaka University, Japan.

8:35 PM MF01.13.03

Hydrogen Production from Steam Decomposition by Atmospheric Pressure Plasma [Muhd Hadi Iskandar Abd Razak](#); Gifu University, Japan.

SESSION MF01.12: General Session IV
Session Chairs: Takeshi Kitajima and Takayuki Watanabe
Monday Afternoon, May 23, 2022
MF01-Virtual

9:00 PM *MF01.12.01

Machine Learning Approaches Optimizing Semiconductor Manufacturing Processes [Tsuayoshi Moriya](#); Tokyo Electron Limited, Japan.

9:30 PM MF01.12.02

Growth of Nanoparticles in TEOS rf Plasma with Amplitude Modulation [Akihiro Yamamoto](#); Kyushu University, Japan.

9:45 PM *MF01.12.03

Characterization and Diagnostics of Multiphase AC Arc for Innovative Material Processing [Takayuki Watanabe](#); Kyushu Univ, Japan.

10:15 PM MF01.12.04

Numerical Investigation of Heat Source Characteristics in Arc Spot Welding Using Constricted Nozzle [Hisaya Komen](#); Joining and Welding Research Institute, Osaka University, Japan.

10:30 PM MF01.12.05

VIRTUAL PRESENTATIONS ARE LISTED IN EASTERN TIME

Last Updated 5/18/22

Thermal Plasma Generation by Diode-Rectification for Rapid Surface Treatment [Manabu Tanaka](#); Kyushu University, Japan.

10:45 PM MF01.12.06

Application of Underwater Discharge Shock Wave to Pretreatment for Enzymic Saccharification of Wood Flour [Wataru Ueda](#); Tokyo Metropolitan University, Japan.

11:00 PM MF01.13.01

Enhancement of Hydrogen Separation in Plasma Membrane Reactors by Zeolite [Yukio Hayakawa](#); Gifu university, Japan.

SYMPOSIUM MF02

3D Printing of Passive and Active Medical Devices
May 11 - May 25, 2022

Symposium Organizers

Jinah Jang, Pohang University of Science and Technology
Khoon Lim, University of Otago
Roger Narayan, North Carolina State University
Min Wang, University of Hong Kong

* Invited Paper

SESSION MF02.01: 3D Printing of Passive and Active Medical Devices I
Session Chairs: Yong Lin Kong and Rahim Rahimi
Wednesday Afternoon, May 11, 2022
Hawai'i Convention Center, Level 3, 319B

1:30 PM *MF02.01.01

Additive Manufacturing of Smart Ingestible Devices for Spatial Sampling of Gastrointestinal Microbiome [Rahim Rahimi](#); Purdue University, United States.

2:00 PM MF02.01.02

4D Printed Transformable Tube Array for High Throughput 3D Cell Culture and Histology [Howon Lee](#)^{1,2}; ¹Seoul National University, Korea (the Republic of); ²Rutgers, The State University of New Jersey, United States.

2:15 PM MF02.01.03

Bioinspired Sutureless Anastomosis Devices by 3D Printing [Sung Hoon Kang](#); Johns Hopkins University, United States.

2:30 PM BREAK

3:00 PM MF02.01.04

Functionalized 3D-Printed Silkhydroxyapatite Scaffolds for Enhanced Bone Regeneration with Innervation and Vascularization [Vincent Fitzpatrick](#); Tufts University, United States.

3:15 PM MF02.01.05

Dynamically Stretchable Vasculature-on-a-Chip Model by 3D-Printed Porous Molds to Mimic Coronary Arteries During the Cardiac Cycle [Terry T. Ching](#)^{1,2}; ¹Singapore University of Technology and Design, Singapore; ²National University of Singapore, Singapore.

3:30 PM MF02.01.06

Effect of Temperature Gradient on Crosslinking of GelMA for 4D-Bioprinting Deformable Structures [Zeqing Jin](#); University of California, Berkeley, United States.

3:45 PM MF02.01.07

Microstructure of Compositionally Graded Ti+Ti15Mo Alloys Prepared by Direct Laser Deposition [Milos Janecek](#); Charles University, Faculty of Mathematics and Physics, Czechia.

4:00 PM MF02.01.08

Bioactive Self-Limiting Electrospray for Efficient Additive Manufacturing [Jonathan P. Singer](#); Rutgers University, United States.

4:15 PM MF02.01.09

3D-Printing of Mechanically Competent, Low Profile, Radiopaque Bioresorbable Vascular Scaffolds [Yonghui Ding](#); Northwestern University, United States.

SESSION MF02.02: Poster Session: 3D Printing of Passive and Active Medical Devices
Session Chairs: Yong Lin Kong and Rahim Rahimi
Wednesday Afternoon, May 11, 2022
5:00 PM - 7:00 PM
Hawai'i Convention Center, Level 1, Kamehameha Exhibit Hall 2 & 3

MF02.02.01

Potential of 3D Printing in Fabrication of Patient-Specific Biodegradable Microneedle Platform for Alopecia Treatment [Shayan Fakhraei Lahiji](#); Hanyang University, Korea (the Republic of).

MF02.02.03

Correlation Between the Mechanical Strength and Crystallinity of 3D-Printed PEEK Materials [Kyung-hyun Kim](#); ETRI, Korea (the Republic of).

MF02.02.04

Bioinspired 3D Printed Vascularized Polymers for Detection of and Response to Bacteria on Surfaces [Brandon Dixon](#); University of Maine, United States.

MF02.02.05

Development of Ophthalmic Disease Diagnosis System Based on Three-Dimensional Plasmonic Clusters [Minsu Jang](#); Department of Nano Fusion technology, Korea (the Republic of).

MF02.02.06

Development of an Early Diagnosis Platform for Breast Cancer Based on SERS Sensor [YouHwan Kim](#); Pusan National University, Korea (the Republic of).

MF02.02.07

Fumed Silica-Modified Polydimethylsiloxane for Embedded 3D Printing of Microfluidic Chips [Yifei Jin](#); University of Nevada Reno, United States.

MF02.02.08

3D-Printed Architected Tablets with Tunable Porosity and Drug Release [Sang Hoon Lee](#); Changwon national University, Korea (the Republic of).

MF02.02.09

3D-Printed Metallic Lattice Scaffolds for Orthopedic Bone Reconstruction [Galit Katarivas Levy](#); Ben-Gurion University of the Negev, Israel.

SESSION MF02.03: 3D Printing of Passive and Active Medical Devices II

Session Chairs: Spencer Moore and Stephanie Willerth

Thursday Morning, May 12, 2022

Hawai'i Convention Center, Level 3, 319B

10:00 AM *MF02.03.01

3D Bioprinting Personalized Neural Tissue Models [Stephanie M. Willerth](#); University of Victoria, Canada.

10:30 AM MF02.03.02

Materials and Technologies for Implantable Focal Brain Cooling Systems [Spencer R. Moore](#); University of Sheffield, United Kingdom.

10:45 AM MF02.03.03

Expanding Geometries Available for Melt Electrowritten Scaffolds Using Microscale Layer Shifting [Ievgenii Liashenko](#); Phil and Penny Knight Campus for Accelerating Scientific Impact, University of Oregon, United States.

11:00 AM MF02.03.04

Development of Shape Memory Alloy Based Micro-Tentacle Actuator Using Two-Photon Polymerization [Hyun-Taek Lee](#); Inha University, Korea (the Republic of).

11:15 AM MF02.03.05

Laser Processing of Thermoelectrics for Medical Devices [George S. Nolas](#); Univ of South Florida, United States.

11:30 AM MF02.03.07

Utilising Stereolithography Based 3D Printing for the Direct Fabrication of BioCompatible Hollow Microneedles [Joe Turner](#); University of Bath, United Kingdom.

SESSION MF02.04: 3D Printing of Passive and Active Medical Devices III

Session Chairs: Jayanthi Parthasarathy and Fiorenzo Vetrone

Thursday Afternoon, May 12, 2022

Hawai'i Convention Center, Level 3, 319B

1:45 PM *MF02.04.01

Materials for 3D Printing Patient Specific Blood Specific Vascular Models for Biomechanical Evaluation and Clinical Decision Making [Jayanthi Parthasarathy](#); Nationwide Children's Hospital, United States.

2:15 PM *MF02.04.02

Multiscale 3D Printing of Nanomaterials-Based Biomedical Electronics and Ingestible System [Yong Lin Kong](#); University of Utah, United States.

2:45 PM MF02.04.03

3D-Printed Epidermal Microfluidic Systems for the Collection and Analysis of Sweat [Chung-Han Wu](#); University of Hawaii, United States.

3:00 PM BREAK**3:30 PM *MF02.04.04**

Upconversion Nanoparticles [Fiorenzo Vetrone](#); INRS, Université du Québec, Canada.

4:00 PM MF02.04.05

Printed Electrode Arrays for Implantable and Wearable Soft Bioelectronic Interfaces [Ivan Minkev](#); University of Sheffield, United Kingdom.

4:15 PM MF02.04.06

3D Printed Replica Teeth for Understanding Characterization of Cracks Using Quantitative Percussion Diagnostics [James C. Earthman](#); University of California, Irvine, United States.

4:30 PM MF02.04.07

Effect of Printing Parameters on Cross-Linked Polymer Networks—An Investigation into Additive Manufacturing [Kris M. Van de Voorde](#)^{1,2}; ¹US Army, United States; ²Oak Ridge Institute for Science and Education, United States.

4:45 PM MF02.04.08

Expresion of Pluripotency Markers in Thermal Injet Bioprinted Adult Human Fibroblasts [Thomas Boland](#); Univ of Texas-El Paso, United States.

SESSION MF02.05: 3D Printing of Passive and Active Medical Devices IV
Session Chairs: Roger Narayan and Min Wang
Wednesday Morning, May 25, 2022
MF02-Virtual

8:00 AM *MF02.05.01

Additive Manufacturing of Novel Structures for Tissue Engineering Applications [Min Wang](#); University of Hong Kong, Hong Kong.

8:30 AM MF02.05.02

Wetting and Design Guidelines for Bio-Inspired Liquid Diodes [Camilla Sammartino](#); Tel Aviv University, Israel.

8:45 AM MF02.05.03

3D Printing of Nano Biphasic Calcium Phosphate Bioceramic for Fabricating Bone Tissue Engineering Scaffolds [Min Wang](#); The University of Hong Kong, Hong Kong.

9:00 AM MF02.05.04

3D Printing Approaches for Transdermal Drug Delivery [Roger Narayan](#); North Carolina State University, United States.

9:15 AM MF02.05.05

4D Printing and Characteristics of Shape Morphing GelMA/PDLLA-co-TMC Tissue Engineering Scaffolds [Min Wang](#); The University of Hong Kong, Hong Kong.

9:20 AM MF02.05.06

4D Printed Fiber-Reinforced Highly Stretchable Tissue Engineering Scaffolds for Soft Tissue Applications [Min Wang](#); The University of Hong Kong, Hong Kong.

9:25 AM MF02.05.07

Melt Printing of Polymeric Drug Delivery Microdepots in 2.5D [Dan Lewitus](#); Shenkar- Engineering, Design, Art, Israel.

9:40 AM MF02.05.08

3D Microfabrication of Fully-Embedded Transdermal Microneedles for Single-Administration Vaccines [Khanh T. Tran](#); University of Connecticut, United States.

9:55 AM MF02.05.09

Leech-Inspired 3D-Printed Origami Electrodes for Electrophysiology Sensing [Tae-Ho Kim](#); Simon Fraser University, Canada.

10:10 AM MF02.02.02

Fabrication of Polycaprolactone-Hydroxyapatite Composites Filaments for FDM 3D Printing of Bone Imitation Application [Chang Geun Kim](#); Chungnam National University, Korea (the Republic of).

SYMPOSIUM MF03

Materials and Methods for Fabricating Flexible and Large-Area Electronics
May 9 - May 24, 2022

Symposium Organizers

Joseph Andrews, University of Wisconsin
Thomas Anthopoulos, King Abdullah University of Science and Technology
Cinzia Casiraghi, University of Manchester
Aaron Franklin, Duke University

* Invited Paper

SESSION MF03.01: Nanomaterial Electronics for Large-Area or Flexible Applications

Session Chairs: Aaron Franklin and Hideo Hosono

Monday Morning, May 9, 2022

Hawai'i Convention Center, Level 3, 328

10:30 AM *MF03.01.01

Two-Dimensional Skintronics [Deji Akinwande](#); The University of Texas at Austin, United States.

11:00 AM MF03.01.02

Acoustic-Assisted Wafer-Scale Self-Limiting Assembly of Hard-to-Wet Nanomaterials on Flexible Polymer Substrates in Water Solution [Bo Li](#); Villanova University, United States.

11:15 AM MF03.01.03

All-Solution Processed Silver Nanowire Transparent Electrode with a Conformally Encapsulating Reduced Graphene Oxide Layer Leading to Improved Stability [Woo Hyun Chae](#); Massachusetts Institute of Technology, United States.

11:30 AM MF03.01.04

Plasmonic ITO Nanoparticles' Ink for IR Thermo-Enabled Applications on Flexible Substrates [Arianna Mazzotta](#)^{1,2}; ¹Istituto Italiano di Tecnologia, Italy; ²Scuola Superiore Sant'Anna, Italy.

SESSION MF03.02: Flexible/Stretchable Electronics I

Session Chairs: Aaron Franklin and Dmitry Kireev

Monday Afternoon, May 9, 2022

Hawai'i Convention Center, Level 3, 328

1:30 PM *MF03.02.01

Inorganic Semiconductors for Flexible and Large Area Electronics [Hideo Hosono](#); Tokyo Institute of Technology, Japan.

2:00 PM MF03.02.02

Gold-Assisted Transfer of Top-Gated Indium Tin Oxide Field-Effect Transistors on Flexible Substrates [Sumaiya Wahid](#); Stanford University, United States.

2:15 PM MF03.02.03

Highly Stretchable and Reliable Metal-Oxide Thin-Film-Transistors and Integrated Circuits on a Molecular-Tailored Heterogeneous Acrylate Substrate [Seung-Han Kang](#); Chung-Ang University, Korea (the Republic of).

2:30 PM BREAK

3:00 PM MF03.02.04

Conductive Self-Healable Rhenium Oxides/Polytetrahydrofuran Composite for the Resilient Flexible Electrodes [Seok Min Yoon](#); Wonkwang University, Korea (the Republic of).

3:15 PM MF03.02.05

Highly Flexible Polymer/Metal-Oxide Hybrid Dielectrics Using Plasma Polymerization for Flexible Electronics [Gwan In Kim](#); Yonsei University, Korea (the Republic of).

3:30 PM MF03.02.06

UV Curing Effect on Mechanical Stability of Flexible Dielectric Thin Films Fabricated by Plasma-Enhanced Chemical Vapor Deposition of tetrakis(trimethylsilyloxy)silane Precursor [William Wirth](#); University of Louisiana at Lafayette, United States.

SESSION MF03.03: Flexible/Stretchable Electronics II

Session Chairs: Joseph Andrews and Aaron Franklin

Tuesday Morning, May 10, 2022
Hawai'i Convention Center, Level 3, 328

8:30 AM *MF03.03.01

3D Assembly Approaches for Stretchable Optoelectronic Devices [Jong-Hyun Ahn](#); Yonsei University, Korea (the Republic of).

9:00 AM MF03.03.02

A Sub-150-Nanometre-Thick and Ultraconformable Solution-Processed All-Organic Transistor [Fabrizio A. Viola](#); Italian Institute of Technology, Italy.

9:15 AM MF03.03.03

Large-Area Pixelized Stretchable Full-Color Electrochromic Displays with Photo Patternable Acrylate Viologen Derivatives [Seong Hwan Yang](#); ChungAng University, Korea (the Republic of).

9:30 AM MF03.03.04

WITHDRAWN 5/6/22 MF03.03.04 Flow-Induced Directed Self-Assembly Strategies for High-Resolution Freeform Soft Electronics [Lingying Li](#)^{2,1}; ¹National Institute for Materials Science, Japan; ²University of Tsukuba, Japan.

9:45 AM BREAK**10:15 AM MF03.03.05**

Energetic and Kinetic Factors Governing the Direct Fabrication of Laser Induced Graphene Microelectrodes on Flexible Substrates [Mostafa Bedewy](#); University of Pittsburgh, United States.

10:30 AM MF03.03.06

Quantum Dot-Based Flexible Full Color Micro-LED Display for Visible Light Communication Application [Luhing Hu](#); Yonsei University, Korea (the Republic of).

10:45 AM MF03.03.07

A Novel Soft Electronic Platform for Improved Targeted Electro-Culture [Catherine Crichton](#); University of Colorado Boulder, United States.

SESSION MF03.05: Printed Electronics
Session Chairs: Joseph Andrews and Thomas Anthopoulos
Tuesday Afternoon, May 10, 2022
Hawai'i Convention Center, Level 3, 328

1:30 PM *MF03.05.01

Solvent-Free, Environment-Friendly Printing for Large-Area Electronics [Oana D. Jurchescu](#); Wake Forest University, United States.

2:00 PM MF03.05.02

A Fully Organic, Flexible, Ink-Jet Printed 8-Bit Tag for Radio-Frequency Applications [Fabrizio A. Viola](#); Italian Institute of Technology, Italy.

2:15 PM MF03.05.03

Roadmap Towards Fabrication of Fully Printed Artificial Neurons on Flexible Substrates for Neuromorphic Computing Applications [Surya A. Singaraju](#); Karlsruhe Institute of Technology, Germany.

2:30 PM MF03.05.04

Field-Assisted Aerosol Jet Printing for Fabricating Flexible Electronics [Tyler Ray](#); University of Hawaii, United States.

2:45 PM MF03.05.05

Fully Printed ZnO Photosensors for Next Generation User Interfaces [Georgios Bairaktaris](#); University of Surrey, United Kingdom.

3:00 PM BREAK**3:30 PM MF03.05.06**

Cyclic Production of Biocompatible Graphene Ink with In-Line Shear-Mixing for Inkjet-Printed Electrodes, Li-Ion Energy Storage and Sensors [Tian Carey](#); Trinity College Dublin, Ireland.

3:45 PM MF03.05.07

Scalable Solution Processing of Cu(In,Ga)(S,Se)₂ Solar Cells via Slot Die Coating [Jonathan Turnley](#); Purdue University, United States.

4:00 PM MF03.05.08

Inkjet-Printed Electrochemical Phosphate Sensors [Thiba Nagaraja](#); Kansas State University, United States.

SESSION MF03.06: Poster Session I: Printed and Flexible Electronics
Session Chairs: Joseph Andrews and Aaron Franklin
Tuesday Afternoon, May 10, 2022
5:00 PM - 7:00 PM
Hawai'i Convention Center, Level 1, Kamehameha Exhibit Hall 2 & 3

MF03.06.01

High Power Output of Passive Radiative Cooled Thermoelectric Generator Based on Body Heat [Salman Khan](#); Yonsei University, Korea (the Republic of).

MF03.06.02

Development of Self-Attachable Flexible Transparent Electrodes with Strong Mechanical and Low-Resistant Electrical Contacts [Seongjin Park](#); Ulsan National Institute of Science and Technology, Korea (the Republic of).

MF03.06.03

Flexible Blade-Coated Devices—Dual Functionality via Simultaneous Deposition [Jasmine M. Jan](#); University of California, Berkeley, United States.

MF03.06.04

Wrinkled PDMS-Electrodes-Wrinkled PDMS of Wrinkled Sandwich Structures of High Stability Serpentine Electrodes [Jeongeun Kang](#); Ulsan National Institute of Science and Technology, UNIST, Korea (the Republic of).

MF03.06.05

Lithography Free, Soft, Flexible Vias for 2.5D Fabrication of Ultra-Flexible Circuits [S  verine C. de Mulatier](#); Ecole des Mines de Sainte Etienne, France.

MF03.06.06

Flexible and Mechanical Damage-Tolerant Metal-Graphene Stretchable Conductors [Jad Yaacoub](#); University of Illinois at Urbana Champaign, United States.

MF03.06.07

Solution-Processable, Ag-Sandwiched Carbon Nanotube-Coated, Durable Architecture Realizing Power-Efficient Anti-Breaking Cyclic Heating on Glass and Polymer Substrates [Minwook Kim](#); Seoul National University of Science and Technology, Korea (the Republic of).

MF03.06.09

Evaluation of Additively Printed Dielectrics for Fully Printed Carbon Nanotube Thin-Film Transistors [Brittany N. Smith](#); Duke University, United States.

MF03.06.10

Aerosol Jet Printing of Conductive Three-Dimensional Graphene Structures [Peter Ballentine](#); Duke University, United States.

MF03.06.12

Methods of 3D Printing Bi₂Te₃-Ink-Based Thermoelectric Modules [Jorge A. Cardenas](#); Sandia National Laboratories, United States.

MF03.06.13

All-Solution-Processable, Lithography- and Vacuum-Free Nanoarchitecturing [Kwangjun Kim](#); Seoul National University of Science and Technology, Korea (the Republic of).

MF03.06.14

High-Resolution Graphene-Based Flexible Electrode Array [Dain Kim](#); Yonsei University, Korea (the Republic of).

MF03.06.15

Stretchable and Conductive Graphite/PDMS Ink for 3D Printing Multi-Sensor Wearable Devices [Thomas Paterson](#); University of Sheffield, United Kingdom.

MF03.06.16

All-Carbon Nanotube Stretchable Thin-Film Transistors Employing Low Percolating Unsorted Single-Walled Carbon Nanotube Film as a Channel Material [Alena A. Alekseeva](#); Skolkovo Institute of Science and Technology, Russian Federation.

SESSION MF03.07: Processing for Flexible/Large-Area Electronics I
Session Chairs: Aaron Franklin and Chang Kyu Jeong
Wednesday Morning, May 11, 2022
Hawai'i Convention Center, Level 3, 328

8:30 AM *MF03.07.01

Thin-Film Conformable Electronics Based on Epitaxial Transfer [Stephen R. Forrest](#); University of Michigan, United States.

9:00 AM MF03.07.02

Integration of Solution Blow Spun Fiber Materials into Flexible 3D Printed Constructs for Scalable Production of Responsive Materials [Anne Walker](#); U.S. Department of the Army, United States.

9:15 AM MF03.07.03

Thermoforming Based Customizable, Conformal and Stretchable 3D Electronics [Jungrak Choi](#); KAIST, Korea (the Republic of).

9:30 AM MF03.07.04

A Very Large-Scale Integration of High Performance, Low Leakage Internal Ion-Gated Organic Electrochemical Transistors (IGTs) [Claudia Cea](#); Columbia University, United States.

9:45 AM MF03.07.05

Scalable, Flow-Based Processing of 2D Exfoliated Nanosheets via Cross-Flow Filtration [Julia R. Downing](#); Northwestern University, United States.

10:00 AM BREAK**10:30 AM MF03.07.06**

Template-Free Alignment of Lamellar Block Copolymers for Large Area Sub-10 nm Patterning and Hybrid Nanostructures [Maninderjeet Singh](#); University of Houston, United States.

10:45 AM MF03.07.07

Influence of The Surface Conductivity of Polymer Films on The Attractive Force of A Bipolar Electrostatic Chuck [Jeremy Gavriel](#); Tokyo Institute of Technology, Japan.

11:00 AM MF03.07.08

High-Resolution Transfer Lithography for Conformable Circuits on Developable High-Curvature Surfaces [Marco Carlotti](#); Italian Institute of Technology, Italy.

SESSION MF03.08: Processing and Packaging Perovskite Electronics
Session Chairs: Thomas Anthopoulos and Stephen Forrest
Wednesday Afternoon, May 11, 2022
Hawai'i Convention Center, Level 3, 328

1:30 PM MF03.08.01

Efficient Upscaling of Perovskite Photovoltaics Through Temperature-Modulated Inkjet Printing [Helge Eggers](#)^{1,2,3}; ¹Karlsruhe Institute of Technology, Germany; ²Karlsruhe Institute of Technology, Germany; ³Innovation Lab, Germany.

1:45 PM MF03.08.02

Packaging Flexible Perovskite Solar Cells to Withstand Accelerated Stress Testing [Nancy Trejo Macias](#); Swift Solar, United States.

2:00 PM MF03.08.03

Highly Efficient and Fully Roll-to-Roll Processible Perovskite Solar Cells Incorporating Printed Electrodes [Luke Sutherland](#)^{1,2}; ¹CSIRO, Australia; ²Monash University, Australia.

2:15 PM MF03.08.04

WITHDRAWN 5/6/22 MF03.08.04 Large-Area Fabrication Of Photoelectric Memristors And Arrays Based On Solution-Processed Lead-Free Perovskites [Dimitra G. Georgiadou](#); University of Southampton, United Kingdom.

2:30 PM BREAK

SESSION MF03.09: Energy Harvesting and Storage
Session Chairs: Thomas Anthopoulos and Stephen Forrest
Wednesday Afternoon, May 11, 2022
Hawai'i Convention Center, Level 3, 328

3:30 PM *MF03.09.01

Principles of Energy Harvesting Devices for Self-Powered and Flexible Mechanical Sensors—Case Studies [Chang Kyu Jeong](#); Jeonbuk National University, Korea (the Republic of).

4:00 PM MF03.09.02

3D Direct Ink Writing of Solid-State Li-Ion Batteries Toward Shape-Versatile Energy Storage Devices [Junho Bae](#)^{1,2}; ¹Korea Institute of Science and Technology, Korea (the Republic of); ²Seoul National University, Korea (the Republic of).

4:15 PM MF03.09.03

Printed Biodegradable Batteries for Soil Sensing Using a Fruit-Waste Based Separator [Anupam Gopalakrishnan](#); University of Colorado Boulder, United States.

4:30 PM MF03.09.04

Innovative Additive Manufacturing of LiNi_xMn_yCo_zO₂ as Positive Electrode Material for Lithium-Ion Batteries Through the Precursor Approach [Ana C. Martinez Maciel](#); The University of Texas at El Paso, United States.

4:45 PM MF03.09.05

Vat Photopolymerization Additive Manufacturing of Shape-Conformable Copper-Based Current Collector for Lithium-Ion Battery [Alexis Maurel](#); The University of Texas at El Paso, United States.

SESSION MF03.10: Poster Session II: Processing for Printed or Flexible Electronics and Sensors
Session Chairs: Joseph Andrews and Chang Kyu Jeong
Wednesday Afternoon, May 11, 2022
5:00 PM - 7:00 PM
Hawai'i Convention Center, Level 1, Kamehameha Exhibit Hall 2 & 3

MF03.10.01

UV Photodoping and Remote Hydrogen Plasma Treatment of ZnO Nanocrystal Films [Chengjian Zhang](#); University of Minnesota, United States.

MF03.10.02

All-atmospheric Processed Ag-Cu Core-Shell Nanowire Transparent Electrode with Haacke Figure of Merit >600 [Steven DiGregorio](#); Colorado School of Mines, United States.

MF03.10.03

Selective Deposition of Conductive Nanofiber Network with Minimized Contact Resistance for Large-Area Soft Electronics [Hyeonsu Woo](#); Pohang University of Science and Technology, Korea (the Republic of).

MF03.10.04

Photovoltaic Photographs [Jeroen Hustings](#); University of Hasselt, Belgium.

MF03.10.05

Multi-Functional Thermoelectric Bi₂Te₃ Fabric for Negative Strain and Temperature Sensing [Chaebeen Kwon](#); Yonsei University, Korea (the Republic of).

MF03.10.06

Implantable Flexible Fiber Neural Probes with Low Mechanical Stiffness for Long-Term Measuring Neural Signals [Chihyeong Won](#); Yonsei University, Korea (the Republic of).

MF03.10.07

High-Gain Common-Source Voltage Amplifier with Intrinsic Temperature Compensation for Biosensing [Georgios Bairaktaris](#); Advanced Technology Institute, United Kingdom.

MF03.10.08

Micro-Buckled Shell Structured Fiber Electronics and Its Application in Wearable Devices [Kukro Yoon](#); Yonsei University, Korea (the Republic of).

MF03.10.09

Fiber Form GeS₂ OTS Device for Wearable Electronics [DongHun Shim](#); YONSEI university, Korea (the Republic of).

MF03.10.10

In Situ Monitoring of Marine Environment by Multi-Analyte Microfluidic Platform [Shuoan Wu](#); University of California San Diego, United States.

MF03.10.11

Thermally Drawn Piezoelectric Fiber Enables Fabric for Acoustic Healthcare Monitoring [Grace H. Noel](#); MIT, United States.

MF03.10.12

Dual Regime Spray of Functional Nanomaterials for Electronic Textiles [Taehoo Chang](#); Purdue University, United States.

MF03.10.13

High-Performance Top-Gate Transistors by Metal Induced Charge Transport [Ji-Min Park](#); Chungnam National University, Korea (the Republic of).

MF03.10.14

Scalable Manufacturing of Bioinspired Materials with Tunable Heat-Managing Properties [Mohsin Ali Badshah](#); University of California, Irvine, United States.

MF03.10.15

Single Crystal Thin Films of Silicon on Graphene Enabled by Solid Phase Epitaxy [Xella Doi](#); University of Chicago, United States.

SESSION MF03.11: Processing for Flexible/Large-Area Electronics II

Session Chairs: Joseph Andrews and Cinzia Casiraghi

Thursday Morning, May 12, 2022

Hawai'i Convention Center, Level 3, 328

9:15 AM MF03.11.01

High Performance P-Type Metal Oxide Field-Effect Transistors for Large-Area Monolithic Three-Dimensional Integration [Sooji Nam](#)^{1,2}; ¹Electronics and Telecommunications Research Institute, Korea (the Republic of); ²University of Science and Technology, Korea (the Republic of).

9:30 AM MF03.11.02

Small Molecule Contact-Controlled Transistors with Reduced Saturation Voltage via Vacuum Deposition [Eva Bestelink](#); University of Surrey, United Kingdom.

9:45 AM MF03.11.03

Record CVD Graphene Mobility on Large Area and Scalable CVD Grown Hexagonal Boron Nitride [Ankit S. Rao](#); Indian Institute of Science, India.

10:00 AM BREAK**10:30 AM MF03.11.04**

Epitaxial Deposition of Germanium Thin Films on Low-Cost, Large-Area, Flexible, Single-Crystal-Like Substrates [Amit Goyal](#)^{1,2}; ¹SUNY-Buffalo, United States; ²TapeSolar Inc., United States.

10:45 AM MF03.11.05

Directly Photo-Patternable High-k Polymer Gate Dielectrics for Oxide Thin-Film Transistors [Seongcheol Jang](#); chungnam national university, Korea (the Republic of).

11:00 AM MF03.11.06

Scalable Open-Air Ultrasonic Spray Deposition of PCBM/BCP Electron Transport Layer and Morphology Control via Rapid Thermal Processing [Justin P. Chen](#); Stanford University, United States.

11:15 AM MF03.11.07

Ultrathin Pinhole-Free Hexagonal Boron Nitride Dielectrics by the Repeated Stacking of Liquid-Liquid Assembled Monolayers [Joe Neilson](#); The University of Manchester, United Kingdom.

11:30 AM MF03.11.08

Functional Oxides—Challenging the Future of Electronics [Rodrigo Martins](#); FCT-UNL, Portugal.

SESSION MF03.12: Flexible Electronics to Enable Sensors or Wearable Devices

Session Chairs: Joseph Andrews and Cinzia Casiraghi

Thursday Afternoon, May 12, 2022

Hawai'i Convention Center, Level 3, 328

1:30 PM *MF03.12.01

From Forest to Electronics—Green Graphene for Biosensor and Applications [Rodrigo Martins](#); FCT-UNL, Portugal.

2:00 PM MF03.12.02

Conformable High Sensitivity Tactile Sensors for Electronic Skin Applications [Annalisa Bonfiglio](#); University of Cagliari, Italy.

2:15 PM MF03.12.03

Printed Radiation Sterilization Monitoring Sensor [Ulisses Heredia Rivera](#); purdue university, United States.

2:30 PM MF03.12.04

Conformable Microneedle Platform for Sensing Bio-Chemical Analytes [Wonryung Lee](#); Korea Institute of Science and Technology, Korea (the Republic of).

2:45 PM MF03.12.05

Low-Temperature Fabrication of Hole Blocking Layers for Large-Area, Flexible Amorphous Selenium UV and X-Ray Detectors [Kaitlin Hellier](#); University of California, Santa Cruz, United States.

3:00 PM BREAK

3:30 PM MF03.12.06

Additive Manufacturing of Phase Change Electronic and Photonic Temperature Sensors Based on Chalcogenide Glasses—Nanoparticle Ink Formulation, Inkjet Printing and Devices Characterization [Maria Mitkova](#); Boise State Univ, United States.

3:45 PM MF03.12.07

Scalable Piezoelectric TFT Arrays on Flexible Substrates for Ultra-High Resolution 3D Force Imaging—From the Mechanism to Applications in Closed-Loop Robotics [Hongseok Oh](#); Soongsil University, Korea (the Republic of).

4:00 PM MF03.12.08

In-Fiber Micro-Devices and Stretchable Interconnects for Textile-Based Electronics [Juliette Marion](#)^{2, 1}; ¹Massachusetts Institute of Technology, United States; ²Massachusetts Institute of Technology, United States.

4:15 PM MF03.12.09

Wearable Thermoelectric Generator for Sustainable Wearable Electronics [Jiyong Kim](#); Yonsei University, Korea (the Republic of).

SESSION MF03.13: Flexible and Large-Area Electronics I

Session Chairs: Joseph Andrews and Cinzia Casiraghi

Monday Morning, May 23, 2022

MF03-Virtual

8:00 AM *MF03.13.01

Processing and Doping of Carbon Nanotube Network Transistors on Polymer Substrates [Jana Zaumscil](#); University of Heidelberg, Germany.

8:30 AM MF03.13.02

A Universal Approach for Room-Temperature Printing and Coating of Two-Dimensional Materials [Sina Abdolhosseinzadeh](#)^{1, 2}; ¹Swiss Federal Laboratories for Materials Science and Technology (Empa), Switzerland; ²Swiss Federal Institute of Technology Lausanne (EPFL), Switzerland.

8:45 AM *MF03.13.03

Sensing at the Zeptomolar Concentration Level with Large Area Bioelectronic Interfaces [Eleonora Macchia](#); University of Bari A. Moro, Italy.

9:15 AM MF03.13.04

Laser Photophysical Manufacturing of Multi-Functional Three-Dimensional Graphene and Graphene-Based Hybrid Materials with Polymers [Pilgyu Kang](#); George Mason University, United States.

9:30 AM MF03.13.05

Comparative Study of Printed and Laser-scribed Stretchable Conductors on Thin Elastomers for Soft and Wearable Electronics [Kirill Keller](#); Graz University of Technology, Austria.

9:35 AM MF03.13.06

Study on the Rheological Properties of Etch Resist Inks for Flexible Printed Circuit Board [Bo-Young Kim](#); Korea Electronics Technology Institute, Korea (the Republic of).

9:40 AM MF03.13.07

Molecular Gates: Unlocking the Path to High-Resolution Patterning of Doping, Orientation and Microstructure in Organic Semiconductors Films [Aleksandr Perevedentsev](#)^{1, 2}; ¹Karlsruhe Institute of Technology, Germany; ²Institute of Materials Science of Barcelona (ICMAB-CSIC), Spain.

9:55 AM MF03.13.08

Textiles Coated with Conductive Nanoparticles for Energy Scavenging Wearables and Self-Powered Electronics [Bhaskar Dudem](#); University of Surrey, United Kingdom.

10:00 AM MF03.13.09

Tunable Wettability and Fog-Basking of Laser-Induced Graphene Through Processing Environment and Parameters [Alexander Dallinger](#); Graz University of Technology, Austria.

SESSION MF03.14: Flexible and Large-Area Electronics II

Session Chairs: Joseph Andrews and Vincenzo Pecunia

Monday Morning, May 23, 2022

MF03-Virtual

10:30 AM *MF03.14.01

Material and Process Considerations for Printing Organic Semiconductor Based Sensors [Ioannis Kymissis](#); Columbia University, United States.

11:00 AM *MF03.14.02

Manufacturable Heterogeneous Integration of Flexible 3D-IC Based Intelligent System [Muhammad M. Hussain](#); King Abdullah University of Science, Saudi Arabia.

11:30 AM MF03.14.03

Rapid and Scalable Open-Air Combustion Synthesis with Plasma Anneal for Transparent Conducting Oxides [Thomas W. Colburn](#); Stanford University, United States.

11:45 AM MF03.14.04

Silicon Dioxide Deposition in Polymer Using Sequential Infiltration Synthesis—*In Situ* FTIR Study [Mahua Biswas](#)^{1,2}; ¹Illinois State University, United States; ²Argonne National Laboratory, United States.

12:00 PM MF03.07.10

Laser-Induced Graphene (LIG) Electrodes for Organic Electrochemical Transistors (OECT) [Mohammad Nazeri](#); York University, Canada.

SESSION MF03.15: Flexible and Large-Area Electronics III

Session Chairs: Joseph Andrews and Chang Kyu Jeong

Monday Afternoon, May 23, 2022

MF03-Virtual

9:25 PM MF03.06.08

Stretchable Lead-Free Perovskite/Polymer Nanofiber Composite for Hybrid Triboelectric and Piezoelectric Energy Harvesting [Feng Jiang](#)^{1,2}; ¹Nanyang Technological University, Singapore; ²Institute of Flexible Electronics Technology of Tsinghua, Zhejiang, China.

9:30 PM MF03.15.01

Grain Boundary Passivation via Balancing Feedback of Hole Barrier Height Modulation in HfO_{2-x} for Flexible Electronics [Yeon Soo Kim](#); Ewha Womans University, Korea (the Republic of).

9:45 PM *MF03.15.02

Solution-Processed Semiconductors for Self-Powered Electronics Toward Sustainable Internet of Things [Vincenzo Pecunia](#); Simon Fraser University, Canada.

10:15 PM MF03.15.03

Near-Zero Hysteresis Ionic Conductive Elastomers with Long-Term Stability for Sensing Applications [Firoozeh Foroughi](#); National University of Singapore, Singapore.

10:30 PM MF03.15.04

2D- SnS₂ Nanosheets Interspersed 3D-Hierarchical Melamine Foam-Based Ultra-Lightweight Composite for Multifunctional Sensing Applications [Sushmitha Veeralingam](#); Indian Institute of Technology Hyderabad, India.

10:45 PM MF03.15.05

Versatile Solution-Processed Organic-Inorganic Hybrid Superlattices for Ultraflexible and Transparent High-Performance Optoelectronic Devices [Minh Nhut Le](#); SungKyunKwan University, Korea (the Republic of).

SESSION MF03.16: Flexible and Large-Area Electronics IV

Session Chairs: Joseph Andrews and Vincenzo Pecunia

Tuesday Morning, May 24, 2022

MF03-Virtual

10:30 AM *MF03.16.01

Textile-Based, Garment-Integrated Sensor Systems Created Using Chemical Vapor Deposition [Trisha L. Andrew](#); University of Massachusetts Amherst, United States.

11:00 AM *MF03.16.02

N-Type and P-Type Oxide Electronics Through Area-Selective Atomic Layer Deposition [Rebecca L. Peterson](#); University of Michigan, United States.

11:30 AM MF03.16.03

Characterization of Flexible RFID Antenna Tags Fabricated by Sintering of Printed Silver Nanoparticulate Patterns [Justin Courville](#); University of Louisiana at Lafayette, United States.

11:45 AM MF03.16.04

NIR-Assisted Flash Soldering of Electrical Components on Printed Circuits [Venkat Kasi](#); Purdue University, United States.

12:00 PM MF03.16.05

Scalable Manufacturing of Nano and Microelectronics Using Directed Assembly-Based Printing of Nanomaterials on Rigid and Flexible Substrates [Ahmed A. Busnaina](#); Northeastern University, United States.

12:15 PM MF03.07.09

Laser-Assisted Scalable Manufacturing of Nanoporous Carbon Electrodes for Rapid and Low-Cost Detection of Opioid and Non-Opioid Drugs in Biofluids [Akshay Krishnakumar](#); Purdue University, United States.

SYMPOSIUM NM01

Beyond Graphene 2D Materials—Synthesis, Properties and Device Applications
May 8 - May 23, 2022

Symposium Organizers

Zakaria Al Balushi, University of California, Berkeley
Olga Kazakova, National Physical Laboratory
Su Ying Quek, National University of Singapore
Hyeon Jin Shin, Samsung Advanced Institute of Technology

* Invited Paper

SESSION NM01.01: Large-Scale Synthesis of 2D Materials by CVD
Session Chairs: Zakaria Al Balushi and Hanbin Song
Sunday Morning, May 8, 2022
Hawai'i Convention Center, Level 3, 311

8:30 AM INTRODUCTIONS AND WELCOME

8:45 AM NM01.01.01

Migration-Enhanced MOCVD of Fully-Coalesced WS₂ Monolayers [Holger Kalisch](#); RWTH Aachen University, Germany.

9:00 AM NM01.01.02

Controlled Rhenium Doping of Few-Layer MoS₂ Films Grown by Metal Organic Chemical Vapor Deposition [Riccardo Torsi](#); The Pennsylvania State University, United States.

9:15 AM NM01.01.03

Domain Orientation-Controlled Epitaxial Growth of Tungsten Diselenide Monolayers [Thomas McKnight](#)^{1,3}; ¹The Pennsylvania State University, United States; ³The Pennsylvania State University, United States.

9:30 AM NM01.01.04

Conformal Growth of Monolayer MoS₂ and WSe₂ on High Aspect Ratio Trenches [Connor Bailey](#); Stanford University, United States.

9:45 AM BREAK

SESSION NM01.02: Protocols to Large Scale Electronic Grade 2D Materials
Session Chairs: Zakaria Al Balushi and Andrew Mannix
Sunday Morning, May 8, 2022
Hawai'i Convention Center, Level 3, 311

10:30 AM NM01.02.01

Universal Approach towards 2D van der Waals Metal Chalcogenides from Molecular Building Blocks for Device Application [Veronika Brune](#); University of Cologne, Germany.

10:45 AM NM01.02.02

Two-Dimensional Covalent Crystals by Chemical Conversion of Thin van der Waals Materials [Vishnu Sreepal](#)^{1,2}; ¹University of Manchester, United Kingdom; ²National Graphene Institute, United Kingdom.

11:00 AM NM01.02.04

Clearing the Chemistry in the Synthesis of Transition Metal Dichalcogenides [Jincheng Lei](#); Rice University, United States.

11:15 AM *NM01.02.05

Strategies Towards the Synthesis of Wafer-Scale Single Crystalline 2D Materials [Feng Ding](#); Ulsan National Institute of Science and Technology, Korea (the Republic of).

SESSION NM01.03: Novel Growth Methods to Synthetic 2D Materials
Session Chairs: Zakaria Al Balushi and Hanbin Song
Sunday Afternoon, May 8, 2022
Hawai'i Convention Center, Level 3, 311

1:30 PM NM01.03.01

Towards Coveted Borophene on Insulators, Enabled by Step-Edge Epitax [Ksenia V. Bets](#); Rice University, United States.

1:45 PM NM01.03.02

Two-Dimensional Gallium Oxide Realized via Confinement Heteroepitaxy [Furkan Turker](#)^{1,2}; ¹The Pennsylvania State University, United States; ²The Pennsylvania State University, United States.

2:00 PM NM01.03.03

Stabilizing 2D Phosphorus Allotropes at Confined Heterointerfaces [Jiayun Liang](#); University of California, Berkeley, United States.

2:15 PM NM01.03.04

Accessing Exotic Quantum Materials via Soft-Chemical Synthesis [Xiaoyu Song](#); Princeton University, United States.

2:30 PM NM01.03.05

Lattice Thermal Conductivity of VLS Grown van der Waals Nanowires [Anthony C. Salazar](#)^{1,2}; ¹University of California, Berkeley, United States; ²Lawrence Berkeley National Laboratory, United States.

2:45 PM BREAK

SESSION NM01.04: Large Scale Processing and Integration of 2D Materials

Session Chairs: Zakaria Al Balushi and Anthony Salazar

Sunday Afternoon, May 8, 2022

Hawai'i Convention Center, Level 3, 311

3:15 PM *NM01.04.01

Probing and Pushing the Limit of Emerging Electronic Materials Through van der Waals Integration [Xiangfeng Duan](#); University of California-Los Angeles, United States.

3:45 PM NM01.04.02

Scalable Back-End-of-Line Compatible Growth of WS₂ Thin Films via Atomic Layer Deposition [Muhammed Juvaid Mangattuchali](#); NUS Singapore, Singapore.

4:00 PM NM01.04.03

Large Scale Development of MoS₂ Circuitry for Flexible, Active Matrix X-Ray/Vis Light Detector [Beom Jin Kim](#); Yonsei University, Korea (the Republic of).

4:15 PM NM01.04.04

Designing and Processing Transition Metal Dichalcogenide Alloys for Photonic Integrated Circuit Applications [Yifei Li](#); Massachusetts Institute of Technology, United States.

4:30 PM NM01.04.05

High Optical Quality TMD Heterostructures Obtained from MBE Growth and Subsequent Transfer onto SiO₂/Si Wafers [Valentino Jadrisko](#)^{1,2}; ¹Politecnico di Milano, Italy; ²Institute of Physics, Croatia.

4:45 PM NM01.04.06

Structure, Morphology and Strain in MoTe₂ Layers Grown on GaAs(111)B Substrates, MnTe and NiTe₂ Buffers by Molecular Beam Epitaxy [Wiktoria Zajkowska](#); Polish Academy of Sciences, Poland.

SESSION NM01.05: Twisted 2D Materials

Session Chairs: Zakaria Al Balushi and Hyeon Jin Shin

Monday Morning, May 9, 2022

Hawai'i Convention Center, Level 3, 311

10:30 AM *NM01.05.01

Topological Domain Anti-Ferroelectricity in Twisted Bilayer Transition Metal Dichalcogenides [Philip Kim](#); Harvard University, United States.

11:00 AM NM01.05.02

Quantitatively Mapping Lattice Reconstruction and Strain Fields in Moiré Materials [Madeline Van Winkle](#); University of California, Berkeley, United States.

11:15 AM *NM01.05.03

WITHDRAWN 5/9/22 NM01.05.03 **Stacking-Dependent Electrochemistry in Twisted-Bilayer Graphene Superlattices** [Daniel K. Bediako](#); UC Berkeley, United States.

11:45 AM NM01.02.03

Scalable Synthesis of 2D van der Waals Superlattices [Nicholas Glavin](#); Air Force Research Laboratory, United States.

SESSION NM01.06: Defect Engineering in 2D Materials

Session Chairs: Zakaria Al Balushi and Hyeon Jin Shin

Monday Afternoon, May 9, 2022

Hawai'i Convention Center, Level 3, 311

1:30 PM *NM01.06.01

Layered Quantum Materials—Characterization and Applications [Andrea C. Ferrari](#); University of Cambridge, United Kingdom.

2:00 PM NM01.06.02

Defect Emission in Two-Dimensional Transition Metal Dichalcogenides [Yiru Zhu](#); University of Cambridge, United Kingdom.

2:15 PM NM01.06.03

Control of Optical Properties via Ion Irradiation of Two-Dimensional Transition Metal Dichalcogenides [Xuejing Wang](#); Los Alamos National Laboratory, United States.

2:30 PM NM01.06.04

Generation of Monosulfur Vacancies Using Synchrotron Radiation [Theresa Gruenleiner](#); Walter Schottky Institute, TUM, Germany.

2:45 PM NM01.06.05

Atomic-Layer-Confined Multiple Quantum Wells Enabled by Monolithic Bandgap Engineering of Transition Metal Dichalcogenides [Yoon Seok Kim](#); Korea University, Korea (the Republic of).

3:00 PM BREAK

SESSION NM01.07: New Frontiers in 2D Materials
Session Chairs: Zakaria Al Balushi and Hyeon Jin Shin
Monday Afternoon, May 9, 2022
Hawai'i Convention Center, Level 3, 311

3:30 PM *NM01.07.01

New 2D with Atomically Thin Crystals [Jiwoong Park](#); University of Chicago, United States.

4:00 PM *NM01.07.02

Two-Dimensional Spin Bistable Molecules [Xiao-Xiao Zhang](#); University of Florida, United States.

4:30 PM *NM01.11.02

Ultrathin Solid Polymer Electrolytes for Electric Double Layer Gating of Two-Dimensional Crystal Field-Effect Transistors [Susan Fullerton](#)^{5,3}; ³University of Pittsburgh, United States; ⁵University of Pittsburgh, United States.

SESSION NM01.08: Poster Session I: Beyond Graphene 2D Materials—Synthesis, Properties and Device Applications I
Session Chair: Zakaria Al Balushi
Monday Afternoon, May 9, 2022
5:00 PM - 7:00 PM

Hawai'i Convention Center, Level 1, Kamehameha Exhibit Hall 2 & 3

NM01.08.02

Phase Transition of Mechanically Exfoliated Molybdenum Disulfide [Ismail Sami](#)^{1,2}; ¹University of Cambridge, United Kingdom; ²University of Cambridge, United Kingdom.

NM01.08.03

Ferromagnetism in Monolayer WSe₂ Semiconductor via Vanadium Dopant [Seokjoon Yun](#)^{2,1}; ¹Sungkyunkwan University, Korea (the Republic of); ²Center for integrated nanostructure and physics, Korea (the Republic of).

NM01.08.04

Thermodynamics Perspective on 2D Materials Oxide Formation and Amelioration [Yih-Ren Chang](#); The University of Tokyo, Japan.

NM01.08.05

Morphology Engineering of Multilayer MoSe₂ FETs by Two-Step Functionalization [Chang hwan Oh](#); School of Materials Science & Engineering, Department of Materials Engineering and Convergence Technology, Gyeongsang National University, Korea (the Republic of).

NM01.08.06

Platform-Independent Integration of High-Speed Tellurium Photodetectors [Geun Ho Ahn](#); Stanford University, United States.

NM01.08.07

High Current Density of 2D Electrocatalysts for Hydrogen Evolution Reaction [Jieun Yang](#); Kyung Hee University, Korea (the Republic of).

NM01.08.08

The Impact of Strain on the Growth Mode in CVD Mono- and Few-Layer MoS₂ [Jonathan Rommelfangen](#); University of Luxembourg, Luxembourg.

NM01.08.09

Adoptable High-Performance Actuators and Pumps Based on Ultralightweight 2D Nanomaterial Assemblies [Lena M. Saure](#); Kiel University, Germany.

NM01.08.10

Depletion Layer Formation-Driven Triboelectric Nanogenerators Based on MoS₂ [Myeongjin Kim](#); Yonsei University, Korea (the Republic of).

NM01.08.11

Diverse Near Infrared and Visible-Range Optoelectronic Applications in Heterostructures of 2D Perovskites with Transition Metal Dichalcogenides [Nikhil Medhekar](#)^{1,2}; ¹Monash University, Australia; ²ARC Centre of Excellence in Future Low Energy Electronic Technologies, Australia.

NM01.08.12

Gas Adsorption Kinetics in Monolayer WS₂—*In Situ* Study [Rahul Rao](#); Air Force Research Laboratory, United States.

NM01.08.13

Physics of Charge Transport in Two-Dimensional TMDCs and Heterojunction Based Field Effect Transistors for Future Photoelectronics [Vishakha Kaushik](#); Indian Institute of Technology Delhi, India.

NM01.08.14

Capillary-Force-Assisted Clean-PDMS Transfer for Moiré van der Waals Heterostructures [Xuezhi Ma](#)^{2,1}; ¹University of California, Riverside, United States; ²Agent for Science, Technology and Research (A*STAR), Singapore.

NM01.08.15

New Molecular Approach Towards TMDCs and TMDC-Like Structures by Single Source Precursors [Anja Sutorius](#); University of Cologne, Germany.

NM01.08.17

Functional WS₂/CoFe₂O₄ Heterostructures Grown by Dual Laser Ablation [Derick C. DeTellem](#); University of South Florida, United States.

NM01.08.18

Remote Epitaxy on Monolayer MoS₂ to Fabricate Microcavity [Jinkyoun Yoo](#); Los Alamos National Laboratory, United States.

NM01.08.19

In Situ Mechanical Characterization and Degradation of 2D MOFs [Rainhard Machatschek](#)^{1,2}; ¹Helmholtz Zentrum Hereon, Germany; ²University of Potsdam, Germany.

NM01.08.20

Chemical Vapor Deposition of Monolayer MoS₂ on Chemomechanically Polished N-Polar GaN [Rohan Sengupta](#); North Carolina State University, United States.

NM01.08.21

Preparation of Magnesium Diboride Surface Coatings for Gravimetric Adsorption Characterization [Thi Kieu Ngan Pham](#); University of Hawaii at Manoa, United States.

NM01.08.22

Visualizing Transparent 2D Sheets by Fluorescence Quenching Microscopy [Zhizhi Kong](#)^{1,2}; ¹University of California, Berkeley, United States; ²Northwestern University, United States.

NM01.08.23

Boosting Thermoelectric Performance of Ultrathin MoS₂ by Substrate-Induced Non-Uniform Strain [Hong Kuan Ng](#)^{1,2}; ¹Institute of Materials Research and Engineering, Singapore; ²National University of Singapore, Singapore.

NM01.08.24

Abundant Active Sites on the Basal Plane and Edges of Layered van der Waals Fe₃GeTe₂ for Highly Efficient Hydrogen Evolution [Eunsoo Lee](#); University of California, Riverside, United States.

NM01.08.25

Functional Ultralightweight Foams by Effective Assembly of 1D and 2D Nanomaterials [Fabian Schuett](#); Kiel University, Germany.

NM01.08.26

The Unusual Electronic Structure of the ($\sqrt{3}\times\sqrt{7}$)R19° Phase of Au-Sn Layer Grown on Au(111) [Sudipta Roy Barman](#); UGC-DAE Consortium for Scientific Research, India.

NM01.08.27

Modulating Electrical Properties of MoS₂-FETs with Controlled Surface Charge Transfer Doping via Selective Inkjet Printing [Kyungjune Cho](#); Korea Institute of Science and Technology, Korea (the Republic of).

NM01.08.28

Ferromagnetism in Co-Doped 2D Graphitic ZnO at Room Temperature [Rui Chen](#)^{1,2}; ¹University of California, Berkeley, United States; ²Lawrence Berkeley National Laboratory, United States.

NM01.08.29

Surface and Dynamical Properties of GeI₂ [Archit Dhingra](#); University of Nebraska-Lincoln, United States.

SESSION NM01.09: Advanced Characterization of 2D Materials
Session Chairs: Zakaria Al Balushi and Susan Fullerton
Tuesday Morning, May 10, 2022
Hawai'i Convention Center, Level 3, 311

8:30 AM NM01.09.01

Scanning Tunneling Microscopy and Spectroscopy of Solution-Synthesized Zigzag-Shape Graphene Nanoribbons with Asymmetric Structure [Hanfei Wang](#); University of Illinois at Urbana-Champaign, Afghanistan.

8:45 AM NM01.09.02

Understanding the Effect of Temperature on Phonon Vibrational Modes of WS₂ Crystals [Sanjay K. Behura](#); University of Arkansas at Pine Bluff, United States.

9:00 AM NM01.09.03

Investigation of 1D-2D Heterostructures of Te on WSe₂ Using Scanning Nanodiffraction [Bengisu N. Sari](#)^{2,3}; ²University of California, Berkeley, United States; ³Lawrence Berkeley National Laboratory, United States.

9:15 AM NM01.09.04

Asymmetry of the Junction Line Defect Distribution in WS₂-WSe₂ Lateral/Vertical Heterostructures Revealed by TERS Imaging [Andrey Kravayev](#); Horiba Scientific, United States.

9:30 AM NM01.09.05

Toughening in 2D Materials [Yingchao Yang](#); The University of Maine, United States.

9:45 AM BREAK

SESSION NM01.10: Advanced Microscopy of 2D Materials
Session Chairs: Zakaria Al Balushi and Sanjay Behura

Tuesday Morning, May 10, 2022
Hawai'i Convention Center, Level 3, 311

10:30 AM *NM01.10.01

Picometer-Scale Characterization of Structure, Fields and Defects in 2D Materials Using 4D-STEM [Yu-Tsun Shao](#); Cornell University, United States.

11:00 AM NM01.10.02

Revealing Optoelectronic Processes in Monolayer Transition Metal Dichalcogenides with Nanometre Resolution Cathodoluminescence [Hugh Ramsden](#)^{1,2}; ¹University of Cambridge, United Kingdom; ²University of Cambridge, United Kingdom.

11:15 AM NM01.10.03

Visualizing Transparent 2D Sheets by Fluorescence Quenching Microscopy [Zhizhi Kong](#)^{1,2}; ¹University of California, Berkeley, United States; ²Northwestern University, United States.

11:30 AM *NM01.10.04

Electronic Structure, Stacking Arrangement and the Interaction Strength of Tungsten Disulfide at the Gold Contact [Taisuke Ohta](#); Sandia National Laboratories, United States.

SESSION NM01.11: Logic Devices Enabled by 2D Materials
Session Chairs: Zakaria Al Balushi and Sanjay Behura
Tuesday Afternoon, May 10, 2022
Hawai'i Convention Center, Level 3, 311

1:30 PM *NM01.11.01

Towards High-Performance Transistors Based on High 2D Transition Metal Dichalcogenide Monolayers [Sean Li](#); University of New South Wales, Australia.

2:00 PM NM01.11.02

Multichannel Dual-Gate MoS₂ FETs Enabled by Folding van der Waals Heterostructures [Hefei Liu](#); University of Southern California, United States.

2:15 PM NM01.11.03

Mechanical Stress Induced Tunable Resistance in MoS₂ Junctions [Pradeep Chaudhary](#); University of Nebraska-Lincoln, United States.

2:30 PM BREAK**3:00 PM *NM01.07.03**

Advances in Organic 2D Crystals [Xinliang Feng](#); Technische Universität Dresden, Germany.

3:30 PM NM01.11.05

Optically Probing Energy Barrier Height Modulation in α -In₂Se₃ Based Ferroelectric Semiconductor Field Effect Transistors for Neuromorphic Applications [Ting-Ching Chu](#); Northwestern University, United States.

3:45 PM NM01.11.06

Negative Capacitance in Two-Dimensional Devices—Exploration of Performance Metrics for Energy-Efficient Switching [Sadegh Kamaei Bahmaei](#); Ecole Polytechnique Federale de Lausanne, Switzerland.

4:00 PM NM01.11.07

Charge Trap Engineering and Synaptic Behavior of Transition Metal Dichalcogenides Transistor, via Molecular Dynamics. [Yeonjin Je](#); Department of Materials Engineering and Convergence Technology, School of Materials Science & Engineering, Gyeongsang National University, Korea (the Republic of).

4:15 PM NM01.11.08

Enhanced Normally-off Characteristic of Dual p-n Homojunction WSe₂ FETs [Dongryul Lee](#); Korea University, Korea (the Republic of).

4:30 PM NM01.11.09

Modulating Electrical Properties of MoS₂-FETs with Controlled Surface Charge Transfer Doping via Selective Inkjet Printing [Kyungjune Cho](#); Korea Institute of Science and Technology, Korea (the Republic of).

SESSION NM01.12: Poster Session II: Beyond Graphene 2D Materials—Synthesis, Properties and Device Applications II
Session Chair: Zakaria Al Balushi
Tuesday Afternoon, May 10, 2022
5:00 PM - 7:00 PM

Hawai'i Convention Center, Level 1, Kamehameha Exhibit Hall 2 & 3

NM01.12.01

Multi-Level Generation Mechanism in Basic Floating Gate Memory Structure [Oh Hun Gwon](#); Chungnam National University, Korea (the Republic of).

NM01.12.03

Gas Barrier Properties of Chemical Vapor-Deposited Graphene to Oxygen Imparted with Sub-eV Kinetic Energy [Hisato Yamaguchi](#); Los Alamos National Laboratory, United States.

NM01.12.04

Characterisation and Defect Analysis of 2D Layered Ternary Chalcogenides [Tigran Simonian](#)^{1,3}; ¹Trinity College Dublin, Ireland; ³Trinity College Dublin, The University of Dublin, Ireland.

NM01.12.05

Photoemission from Alkali Photocathodes Through an Atomically Thin Protection Layer [Hisato Yamaguchi](#); Los Alamos National Laboratory, United States.

NM01.12.06

Simple and Efficient Functionalization Strategy of Molybdenum Disulfide for Realizing High-Sensitivity Sensors [Joonhyub Kim](#); Pusan National University, Korea (the Republic of).

NM01.12.07

Biaxial Strain Engineering of MoSe₂/WSe₂ Heterostructures [Jennifer Toy](#); University of California, Berkeley, United States.

NM01.12.08

2D Hybrid rGO/MOS₂ Nanofiller Reinforced Polyurethane Composite Foam for Absorption Dominant Electromagnetic Interference Shielding Material [Sushant Sharma](#); University of Ulsan, Korea (the Republic of).

NM01.12.09

NaCl-Assisted Low-Temperature Growth of Few-Layer WSe₂ by Pulsed Laser Deposition [Inhyeok Oh](#); Gwangju Institute of Science and Technology, Korea (the Republic of).

NM01.12.10

Seebeck Domain Formed by Grain Boundaries of 1H-MoS₂ [Seungil Baek](#); KAIST, Korea (the Republic of).

NM01.12.11

High-Mobility Junction Field-Effect Transistor via Graphene/MoS₂ Heterointerface [Taesoo Kim](#)^{2,1}; ¹Sungkyunkwan University, Korea (the Republic of); ²Sungkyunkwan University, Korea (the Republic of).

NM01.12.12

Covalent Functionalization of Carbofene Pores [Chad Junkermeier](#); University of Hawaii Maui College, United States.

NM01.12.13

Dynamically Structure-Evolved Ultrathin Layered Double Hydroxide Nanosheets for Highly Efficient 5-(hydroxymethyl)furfural Oxidation [Haira G. Hackbarth](#); University of New South Wales, Australia.

NM01.12.14

Van der Waals Stacked Synapse Transistor Based on Efficient Charge-(de)trap Flash Memory [Hoyeon Cho](#); Ulsan National Institute of Science and Technology, United States.

NM01.12.15

Ambipolar Charge Transport in Degenerately Doped Transition Metal Dichalcogenides [Kyungmin Ko](#); UNIST, Korea (the Republic of).

NM01.12.16

Preparation of WO₃/MoS₂/Carbon Nanomaterials Hybrid Structures for Potential Energy Applications [Marta Mazurkiewicz-Pawlicka](#); Warsaw University of Technology, Poland.

NM01.12.17

Synthesis of Borophane Polymorphs via Hydrogenation of Borophene [Qiucheng Li](#); Northwestern University, United States.

NM01.12.18

Complex Exciton Behavior in Monolayer WS₂ by Laser Irradiation [Hyojung Kim](#); Sungkyunkwan University, Korea (the Republic of).

NM01.12.19

Unveiling the Nanoscale Mechanism(imaging) of 2D Nanomaterial-Based Memristive Devices [Seokjun Kim](#); Pusan National University, Korea (the Republic of).

NM01.12.20

Monolithic Interface Contact Engineering in 2D Semiconductor Photovoltaic Heterojunctions [Seunghoon Yang](#); Korea University, Korea (the Republic of).

NM01.12.21

Effect of Gamma Radiation on Structural and Optical Properties of Monolayer WS₂ [Pallavi Aggarwal](#); Indian Institute of Technology Delhi, India.

NM01.12.22

Palladium Nanoparticles Decorated Few Layer 2D SnS Film for Enhanced Room Temperature Gas Sensing [Prashant Bisht](#); Indian Institute of Technology Delhi, India.

NM01.12.23

Electrically Controllable Neuromodulation Emulated by 2D Weight-Tunable Memristor for Neuromorphic Application [Woong Huh](#); Korea University, Korea (the Republic of).

NM01.12.24

Origin of Proton-Beam-Induced Subgap Emission in MoSe₂ Monolayers [Yuan Chen](#); National University of Singapore, Singapore.

NM01.12.25

Synthesis of MoS₂/CNMs/TiO₂ Hybrid Nanostructures as Potential HER Catalysts [Zuzanna Bojarska](#); Warsaw University of Technology, Poland.

NM01.12.26

Remote Modulation Doping in van der Waals Heterostructure Transistors [Yoon Seok Kim](#); Korea University, Korea (the Republic of).

NM01.12.27

Microwave-Assisted Synthesis of Pt Nanoclusters on ReS₂ for Enhanced Hydrogen Evolution Reaction [Geonwoo Kim](#); Pohang University of Science and Technology, Korea (the Republic of).

NM01.12.28

Investigating Large-Area 2D Magnetic Materials with Neutron Reflectometry [June Hyuk Lee](#); Korea Atomic Energy Research Institute, Korea (the Republic of).

NM01.12.29**Layer Control and Electronic State Modulation of MoS₂ Thin Film with Wafer-Scaled Uniformity** [Jae-Hwan Jung](#); SungKyunKwan University, Korea (the Republic of).**NM01.12.30****Tunneling Contacts on Vertically-Oriented CVD Grown ReS₂ Film** [Hyeyoon Ryu](#); Kyung Hee University, Korea (the Republic of).**NM01.12.31****Effect of Point Defects on Structural and Electronic Properties of Monolayer GeS** [Suklyun Hong](#); Sejong Univ, Korea (the Republic of).

SESSION NM01.13: Hybrid 2D Materials
Session Chairs: Zakaria Al Balushi and Taisuke Ohta
Wednesday Morning, May 11, 2022
Hawai'i Convention Center, Level 3, 311

8:30 AM NM01.13.01**Defect Engineered 2D Layered Double Hydroxides for Biomass Electrooxidation Reactions** [Nicholas Bedford](#); University of New South Wales, Australia.**8:45 AM NM01.13.02****Robust Synthesis of 2D ABX₃ Perovskites as Building Blocks for Vertical Junction** [Shuchen Zhang](#); Purdue University, United States.**9:00 AM NM01.13.03****Atomically Precise Single-Crystal Structures of Electrically Conducting 2D Metal–Organic Frameworks** [Jinhu Dou](#)^{2,1}; ¹Massachusetts Institute of Technology, United States; ²Peking University, China.**9:15 AM NM01.13.04****Microwaves-Assisted Synthesis of Tunable TMD-COF Heterostructures** [Lucas K. Beagle](#)^{1,2}; ¹Air Force Research Laboratory, United States; ²UES, Inc., United States.**9:30 AM BREAK**

SESSION NM01.14: Magnetism in 2D Materials
Session Chairs: Zakaria Al Balushi and Souvik Biswas
Wednesday Morning, May 11, 2022
Hawai'i Convention Center, Level 3, 311

10:15 AM *NM01.14.01**van der Waals Layered Magnetic Semiconductors** [Young Hee Lee](#)^{1,2}; ¹Sungkyunkwan University, Korea (the Republic of); ²IBS Center for Integrated Nanostructure Physics, Korea (the Republic of).**10:45 AM NM01.14.02****Room Temperature Ferromagnetism in Metal-Rich, Large-Area Fe_{3-x}GeTe₂ Films Synthesized by van der Waals Epitaxy on Graphene** [Hua Lv](#); Paul-Drude-Institut für Festkörperelektronik, Leibniz-Institut im Forschungsverbund Berlin e. V., Germany.**11:00 AM NM01.14.03****Unravelling the Longstanding Problem of the van der Waals Magnetic Material CrI₃—Spins, Structure and Dimensionality** [Efrén Navarro-Moratalla](#); Instituto de Ciencia Molecular, Spain.**11:15 AM NM01.14.04****Spin Valves with Exfoliated 2D Semiconductors—MoS₂ and Beyond** [Marta Galbiati](#)^{1,2}; ¹Universidad de Valencia, Spain; ²Unité Mixte de Physique CNRS/Thales, France.**11:30 AM *NM01.14.05****Low-Power, Long-Range Spin Transfer in Frustrated Magnets and Other Correlated Systems** [Shannon C. Haley](#); University of California, Berkeley, United States.

SESSION NM01.15: Memory Devices Based on 2D Materials
Session Chairs: Zakaria Al Balushi and SungWoo Nam
Wednesday Afternoon, May 11, 2022
Hawai'i Convention Center, Level 3, 311

1:30 PM *NM01.15.01**Defectronics—Application of Defects in Memory, Computing and Switching** [Deji Akinwande](#); The University of Texas at Austin, United States.**2:00 PM NM01.15.02****Two-Dimensional Ferroelectric Heterostructure Field-Effective-Transistor for Wide Memory Window Non-Volatile Memory and Neuromorphic Computing** [Hyun Ho Yoo](#); Sungkyunkwan University, Korea (the Republic of).**2:15 PM NM01.15.03****2D Memristors Based on Gr/Sr₂Nb₃O₁₀/Gr van der Waals Heterostructure for Neuromorphic Computing** [Kyungjune Cho](#); Korea Institute of Science and Technology, Korea (the Republic of).**2:30 PM BREAK**

SESSION NM01.16: 2D Mechanics
Session Chairs: Zakaria Al Balushi and Young Hee Lee
Wednesday Afternoon, May 11, 2022
Hawai'i Convention Center, Level 3, 311

3:30 PM *NM01.16.01

Fracture of Two-Dimensional Materials [Jun Lou](#); Rice University, United States.

4:00 PM *NM01.16.02

Strain Engineering of Two-Dimensional Semiconductors [SungWoo Nam](#); University of California, Irvine, United States.

4:30 PM NM01.16.03

Tuning Properties of Molybdenum Disulfide Electrochemical Actuators with Ion Intercalation [Ismail Sami](#)^{1, 2}; ¹University of Cambridge, United Kingdom; ²University of Cambridge, United Kingdom.

4:45 PM NM01.16.04

Converse Flexoelectric Two-Dimensional MoS₂ Actuator [Yeageun Lee](#); University of Illinois at Urbana-Champaign, United States.

SESSION NM01.17: Poster Session III: Beyond Graphene 2D Materials—Synthesis, Properties and Device Applications III

Session Chair: Zakaria Al Balushi
Wednesday Afternoon, May 11, 2022
5:00 PM - 7:00 PM

Hawai'i Convention Center, Level 1, Kamehameha Exhibit Hall 2 & 3

NM01.17.01

Optical and Electrical Investigation into HFS₂ Oxidation Mechanisms [Irina Chirca](#); University of Cambridge, United Kingdom.

NM01.17.02

Water-Based Solution Synthesis for a MoS₂ Atomic Layer with Large Scale and Its Application to Thin-Film Transistors Using Printing Process [Young-Jin Kwack](#); Hoseo University, Korea (the Republic of).

NM01.17.03

Wide Range Continuously Tunable and Fast Thermal Switching Based on Compressible Graphene Composite Foams [Zixin Xiong](#); Purdue University, United States.

NM01.17.04

HfZrO₂-Based Negative Capacitance Field-Effect Transistor with Molybdenum Disulfide Transition Metal Dichalcogenides and Al₂O₃ Dielectrics [Moonyoung Jung](#); Sungkyunkwan university, Korea (the Republic of).

NM01.17.05

Synthesis of Bimetallic MoS₂/VS₂ Nano-Urchins-Reduced Graphene Oxide Hybrid Nanocomposite for High-Performance Supercapacitor Application [Syeda Wishal Bokhari](#)^{1, 2}; ¹University of Auckland, New Zealand; ²University of Waterloo, Canada.

NM01.17.06

Buried Graphene-Based Triple Gates for Steep Slope TFETs [Raphael D. Ahlmann](#); TU Dortmund University, Germany.

NM01.17.07

Scanning Tunneling Microscopy and Spectroscopy of Solution-Synthesized Zigzag-Shape Graphene Nanoribbons with Asymmetric Structure [Hanfei Wang](#); University of Illinois at Urbana-Champaign, Afghanistan.

NM01.17.08

Long-Term Multilevel Memory and Synaptic Function Transistors Using 2D MoSe₂/MoS₂ Heterostack Channel [Yeonsu Jeong](#); Yonsei University, Korea (the Republic of).

NM01.17.09

Contact Resistance Reduction in 2D MoS₂ FETs Through the Thermal-Evaporated LiF Interlayer [Hyunmin Cho](#); Department of Physics, Yonsei University, Korea (the Republic of).

NM01.17.10

Li Intercalation in van der Waals (vdW) Heterostructures—Kinetic and Doping Effects from *Ab Initio* Calculations [Aakash Kumar](#); Yale University, United States.

NM01.17.11

Change in the Phonon Frequency Spectra of Xenon due to an Isotopic Impurity [Vinod K. Tewary](#); National Institute of Standards and Technology, United States.

NM01.17.13

Surface Alloy as a New Substrate for Transition Metal Dichalcogenide Growth by Chemical Vapor Deposition [Intek Song](#); Andong National University, Korea (the Republic of).

NM01.17.14

The Synthesis and Characterization of Homogeneous High-Quality Graphene Encapsulated Metallic Powders via Plasma Enhanced Rotating CVD [Omer R. Caylan](#)^{1, 2}; ¹TOBB University of Economics and Technology, Turkey; ²Bilkent University, Turkey.

NM01.17.15

Heterostructuring MoS₂/MoSe₂ for Basal Plane Activation on Silicon Nanowires for Efficient Photoelectrochemical H₂ Generation [Pooja Devi](#); CSIO Chandigarh, India.

NM01.17.16

Predicting the Electronic and Thermal Properties of Transitional Metal Dichalcogenide Heterostructure [Steven P. Hepplestone](#); University of Exeter, United Kingdom.

NM01.17.17

Mesoscale Operando Investigation of Electrochemically Controlled Anion Intercalation in 2D van der Waals Heterostructure [Mehdi Rezaee](#); Harvard University, United States.

NM01.17.18

Molecular Beam Epitaxial Growth of Indium Telluride on Graphene [Sangmin Lee](#); Seoul National University, Korea (the Republic of).

NM01.17.19

Superior Performance of 2D-BNC Composites in Water Electrolysis [Menna M. Hasan](#); American University In Cairo, Egypt.

NM01.17.21

A Low Temperature, Liquid Phase Route to Porous Graphene and Graphene-Magnetic Composites [Vicki L. Colvin](#); Brown University, United States.

NM01.17.22

Understanding the Effect of Temperature on Phonon Vibrational Modes of WS₂ Crystals [Sanjay K. Behura](#); University of Arkansas at Pine Bluff, United States.

NM01.17.23

Kinetic Three Modes of Growth in CVD Grown Hexagonal Boron Nitride (h-BN) [Ankit S. Rao](#); Indian Institute of Science, India.

NM01.17.24

Ion Beam Synthesis of Layer-Tunable and Transfer-Free Graphene on Arbitrary Substrates Towards Versatile Applications [Yongqiang Wang](#); Los Alamos National Laboratory, United States.

NM01.17.26

Methods of Obtaining Graphene Structures from Mineral Graphite [Pawel Gluchowski](#); Institute of Low Temperature and Structure Research Polish Academy of Sciences, Poland.

NM01.17.27

Laser Induced Generation of Hydrogen in Solvents by Using Graphene [Wieslaw Strek](#); Institute of Low Temperature and Structure Research Polish Academy of Sciences, Poland.

NM01.17.28

Graphene Flakes from the Mineral Graphite and Its Use in the Composites [Robert Tomala](#); Institute of Low Temperature and Structure Research, Polish Academy of Sciences, Poland.

NM01.17.29

Graphitic Carbon Fiber Microelectrode pH Sensors [Alexander G. Zestos](#); American University, United States.

NM01.17.30

Density Functional Theory Driven Phononic Thermal Conductivity Prediction of Biphenylene—A Comparison with Graphene [Ankit Jain](#); Indian Institute of Technology Bombay, India.

NM01.17.31

Shear-Assisted Compression Induced Diamane Formation in Hydrogenated Multilayer Graphene [Shiddhartha Paul](#); The University of Alabama, United States.

NM01.17.33

Synthesis of Negatively Charged Two-Dimensional Semiconducting 2H-MoS₂ and Its Functionalisation [Aleksandra M. Krajewska](#)^{1,2}; ¹Trinity College Dublin, Ireland; ²Trinity College Dublin, Ireland.

NM01.17.34

Highly Conducting p-type MoS_{2-x}N_x Thin-Film Growth with Enhanced 1T' Phase by Pulsed Laser Deposition and Their Nanogenerator Application [Swati Parmar](#); University of Pune, India.

SESSION NM01.18: Optical Properties of 2D Materials

Session Chairs: Zakaria Al Balushi and Kibum Kang

Thursday Morning, May 12, 2022

Hawai'i Convention Center, Level 3, 311

8:30 AM NM01.18.01

First-Principles Study of Borophene-Boride Hetero-Structures [Luqing Wang](#)^{1,2}; ¹Northwestern University, United States; ²Argonne National Laboratory, United States.

8:45 AM NM01.18.02

Impurity Luminescence from a 2D Semiconductor in the Ultradilute Limit [Leyi Loh](#)^{1,2}; ¹National University of Singapore, Singapore; ²National University of Singapore, Singapore.

9:00 AM NM01.18.03

Optical Properties of Group-14 Xenon [Carlo Grazianetti](#); CNR-IMM, Italy.

9:15 AM NM01.18.04

First Principles Study of Multiparticle Excitations in Monolayer MoTe₂; [Supavit Pokawanvit](#)^{1,2}; ¹Stanford University, United States; ²Stanford University, United States.

9:30 AM NM01.18.05

Photoexcitations and Optical Response of Carrier-Doped Monolayer MoTe₂ from First Principles [Aurelie Champagne](#)^{1,2}; ¹Lawrence Berkeley National Laboratory, United States; ²University of California, Berkeley, United States.

9:45 AM NM01.18.06

Interlayer Excitons Investigated by Nano-PL and Nano-Photocurrent Modalities [Thomas P. Darlington](#); Columbia University, United States.

10:00 AM BREAK**10:30 AM NM01.18.07**

Exciton Dynamics at Reconstructed Edges in Monolayer Black Phosphorus [Souvik Biswas](#); California Institute of Technology, United States.

10:45 AM NM01.18.08

Many-Body Exciton and Inter-Valley Correlations in Heavily Electron-Doped WSe₂ Monolayers [Scott Crooker](#); National High Magnetic Field Lab, United States.

11:00 AM NM01.18.09

Tuning van der Waals Heterostructures with Near-Field Electrostatics [Qunfei Zhou](#); Northwestern University, United States.

11:15 AM *NM01.18.10

Exploring Many-Body Effects on the Dynamics of Optical Excitations in Low-Dimensional Materials [Diana Qiu](#); Yale University, United States.

SESSION NM01.19: Advance Manufacturing Methods for 2D Materials

Session Chairs: Zakaria Al Balushi and Diana Qiu

Thursday Afternoon, May 12, 2022

Hawai'i Convention Center, Level 3, 311

1:30 PM *NM01.19.01

Robotic Four-Dimensional Pixel Assembly of van der Waals Solids [Andrew J. Mannix](#); Stanford University, United States.

2:00 PM NM01.19.02

Inkjet Printed Circuits with 2D Semiconductor Inks for High-Performance Electronics [Tian Carey](#); Trinity College Dublin, Ireland.

2:15 PM NM01.19.04

From Powder to Large-Area Films—A Solution Processable Route for Production of Pristine and Alloyed 2D TMDs for Optoelectronic Applications [Rebekah Wells](#); Ecole Polytechnique Federale de Lausanne, Switzerland.

2:30 PM BREAK**3:00 PM *NM01.19.05**

Beyond 2D Binary Metal-Chalcogenides—2D Ternary Metal-Chalcogenides and 2D Oxides [Kibum Kang](#); Korea Advanced Institute of Science and Technology, Korea (the Republic of).

3:30 PM NM01.19.06

2D-Material-Integrated Micromachines with Anomalous Propulsion [Donglei \(Emma\) Fan](#); The University of Texas at Austin, United States.

3:45 PM NM01.19.07

Edge-Contacted Transition Metal Dichalcogenide Transistors—An Experimental Analysis of Fabrication Techniques [Hattan Abuzaid](#); Duke University, United States.

4:00 PM NM01.19.08

Ultrasensitive Molecular Sensors Based on Real-Time Impedance Spectroscopy in Solution-Processed 2D Materials [David Moore](#)^{2,1}; ¹AFRL, United States; ²UES inc, United States.

4:15 PM NM01.19.09

Hexagonal BN Enabled Fabrication of 2D Transition Metal Dichalcogenides Based Electronic Nanobiosensors [Mengqiang Zhao](#); New Jersey Institute of Technology, United States.

SESSION NM01.20: Physical Properties of 2D Materials

Session Chairs: Zakaria Al Balushi and Kate Reidy

Friday Morning, May 13, 2022

Hawai'i Convention Center, Level 3, 311

8:30 AM NM01.20.01

Data-Driven Engineering of Spin Injection in Magnetic Tunnel Junctions Based on van der Waals Materials [Marcelo A. Kuroda](#); Auburn Univ, United States.

8:45 AM NM01.20.02

Electronic Properties of Quasi-1D Materials, TiS₃ and In₄Se₃ [Alexander Sinitskij](#); University of Nebraska -Lincoln, United States.

9:00 AM NM01.20.03

Local Electronic Structure and Control of Nanoscale Heterogeneity in Transition Metal Dichalcogenide-Au Interfaces [Alex M. Boehm](#); Sandia National Laboratories, United States.

9:15 AM NM01.20.04

Strain-Induced Semiconducting to Semi-Metallic Phase Transition in MoTe₂ Using a Single-Ion Conductor [Shubham Sukumar Awate](#); University of Pittsburgh, United States.

9:30 AM NM01.20.05

Experimental Demonstration of Gate Dependent Refractive Index and Phase Modulation in Monolayer Molybdenum Diselenide Heterostructures for Active Metasurfaces [Melissa Li](#); California Institute of Technology, United States.

9:45 AM BREAK

SESSION NM01.21: Novel Synthesis of 2D Materials and Heterostructures
Session Chairs: Zakaria Al Balushi and Jiayun Liang
Friday Morning, May 13, 2022
Hawai'i Convention Center, Level 3, 311

10:30 AM NM01.21.01

Formation and Structure of Oxides of Layered Two-Dimensional Semiconductors [Kate Reidy](#); Massachusetts Institute of Technology, United States.

10:45 AM NM01.21.02

Gold-Catalyzed Growth of Vertically Oriented GaS_{1-x}Te_x van der Waals Nanowire Arrays [Daniel R. Paulo-Wach](#)^{3,4}; ³Lawrence Berkeley National Laboratory, United States; ⁴University of California, Berkeley, United States.

11:00 AM NM01.21.03

Synthesis and Characterization of Monolayer and Few-Layer InSe Electronics [Kathryn Neilson](#); Stanford University, United States.

11:15 AM NM01.21.04

Mechanisms of Nanoscroll Formation in 2D Transition Metal Oxides from *Ab Initio* Simulations [Adway Gupta](#); Arizona State University, United States.

11:30 AM NM01.21.05

High-Throughput Identification of Stable 2D Janus-Bulk Materials Heterostructures [Tara M. Boland](#); Arizona State University, United States.

11:45 AM NM01.21.06

Energy and Charge Transfer in Hybrid Heterostructures Consisting of MoS₂ Monolayers and Fluorescent Organic Molecules [Soyeong Kwon](#); Ewha Womans University, Korea (the Republic of).

SESSION NM01.22: 2D Materials for Energy
Session Chairs: Zakaria Al Balushi and Jiayun Liang
Friday Afternoon, May 13, 2022
Hawai'i Convention Center, Level 3, 311

1:30 PM NM01.22.01

Metallic Phase 2D MoS₂ Nanosheets as Anodes for Sodium-Ion Batteries [Jung-In Lee](#); University of Cambridge, United Kingdom.

1:45 PM NM01.22.02

Large-Area 2D-MoS₂/black-Si Heterostructure for Next-Generation Energy Storage [Katrina A. Morgan](#); University of Southampton, United Kingdom.

2:00 PM NM01.22.03

Synthesis and Electrochemical Performance of Mo₂AlB₂ as Electrode Material for Li-Ion Battery [Ahmad Majed](#); Tulane University, United States.

2:15 PM BREAK

SESSION NM01.23: Transport Properties in 2D Materials
Session Chairs: Zakaria Al Balushi and Jiayun Liang
Friday Afternoon, May 13, 2022
Hawai'i Convention Center, Level 3, 311

3:00 PM NM01.23.01

P-type Contacts on Two-Dimensional Transition Metal Dichalcogenide Semiconductors [Yan Wang](#); University of Cambridge, United States.

3:15 PM NM01.23.02

Understanding the Role of Contacts for Ferroelectric Control in vdW Heterostructures [Soumya Sarkar](#); University of Cambridge, United Kingdom.

3:30 PM NM01.23.03

Van der Waals Vertical *p-n* Junction Using Low Resistance Contacts [Jung Ho Kim](#); University of Cambridge, United Kingdom.

3:45 PM NM01.23.04

In, Sn and Bi Contacts to Monolayer MoS₂—Alloying for Temperature Tolerance and Silicon CMOS Compatibility [Aravindh Kumar](#); Stanford University, United States.

4:00 PM NM01.23.05

Ultrathin Germanium as an Interlayer for Silver Contacts to Monolayer MoS₂ [Kirstin E. Schauble](#); Stanford University, United States.

4:15 PM NM01.23.06

Photocurrent in TMDC/Graphene Heterostructure Photodetectors—The Role of Adsorbates [Tilmar Kuemmel](#); Universität Duisburg-Essen, Germany.

4:30 PM NM01.23.07

Ferroelectric Control of the Band Structure of the Transition Metal Dichalcogenide WSe₂ [Raphael Salazar](#); Synchrotron SOLEIL, France.

SESSION NM01.24: Physical Properties of 2D Materials Beyond Graphene I
Session Chairs: Sarah Haigh and Jiayun Liang
Monday Morning, May 23, 2022
NM01-Virtual

8:00 AM *NM01.24.01

WITHDRAWN 5/17/22 NM01.24.01 Engineering Correlation and Topology in Two-Dimensional Moire Superlattices [Feng Wang](#); Univ of California-Berkeley, United States.

8:30 AM *NM01.24.02

Exciton Complexes and Spin/Valley Pumping in Doped Monolayer Semiconductors [Marie Xavier](#); INSA, France.

9:00 AM NM01.24.03

Valley-Polarized Hyperbolic-Exciton-Polaritons in 2D Semiconductors [Tomer Eini](#); Tel Aviv University, Israel.

9:15 AM NM01.24.04

Anomalous Raman Spectra Obtained from Zirconium-Based TMDs Nanosheets toward Thermal Properties Extracting [Awsaf A. AlSulami](#); King Abdulaziz City for Science and Technology (KACST), Saudi Arabia.

9:30 AM NM01.24.05

Analysis of Avalanche Multiplication in Ambipolar WSe₂ Field-Effect Transistors through Channel Length Modulation [Jaeyoung Kim](#); Seoul National University, Korea (the Republic of).

9:45 AM NM01.24.06

Incipient Ferroelectric Transition Enables Ultrahigh Electron Mobility in Semiconducting Bi₂O₂Se [Ziye Zhu](#)^{1,2,3}; ¹Westlake University, China; ²Westlake Institute for Advanced Study, China; ³Zhejiang University, China.

10:00 AM NM01.24.07

Comparative Study Regarding the Synthesis of Carbon Doped 2D Hexagonal Boron Nitride Films [Eoin O'Sullivan](#); University of Oxford, United Kingdom.

SESSION NM01.25: Physical Properties of 2D Materials Beyond Graphene II
Session Chairs: Jiayun Liang and Hanbin Song
Monday Morning, May 23, 2022
NM01-Virtual

10:30 AM *NM01.25.01

Probing and Manipulating Two-Dimensional Semiconductors [Amalia Patane](#); University of Nottingham, United Kingdom.

11:00 AM NM01.25.02

Mobility Enhancement in Bilayer 2D Material Field-Effect Transistors by the Giant Stark Effect [Haruki Uchiyama](#); The University of Tokyo, Japan.

11:15 AM NM01.25.03

Origin of Defect-Related Photoluminescence in Boron Nitride Grown by MOVPE [Aleksandra K. Dabrowska](#); University of Warsaw, Poland.

11:30 AM NM01.25.04

Current Injection into Single-Crystalline *h*-BN Towards 2D Power Device Application [Supawan Ngamprapawat](#); The University of Tokyo, Japan.

11:45 AM NM01.25.05

Prediction of High Temperature Bose-Einstein Condensation and Valley-Filling Instabilities in Low-Dimensional Quantum Materials [Su Ying Quek](#); National University of Singapore, Singapore.

12:00 PM NM01.25.06

Bending Response and Flexoelectricity in Atomic Monolayers from First Principles [Shashikant Kumar](#); Georgia institute of technology, United States.

12:15 PM NM01.25.07

Divergent Properties in Structural Isomers of Triphenylamine-Based Covalent Organic Frameworks [Ly D. Tran](#)^{1,2}; ¹UES, Inc, United States; ²Air Force Research Laboratory, United States.

12:30 PM NM01.25.08

Ultrafast Dynamics of Rydberg Excitons in Monolayer WSe₂ [Armando Genco](#); Politecnico di Milano, Dipartimento di Fisica, Italy.

SESSION NM01.26: 2D Materials for Sensors and Poster Session
Session Chairs: Jiayun Liang and Hanbin Song
Monday Afternoon, May 23, 2022
NM01-Virtual

1:00 PM NM01.26.01

MXene Immune Profiling by High-Dimensional Approaches Towards Biomedical Applications [Lucia G. Delogu](#); University of Padua, Italy.

1:15 PM NM01.26.02

Graphene and Phthalocyanine Heterostructures for SERS and Gas Sensing Applications [Angela Luis Matos](#); University of Puerto Rico-Rio Piedras, United States.

1:30 PM NM01.26.03

Exploring Supported Metal Nanoclusters on MoS₂ for the Chemical Detection of Biomolecules in Health Monitoring Wearable Devices [Gabriele Boschetto](#); LIRMM, University of Montpellier, CNRS, France.

1:45 PM NM01.26.04

WITHDRAWN 5/19/22 NM01.26.04 Enhancement of Low-Temperature NO₂ Sensing via CVD Grown MoS₂ Nanoflowers with Nanosheets Based Sensor [Sapana Ranwa](#); National Institute of Technology Durgapur, India.

2:00 PM NM01.26.05

Defect Dynamics in Two-Dimensional Black Phosphorus under Noble Gas Ions Irradiation [Saransh Gupta](#); University of Louisville, United States.

2:15 PM NM01.26.06

Synthesis of One Atom Thick, Two-Dimensional Gold Crystals and Their Novel Properties [Ramesh Jagannathan](#); NYUAD, United Arab Emirates.

2:30 PM NM01.26.07

Enhancement of Magnetization in Atomically Thin Cobalt Telluride [Solomon D. Negedu](#)^{1,2}; ¹Jimma Institute of Technology/Jimma University, Ethiopia; ²Indian Institute of Technology Kharagpur, India.

2:35 PM NM01.26.08

Wafer-Scale Growth and Transfer of Group III-Nitrides by Nanocrystalline Graphene for Flexible and 3D Stacking Devices [Shu-Ju Tsai](#); National Applied Research Laboratories Taiwan Instrument Research Institute, Taiwan.

2:40 PM NM01.26.09

Electrochemical Impedance Spectroscopy as an Unorthodox Tool for Discerning Graphite, Graphene and Graphene Oxide [Sonjoy Dey](#); Kansas State University, United States.

2:45 PM NM01.26.10

Synthesis of Wafer-Scale WS₂ Thin Films via Chelant-Assisted Solution-Based Processing [Pedro A. Pena](#); University of California, Riverside, United States.

2:50 PM NM01.26.11

Mechanical and Interface Properties of Carbyne Chains on Metallic Surfaces [Abigail Eaton](#); University of Arkansas, United States.

2:55 PM NM01.26.12

Holey 2D Metal Nitride Nanosheets as Efficient Hybridization Matrices to Maximize the Mass Activity of Metal Nanoclusters [Xiaoyan Jin](#); Yonsei University, Korea (the Republic of).

3:00 PM NM01.26.13

Electron Charging and Discharging in Double Layer Mechanically Exfoliated MoS₂ Flakes [Ammar Nayfeh](#); Khalifa University of Science and Technology, United Arab Emirates.

SESSION NM01.27: 2D Materials for Energy Applications

Session Chairs: Su Ying Quek and Hanbin Song

Monday Afternoon, May 23, 2022

NM01-Virtual

4:00 PM NM01.27.01

Interface- and Defect-Engineering Routes to High-Performance 2D Nanosheet-Based Hybrid Electrodes and Catalysts [Seong-Ju Hwang](#); Yonsei University, Korea (the Republic of).

4:15 PM NM01.27.02

Monolayer and Laminar 2D Membranes for Organic Solvent Nanofiltration and Hydrogen Purification [Sui Zhang](#); National University of Singapore, Singapore.

4:30 PM NM01.27.03

Intersheet Distance and Electronic Coupling as Governing Design Factors to Optimize the Photocatalytic Activity of 2D Nanosheet [Tae-Ha Gu](#); Yonsei University, Korea (the Republic of).

4:45 PM NM01.27.04

2D Silicon-Germanium-Layered Materials as Anodes for Li-Ion Batteries [Xi Chen](#); Laboratoire de Réactivité et Chimie des Solides (LRCS), France.

5:00 PM NM01.27.05

Multilayered Conductive Nanosheet as an Emerging Hybridization Matrix to Explore High-Performance Energy-Functional Materials [Nam Hee Kwon](#); Yonsei University, Korea (the Republic of).

5:15 PM NM01.27.06

Engineering Two-Dimensional Materials and Interfaces for Photocatalytic and Spintronic Applications Using Density Functional Theory [Leah Bendavid](#); Vassar College, United States.

5:30 PM NM01.27.07

Understanding the Effects of Phase, Defects, Functional Groups, and D-Orbitals in Transition Metal Dichalcogenides for the Nitrogen Reduction Reaction in Real Media Through *Ab Initio* Studies [Taylor Aubry](#); National Renewable Energy Laboratory, United States.

5:45 PM NM01.27.08

Integration of 2D Material Characterization and Reliability into Device Manufacturing [Elisabeth Mansfield](#); National Institute of Standards and Technology, United States.

6:00 PM NM01.27.09

Clay Nanosheets at the Air-Water Interface [Paulo H. Michels Brito](#); Norwegian University of Science and Technology, Norway.

SESSION NM01.28: Properties of 2D Materials

Session Chairs: Jiayun Liang and Su Ying Quek

Monday Afternoon, May 23, 2022

NM01-Virtual

6:30 PM *NM01.28.01

Fast Ion Exchange, Chemical Synthesis and Atomic Motion in Liquids Studied Using 2D Heterostructures and Scanning Transmission Electron Microscopy [Sarah J. Haigh](#); University of Manchester, United Kingdom.

7:00 PM *NM01.28.02

Water-Based and Defect-Free 2D Material Inks for Printed and Wearable Electronics [Cinzia Casiraghi](#); University of Manchester, United Kingdom.

7:30 PM NM01.28.03

Synthesis, Surface Modification and Environmental Impact of InSe 2D Nanomaterials [Shreyasi Sengupta](#); University of Maryland Baltimore County, United States.

7:45 PM NM01.28.04

Wafer-Scale Production of TMDs and Alloy Monolayers by Nanocrystal Precursors [Jungwon Park](#); Seoul National University, Korea (the Republic of).

8:00 PM NM01.28.05

Epitaxial Hybrid Covalent-van der Waals Cr₅Te₃/WSe₂ Moiré Superlattices [Mengying Bian](#)^{1,2}; ¹Peking University, China; ²University at Buffalo, The State University of New York, United States.

8:05 PM NM01.28.06

GaSe-Si Based Vertically Standing Self-Powered van der Waals Heterojunction Photodetector with Ultrahigh Responsivity and Detectivity [Sahin Sorifi](#); Indian Institute of Technology Delhi, India.

8:10 PM NM01.28.07

Nucleation and Growth of Palladium on WTe₂(001) [Prescott E. Evans](#); Pacific Northwest National Laboratory, United States.

8:15 PM NM01.28.08

Two-Dimensional Reconfigurable Electronics Enabled by Asymmetric Floating Gate [Tengyu Jin](#); National University of Singapore, Singapore.

8:20 PM NM01.28.09

Long-Lived Photogenerated Carriers in 2D MoS₂ Flakes Chemically Exfoliated [Floriana Morabito](#)^{1,2}; ¹Politecnico di Milano, Italy; ²Istituto Italiano di Tecnologia, Italy.

8:25 PM NM01.28.10

High-Temperature Robustness Exhibited by h-BN Based Deep Ultraviolet Photodetectors [Shuchi Kaushik](#); Indian Institute of Technology Delhi, India.

8:30 PM NM01.28.11

Flexible Ultraviolet Photodetector Based on 2D MoS₂/Ga₂O₃ Heterojunction [Madan Sharma](#); Indian Institute of Technology Delhi, India.

SYMPOSIUM NM02

Reconfiguring the Properties of 2D Materials by Post-Synthesis Design
May 9 - May 24, 2022

Symposium Organizers

Diana Qiu, Yale University
Archana Raja, Lawrence Berkeley National Laboratory
Arend van der Zande, University of Illinois at Urbana Champaign
Stephen Wu, University of Rochester

* Invited Paper

SESSION NM02.01: Quantum Phenomena in Layered Systems I
Session Chairs: Archana Raja and Aditya Sood
Monday Morning, May 9, 2022
Hawai'i Convention Center, Level 3, 303B

10:30 AM *NM02.01.01

Engineering Quantum States in Layered Semiconductors [Bernhard Urbaszek](#); Institut National des Sciences Appliquées de Toulouse, France.

11:00 AM *NM02.01.02

Tuning 2D Electronic Properties by Twisting and Stretching [Madisen Holbrook](#); Columbia University, United States.

11:30 AM NM02.01.03

Tuning Interlayer Exciton Absorption by Out-of-Plane Electric Field and Twist-Angle [Elyse Barre](#); Stanford University, United States.

11:45 AM NM02.01.04

Temperature Dependent Interlayer Exciton Diffusion in a WSe₂/WS₂ Moiré Superlattice [Antonio Rossi](#); Lawrence Berkeley National Laboratory, United States.

SESSION NM02.02: Quantum Phenomena in Layered Systems II
Session Chairs: Archana Raja and Alexander Weber-Bargioni
Monday Afternoon, May 9, 2022
Hawai'i Convention Center, Level 3, 303B

1:30 PM *NM02.02.02

Interplay Between Structural and Excited-State Properties of Twisted TMDC Moiré Heterostructures [Felipe H. da Jornada](#); Stanford University, United States.

2:00 PM NM02.02.03

Spectroscopic Signatures of Moiré-Confined Excitons in Bilayer TMDCs from First Principles [Johnathan Georgaras](#); Stanford University, United States.

2:15 PM *NM02.02.04

Bidirectional Phonon Emission Across van der Waals Heterojunctions During Ultrafast Charge Transfer [Aditya Sood](#); Stanford University, United States.

2:45 PM BREAK

3:15 PM *NM02.02.05

Tunable Valley Currents in Aligned Bilayer Graphene/BN [Rebecca Ribeiro-Palau](#); Université Paris-Saclay, CNRS, Centre de Nanosciences et de Nanotechnologies (C2N), France.

3:45 PM *NM02.02.06

Interlayer Electronic Transport in Bilayer Graphene Systems [Elad Koren](#); Technion - Israel Institute of Technology, Israel.

4:15 PM NM02.02.07

WITHDRAWN 5/8/22 EN02.02.07 A Study on Ferromagnetic Properties of Bi- and Tri-Layer Hydrogenated Graphene [Solimar Collazo](#); University of Puerto Rico-Rio Piedras, United States.

SESSION NM02.03: Defect Engineering I
Session Chairs: Felipe H. da Jornada and Diana Qiu

Tuesday Morning, May 10, 2022
Hawai'i Convention Center, Level 3, 303B

8:30 AM *NM02.03.01

Engineering 0D and 1D Heterostructures in 2D Materials to Define New Localized Quantum States with Quantum Coherent Properties [Alexander Weber-Bargioni](#); Lawrence Berkeley National Laboratory, United States.

9:00 AM *NM02.03.02

Optically Active Atomic Defects in 2D Semiconductors [Goki Eda](#); National University of Singapore, Singapore.

9:30 AM NM02.03.03

Transition Metal Dichalcogenide Defect Functionalization with Magnetic Impurities—Defect Introduction and Identification [John C. Thomas](#); Molecular Foundry, Lawrence Berkeley National Laboratory, United States.

9:45 AM BREAK**10:15 AM *NM02.03.04**

Engineering Quantum Emitters in Two-Dimensional Materials [Chitralcema Chakraborty](#); University of Delaware, United States.

10:45 AM *NM02.03.05

Photophysics of Quantum Defects in Two-Dimensional Materials from First-Principles [Yuan Ping](#); University of California Santa Cruz, United States.

11:15 AM NM02.03.06

Charge Density Modulation in Transition Metal Dichalcogenides via E-Beam Chemistry [Ryan Selhorst](#)^{2,1}; ¹UES Inc, United States; ²Air Force Research Laboratory, United States.

11:30 AM NM02.03.07

Tip Enhanced Photoluminescence Based on Gold Pyramid Tip—Towards Inducing and Probing Highly Polarized and Localized Excitonic Emission in Atomically Thin Semiconductors [Junze Zhou](#); Lawrence Berkeley National Laboratory, United States.

SESSION NM02.04: Atomic Imaging and Manipulation
Session Chairs: Felipe H. da Jornada and Yuan Ping
Tuesday Afternoon, May 10, 2022
Hawai'i Convention Center, Level 3, 303B

1:30 PM *NM02.04.01

Probing Atomic Reconstruction at 2D Interfaces via Scanning Transmission Electron Microscopy [Pinshane Y. Huang](#); University of Illinois at Urbana-Champaign, United States.

2:00 PM NM02.04.02

Bend-Induced Polarization Switching and Formation of Ferroelectric Domain Walls in α -In₂Se₃ [Edmund Han](#); University of Illinois at Urbana-Champaign, United States.

2:15 PM NM02.04.03

Scanning Transmission Electron Microscope (STEM) Characterization of Structures and Defects of Air-Stable Novel 2D van der Waals Magnets [Eugene Park](#); Massachusetts Institute of Technology, United States.

2:30 PM NM02.04.04

Engineering Vacancy Defects in 2D Hexagonal Boron Nitride Using Electron and Ion Beam Methods [Dana Byrne](#)^{1,2}; ¹University of California, Berkeley, United States; ²Lawrence Berkeley National Laboratory, United States.

2:45 PM BREAK**3:15 PM NM02.04.05**

Ion Beam Modification of Two-Dimensional MoS₂—A Comprehensive Study [Kory Burns](#)^{1,2}; ¹University of Florida, United States; ²Sandia National Laboratories, United States.

3:30 PM NM02.04.06

Determining the 3D Atomic Coordinates and Properties of Low-Dimensional Chalcogenides with Picometer Precision [Dennis Kim](#); University of California, Los Angeles, United States.

SESSION NM02.05: Ultrafast Spectroscopy and Control
Session Chairs: Yuan Ping and Diana Qiu
Tuesday Afternoon, May 10, 2022
Hawai'i Convention Center, Level 3, 303B

4:15 PM NM02.05.01

Control of Ultrafast Many-Body Physics in Monolayer Transition Metal Dichalcogenides by Means of Applied Gate Bias Voltage [Irantzu Landa](#); Politecnico di Milano, Italy.

4:30 PM NM02.05.02

Multivalley Dynamics in Monolayer TMDs at High Pressures Revealed by Double-Resonance Raman [Luiz G.P. Martins](#); MIT, United States.

SESSION NM02.06: Proximal Coupling and Transport Phenomena
Session Chairs: Chitrleema Chakraborty and Archana Raja
Wednesday Morning, May 11, 2022
Hawai'i Convention Center, Level 3, 303B

8:15 AM *NM02.06.01

Tunable Mobile Excitons in 2D Materials [Jonas Ziegler](#); Dresden University of Technology, Germany.

8:45 AM NM02.06.02

Directing Exciton Propagation in Monolayer TMDCs Through Patterned Dielectric Substrates [Jonas Zipfel](#); Lawrence Berkeley National Laboratory, United States.

9:00 AM NM02.06.03

Creating a Nanoscale Lateral Heterojunction in a TMD Monolayer by Engineering the Electrostatic Landscape [Madisen Holbrook](#)^{1,2}; ¹Columbia University, United States; ²The University of Texas at Austin, United States.

9:15 AM *NM02.06.04

Spatial and Temporal Imaging of Exciton Transport in Two-Dimensional Heterostructures [Libai Huang](#); Purdue University, United States.

9:45 AM BREAK

10:15 AM NM02.06.05

Dielectric Screening Modulates Semiconductor Nanoplatelet Excitons [Ashley J. Shin](#); University of California Los Angeles, United States.

10:30 AM *NM02.06.06

Manipulating Excitons in van der Waals Materials with Strain and Dielectric Nanobubbles [Milan Delor](#); Columbia University, United States.

11:00 AM NM02.06.07

Tailoring Exciton Transport in Strained Two-Dimensional Tungsten Diselenide Toward Straintronics [Jin Myung Kim](#); University of Illinois at Urbana-Champaign, United States.

11:15 AM NM02.06.08

Direct Spatiotemporal Observation of Coupled Exciton and Heat Transport Reveals Thermoelectric Behavior in Few-Layer MoS₂ [Hannah L. Weaver](#); University of California, Berkeley, United States.

SESSION NM02.07: Synthesis and Modification
Session Chairs: Arend van der Zande and Stephen Wu
Wednesday Afternoon, May 11, 2022
Hawai'i Convention Center, Level 3, 303B

1:30 PM *NM02.07.01

Proximity Effect on Growth, Crystallization and Phase Transition in 2D Materials [Gwan-Hyong Lee](#); Seoul National University, Korea (the Republic of).

2:00 PM NM02.07.02

Surface Energy of Supported Graphene—The Effects of Chemical Functionalization and Adsorption of Volatile Organic Compounds [James Carpenter](#); University of Illinois at Urbana-Champaign, United States.

SESSION NM02.08: Poster Session: Synthetic Modifications of 2D Materials
Session Chairs: Gwan-Hyong Lee and Arend van der Zande
Wednesday Afternoon, May 11, 2022
5:00 PM - 7:00 PM
Hawai'i Convention Center, Level 1, Kamehameha Exhibit Hall 2 & 3

NM02.08.01

WITHDRAWN 5/9/22 NM02.08.01 Modification of Charge Transport Behavior in Rare-Earth Tritellurides by Electrochemical Intercalation [Valerie McGraw](#); University of California, Berkeley, United States.

NM02.08.03

The Role of Si During the Chemical Reaction of XeF₂ with Graphene and h-BN [Subin Shin](#)^{1,2}; ¹Korea Institute of Science and Technology, Korea (the Republic of); ²Kyung Hee University, Korea (the Republic of).

NM02.08.04

Nitrogen-Pair Dopant at Graphene Edges with Electrochemically Bifunctional ORR/OER Catalytic Activity for Zn-Air Battery [Joonwon Lim](#)^{1,2}; ¹Kyung Hee University, Korea (the Republic of); ²Korea Advanced Institute of Science and Technology, Korea (the Republic of).

NM02.08.05

Study on the Dipole Moment of H-C-F Type Janus Single Layer Graphene [Dong-hyun Kim](#); Korea Institute of Science and Technology, United States.

NM02.08.06

Electronic Transport in Graphene-PZT Ferroelectric Field-Effect Transistors [Alexandra Fursina](#); University of Nebraska Lincoln, United States.

SESSION NM02.09: Strain Engineering I
Session Chairs: Milan Delor and Archana Raja

Thursday Morning, May 12, 2022
Hawai'i Convention Center, Level 3, 303B

8:30 AM *NM02.09.01

Tuning the Optical Properties of MoS₂ by Strain Engineering and its Applications [Jong-Hyun Ahn](#); Yonsei University, Korea (the Republic of).

9:00 AM NM02.09.02

Uniaxial and Biaxial Strain Engineering in 2D Materials with Thin-Film Stressors [Ahmad Azizimanesh](#); University of Rochester, United States.

9:15 AM NM02.09.03

Strain Engineering Metal Contacts to Monolayer MoS₂ Transistors [Marc Jaikissoon](#); Stanford University, United States.

9:30 AM BREAK

10:00 AM NM02.09.04

Heterostrain Engineering for Twisted and Non-Twisted 2D Systems with Process-Induced Strain [Tara Pena](#); University of Rochester, United States.

10:15 AM NM02.09.05

Dynamic Strain Engineering of 2D Materials with Piezoelectrics [Wenhui Hou](#); University of Rochester, United States.

10:30 AM NM02.09.07

Buckling and Strain Engineering of Two-Dimensional CsPbBr₃ Perovskite Nanostructures [Yehonadav Bekenstein](#); Technion, Israel.

10:45 AM NM02.09.08

Two-Dimensional Interfaces May Not Be Flat [Zhihui Cheng](#)^{1,2}; ¹Purdue University, United States; ²National Institute of Standards and Technology, United States.

11:00 AM *NM02.09.09

Assembled Functional Oxide Membrane Heterostructures [Chang-Beom Eom](#); University of Wisconsin--Madison, United States.

SESSION NM02.10: Strain Engineering II

Session Chair: Stephen Wu

Thursday Afternoon, May 12, 2022

Hawai'i Convention Center, Level 3, 303B

1:30 PM *NM02.10.01

Stretching, Bending and Breaking Freestanding Oxide Membranes [Harold Y. Hwang](#)^{1,2}; ¹Stanford University, United States; ²SLAC National Accelerator Laboratory, United States.

2:00 PM NM02.10.02

WITHDRAWN 5/16/22 NM02.10.02 Probing the Effect of Biaxial Strain on Raman Scattering of CVD-Grown WSe₂ Monolayers [Jerry A. Yang](#); Stanford University, United States.

2:15 PM NM02.10.03

Mechanically Reconfigurable Electrical Polarization in Two Dimensional α -In₂Se₃ [Shahriar Muhammad Nahid](#); University of Illinois Urbana Champaign, United States.

2:30 PM NM02.10.04

Wrinkle Dynamics in Graphene Supported on a Polymer [Anikeya Aditya](#); University of Southern California, United States.

2:45 PM BREAK

SESSION NM02.11: Device Applications

Session Chairs: Arend van der Zande and Stephen Wu

Thursday Afternoon, May 12, 2022

Hawai'i Convention Center, Level 3, 303B

3:30 PM NM02.11.01

Engineering the Resonant Modes of a Graphene Optomechanical Transducer [Chunhui Dai](#)^{1,2,3}; ¹Lawrence Berkeley National Laboratory, United States; ²University of California, Berkeley, United States; ³University of California, Berkeley, United States.

3:45 PM NM02.11.02

Integrating Ultrathin Gate Dielectrics on 2D Materials for High-Performance Transistors [Jung-Soo Ko](#); Stanford University, United States.

4:00 PM NM02.11.03

Optimization of 2D Materials for Atmospheric Monitoring [Michael Brothers](#)^{1,2}; ¹UES Inc, United States; ²Air Force Research Laboratory, United States.

4:15 PM NM02.11.04

Controlled Encapsulation of Monolayer MoS₂ with Ultrathin Aluminum Oxide for Tunnel Contacts [Alex Henning](#); Technical University of Munich, Germany.

4:30 PM NM02.11.05

Interlayer Slip and Friction in 2D Material Nanoelectromechanical Systems [Paolo F. Ferrari](#); University of Illinois at Urbana Champaign, United States.

SESSION NM02.12: Reconfiguring the Properties of 2D Materials by Post-Synthesis Design

Session Chair: Arend van der Zande

Monday Morning, May 23, 2022
NM02-Virtual

8:00 AM *NM02.12.01

Surface/Interface Engineering of 2D Materials via Chemical Functionalization [Jangyup Son](#); Korea Institute of Science and Technology, Korea (the Republic of).

8:30 AM NM02.12.02

Room Temperature Enhancement of 2D Materials by Superacid Analogue Treatments [Sophie L. Pain](#); School of Engineering, The University of Warwick, United Kingdom.

8:45 AM NM02.12.03

Magnetic Sensing Using Two-Dimensional Transition Metal Dichalcogenides [Bivek Pokhrel](#); University of Delaware, United States.

SESSION NM02.13: Synthesis and Applications
Session Chairs: Diana Qiu and Stephen Wu
Monday Morning, May 23, 2022
NM02-Virtual

10:30 AM *NM02.13.01

Nanocavities and Polaritons in Twisted and Indirectly Nanostructured 2D Materials [Frank Koppens](#); ICFO-The Institute of Photonics Sciences, Spain.

11:00 AM *NM02.13.02

Post-Synthesis Design of 2D Materials—Surface Functionalization and Intercalation [Judy Cha](#); Yale University, United States.

11:30 AM *NM02.13.03

Silver Organochalcogenides—An Emerging Family of Hybrid 2D Semiconductors [William Tisdale](#); Massachusetts Institute of Technology, United States.

12:00 PM *NM02.13.04

WITHDRAWN 5/17/22 NM02.13.04 *In Situ* Synthesis of Excitonic Grade Janus Quantum Layers [Sefaattin \(. Tongay](#); Arizona State University, United States.

SESSION NM02.14: 2D Materials—Electronic and Optical Properties
Session Chairs: Diana Qiu and Archana Raja
Monday Afternoon, May 23, 2022
NM02-Virtual

9:00 PM *NM02.14.01

Excitons in Two-Dimensional Semiconductors—a Momentum-Resolved Perspective [Keshav M. Dani](#); Okinawa Institute of Science and Technology, Japan.

9:30 PM NM02.14.02

On-Chip Strain Engineering of Two-Dimensional Semiconducting Optoelectronic Devices [Yong Xie](#); Xidian University, China.

9:45 PM NM02.14.03

Large-Scale Flexible Electronics on Ultrathin Glass Using Low-Temperature Grown MoS₂ [Anh Tuan Hoang](#); Yonsei University, Korea (the Republic of).

10:00 PM *NM02.14.04

Excitonic Effects in Optical-Field-Driven Quasi 2D Materials from Time-Dependent GW Approach [Yang-Hao Chan](#); Institute of Atomic and Molecular Sciences, Academia Sinica, Taiwan.

10:30 PM NM02.02.01

Atomic Reconstruction and Interfacial Ferroelectricity in Twisted TMD Interfaces [Roman Gorbachev](#); Univ of Manchester, United Kingdom.

SESSION NM02.15: New Materials and Strong Correlations
Session Chairs: Archana Raja and Stephen Wu
Tuesday Morning, May 24, 2022
NM02-Virtual

8:00 AM *NM02.15.01

Correlated Electrons in van der Waals Superlattices: Control and Understanding [Tim Wehling](#); Universität Hamburg, Germany.

8:30 AM *NM02.15.02

Strongly Correlated Excitonic Insulator in Atomic Double Layers [Kin Fai Mak](#); Cornell University, United States.

9:00 AM *NM02.15.03

Engineering New Magnetic Ground States in Twisted Bilayer CrI₃ [Jie Shan](#); Cornell University, United States.

9:30 AM *NM02.15.04

Moiré-Based Quantum Sensing of Correlated Electrons [Ajit Srivastava](#); Emory University, United States.

SYMPOSIUM NM03

2D MXenes—Synthesis, Properties and Applications
May 9 - May 25, 2022

Symposium Organizers

Babak Anasori, Indiana University-Purdue University
Christina Birkel, Arizona State University
Chong Min Koo, Korea Institute of Science & Technology
Valeria Nicolosi, Trinity College Dublin

* Invited Paper

SESSION NM03.01: MXenes Synthesis and Structure
Session Chairs: Babak Anasori and Christina Birkel
Monday Morning, May 9, 2022
Hawai'i Convention Center, Level 3, 301B

8:30 AM *NM03.01.01

Bottom-Up, Scalable Synthesis of Anatase Nanofilament-Based Two-Dimensional Titanium Carbo-Oxide Flakes [Michel Barsoum](#); Drexel University, United States.

9:00 AM NM03.01.02

Synthesis of Solid-Solution MXenes with Tunable Electronic, Optical and Electrochemical Properties [Christopher E. Shuck](#)^{1,2}; ¹Drexel University, United States; ²Drexel University, United States.

9:15 AM NM03.01.03

Ionic Liquid-Based Synthesis of 2D MXenes Nanocarbidides [Samantha Husmann](#); INM–Leibniz Institute for New Materials, Germany.

9:30 AM NM03.01.04

Delamination of Aqueous Multilayer MXene Dispersions by High Shear Mixing [Alex Inman](#); Drexel University, United States.

9:45 AM NM03.01.05

2D Transition Metal Carbides and Carbonitrides (MXenes) as Surface-Enhanced Raman Scattering (SERS)-Active Substrates [Kateryna Shevchuk](#); A.J. Drexel Nanomaterials Institute, United States.

10:00 AM BREAK

10:30 AM *NM03.01.06

Synthesis of 2D Transition Metal Carbides and Nitrides (MXenes) [Yury Gogotsi](#); Drexel University, United States.

11:00 AM NM03.01.07

The Synthesis Mechanism of Ultrathin Mo₂C on Liquid Metal Substrates by Chemical Vapor Deposition and the Impact of Substrate Choice [Katherine T. Young](#)^{1,2}; ¹Georgia Tech Research Institute, United States; ²Georgia Institute of Technology, United States.

11:15 AM NM03.01.08

Properties of the Overlooked Boride-Carbide-Nitride Families of MXenes via High-Throughput DFT Calculations [Murali Gopal Muraliedharan](#); Oak Ridge National Laboratory, United States.

11:30 AM NM03.01.09

High-Entropy 2D Carbide MXenes—TiVNbMoC₃ and TiVCrMoC₃ [Kartik Nemani](#); Indiana University Purdue University, United States.

11:45 AM NM03.01.10

Intrinsic Electronic and Mechanical Properties of MXenes Determined in Single-Flake Measurements [Alexander Sinitskij](#); University of Nebraska -Lincoln, United States.

SESSION NM03.02: MXenes Synthesis, Structure, and Bio Applications
Session Chairs: Michael Naguib and Armin VahidMohammadi
Monday Afternoon, May 9, 2022
Hawai'i Convention Center, Level 3, 301B

1:30 PM *NM03.02.01

Safer MXene Synthesis Using Quaternary Ammonium Salts [Miladin Radovic](#); Texas A&M Univ, United States.

2:00 PM NM03.02.02

Halogen-Free MXene with High Electrical Conductivity and Moisture Resistance [Masashi Koyanagi](#); Murata Manufacturing Co., Ltd., Japan.

2:15 PM NM03.02.03

Identifying the Suitable Medium for Long-Duration Storage of Ti_2CT_x MXene [Chiranjit Roy](#); IIT MADRAS, India.

2:30 PM BREAK

3:00 PM NM03.02.04

Atomic-Resolution Study of Structure and Bonding in 2D Metal-Organic Hybrid MXenes Using *In Situ* STEM [Francisco J. Lagunas Vargas](#); University of Illinois at Chicago, United States.

3:15 PM NM03.02.05

Synthesis and Characterization of 2D Mo_2C Crystals and Graphene Heterostructures Through CVD [Omer R. Caylan](#)^{1,2}; ¹TOBB University of Economics and Technology, Turkey; ²Bilkent University, Turkey.

3:30 PM SPECIAL TALK

3:35 PM NM03.03.01

Poster Spotlight: Green Synthesis of $Ti_3C_2T_x$ MXene [Habib M. Pathan](#); Savitribai Phule Pune University, India.

3:36 PM NM03.03.03

Poster Spotlight: A New Route to Synthesize Ti_3AlC_2 MAX Phase with Lowered Oxygen Content for Improved Conductivity and Morphology of the MXene Electrode [Su Bin Choi](#); Jeonbuk National University, Korea (the Republic of).

3:37 PM NM03.03.04

Poster Spotlight: Inspiration from the Nature—Designing of Universal Ligands for MXenes [Seongmin Park](#); Korea National University of Transportation, Korea (the Republic of).

3:38 PM NM03.03.05

Poster Spotlight: Ion Exchange Coupled with Flocculation Extends Oxidation Stability of V_2CT_x MXene [Kyle Matthews](#); Drexel University, United States.

3:39 PM NM03.03.06

Poster Spotlight: Synthesis of an Ordered Double-Transition Metal $W_2TiC_2T_x$ MXene [Wyatt Highland](#); Indiana University-Purdue University Indianapolis, United States.

3:40 PM NM03.03.07

Poster Spotlight: Synthetic Mechanism Discovery of Ti_3C_2 MXene [Yong-Jae Kim](#); National NanoFab Center, Korea (the Republic of).

3:41 PM NM03.03.08

Poster Spotlight: A Novel Mo_2CT_x MXene/Au Hybrid as an Efficient Substrate for Surface-Enhanced Raman Scattering [Prachi Rajput](#)^{1,2}; ¹Academy of Scientific and Innovative Research, Council of Scientific and Industrial Research, India; ²Central Scientific Instruments Organisation, India.

3:42 PM NM03.03.09

Poster Spotlight: Weak Anti-Localization (WAL)/Weak Localization (WL) Crossover at Inkjet-Printed $Ti_3C_2T_x$ MXene Thin-Film [DooSeung Um](#)^{1,2}; ¹Sejong University, Korea (the Republic of); ²University of Cambridge, United Kingdom.

SESSION NM03.03: Poster Session: MXenes Synthesis, Structure, and Stability

Session Chairs: Babak Anasori and Christina Birkel

Monday Afternoon, May 9, 2022

5:00 PM - 7:00 PM

Hawai'i Convention Center, Level 1, Kamehameha Exhibit Hall 2 & 3

NM03.03.01

Poster Spotlight: Green Synthesis of $Ti_3C_2T_x$ MXene [Habib M. Pathan](#); Savitribai Phule Pune University, India.

NM03.03.03

Poster Spotlight: A New Route to Synthesize Ti_3AlC_2 MAX Phase with Lowered Oxygen Content for Improved Conductivity and Morphology of the MXene Electrode [Su Bin Choi](#); Jeonbuk National University, Korea (the Republic of).

NM03.03.04

Poster Spotlight: Inspiration from the Nature—Designing of Universal Ligands for MXenes [Seongmin Park](#); Korea National University of Transportation, Korea (the Republic of).

NM03.03.05

Poster Spotlight: Ion Exchange Coupled with Flocculation Extends Oxidation Stability of V_2CT_x MXene [Kyle Matthews](#); Drexel University, United States.

NM03.03.06

Poster Spotlight: Synthesis of an Ordered Double-Transition Metal $W_2TiC_2T_x$ MXene [Wyatt Highland](#); Indiana University-Purdue University Indianapolis, United States.

NM03.03.07

Poster Spotlight: Synthetic Mechanism Discovery of Ti_3C_2 MXene [Yong-Jae Kim](#); National NanoFab Center, Korea (the Republic of).

NM03.03.08

Poster Spotlight: A Novel Mo_2CT_x MXene/Au Hybrid as an Efficient Substrate for Surface-Enhanced Raman Scattering [Prachi Rajput](#)^{1,2}; ¹Academy of Scientific and Innovative Research, Council of Scientific and Industrial Research, India; ²Central Scientific Instruments Organisation, India.

NM03.03.09

Poster Spotlight: Weak Anti-Localization (WAL)/Weak Localization (WL) Crossover at Inkjet-Printed $Ti_3C_2T_x$ MXene Thin-Film [DooSeung Um](#)^{1,2}; ¹Sejong University,

Korea (the Republic of); ²University of Cambridge, United Kingdom.

SESSION NM03.04: MXenes Stability and Phase Transformation

Session Chair: Majid Beidaghi

Tuesday Morning, May 10, 2022

Hawai'i Convention Center, Level 3, 301B

8:30 AM *NM03.04.01**Chemistry of 2D Transition Metal Carbides and Carbonitrides (MXenes)** [Vadym Mochalin](#); Missouri University of Science and Technology, United States.**9:00 AM NM03.04.02****Solid-State NMR Characterisation of Surface and Bulk MXene Chemistry** [Michael A. Hope](#)^{1,2}; ¹EPFL, Switzerland; ²University of Cambridge, United Kingdom.**9:15 AM NM03.04.03****Plasma Engineering of Ti₂C MXene and *In Situ* Oxidation of Ti₂C MXene Using Atmospheric Pressure Plasma Printing** [Lois A. Dampney](#); The Open University, United Kingdom.**9:30 AM NM03.04.04****Controlled Surface Modification and Oxidation of Ti₃C₂T_x via Ozonation** [Benjamin E. Sartor](#); New York University, United States.**9:45 AM NM03.04.05****Solid Lubrication Performance and Tribolayer Formation of 2D MXenes—Underlying Mechanisms and Kinetics** [Andreas Rosenkranz](#); University of Chile, Chile.**10:00 AM BREAK****10:30 AM *NM03.04.06*****In Situ* TEM Approaches to Study Dynamic Transformations in MXenes** [Raymond R. Unocic](#); Oak Ridge National Laboratory, United States.**11:00 AM NM03.04.07****Molecular Structure and Oxidation Stability—Interactions Between Antioxidants and Ti₃C₂T_x and Ti₂CT_x MXenes** [Micah Green](#); Texas A&M University, United States.**11:15 AM NM03.04.08****High-Temperature Phase Transformation and Stability of Ti₃C₂T_x and Mo₂TiC₂T_x MXenes** [Brian Wyatt](#); Indiana University - Purdue University of Indianapolis, United States.**11:30 AM NM03.04.09****Free Chlorine Induced Phototransformation of Ti₃C₂T_x MXenes in Water** [Nasim Ganji](#); University of Wisconsin-Madison, United States.**11:45 AM NM03.04.10****MXene-Derived Oxides as Electrodes for Energy Storage** [Ekaterina Pomerantseva](#); Drexel University, United States.

SESSION NM03.05: MXenes Electrochemistry

Session Chairs: Babak Anasori and Valeria Nicolosi

Tuesday Afternoon, May 10, 2022

Hawai'i Convention Center, Level 3, 301B

1:30 PM NM03.05.01**MXenes—Optimism or a Path to the Promised Land?** [Armin VahidMohammadi](#); Drexel University, United States.**1:45 PM NM03.05.02****Improved Energy Storage and Rate Capability of MoO₃/Ti₃C₂ MXene Hybrid Electrode in Saturated Water-in-Salt Electrolytes** [Mohit Saraf](#); Drexel University, United States.**2:00 PM *NM03.05.03****Nanoengineering MXenes Interlayer Spacing for High Performance Electrochemical Energy Storage Electrodes** [Michael Naguib](#); Tulane University, United States.**2:30 PM BREAK****3:00 PM *NM03.05.04****Assembling MXenes Heterostructures and 3D Printing of MXenes for Energy Storage** [Majid Beidaghi](#); Auburn University, United States.**3:30 PM NM03.05.05****MXene-Transition Metal Oxide Heterostructures as Electrodes for Neutral Aqueous Supercapacitors** [Kaitlyn E. Prenger](#); Tulane University, United States.**3:45 PM NM03.05.06****Ti₃C₂ MXenes Microcapacitors on Textile by Inkjet Printing and Aerosol Printing** [Eugenio Gibertini](#); Politecnico di Milano, Italy.**4:00 PM NM03.05.07****High Performance Ti₃C₂T_x Based Supercapacitors by Controlled Micro- and Nanostructure** [Helge Krüger](#); Kiel University, Germany.**4:15 PM NM03.05.08****3D Printed and Templated Ti₃C₂T_x MXene for Energy Storage Applications** [Dahnan Spurling](#); Centre for Research on Adaptive Nanostructures and Nanodevices (CRANN) and Advanced Materials Bio-Engineering Research Centre (AMBER), and School of Chemistry, Trinity College Dublin, Ireland.**4:30 PM NM03.06.01**

Poster Spotlight: Novel Technique for Developing E-Textiles: Printing MXene Supercapacitors on Fabrics for Wearable Electronics [Anastasiia Shandra](#)^{1,2}; ¹Trinity College Dublin, The University of Dublin, Ireland; ²Trinity College Dublin, The University of Dublin, Ireland.

4:31 PM NM03.06.02

Poster Spotlight: Flexible and Stackable Textile Supercapacitors Based on MXene for Wearable Energy Storage Devices [Alex Inman](#); Drexel University, United States.

4:32 PM NM03.06.03

Poster Spotlight: Two-Dimensional Titanium Carbides MXene Electrode-Based Microsupercapacitors with Sub-Micrometer Gaps [Yonghee Lee](#); National Nanofab Center, Korea (the Republic of).

4:33 PM NM03.06.05

Poster Spotlight: Design of Effective Hybrid Photocatalysts via Coupling TiO₂ with Delaminated Ti₃C₂T_x [Placidus B. Amama](#); Kansas State University, United States.

4:34 PM NM03.06.06

Poster Spotlight: Synthesis of Ordered Double Transition Metal (Mo_{2+a}Nb_{2-a})AlC₃ MAX Phases and Their (Mo_{2+a}Nb_{2-a})C₃T_x MXenes [Krista Pulley](#)^{2, 1}; ¹Butler University, United States; ²Indiana University-Purdue University Indianapolis, United States.

4:35 PM NM03.06.07

Poster Spotlight: MXene Embedded Bimetallic Organic Framework Electrocatalyst in Lithium-Oxygen Batteries [Sanghee Nam](#); Korea Advanced Institute of Science and Technology, Korea (the Republic of).

4:36 PM NM03.06.08

Poster Spotlight: Electronic and Thermal Properties of Ti₃C₂-MXenes for Sensing Applications [Krzysztof Grabowski](#); AGH University of Science and Technology, Poland.

SESSION NM03.06: Poster Session: Electrochemistry and Electrocatalysis
Session Chairs: Babak Anasori, Christina Birkel, Chong Min Koo and Valeria Nicolosi
Tuesday Afternoon, May 10, 2022
5:00 PM - 7:00 PM
Hawai'i Convention Center, Level 1, Kamehameha Exhibit Hall 2 & 3

NM03.06.01

Poster Spotlight: Novel Technique for Developing E-Textiles: Printing MXene Supercapacitors on Fabrics for Wearable Electronics [Anastasiia Shandra](#)^{1,2}; ¹Trinity College Dublin, The University of Dublin, Ireland; ²Trinity College Dublin, The University of Dublin, Ireland.

NM03.06.02

Poster Spotlight: Flexible and Stackable Textile Supercapacitors Based on MXene for Wearable Energy Storage Devices [Alex Inman](#); Drexel University, United States.

NM03.06.03

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NM03.06.07

Poster Spotlight: MXene Embedded Bimetallic Organic Framework Electrocatalyst in Lithium-Oxygen Batteries [Sanghee Nam](#); Korea Advanced Institute of Science and Technology, Korea (the Republic of).

NM03.06.08

Poster Spotlight: Electronic and Thermal Properties of Ti₃C₂-MXenes for Sensing Applications [Krzysztof Grabowski](#); AGH University of Science and Technology, Poland.

SESSION NM03.07: MXenes Electrochemistry, Sensing, and EMI Shielding
Session Chairs: Vadym Mochalin and Raymond Unocic
Wednesday Morning, May 11, 2022
Hawai'i Convention Center, Level 3, 301B

8:00 AM NM03.07.01

Synthesis of New Two-Dimensional Titanium Carbonitride (Ti₂C_{0.5}N_{0.5}) MXene [Anika Tabassum](#); Tulane University, United States.

8:15 AM NM03.07.02

Synthesis and Characterization of MXenes for Flexible Current Collectors Fabricated Through Inkjet Printing [Prisca Viviani](#); Politecnico di Milano, Italy.

8:30 AM NM03.07.03

Electrochemical Performance of Vanadium Containing MXenes in Aqueous Electrolytes [Teng Zhang](#); Drexel University, United States.

8:45 AM NM03.07.04

Screening MXenes Based on Polysulfide Adsorption Capability for Li-S Batteries [Geetha Valurouthu](#); Drexel University, United States.

9:00 AM NM03.07.05

Functionalized MXenes for Triboelectric Nanogenerators—A Step Towards Extending Material Choice and Stability of Triboelectric Nanogenerators [Dae Joon Kang](#); Sungkyunkwan University, Korea (the Republic of).

9:15 AM NM03.07.06

“Smell” Diseases: a Fast, Risk-Free, Novel Sensing System for Disease Intervention and Management [Danling Wang](#); North Dakota State University, United States.

9:30 AM *NM03.07.07

The Application of MXenes in Gas Sensors [Hanna Pazniak](#); University of Duisburg-Essen, Germany.

10:00 AM BREAK

10:30 AM NM03.07.09

MXene Membranes for Concurrent Functioning as Microwave Components and Sensing Elements [Mohammad H Zarifi](#); University of British Columbia, Canada.

10:45 AM NM03.07.10

Anomalous Absorption of Electromagnetic Waves by 2D Transition Metal Carbonitride Ti_3CNT_x (MXene) [Chong Min Koo](#); Korea Institute of Science and Technology (KIST), Korea (the Republic of).

11:00 AM NM03.07.11

MXene Surface Chemistry and Their Electronic Applications [Chong Min Koo](#)^{1,2,3}; ¹Korea Institute of Science & Technology, Korea (the Republic of); ²Korea University, Korea (the Republic of); ³University of Science and Technology, Korea (the Republic of).

11:15 AM NM03.07.13

Electrochemical RAMs for Neuromorphic Computers Based on MXenes [Mahiar M. Hamedj](#); KTH, Sweden.

SESSION NM03.08: MXenes Sensing and Electronics

Session Chairs: Christina Birkel and Brian Wyatt

Wednesday Afternoon, May 11, 2022

Hawai'i Convention Center, Level 3, 301B

1:30 PM NM03.08.02

Multiscale Bioelectronics Enabled by Ti_3C_2 MXene [Flavia Vitale](#); University of Pennsylvania, United States.

1:45 PM NM03.08.04

Clean Water Recycling Through Adsorption via Nanocomposites of $Ti_3C_2T_x$ MXene-AgMOF and Graphene-Oxide-Ag-MOF [Mostafa Dadashi Firouzjaei](#)^{1,2}; ¹The University of Alabama, United States; ²Indiana University-Purdue University, United States.

2:00 PM *NM03.08.01

Water Treatment and Environmental Remediation Applications of Two-Dimensional Metal Carbides (MXenes)—Opportunities and Challenges [Khaled Mahmoud](#); Hamad Bin Khalifa University, Qatar.

2:30 PM BREAK

3:00 PM NM03.08.03

Carbon Capture by $Ti_3C_2T_x$ MXene—Influence of Amine Intercalation and Particle Size [Daniel E. Autrey](#); Fayetteville State University, United States.

3:15 PM NM03.08.05

Spin Manipulated Charge Transport in Activated Janus MoS₂/Mo₂C Heterostructures for Efficient and Stable Photoelectrochemical H₂ Generation [Praveen Kumar](#); Indian Association for the Cultivation of Science, India.

3:30 PM NM03.08.06

Ti₂N Nitride MXene as Electrocatalyst for Nitrogen Reduction Reaction [Abdoulaye Djire](#); Texas A&M University, United States.

3:45 PM NM03.09.01

Poster Spotlight: Few- and Multi-Layer $Ti_3C_2T_x$ MXenes Mediate Antibacterial Effects Through Near-Infrared LASER Radiation to Heat Conversion [Enrico Rosa](#); Università Cattolica Del Sacro Cuore, Italy.

3:46 PM NM03.09.02

Poster Spotlight: Immune Compatibility of MXenes [Laura Fusco](#)^{1,2,3}; ¹University of Padua, Italy; ²Drexel University, United States; ³Sidra Medicine, Qatar.

3:47 PM NM03.09.03

Poster Spotlight: Neuromorphic Synaptic Device Based on $Ti_3C_2T_x$ MXene Nanosheets [Sungpyo Baek](#); Sungkyunkwan University, Korea (the Republic of).

3:48 PM NM03.09.04

WITHDRAWN 5/7/22 NM03.09.04 Poster Spotlight: Transparent and Flexible Field-Driven Electronics with Polymer-Laminated $Ti_3C_2T_x$ MXene Electrodes Having Environmental Stability [Seokyeong Lee](#); Yonsei University, Korea (the Republic of).

3:49 PM NM03.09.05

Poster Spotlight: MXene Back Contacts for CdTe Photovoltaics [Benjamin E. Sartor](#); New York University, United States.

3:50 PM NM03.09.06

Poster Spotlight: Thermal and Rheological Behavior of MXene-Based Nanofluids as a Promising Heat Transfer Fluid [Rafael K. Nishihora](#); Universidade Federal do ABC, Brazil.

3:51 PM NM03.09.07

Poster Spotlight: Surface Modified MXene via Initiated Chemical Vapor Deposition (iCVD) for Aptamer-Based Biosensor [Mina Kim](#)^{1,3}; ¹Center for BioMicrosystems, Brain Science Institute, Korea Institute of Science and Technology (KIST), Korea (the Republic of); ³KU-KIST Graduate School of Converging Science and Technology, Korea University, Korea (the Republic of).

3:52 PM NM03.09.08

Poster Spotlight: A MXene Nano-Hybrid Based Electrochemical Sensing and Biosensing Platform [Reem Khan](#); Clarkson University Potsdam, NY, United States.

3:53 PM NM03.09.09

Poster Spotlight: Control of Mxene Surface Area by Microcontact Printing for Gas Sensing and Its Reusability [Linh Chi T. Cao](#); Sirindhorn International Institute of Technology, Thammasat University, Thailand.

SESSION NM03.09: Poster Session: MXenes Applications

Session Chairs: Babak Anasori, Christina Birkel, Chong Min Koo and Valeria Nicolosi

Wednesday Afternoon, May 11, 2022

5:00 PM - 7:00 PM

Hawai'i Convention Center, Level 1, Kamehameha Exhibit Hall 2 & 3

NM03.09.01

Poster Spotlight: Few- and Multi-Layer Ti₃C₂T_x MXenes Mediate Antibacterial Effects Through Near-Infrared LASER Radiation to Heat Conversion [Enrico Rosa](#); Università Cattolica Del Sacro Cuore, Italy.

NM03.09.02

Poster Spotlight: Immune Compatibility of MXenes [Laura Fusco](#)^{1,2,3}; ¹University of Padua, Italy; ²Drexel University, United States; ³Sidra Medicine, Qatar.

NM03.09.03

Poster Spotlight: Neuromorphic Synaptic Device Based on Ti₃C₂T_x MXene Nanosheets [Sungpyo Baek](#); Sungkyunkwan University, Korea (the Republic of).

NM03.09.04

WITHDRAWN 5/7/22 NM03.09.04 Poster Spotlight: Transparent and Flexible Field-Driven Electronics with Polymer-Laminated Ti₃C₂T_x MXene Electrodes Having Environmental Stability [Seokyeong Lee](#); Yonsei University, Korea (the Republic of).

NM03.09.05

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NM03.09.06

Poster Spotlight: Thermal and Rheological Behavior of MXene-Based Nanofluids as a Promising Heat Transfer Fluid [Rafael K. Nishihora](#); Universidade Federal do ABC, Brazil.

NM03.09.07

Poster Spotlight: Surface Modified MXene via Initiated Chemical Vapor Deposition (iCVD) for Aptamer-Based Biosensor [Mina Kim](#)^{1,3}; ¹Center for BioMicrosystems, Brain Science Institute, Korea Institute of Science and Technology (KIST), Korea (the Republic of); ³KU-KIST Graduate School of Converging Science and Technology, Korea University, Korea (the Republic of).

NM03.09.08

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NM03.09.09

Poster Spotlight: Control of Mxene Surface Area by Microcontact Printing for Gas Sensing and Its Reusability [Linh Chi T. Cao](#); Sirindhorn International Institute of Technology, Thammasat University, Thailand.

SESSION NM03.10: MXenes I

Session Chairs: Christina Birkel and Anupma Thakur

Tuesday Morning, May 24, 2022

NM03-Virtual

8:00 AM *NM03.10.01

MXetronics—The Electronic Applications of MXenes [Husam N. Alsharief](#); King Abdullah University of Science and Technology, Saudi Arabia.

8:30 AM NM03.10.02

WITHDRAWN 5/12/22 NM03.10.02 Friction Between MXenes and Other 2D Materials at the Nanoscale [Yanxiao Li](#); Missouri University of Science and Technology, United States.

8:45 AM NM03.10.03

WITHDRAWN 5/12/22 NM03.10.03 In Situ Testing of Nanometer-Thick Two-Dimensional Transition-Metal Carbide Films—Implications for MXenes Acting as Nanoscale Reinforcement Agents [Yanxiao Li](#); Missouri University of Science and Technology, United States.

9:00 AM NM03.10.04

Photocatalytical Properties of the Ti₃C₂T_x MXene [Agnieszka M. Jastrzebska](#); Warsaw University of Technology, Poland.

9:15 AM *NM03.10.05

Chemically Ordered Laminate Borides and Their Two-Dimensional Derivatives from Chemical Exfoliation [Johanna Rosen](#); Linköping University, Sweden.

9:45 AM NM03.10.06

Interactions of Ti₃C₂ MXenes with N-Substituted Zwitterionic Biological Buffers [Swapnil Ambade](#); University of Maryland Baltimore County, United States.

SESSION NM03.11: MXenes II

Session Chairs: Christina Birkel and Valeria Nicolosi

Tuesday Morning, May 24, 2022
NM03-Virtual

10:30 AM NM03.11.01

Electrochemistry and Storage Mechanism of Rechargeable Li/Na-CO₂ Battery [Aninda J. Bhattacharyya](#); Indian Institute of Science, India.

10:45 AM NM03.11.02

Self-Assembly of MXene Hydrogels for High-Performance Supercapacitors [Ke Li](#); Trinity College Dublin, Ireland.

11:00 AM NM03.11.03

Aerosol-Jet Printing Enables High-Resolution Ti₃C₂ MXene Printed Electrodes on a PTFE Structure For Neural Stimulation [Javier Gutierrez Gonzalez](#)^{1,2}; ¹Trinity College, Ireland; ²RCSI, Ireland.

11:15 AM NM03.11.04

WITHDRAWN 5/10/22 NM03.11.04 Optical Properties of Semiconductor and Metallic MXene Crystals [Cem Sevik](#); Eskisehir Technical University, Turkey.

11:30 AM *NM03.11.05

Designing Electrochemical Response of MXenes [Maria Lukatskaya](#); ETH Zürich, Switzerland.

12:00 PM NM03.11.06

Multifunctional Electromagnetic-Interference Shielding Materials Based on Ti₃C₂T_x MXene Composites [Ji Liu](#); Trinity College Dublin, The University of Dublin, Ireland.

12:15 PM NM03.11.07

Ordered Double Transition Metal MXenes for High Energy Density Asymmetric Supercapacitors [Yaqoob Khan](#)^{1,2}; ¹Middle East Technical University, Turkey; ²National Centre for Physics, Pakistan.

SESSION NM03.12: MXenes III
Session Chairs: Babak Anasori and Anupma Thakur
Tuesday Afternoon, May 24, 2022
NM03-Virtual

1:00 PM NM03.12.01

Synthesis of Ultrathin 2D Metal Oxides Films via *In Situ* Oxidation of MXenes on Electrochromic Devices [Xiaoyuan Ma](#); Boston University, United States.

1:15 PM NM03.12.02

MXene-Mediated Immune Cell-Cell Interactions Revealed by Enzymatic Lipstic Labelling [Arianna Gazzzi](#)^{1,2}; ¹University of Trieste, Italy; ²University of Padua, Italy.

1:30 PM NM03.12.03

WITHDRAWN 5/12/22 NM03.12.03 On-Mask MXene-Graphene Field Effect Transistor Sensing Influenza Virus and SARS-CoV-2 [Yanxiao Li](#); Missouri University of Science and Technology, United States.

1:45 PM NM03.12.04

Nanoscale Heterogeneities in 2D Ti₃C₂T_x MXene Crystals Revealed by TERS [Marudachalam Shanmugasundaram](#); HORIBA Instruments Inc, United States.

2:00 PM *NM03.12.05

Computational Discovery and Properties of Novel MXenes [Paul Kent](#); Oak Ridge National Laboratory, United States.

2:30 PM NM03.12.06

Superlubricity of Ti₃C₂T_x MXene at the Nanoscale—Effect of Layer Thickness and Aging [James Wait](#); Clarkson University, United States.

2:45 PM NM03.12.07

Ti₃C₂T_x MXene-Based Hybrid Aerogels with Tunable Porosity [Farivash Gholamirad](#); University of South Carolina, United States.

SESSION NM03.13: MXenes IV
Session Chairs: Babak Anasori and Kartik Nemani
Tuesday Afternoon, May 24, 2022
NM03-Virtual

4:00 PM NM03.13.01

Green Synthesis and Optimization of MXene-Carbon Composites for Capacitor and Battery Applications [Amirali S. Akhavi](#); University of California, Riverside, United States.

4:15 PM NM03.13.02

Graphite-MXene Composites for Capacitor and Battery Applications [William C. Coley](#); University of California Riverside, United States.

4:30 PM NM03.13.03

Understanding the Cation and Anion Trapping in the Water Desalination Processes Mediated by 2D Mo_{1.33}C (i-MXene) [Jonathan Guerrero Sanchez](#); Universidad Nacional Autonoma de Mexico, Mexico.

4:45 PM *NM03.13.04

Synthesis of MXenes and Their Integration with other 2D Materials for Electronic Devices [Xi Ling](#); Boston University, United States.

5:15 PM NM03.13.05

Enhanced Electrochemical Behaviors of Ti₃C₂ MXenes/Polypyrrole Polymer Composites as Electrode Materials for Electrocatalytic Water Splitting [Anupma Thakur](#);

Indian Institute of Technology Gandhinagar, India.

SESSION NM03.14: MXenes V
Session Chair: Chong Min Koo
Tuesday Afternoon, May 24, 2022
NM03-Virtual

7:00 PM *NM03.14.01

Nanoscale Assembly of 2D Materials for Energy & Environmental Applications [Sang Ouk Kim](#); Korea Advanced Institute of Science and Technology, Korea (the Republic of).

7:30 PM *NM03.14.02

Surface Modification of MXene Through Lewis Acidic Molten Salt Etching Route and Investigation on Their Properties [Qing Huang](#); Ningbo Institute of Materials Technology & Engineering, Chinese Academy of Sciences, China.

8:00 PM NM03.03.02

Flash Sintering—An Economic and Ultrafast Technique for Synthesis of MAX Phases [N Usha Kiran](#)^{1,2}; ¹CSIR, India; ²CSIR- Institute of Minerals & Materials Technology, India.

SESSION NM03.15: MXenes VI
Session Chairs: Seon Joon Kim and Chong Min Koo
Tuesday Afternoon, May 24, 2022
NM03-Virtual

8:40 PM SPECIAL TALK

8:45 PM *NM03.15.01

Exploring the Etching Mechanism of Monoatomic Aluminium Layers During MXene Synthesis [Hee-Tae Jung](#)^{1,2}; ¹Korea Advanced Institute of Science & Technology, Korea (the Republic of); ²KAIST Institute for Nanocentury, Korea (the Republic of).

9:15 PM *NM03.15.02

Application of MXenes in Energy Storage [Bin Xu](#); Beijing University of Chemical Technology, China.

9:45 PM NM03.15.03

Fabrication of Polyethyleneimine Conjugated Fluorescent MXene Nanosheets and Its Application as Cancer Theranostics Agent [Barkha Singh](#)^{2,1}; ¹Indian Institute of Technology (IIT) Bombay, India; ²Indian Institute of Technology (IIT) Bombay, India.

10:00 PM NM03.15.04

Cl-Based Hydrothermal Etching Strategy Towards Fluoride-Free MXenes and Heterojunctions [Changda Wang](#)^{1,2}; ¹University of Science and Technology of China, China; ²MAX IV lab, Sweden.

10:15 PM *NM03.15.05

Highly Stretchable and Conductive Ti₃C₂T_x MXene Films for Efficient Electromagnetic Interference Shielding and Pressure Sensing [Hao-Bin Zhang](#); Beijing University of Chemical Technology, China.

10:45 PM NM03.15.06

Metamaterial-Based Ring Resonator Sensor for Detection of Poisonous Nitrogen Oxide (NO_x) Gas by Using Fe₃O₄ Doped MXene (Ti₃C₂T_x) Nanosheets [Shravani Kale](#); Defence Institute of Advanced Technology, Pune, India.

SESSION NM03.16: MXenes VII
Session Chairs: Tae Hee Han and Chong Min Koo
Wednesday Afternoon, May 25, 2022
NM03-Virtual

9:00 PM *NM03.16.01

Designing MXene-Based Chemical Sensors Using Intercalation Chemistry and Surface Modification [Seon Joon Kim](#)^{1,2}; ¹Korea Institute of Science and Technology (KIST), Korea (the Republic of); ²University of Science and Technology, Korea (the Republic of).

9:30 PM NM03.16.02

Grafted Phosphorus Atoms on Ti₃C₂T_x MXene Providing Extra Capacitance for Improved Super Capacitive Performance [Hao Li](#); The Hong Kong Polytechnic University, Hong Kong.

9:45 PM NM03.16.03

Microstructural and Compositional Design Principles for High-Entropy MXenes (Ti-V-Nb-Mo)₄C₃ and (Ti-V-Cr-Mo)₄C₃—A High-Throughput First-Principles Study [Zhidong Leong](#); A*STAR, Singapore.

10:00 PM *NM03.16.04

Assembly of Ti₃C₂T_x MXene into Functional Fibers [Tae Hee Han](#); Hanyang University, Korea (the Republic of).

10:30 PM *NM03.16.05

Flexible and Transparent MXene Electrodes for High-Performance Wearable Electronics [Cheolmin Park](#); Yonsei University, Korea (the Republic of).

VIRTUAL PRESENTATIONS ARE LISTED IN EASTERN TIME

Last Updated 5/18/22

SYMPOSIUM NM04

Nanotubes and Related Low-Dimensional Nanostructures
May 9 - May 25, 2022

Symposium Organizers

Don Futaba, National Institute of Advanced Industrial Science and Technology
Alister Page, The University of Newcastle, Australia
Ranjit Pati, Michigan Technological University
Ming Xu, Huazhong University of Science and Technology

* Invited Paper

SESSION NM04.01: Opening
Session Chairs: Don Futaba, Alister Page, Ranjit Pati and Ming Xu
Monday Morning, May 9, 2022
Hawai'i Convention Center, Level 3, 301A

10:30 AM *NM04.01.02

ARES™ Autonomous Research Systems Control of Carbon Nanotube Yield and Structure [Benji Maruyama](#); Air Force Research Laboratory, United States.

11:00 AM NM04.01.03

Bulk-Diffusion-Limited Growth Kinetics Enables Synthesis of Wafer-Scale SWCNT Forests with Remarkably Invariant Structural Properties [Francesco Fornasiero](#); Lawrence Livermore National Laboratory, United States.

11:15 AM NM04.01.04

Carbon Nanotube (CNT) Growth Using Mixed-Metal Catalysts That Incorporate Heavy Refractory Diffusion Inhibitors—A Route to Extended CNT Growth [Michael J. Bronikowski](#); University of Tampa, United States.

SESSION NM04.02: Preparation and Characterization

Session Chairs: Don Futaba and Benji Maruyama
Monday Afternoon, May 9, 2022
Hawai'i Convention Center, Level 3, 301A

1:30 PM *NM04.02.01

Mechanism of Carbon Nanotube Growth Catalyzed by Cobalt-Tungsten Intermetallic Compound [Yan Li](#); Peking University, China.

2:00 PM NM04.02.02

Controlling Carbon Nanotube Diameters Using Machine Learning [Rahul Rao](#); Air Force Research Laboratory, United States.

2:15 PM NM04.02.03

Rapid Synthesis of Carbon Nanotubes by CVD in High Frequency Induction Heating System for X-Ray Application [Jinho Choi](#); Kyung Hee University, Korea (the Republic of).

2:30 PM BREAK

3:00 PM NM04.02.05

Synthesis of Templating Hexagonal Boron Nitride on (Non-)Catalytic Substrates for Electronic Devices [Anja Sutorius](#); University of Cologne, Germany.

3:15 PM NM04.02.06

Quantifying (n,m) Specific SWCNT Partition Conditions in Aqueous Two-Polymer Phase Extraction [Jeffrey Fagan](#); National Institute of Standards and Technology, United States.

3:30 PM NM04.02.07

Improving Geometric Uniformity of Carbon Nanotube Forests by Tuning Catalyst Formation Step in Dynamic Chemical Vapor Deposition [Mostafa Bedewy](#); University of Pittsburgh, United States.

3:45 PM NM04.10.02

Sulfur Encapsulated in Microporous Carbon Composites for Improved Hydrogen Storage [Charles D. Brewster](#); University of Bristol, United Kingdom.

4:00 PM NM04.10.01

Carbon Nanotube Chemiresistors Coated with Hygroscopic Aqueous Film for the Selective Detection of Hydrolysable Toxic Compounds [SeongWoo Lee](#); Ulsan National Institute of Science and Technology, Korea (the Republic of).

SESSION NM04.03: Poster Session I: Nanotubes and Related Low-Dimensional Nanostructures I

Session Chairs: Alister Page and Ming Xu

Monday Afternoon, May 9, 2022

5:00 PM - 7:00 PM

Hawai'i Convention Center, Level 1, Kamehameha Exhibit Hall 2 & 3

NM04.03.01**Copper Nanowires Covered with Lattice-Rearranged 2D Materials for Flexible Transparent Electronics** [Jongyoun Kim](#); Daegu Gyeongbuk Institute of Science and Technology, Korea (the Republic of).**NM04.03.02****Electrical Transport of Polyacrylonitrile-Based Carbon Fibers with Various Carbonization Temperature** [Dong Su Lee](#); Korea Institute of Science and Technology, Korea (the Republic of).**NM04.03.03****Highly Conductive Direct-write Electrospun PEDOT: PSS Nanofibers** [Noori Na](#); University of Utah, United States.**NM04.03.04****Thermal Stability of Pool Boiling Heat Transfer on Vertical Nanowire Surfaces Under Heater Size Effect** [Maroosol Yun](#); Yonsei University, Korea (the Republic of).**NM04.03.05****Engineered Vertically-Aligned CNT for Plasmon-Enhanced Optical Sensing with Programmable Molecular Delivery** [Seong Jae Kim](#); KAIST, Korea (the Republic of).**NM04.03.06****Hygroscopic Micro/Nanolenses Along Carbon Nanotube Ion Channels** [Yun-Tae Kim](#); Ulsan National Institute of Science and Technology, Korea (the Republic of).**NM04.03.07****The Influence of the CNC Contents to the Tensile Properties of Poly(Arylene Ether Sulfone)/Cellulose Nanocrystal Composite Fibers** [Minjung Han](#); Ulsan National Institute of Science and Technology, Korea (the Republic of).**NM04.03.08****Molecular Beam Epitaxy Grown Core-Shell Nanowires Comprising III-V Semiconductor Cores and Narrow Bandgap IV-VI Semiconductor Shells** [Janusz Sadowski](#)^{2,3}; ²Institute of Physics Polish Academy of Sciences, Poland; ³Linnaeus University, Sweden.**NM04.03.10****Tuning the Thermoelectric Properties of Boron-Doped Silicon Nanowires Integrated in a Micro-Harvester** [Carolina Duque Sierra](#); Catalonia Institute for Energy Research, Spain.**NM04.03.11****TiO₂ Nanorods Synthesized by Hydrothermal Method for Biophotovoltaic Cells** [Daniela Zúñiga Rivera](#); Tecnológico de Costa Rica, Costa Rica.**NM04.03.12****Electrical Properties of Pt-SnO₂/MWCNT Catalyst with Improved Catalyst Support** [Haeun Kang](#); Gachon University, Korea (the Republic of).

SESSION NM04.04: Nanotube Applications I

Session Chairs: Shigeo Maruyama, Ranjit Pati and Desiree Plata

Tuesday Morning, May 10, 2022

Hawai'i Convention Center, Level 3, 301A

8:30 AM *NM04.04.01**Functionalized Alkyne Precursors for Direct Placement of Heteroatoms in Carbon Nanotube Growth** [Desiree Plata](#)^{1,2}; ¹Massachusetts Institute of Technology, United States; ²Yale University, United States.**9:00 AM *NM04.04.02****Powerful, Large Stroke Electrochemical Carbon Nanotube Yarn Artificial Muscles** [Ray H. Baughman](#); The University of Texas at Dallas, United States.**9:30 AM NM04.04.03****Building Chiral Representations of Carbon Nanotube RBM Spectra for Synthesis Control and Analysis** [Robert Waelder](#)^{1,2}; ¹Air Force Research Laboratory, United States; ²UES, Inc., United States.**9:45 AM NM04.04.04****Superstructures of 0D-Magic Semiconductor Clusters—Highly Luminescent and Catalytically Active by Assembly** [Woonhyuk Back](#); Seoul National University, Korea (the Republic of).**10:00 AM BREAK****10:30 AM NM04.04.06****Nanocomposite Based on Silicon Nanowires-Nanometric Alumina-Conducting Polymer for Flexible Pseudocapacitors** [Pascal Gentile](#)^{1,2,3}; ¹CEA Grenoble, France; ²IRIG, France; ³UGA, France.**10:45 AM NM04.04.07****Facile Fabrication of Bimetallic Ag-Bi High Dense Nanospheres on Carbon Nanotubes for High Performance Supercapacitor Electrodes** [Taewon Kim](#); Korea University, Korea (the Republic of).**11:00 AM NM04.04.08****Highly Stretchable Thermoelectric Fabrics Woven from Carbon Nanotube-Coated Polymeric Fibers for Wearable Energy Harvesters** [Doojoon Jang](#); Korea Institute of

Science and Technology, Korea (the Republic of).

11:15 AM NM04.03.09

Carbon Nanomaterial-Based Oxygen Photoreduction in the Ionic Liquids Zhe Wang; Oakland University, United States.

SESSION NM04.05: Nanotube Applications II
Session Chairs: Ray Baughman, Don Futaba and Ming Xu
Tuesday Afternoon, May 10, 2022
Hawai'i Convention Center, Level 3, 301A

1:30 PM *NM04.05.01

Low-Voltage Operable, Flexible Analog/Digital Mixed-Signal Integrated Circuits Based on Carbon Nanotubes Yutaka Ohno; Nagoya University, Japan.

2:00 PM NM04.05.02

Fiber-type All Carbon Thermoelectric Devices Developed Using Wet-Spinning of Semiconducting Single-Walled Carbon Nanotubes Yong Kim; Seoul National University, Korea (the Republic of).

2:15 PM NM04.05.03

Low Dimensional Carbon Materials for the Next Generation of Energy Storage, EMS, Sensors and Memory Applications Paolo Bondavalli; Thales Research and Technology, France.

2:30 PM NM04.05.04

Morphology and Dynamic Viscosity of Novel Phase-Change Systems with Plasma-Functionalized Graphene Nanoflakes for Emerging Methane Storage Technologies Adam McElligott; McGill University, Canada.

2:45 PM NM04.05.05

Thermoreversible Bonds and Graphene Oxide Additives Enhance the Flexural and Interlaminar Shear Strength of Self-Healing Epoxy/Carbon Fiber Laminates Poulami Banerjee; Indian Institute of Science Bangalore, India.

3:00 PM BREAK

3:30 PM *NM04.05.06

Directed Evolution of Carbon Nanotube Growth and its Unique Properties Fei Wei; Tsinghua University, China.

4:00 PM *NM04.05.07

A Study on the Growth Mechanism and Controlled Growth of Carbon Nanotubes from Co-Based Catalyst Chang Liu; Chinese Academy of Sciences, China.

4:30 PM NM04.05.08

Functional Chrysotile Nanotubes for Photodynamic Therapy Valeria Secchi; Università Bicocca, Italy.

4:45 PM NM04.10.10

Photodegradation of Rhodamine Moieties by Controllable Porphyrin-Nanocarbon Agglomerates with Resonant Non-Linear Quenching Properties Michael Spencer; University of Surrey, United Kingdom.

SESSION NM04.06: Nanotube Applications III
Session Chairs: Don Futaba, Ming Xu and Takeo Yamada
Wednesday Morning, May 11, 2022
Hawai'i Convention Center, Level 3, 301A

8:30 AM *NM04.06.01

Emerging Applications of Boron Nitride Nanotubes for Advanced Electronics and Biomedicine Yoke Khin Yap; Michigan Technological University, United States.

9:00 AM NM04.06.02

Nitrogen-Doped Carbon Nano-Onions as Electrocatalyst for the Oxygen Reduction Reaction in Terrestrial and Space Applications Armando Pena-Duarte^{1,2}; ¹The University of Texas at El Paso, United States; ²University of Puerto Rico at Río Piedras, United States.

9:15 AM NM04.06.03

Water-Repelling Properties of Low-Dimensional Carbon Nanostructures Makenna Parkinson; Harvey Mudd College, United States.

9:30 AM BREAK

SESSION NM04.07: Theory & Simulation I
Session Chairs: Alister Page and Yoke Khin Yap
Wednesday Morning, May 11, 2022
Hawai'i Convention Center, Level 3, 301A

10:30 AM NM04.07.02

In Situ SEM Synthesis and 3D Simulation of Carbon Nanotube Forests Matthew Maschmann; University of Missouri, United States.

10:45 AM NM04.07.03

Effect of the Nanotube Chirality on Mechanical Properties of Thin Films Composed of Covalently Cross-Linked Carbon Nanotubes Alexey N. Volkov; University of Alabama, United States.

11:00 AM NM04.10.06

Tailoring Morphology in Titania Nanotube Arrays by Implantation—Experiments and Modelling on Designed Pore Size - and beyond [Astrid Kupferer](#)^{2,1}; ¹Universität Leipzig, Germany; ²Leibniz Institute of Surface Engineering, Germany.

SESSION NM04.08: Theory & Simulation II
Session Chairs: Alister Page and Ranjit Pati
Wednesday Afternoon, May 11, 2022
Hawai'i Convention Center, Level 3, 301A

1:30 PM NM04.08.01

Effective Optical Nanoparticles and Nanocomposites Based on a Carbon Nanotubes-Organic-Inorganic Nanohybrid for Industrial Pollutant Removal [Adil Alshoaibi](#); King Faisal University, Saudi Arabia.

1:45 PM NM04.08.02

Rapid Thermochemical Pretreatment for Three-Fold Enhancement of Catalytic Lifetime and Four-Fold Tunability of Density in Chemical Vapor Deposition of Carbon Nanotubes [Mostafa Bedewy](#); University of Pittsburgh, United States.

2:00 PM NM04.08.04

Randomized Low Density Carbons—In the Quest for Auxetic Materials [Tariq Altalhi](#); Taif University, Saudi Arabia.

2:15 PM BREAK

SESSION NM04.09: Low Dimensional Nanostructures I
Session Chairs: Don Futaba and Ming Xu
Wednesday Afternoon, May 11, 2022
Hawai'i Convention Center, Level 3, 301A

3:30 PM *NM04.09.01

The Contrasting Strategies to Enhance Electrical and Thermal Conductivity in Nanocomposites—Direct Contact versus Quantum Tunneling [Seunghyun Baik](#); Sungkyunkwan University, Korea (the Republic of).

4:00 PM NM04.09.02

Chemical Modification of Double-Walled Carbon Nanotubes to Optimize Their Inclusion in Copper Matrix Composites [Mauricio Pavia](#); Université de Lorraine, CNRS, Institut Jean Lamour, France.

4:15 PM NM04.09.03

Molecular Doping of Few-Walled Carbon Nanotubes with Ionic Liquid for High-Performance Flexible Thermoelectric Generators [Jaemin Jung](#); Hanyang University, Korea (the Republic of).

4:30 PM NM04.09.04

Self-Catalytic Growth of 1D Materials Within Dislocations in Gold [Lotan Portal](#); Technion-Israel Institute of Technology, Israel.

4:45 PM NM04.09.05

Multicolour Graphene Quantum Dots as a Non-Cytotoxic Platform for Cell Guidance [Inmaculada J. Gómez Pérez](#); Masaryk University, Czechia.

SESSION NM04.10: Poster Session II: Nanotubes and Related Low-Dimensional Nanostructures II
Session Chairs: Don Futaba and Ranjit Pati
Wednesday Afternoon, May 11, 2022
5:00 PM - 7:00 PM

Hawai'i Convention Center, Level 1, Kamehameha Exhibit Hall 2 & 3

NM04.10.03

High-Sensitivity and Ultra-Fast Recovery H₂ Sensing Using Suspended Graphene-PEDOT:PSS:PEO Nanofiber Channels [Abiral Regmi](#); The University of Utah, United States.

NM04.10.05

Systematically Analysis of Magneto and Vertical Transport of SrRuO₃/SrTiO₃ Superlattices [Hyeonbeom Kim](#)^{1,2}; ¹Sungkyunkwan University, Korea (the Republic of); ²Center for Integrated Nanotechnologies, Korea (the Republic of).

NM04.10.08

Rapid Access to Ordered Mesoporous Carbons for Chemical Hydrogen Storage [Cafer T. Yavuz](#)^{1,2}; ¹King Abdullah University of Science and Technology, Saudi Arabia; ²Korea Advanced Institute of Science and Technology, Korea (the Republic of).

NM04.10.09

Physical Possibilities and Limits of DNA-Enabled Programmable 2D Self-Assembly [Nicholas Tjahjono](#); Rice University, United States.

SESSION NM04.11: Low Dimensional Nanostructures II
Session Chairs: Seunghyun Baik, Vivek Saraswat and Ming Xu
Thursday Morning, May 12, 2022
Hawai'i Convention Center, Level 3, 301A

8:30 AM *NM04.11.01

Synthesis and Integration of Carbon Nanotubes for Electronics Applications [Jing Kong](#); Massachusetts Institute of Technology, United States.

9:00 AM NM04.11.02

Oil-Free Compact X-Ray Generator Based on Carbon Nanotube Field Emitters [Shalini Rajpoot](#); Kyung Hee University, Korea (the Republic of).

9:15 AM NM04.11.03

Charge Transport Dynamics in Microwave Synthesized One-Dimensional Molybdenum Chalcogenides [Jessica Ortiz Rodriguez](#); University of California, Davis, United States.

9:30 AM NM04.11.04

Laser-Treated Transition Metal Oxides for Water Splitting [Jakub Wawrzyniak](#); Institute of Fluid-Flow Machinery, Poland.

9:45 AM BREAK

10:15 AM *NM04.11.05

Wafer-Scale Single-Crystal Film Growth of 2D Layered Materials and Heterostructures [Young Hee Lee](#)^{1,2}; ¹Sungkyunkwan University, Korea (the Republic of); ²IBS Center for Integrated Nanostructure Physics, Korea (the Republic of).

10:45 AM NM04.11.06

Hot-Carrier Relaxation in CdSe/CdS Core/Shell Nanoplatelets [Stephen K. O'Leary](#); University of British Columbia, Canada.

11:00 AM NM04.11.07

Asymmetric "Misfit" Nanotubes—Chemical Affinity Outwits the Entropy at High-Temperature Solid-State Reactions [Sreedhara M. B.](#); Weizmann Institute of Science, Israel.

11:15 AM NM04.11.08

Graphene Tube Catalysts for Reversible Energy Storage and Conversion Via Oxygen Electrocatalysis [Gang Wu](#); SUNY Buffalo, United States.

11:30 AM NM04.11.09

1D Transition Metal Chalcogenides: Novel van der Waals Metals for Microelectronic Applications [Ludwig Bartels](#); University of California, Riverside, United States.

11:45 AM NM04.10.07

Self-Assembled Hybrid Nanomaterials: Interactions of Lipid Bilayers with Metal Oxide Surfaces of Nanoscale Curvature [Tatyana I. Smirnova](#); North Carolina State University, United States.

SESSION NM04.12: Low Dimensional Nanostructures III
Session Chairs: Don Futaba, Young Hee Lee, Ranjit Pati and Vivek Saraswat
Thursday Afternoon, May 12, 2022
Hawai'i Convention Center, Level 3, 301A

1:30 PM NM04.12.01

Comparative Study of Field Emission Performance of Directly Grown CNTs on Metal Alloy Using CVD and PECVD Processes for X-Ray Source [Amar P. Gupta](#); Kyung Hee University, Korea (the Republic of).

1:45 PM NM04.12.02

Effect of Electrostatic Boundary Condition and Orientation on Ferroelectric Nanotube [Mojue Zhang](#); University of Wisconsin–Madison, United States.

2:00 PM NM04.12.03

Escalating Ferromagnetic Order *via* Se-Vacancy Near Vanadium in WSe₂ Monolayer [Byeong Wook Cho](#); CINAP, Center for Integrated Nanostructure Physics, Korea (the Republic of).

2:15 PM NM04.12.04

Surface Modification of Few-Layered Graphene Nanoplatelets for Enhanced Energy Transportation in Nanofluids [Michael Wilhelm](#); University of Cologne, Germany.

2:30 PM BREAK

3:00 PM NM04.12.05

Exploring the Best CVD Conditions for Growth of Small-Diameter Single-Wall Carbon Nanotubes Using an Autonomous Research System [Placidus B. Amama](#); Kansas State University, United States.

3:15 PM NM04.12.06

A Facile Approach for Fabricating Flexible Composite Heaters Based on Laser-Induced Graphene Written on Aramid Substrates [Mostafa Yourdkhani](#); Colorado State University, United States.

3:30 PM NM04.12.07

Low-Dimensional Nanostructures for Multi-Gas Sensing: Synergistic Effects Between Materials Properties and Machine-Learning-Guided Sensor Designs [Radislav A. Potyrailo](#); GE Global Research, United States.

3:45 PM NM04.12.08

Facile Fabrication of Nitrogen-Doped Three-Dimensional Carbon Branches Anchored on Trimetallic Bifunctional Catalysts and their application for Zn-Air Battery [Youngsun Cha](#); Korea University, Korea (the Republic of).

4:00 PM NM04.10.04

The Advanced Electron Microscopy Characterization and Structure-Property Correlation of BaMnO₃ for the Electrocatalytic Oxygen Reduction Reaction [Lucia](#)

Hughes^{2, 1}; ¹Trinity College Dublin, The University of Dublin, Ireland; ²Trinity College Dublin, The University of Dublin, Ireland.

SESSION NM04.13: Nanotubes and Related Low-Dimensional Nanostructures I
Session Chairs: Don Futaba, Alister Page, Ranjit Pati and Ming Xu
Wednesday Morning, May 25, 2022
NM04-Virtual

8:00 AM *NM04.13.01

Manufacturing 2D Crystal Based Devices—From Desktop Inkjet to 100 m/min Industrial-Scale Flexographic Printing Tawfique Hasan; Cambridge University, United Kingdom.

8:30 AM *NM04.13.02

Stage-1 C₆₀-Intercalated Graphene Films Xianjue Chen; The University of Newcastle, Australia.

9:00 AM NM04.13.03

Iron Oxide and Various Metal Oxide Hollow Nanoparticles Engineered by One-Pot Double Galvanic Replacement Reaction and the Application for Anti-Cancer Therapy Aloka S. Paragodaarachchi^{1, 2}; ¹City University of New York, United States; ²Hunter College, United States.

9:15 AM NM04.13.04

Curviness Percolation Threshold in Transparent, Conductive 2D Networks Consisting of Curvy Nanotubes Prithviraj Pachal; University of Florida, United States.

9:30 AM NM04.13.05

Efficient Photon Harvesting in Hetero-Layered Scroll Structure Rapti Ghosh; Academia Sinica, Taiwan.

SESSION NM04.14: Nanotubes and Related Low-Dimensional Nanostructures II
Session Chairs: Don Futaba, Alister Page and Ming Xu
Wednesday Morning, May 25, 2022
NM04-Virtual

10:30 AM *NM04.02.01

CVD Synthesis and Application of 1D vdW Heterostructures Based on SWCNTs Shigeo Maruyama; The University of Tokyo, Japan.

11:00 AM NM04.14.01

A Molecular Dynamics Study of the CO₂ Adsorption Properties of Graphyne and Graphdiyne Nanoscrolls Pedro d. Mazon; Federal University of Paraná, Brazil.

11:15 AM NM04.14.02

Cyclic and Helical Symmetry-Adapted Density Functional Theory—Application to the Study of Nanotubes and Their Response to Mechanical Deformations Phanish Suryanarayana; Georgia Institute of Technology, United States.

11:30 AM NM04.14.03

Gold Nanowire Functionalized SWCNT paper Electrode for the Electrochemical Sensing of Dopamine in the Presence of Its Interferences Janak Paudyal; University of Colorado, Colorado Springs, United States.

11:45 AM NM04.14.04

Accurate Predictions of Ion Solvation Under Nanoconfinement Fikret Aydin; Lawrence Livermore National Laboratory, United States.

11:50 AM NM04.14.05

The On-Site Nanowire-Shape Graphene Formation on Nanoimprinted Si Nanowires for Radial Schottky Junction Solar Cells Wipakorn Jevasuwan; National Institute for Materials Science, Japan.

11:55 AM NM04.14.06

Functionalized Graphene Origami Metamaterials Jun Cai; McGill University, Canada.

12:00 PM NM04.14.09

Engineering Carbon Nanotube Nanostructures in Carbon Fiber Reinforced Epoxy Matrix Composites Ozge Kaynan; Texas A&M University, United States.

12:15 PM NM04.14.10

The Three-Dimensional Carbon Materials as Lithium-Ion Batteries Electrodes Carolina Rojas Michea; University of Puerto Rico at Río Piedras, Puerto Rico.

SESSION NM04.15: Nanotubes and Related Low-Dimensional Nanostructures III
Session Chairs: Don Futaba, Alister Page and Ming Xu
Wednesday Afternoon, May 25, 2022
NM04-Virtual

9:00 PM *NM04.15.01

Two-Dimensional Inorganic Liquid Crystals Hui-Ming Cheng^{1, 3}; ¹Chinese Academy of Sciences, China; ³Chinese Academy of Sciences, China.

9:30 PM *NM04.15.02

Structure and Property Engineering of Two-Dimensional Carbon Nitride Materials Qinghong Yuan; East China Normal University, China.

10:00 PM *NM04.15.03

Developing Industrial Applications of Carbon Nanotubes Takeo Yamada; AIST, Japan.

VIRTUAL PRESENTATIONS ARE LISTED IN EASTERN TIME

Last Updated 5/18/22

10:30 PM NM04.15.04

Integrating Functional Shells on Carbon Nanotubes as Effective Support Materials [Daniel Chua](#); National Univ of Singapore, Singapore.

SYMPOSIUM NM05

Advances in Nanodiamonds for Sensing, Biomedical and Other Novel Applications
May 8 - May 23, 2022

Symposium Organizers

Jean-Charles Arnault, CEA Saclay
Shery Chang, University of New South Wales
Edward Chow, National University of Singapore
Olga Shenderova, Adamas Nanotechnologies

* Invited Paper

SESSION NM05.01: Fluorescent Nanodiamond Fabrication and Characterization

Session Chair: David Simpson

Sunday Afternoon, May 8, 2022

Hawai'i Convention Center, Level 3, 303A

1:30 PM *NM05.01.01

Integrating Optically Addressable Spin Defects in Low Dimension Platforms for Quantum Applications [E. Joseph P. Heremans](#)^{2,1}; ¹University of Chicago, United States; ²Argonne National Laboratory, United States.

2:00 PM NM05.01.02

Locating NV Centers in Nanodiamond Using Simultaneous STEM-EELS/EDS [Bethany M. Hudak](#); U.S. Naval Research Laboratory, United States.

2:15 PM NM05.01.03

Enhanced NV Fluorescence in Flake Nanodiamond Revealed by Correlative Photoluminescence and Transmission Electron Microscopy [Shery Chang](#)^{1,8}; ¹University of New South Wales, Australia; ⁸University of New South Wales, Australia.

2:30 PM *NM05.01.04

Optical Activation and Detection of Charge Transport Between Individual Color Centers in Room-Temperature Diamond [Artur Lozovoi](#); CUNY-City College of New York, United States.

3:00 PM BREAK

3:30 PM NM05.01.05

Impacts of Ultra-Long High Temperature Annealing on Color Centers and Color Center Spin Properties of Particulate Diamonds [Nicholas Nunn](#); North Carolina State University, United States.

3:45 PM NM05.01.06

Theoretical Understanding of the Dynamics of Silicon-Vacancy Color Center Dynamics in Nanodiamonds [Chunjing Jia](#); SLAC National Accelerator Laboratory, United States.

4:00 PM NM05.01.07

Electronic Spin Relaxation and Room Temperature NMR DNP in Microcrystalline HPHT Diamond Particles [Alex I. Smirnov](#); North Carolina State University, United States.

4:15 PM NM05.08.02

Poster Spotlight: NMR Spectroscopy Using Single Shallow NV Centers Exposed to High Magnetic Field Gradients [Raul M. Gonzalez](#); Institute of Quantum Optics - Ulm University, Germany.

4:20 PM NM05.08.03

Poster Spotlight: Origins of Enhanced Fluorescence Intensity of Molten Salt Treated Fluorescent Nanodiamond [Shery Chang](#)^{1,2}; ¹School of Materials Science and Engineering, University of New South Wales, Australia; ²Electron Microscope Unit, Mark Wainwright Analytical Centre, University of New South Wales, Australia.

SESSION NM05.02: Biosensing for Disease Detection

Session Chair: Edward Chow

Monday Morning, May 9, 2022

Hawai'i Convention Center, Level 3, 303A

10:30 AM *NM05.02.01

Harnessing Spin-Enhanced Nanodiamonds for Early Disease Diagnosis [Benjamin S. Miller](#); University College London, United Kingdom.

11:00 AM NM05.02.02

Targeting of Mannose Receptor with Fluorescent Nanodiamonds—Implications for Locoregional Cancer Diagnostics [Petr Cigler](#); IOCB AS CR vvi, Czechia.

11:15 AM NM05.02.03

Magnetically-Sensitive Nanodiamond Thin-Films on Glass Fibers [Mona Jani](#); Jagiellonian University, Poland.

SESSION NM05.03: Nanoscale Sensing
Session Chair: Olga Shenderova
Monday Afternoon, May 9, 2022
Hawai'i Convention Center, Level 3, 303A

1:30 PM NM05.03.02

Nanoscale Sensing of Temperature and Viscosity Inside Single Cells [Jack Hart](#); University of Cambridge, United Kingdom.

1:45 PM NM05.03.03

Nanoscale MRI for Selective Labelling and Localised Free Radical Measurements in the Acrosomes of Single Sperm Cells [Claudia Reyes-San-Martin](#); University Medical Center Groningen, Netherlands.

2:00 PM *NM05.03.04

Fluorescent Nanodiamonds—A Versatile Probe for Quantum Biosensing and Imaging [David A. Simpson](#); University of Melbourne, Australia.

SESSION NM05.04: Biosensing: Radicals and Chemicals
Session Chair: Petr Cigler
Monday Afternoon, May 9, 2022
Hawai'i Convention Center, Level 3, 303A

3:30 PM *NM05.04.01

Quantum Sensing of Paramagnetic Species Using Nitrogen-Vacancy Centers in Nanodiamonds for Biomedical Applications [Melissa L. Mather](#); The University of Nottingham, United Kingdom.

4:00 PM NM05.04.02

Paramagnetic Sensing by Nanodiamond via Magnetically-Induced Fluorescence Contrast [Marco Torelli](#); Adamas Nanotechnologies Inc, United States.

4:15 PM NM05.04.03

In-Solution Quantum Sensing Using Nanodiamond Ensembles [Erin Grant](#); The University of Melbourne, Australia.

4:30 PM NM05.04.04

Fluorescence Modulation of Nanodiamond NV- Centers for Neurotransmitter Detection [Mai S. Rashwan](#)^{1,2}; ¹Case Western Reserve Univ, United States; ²Suez Canal University, Egypt.

4:45 PM NM05.04.05

Nanodiamond Diagnostics—Improving Sensitivity by Spin Manipulation [Benjamin S. Miller](#); University College London, United Kingdom.

SESSION NM05.05: Characterization: Structures and Properties
Session Chair: Oliver Williams
Tuesday Morning, May 10, 2022
Hawai'i Convention Center, Level 3, 303A

8:30 AM *NM05.05.01

Advanced X-Ray Scattering and Spectroscopy Techniques to Monitor Formation of Nanodiamond and Other Novel Carbon Nanostructures During Explosive Detonations [Trevor M. Willey](#); Lawrence Livermore National Laboratory, United States.

9:00 AM NM05.05.02

Unveiling the Metallic Impurities in Detonation Nanodiamond by a Total Oxidation Treatment [Killian Henry](#)^{1,2}; ¹Université de Lorraine, CNRS, IJL, France; ²Université Clermont Auvergne, CNRS, ICCF UMR 6296, 24 av. Blaise Pascal, France.

9:15 AM NM05.05.03

Characterizing the Colloidal Behavior of Detonation Nanodiamonds in Biologically Relevant Media [Shery Chang](#)^{1,2}; ¹University of New South Wales, Australia; ²University of New South Wales, Australia.

SESSION NM05.06: Medical Applications
Session Chair: Benjamin Miller
Tuesday Morning, May 10, 2022
Hawai'i Convention Center, Level 3, 303A

10:30 AM NM05.06.01

Virus Filtration by Nanodiamond Modified Membranes [Oliver A. Williams](#); Cardiff University School of Physics and Astronomy, United Kingdom.

11:00 AM NM05.06.02

Designing Drug-Coated Nanodiamonds for Targeted Delivery [Yevgen Karpichev](#); Tallinn University of Technology, Estonia.

11:15 AM NM05.06.03

Enhanced Penetrative siRNA Delivery by Nanodiamond Drug Delivery Platform against Hepatocellular Carcinoma 3D Models [Jingru Xu](#)^{1,2}; ¹National University of Singapore, Singapore; ²Cancer Science Institute of Singapore, Singapore.

11:30 AM NM05.06.04

Materials Science / Technological Development for Transformational New Generation of Dental Implant Coated with Unique Low Cost / Biocompatible / Oral Fluids Corrosion Resistant Ultrananocrystalline Diamond (UNCD) Coating [Orlando Auciello](#)^{1,2,3}; ¹The University of Texas at Dallas, United States; ²Original Biomedical Implants, LLC, United States; ³Original Biomedical Implants-México, Mexico.

11:45 AM NM05.08.04

WITHDRAWN 5/7/22 NM05.08.04 Poster Spotlight: Atomistic and Electronic Structures of MoO_{3-x} on Hydrogenated Diamond [Liqui Yang](#); University of Southern California, United States.

11:50 AM NM05.08.05

Poster Spotlight: Robust Interaction of Well Dispersed Detonation Nano Diamonds and Graphene Oxide [Tobias Foller](#); University of New South Wales, Australia.

SESSION NM05.07: Synthesis, Functionalisation and Related Applications

Session Chair: Shery Chang

Tuesday Afternoon, May 10, 2022

Hawai'i Convention Center, Level 3, 303A

1:30 PM NM05.07.02

Effect of Nanodiamond on the Growth of YBa₂Cu₃O_{7-δ} Film Prepared by Metal Organic Decomposition [Valentina Pinto](#)^{1,2}; ¹ENEA, Italy; ²Università degli Studi di Roma Tor Vergata, Italy.

1:45 PM NM05.07.03

Microfabrication of Nanoscale Diamond Tips for Atom Probe Tomography [Alexander Bard](#); University of Washington, United States.

2:00 PM NM05.07.04

Diamond Particles as a Platform for Growth of Extended Solids [Marco Torelli](#)^{1,2}; ¹Adamas Nanotechnologies, United States; ²Rivis Inc., United States.

2:15 PM *NM05.07.05

Chemical Activation of Ultrastable Alcohol Terminated HPHT Nanodiamond Surfaces Using a Brominated Intermediate [Abraham Wolcott](#); San Jose State University, United States.

SESSION NM05.08: Poster Session I: Nanodiamond Properties and Applications

Session Chairs: Shery Chang and Edward Chow

Tuesday Afternoon, May 10, 2022

5:00 PM - 7:00 PM

Hawai'i Convention Center, Level 1, Kamehameha Exhibit Hall 2 & 3

NM05.08.01

Nanometer-Depth Low Energy Nitrogen Ions Implantation in Single Crystal Diamond for n-Type Diamond Doping and Subsurface NV-Centers Formation [Orlando Auciello](#)^{2,5,6}; ²The University of Texas at Dallas, United States; ⁵Original Biomedical Implants, LLC, United States; ⁶Original Biomedical Implants-México, Mexico.

NM05.08.02

Poster Spotlight: NMR Spectroscopy Using Single Shallow NV Centers Exposed to High Magnetic Field Gradients [Raul M. Gonzalez](#); Institute of Quantum Optics - Ulm University, Germany.

NM05.08.03

Poster Spotlight: Origins of Enhanced Fluorescence Intensity of Molten Salt Treated Fluorescent Nanodiamond [Shery Chang](#)^{1,2}; ¹School of Materials Science and Engineering, University of New South Wales, Australia; ²Electron Microscope Unit, Mark Wainwright Analytical Centre, University of New South Wales, Australia.

NM05.08.04

WITHDRAWN 5/7/22 NM05.08.04 Poster Spotlight: Atomistic and Electronic Structures of MoO_{3-x} on Hydrogenated Diamond [Liqui Yang](#); University of Southern California, United States.

NM05.08.05

Poster Spotlight: Robust Interaction of Well Dispersed Detonation Nano Diamonds and Graphene Oxide [Tobias Foller](#); University of New South Wales, Australia.

SESSION NM05.09: Synthesis, Property and Applications

Session Chairs: Jean-Charles Arnault and Shery Chang

Monday Morning, May 23, 2022

NM05-Virtual

8:00 AM *NM05.09.01

WITHDRAWN 5/18/22 NM05.09.01 Nitrogen-Vacancy Centers in Nanodiamonds as Temperature Sensors and Immunoassay Reporters [Huan-Cheng Chang](#); Academia Sinica, Taiwan.

8:30 AM *NM05.09.02

Activities Toward Biomedical Applications of Detonation Nanodiamonds [Masahiro Nishikawa](#)^{1,2}; ¹Daicel Corporation, Japan; ²Kyoto University, Japan.

9:00 AM NM05.09.03

Study of Biofilm Inhibition in Oral Pathogens by Nanodiamonds [Tongtong Zhang](#); The University of Hong Kong, Hong Kong.

9:15 AM *NM05.09.04

Simultaneous Causes of Charge Transfer Properties of Diamond Nanoparticles from Bayesian Inference [Amanda Barnard](#); Australian National University, Australia.

9:45 AM NM05.09.05

Towards Implementation of Nanodiamonds with Nitrogen-Vacancy Defects as Hyperpolarized MRI Contrast Agents [Yuliya Mindarava](#); Ulm University, Germany.

10:00 AM *NM05.07.01

Protonation of Diamondoid Molecules [Rodney S. Ruoff](#)^{1,2}; ¹Ulsan National Institute of Science and Technology, Korea (the Republic of); ²IBS-Center for Multidimensional Carbon Materials, Korea (the Republic of).

SESSION NM05.10: Functionalisation, Characterisation and Applications
Session Chairs: Edward Chow and Olga Shenderova
Monday Morning, May 23, 2022
NM05-Virtual

10:30 AM *NM05.10.01

Nanodiamonds Produced by Dynamic Synthesis—Solved and Unsolved Problems [Aleksandr Vul](#); Ioffe Physal-Technical Institute, Russian Federation.

11:00 AM *NM05.10.02

From the Disaggregation of Human Islet Amylin Aggregates to Defibrillation of Collagen I Clusters—The Applicability of Nanodiamonds and Carbon Quantum Dots [Sabine Szunerits](#); University Lille, IEMN, France.

11:30 AM NM05.10.03

XPS Investigation of Surface Graphitized Nanodiamonds—Evidence of a Nano Effect [Jean-Charles Arnault](#); Université Paris-Saclay, CEA, CNRS, NIMBE, France.

11:45 AM *NM05.10.04

Surface Chemistry of Nanodiamond to Control the Interactions with Biological Environments [Anke Krueger](#)^{1,2}; ¹Julius-Maximilians-Universität Würzburg, Germany; ²Universität Stuttgart, Germany.

12:15 PM NM05.10.05

Next-Generation ‘Smart’ Diamond-Silk Dressings for Early Monitoring of Infection and Healing Progression in Burn Wounds [Asma Khalid](#); RMIT University, Australia.

SESSION NM05.11: Nanodiamond Sensing and Applications
Session Chairs: Anke Krueger and Olga Shenderova
Monday Afternoon, May 23, 2022
NM05-Virtual

1:00 PM *NM05.11.01

Perspectives for Color Center-Based Nano-Sensing [Elke Neu-Ruffing](#); Technische Universität Kaiserslautern, Germany.

1:30 PM NM05.11.02

Magnetic Imaging of Iron in Biomolecules Using Diamond Quantum Sensors [Abdelghani Laraoui](#); University of Nebraska-Lincoln, United States.

1:45 PM *NM05.11.03

Diamond Spin Qubits for Nanoscale Magnetic Resonance [Fedor Jelezko](#); Ulm University, Germany.

2:15 PM NM05.11.04

All-Optical Modulation of NV Centers in Nanodiamonds for Contrast-Enhanced Imaging [Lingzhi Wang](#); The University of Hong Kong, China.

2:20 PM NM05.11.05

Materials Science and Technology Development Enabling New Order of Magnitude Longer-Life/Safer Lithium-Ion Batteries with Transformational Low-Cost Ultrananocrystalline Diamond (UNCD™) Coatings for LIBs’ Components [Daniel Villarreal](#)^{1,3}; ¹Universidad Tecnológica de Panamá, Panama; ³University of Texas at Dallas, United States.

2:25 PM *NM05.03.01

Nanoscale Thermometry with Color Centres in Diamond [Igor Aharonovich](#); University of Technology-Sydney, Australia.

SYMPOSIUM NM06

Nanoscale Mass Transport Through 2D and 1D Nanomaterials
May 11 - May 25, 2022

Symposium Organizers

Michael Boutilier, Western University
Piran Ravichandran Kidambi, Vanderbilt University
Shannon Mahurin, Oak Ridge National Laboratory
Sui Zhang, National University of Singapore

* Invited Paper

SESSION NM06.01: Lamellar and Nanostructured Membranes

Session Chair: Piran Ravichandran Kidambi

Wednesday Morning, May 11, 2022

Hawai'i Convention Center, Level 3, 303A

8:30 AM NM06.01.01

WITHDRAWN 5/11/22 NM06.01.01 Role of In-Plane Pores and Graphitic Domain Size for Mass Transport in Graphene Oxide Membranes* [Tobias Foller](#); UNSW, Australia.

8:45 AM NM06.01.02

Monolayer and Laminar 2D Membranes for Molecular Separation [Sui Zhang](#); National University of Singapore, Singapore.

9:00 AM NM06.01.04

Nanopores in Self-Assembled Monolayer-to-Multilayer MXene Films—From Fabrication to Application [Mehrnaz Mojtavai](#); Northeastern University, United States.

SESSION NM06.02: Graphene Membranes

Session Chair: Piran Ravichandran Kidambi

Wednesday Afternoon, May 11, 2022

Hawai'i Convention Center, Level 3, 303A

1:30 PM NM06.02.01

Chemistry and Engineering of Two-Dimensional Materials for Energy-Efficient Molecular Separation [Kumar Varoon Agrawal](#); EPFL, Switzerland.

2:00 PM *NM06.02.02

Direct Chemical Vapor Deposition Synthesis of Porous Single-Layer Graphene Membranes with High Gas Permeances and Selectivities [Zhe Yuan](#); Massachusetts Institute of Technology, United States.

2:30 PM *NM06.02.03

Nanofluidic Transport Across Nanoporous Atomically Thin Graphene and Its Development as a Next-Generation Membrane [Rohit N. Karnik](#); Massachusetts Institute of Technology, United States.

3:00 PM BREAK

3:30 PM *NM06.02.04

Materials Design for Graphene-Based Separations [Jatin J. Patil](#); MIT, United States.

4:00 PM NM06.02.05

Large-Area Atomically Thin Graphene Membranes for Sub-Nanometer Scale Separations [Peifu Cheng](#); Vanderbilt University, United States.

4:15 PM NM06.02.06

Water and Vapor Transport Through Angstrom-Scale Pores in Atomically Thin Graphene Membranes [Peifu Cheng](#); Vanderbilt University, United States.

4:30 PM NM06.02.07

Fluctuation-Induced Quantum Friction in Nanoscale Water Flows [Nikita Kavokine](#); CCQ, Flatiron Institute, United States.

SESSION NM06.03: Poster Session: Nanoscale Mass Transport Through 2D and 1D Nanomaterials

Session Chair: Piran Ravichandran Kidambi

Wednesday Afternoon, May 11, 2022

5:00 PM - 7:00 PM

Hawai'i Convention Center, Level 1, Kamehameha Exhibit Hall 2 & 3

NM06.03.01

Shape-Selective Filtration Using Lamellar Block Copolymer Based Slit Membranes [Maninderjeet Singh](#); University of Houston, United States.

NM06.03.02

Optimizing the Fabrication of Electrospun Nanofibrous Membrane Using Fractional Factorial Design [Yajing Zhao](#); Massachusetts Institute of Technology, United States.

NM06.03.03

Deconstructing the Parameter Space for Scalable Synthesis of 2D Polymers via Interfacial Reactions [Nimrod Korda](#); Vanderbilt University, United States.

SESSION NM06.04: Ion Transport

Session Chairs: Michael Boutilier, Piran Ravichandran Kidambi and Sui Zhang

Thursday Morning, May 12, 2022

Hawai'i Convention Center, Level 3, 303A

8:30 AM *NM06.04.01

Carbon Nanomembranes (CNMs)—2D Materials for Osmosis and Water Purification [Armin Goelzhaeuser](#); Bielefeld University, Germany.

9:00 AM NM06.04.02

Using Thermoelectric MoS₂-Based Thin Films for Novel Desalination and Battery Technologies via Selective Ion Transport [Gabriel Marcus](#); Wake Forest University, United States.

9:15 AM NM06.04.03

Controlling the Structure of Restacked Two-Dimensional Materials for Ion-Selective Separations [Eli V. Hoening](#); University of Chicago, United States.

9:30 AM BREAK**10:00 AM NM06.04.04**

Ion Transport and Selectivity in sub-nm Nanopores—Insights from Integrated Multiscale Simulations [Tuan Anh Pham](#); Lawrence Livermore National Laboratory, United States.

10:15 AM NM06.04.05

Cation Controlled Wetting Properties of Vermiculite Membranes and Its Potential for Fouling Resistant Oil-Water Separation [Robert Marvin](#); The University of Manchester, United Kingdom.

10:30 AM *NM06.04.06

Transport Through Fluctuating and Defective Materials [Narayana R. Aluru](#)^{1,2,3}; ¹The University of Texas at Austin, United States; ²The University of Texas at Austin, United States; ³The University of Texas at Austin, United States.

11:00 AM NM06.04.07

Facile Synthesis of Large-Area Atomically Thin Graphene Membranes via Isopropanol-Assisted Hot Lamination [Peifu Cheng](#); Vanderbilt University, United States.

11:15 AM NM06.04.08

Artificial Water Channels-Toward Biomimetic Membranes for Desalination [Mihail Barboiu](#); Institut Européen des Membranes, France.

11:30 AM NM06.04.09

Precise Way to Characterize the Mass Transport Capacity of Nanomaterials [Jong Ho Won](#); Kookmin University, Korea (the Republic of).

SESSION NM06.05: COF and 2D Polymer Membranes

Session Chair: Sui Zhang

Thursday Afternoon, May 12, 2022

Hawai'i Convention Center, Level 3, 303A

1:30 PM NM06.05.01

Fully Modifiable, Two-Dimensional Covalent Organic Frameworks—Self-Assembling Systems Enabling Pore Size and Functional Group Modification for Applications in Nanoscale Filtration [John Hoberg](#); University of Wyoming, United States.

1:45 PM NM06.05.02

Ab Initio Molecular Dynamics of Covalent Organic Frameworks in an Aqueous Solution of NaCl [Alathca E. Davies](#); University of Wyoming, United States.

2:00 PM NM06.05.03

Selective Ion Sieving and Disorder in Membranes Constructed from Two-Dimensional Covalent Organic Frameworks [Bruce A. Parkinson](#); University of Wyoming, United States.

2:15 PM NM06.05.04

Heat Transfer Mechanisms and Tunable Thermal Conductivity Anisotropy in Two-Dimensional Covalent Organic Frameworks with Adsorbed Gases [Ashutosh Giri](#); University of Rhode Island, United States.

2:30 PM BREAK

SESSION NM06.06: Transport for Biological Systems and Sensing

Session Chair: Sui Zhang

Thursday Afternoon, May 12, 2022
Hawai'i Convention Center, Level 3, 303A

3:00 PM *NM06.06.01

Engineering Adjustable Multi-Pore Devices for Parallel Ion and Molecule Transport [Marija Drndic](#); University of Pennsylvania, United States.

3:30 PM NM06.06.02

Nanopores in Two-Dimensional Materials for High-Resolution Biomolecular Sensing [Meni Wanunu](#); Northeastern University, United States.

3:45 PM *NM06.06.03

Translocation of DNA Through 2D Nanoslits [Wayne Yang](#); École Polytechnique Fédérale de Lausanne (EPFL), Switzerland.

4:15 PM NM06.06.04

Controlled Ion Transport and Transverse DNA Sensing Using 2D Heterostructure Nanopores [Siyuan Huang](#); University of Illinois at Urbana-Champaign, United States.

4:30 PM NM06.07.06

Mass Transport Throughout Anodic TiO₂ Nanotube Layers as Efficient 1D Photocatalyst [Jan M. Macak](#)^{1,2}; ¹Univ of Pardubice, Czechia; ²Brno University of Technology, Czechia.

SESSION NM06.07: CNT Membranes
Session Chairs: Michael Boutilier, Piran Ravichandran Kidambi and Sui Zhang
Friday Morning, May 13, 2022
Hawai'i Convention Center, Level 3, 303A

8:00 AM *NM06.07.01

Nanofluidics in Precise 1D Pores—Ion Diffusion and Ion Transport in Small Diameter Carbon Nanotube Porins [Aleksandr Noy](#)^{1,2}; ¹Lawrence Livermore National Laboratory, United States; ²University of California Merced, United States.

8:30 AM NM06.07.02

High-Yield Analysis of Individual Ions and Molecules Through the Interior of Carbon Nanotubes [Hyegi Min](#)^{1,2}; ¹Ulsan National Institute of Science and Technology, Korea (the Republic of); ²Yonsei University, Korea (the Republic of).

8:45 AM NM06.07.03

Highly Efficient Electroosmotic Pumping Through Atomically Smooth CNT Conduits with Application in Programmed Drug Delivery [Bruce Hinds](#); University of Washington, United States.

9:00 AM *NM06.07.04

Nanoscale Mass Transport in CNT Membranes—From Fundamental Science to Applications [Francesco Fornasiero](#); Lawrence Livermore National Laboratory, United States.

9:30 AM NM06.07.05

The Exterior of Single-Walled Carbon Nanotubes as a Millimeter-Long Cation-Preferring Nanochannel [Yun-Tae Kim](#); Ulsan National Institute of Science and Technology, Korea (the Republic of).

9:45 AM BREAK

SESSION NM06.08: Transport of Sub-Atomic Species Through Ultra-Thin Membranes
Session Chairs: Michael Boutilier, Piran Ravichandran Kidambi and Sui Zhang
Friday Morning, May 13, 2022
Hawai'i Convention Center, Level 3, 303A

10:15 AM *NM06.08.01

Ion Permeation Through Atomically Thin Crystals [Marcelo Lozada-Hidalgo](#); The University of Manchester, United Kingdom.

10:45 AM NM06.08.03

Proton Transport Through Graphene Membranes at Different Length Scales [Pavan Chaturvedi](#); Vanderbilt University, United States.

11:00 AM NM06.08.04

Kinetic Control of Intrinsic Pores in Monolayer Graphene for Large-Area Proton Selective Membranes [Nicole K. Mochring](#); Vanderbilt University, United States.

11:15 AM NM06.08.06

Graphene Synthesized by Chemical Vapor Deposition as a Hydrogen Isotope Permeation Barrier [Katherine T. Young](#)^{1,2}; ¹Georgia Tech Research Institute, United States; ²Georgia Institute of Technology, United States.

SESSION NM06.09: Transport Processes
Session Chairs: Michael Boutilier, Piran Ravichandran Kidambi and Sui Zhang
Friday Afternoon, May 13, 2022
Hawai'i Convention Center, Level 3, 303A

1:30 PM NM06.09.01

Computational Investigation of Structure-Selectivity Relationship in Membranes Using Non-Equilibrium Molecular Dynamics Simulations and Advanced Path Sampling Techniques [Amir Haji-Akbari](#); Yale University, United States.

1:45 PM *NM06.09.02

Water and Molecule Transport Through 2D Nanopores and Nanochannels [Slaven Garaj](#); National University of Singapore, Singapore.

2:15 PM *NM06.09.03

Selective Permeation under Low-Dimensional Confinement [Hyung Gyu Park](#); Pohang University of Science and Technology, Korea (the Republic of).

SESSION NM06.10: Round Table Discussion
Wednesday Afternoon, May 11, 2022
Hawai'i Convention Center, Level 3, 303A

5:00 PM ROUND TABLE DISCUSSION OF INVITED SPEAKERS OF SYMPOSIUM NM06

SESSION NM06.11: Nanoscale Mass Transport Through 2D and 1D Nanomaterials I
Session Chair: Shannon Mahurin
Wednesday Morning, May 25, 2022
NM06-Virtual

8:00 AM *NM06.11.01

Angstrom-Scale Capillaries—Ion Selectivity Beyond Steric Effects [Radha Boya](#); University of Manchester, United Kingdom.

8:30 AM *NM06.11.02

Science and Applications of 2D Materials Based Membranes [Rahul Raveendran Nair](#); University of Manchester, United Kingdom.

9:00 AM NM06.11.03

Membranes of 2D Materials and Capillaries for Mass Transport [Ankit Bhardwaj](#)^{1,2}; ¹The University of Manchester, United Kingdom; ²The University of Manchester, United Kingdom.

9:15 AM NM06.11.04

Biomimetic Membranes from Membrane Protein-Block Copolymer 2D Materials for Aqueous and Vapor Applications [Yu-Ming Tu](#); University of Texas at Austin, United States.

9:30 AM *NM06.11.05

Resolving the Structure of Nanoporosity in 2D and 3D Using Transmission Electron Microscopy [Jamie Warner](#); The University of Texas at Austin, United States.

10:00 AM *NM06.08.05

Mitigating Heterogeneous Mass Transport Through Polymeric Membrane/2D Material Structure [Saheed Bukola](#); National Renewable Energy Laboratory, United States.

SESSION NM06.12: Nanoscale Mass Transport Through 2D and 1D Nanomaterials II
Session Chair: Shannon Mahurin
Wednesday Afternoon, May 25, 2022
NM06-Virtual

9:00 PM NM06.12.01

How Grain Boundaries and Interfacial Electrostatic Interactions Affect Water and Ion Transport Through Nanoporous Hexagonal Boron Nitride [Bharat Bhushan Sharma](#); Indian Institute of Science, India.

9:15 PM *NM06.12.02

Transport at the Fluid-Solid Interface [Nicolas Hadjiconstantinou](#); MIT, United States.

9:45 PM *NM06.12.03

Tunable Nanofluidic Transport Through Graphene Nanopores—Mechanism Illumination and Application Exploration [Luda Wang](#); Peking University, China.

10:15 PM NM06.12.04

MXene Nanofluidics—Ion Selectivity [Seunghyun Hong](#); Khalifa University, United Arab Emirates.

10:30 PM *NM06.08.02

Electrochemical Ion Pumping Through Nafion | Graphene | Nafion Sandwich Structures [Stephen Creager](#); Clemson University, United States.

SYMPOSIUM QT01

Applications and Characterization of Nonequilibrium Electron, Phonon and Polaron Dynamics
May 10 - May 25, 2022

Symposium Organizers

Emiliano Cortés, University of Munich
Michael Nielsen, UNSW Sydney
Annamaria Petrozza, Istituto Italiano di Tecnologia
Ian Sellers, University of Oklahoma

* Invited Paper

SESSION QT01.01: Perovskite Polaron Formation and Dynamics
Session Chairs: Tom Hopper and Annamaria Petrozza
Tuesday Morning, May 10, 2022
Hawai'i Convention Center, Level 3, 304B

10:15 AM *QT01.01.01

Small Polaron Formation in Lead-Free AgBi Semiconductors for Photovoltaic Applications [Laura Herz](#); University of Oxford, United Kingdom.

10:45 AM *QT01.01.02

Exciton-Polarons in Hybrid Ruddlesden Popper Metal Halides—Lessons from Coherent Spectroscopy [Ajay Ram Srimath Kandada](#); Wake Forest University, United States.

11:15 AM QT01.01.03

Hot Carrier Dynamics, Relaxation and the Effects of Polaron Formation in Metal-Halide Perovskites [Ian R. Sellers](#); University of Oklahoma, United States.

11:30 AM QT01.01.04

Influence of Polaron Occupied Surface Trap States on Photoluminescence Dynamics in CsPbBr₃ Nanocrystals [Aaron Forde](#)^{1,2,3}; ¹North Dakota State University, United States; ²Los Alamos National Laboratory, United States; ³Los Alamos National Laboratory, United States.

SESSION QT01.02: Hot Carriers in Perovskites
Session Chairs: Laura Herz and Annamaria Petrozza
Tuesday Afternoon, May 10, 2022
Hawai'i Convention Center, Level 3, 304B

1:30 PM *QT01.02.01

Exploring the Effects of Dimensionality and *In Situ* Solar Cell Behavior on Hot Carriers in Lead Halide Perovskites [Rebecca Scheidt](#); National Renewable Energy Laboratory, United States.

2:00 PM QT01.02.03

Towards Systematic Determination of Hot Carrier Metrics in Halide Perovskites [Jia Wei Melvin Lim](#)^{1,2}; ¹Nanyang Technological University, Singapore; ²Interdisciplinary Graduate School, Singapore.

2:15 PM BREAK

SESSION QT01.03: Structural and Lattice Dynamics of Perovskites
Session Chairs: Annamaria Petrozza and Meng-Ju Sher
Tuesday Afternoon, May 10, 2022
Hawai'i Convention Center, Level 3, 304B

3:15 PM *QT01.03.01

Ultrafast Soft-X Spectroscopy for the Investigation of Electron and Lattice Dynamics in Perovskites [Caterina Vozzi](#); CNR-IFN, Italy.

3:45 PM *QT01.03.02

Ultrafast Structural Deformations in the Hybrid Perovskites Probed by Femtosecond X-Ray and Electron Scattering [Aaron Lindenberg](#); Stanford University, United States.

4:15 PM *QT01.03.03

Heat Transformation and Dissipation in Photoexcited Perovskites [Tom Hopper](#)^{1,2}; ¹Stanford University, United States; ²Imperial College London, United Kingdom.

4:45 PM QT01.03.04

Microscopic Origins of the Ferroelectric and Ferroelastic Effects in Hybrid Halide Perovskites [Milos Dubajic](#); UNSW, Australia.

SESSION QT01.04: Hot Carrier Photovoltaics
Session Chairs: Rebecca Schiedt and Ian Sellers
Wednesday Morning, May 11, 2022
Hawai'i Convention Center, Level 3, 304B

8:30 AM *QT01.04.01

Hot Carrier and Phonon Relaxation Dynamics for Photovoltaics [Maxime Giteau](#)^{4,5}; ⁴The University of Tokyo, Japan; ⁵NextPV, Japan.

9:00 AM *QT01.04.02

Seeking Hot Carrier Solar Cells: Valley Photovoltaics [David K. Ferry](#); Arizona State Univ, United States.

9:30 AM QT01.04.03

WITHDRAWN 5/5/22 QT01.04.03 The Role of Carrier-Carrier Scattering in Hot Carrier Solar Cells [Abhinav S. Sharma](#); University of New South Wales, Australia.

9:45 AM BREAK

SESSION QT01.05: Exotic Effects Outside Equilibrium
Session Chairs: Aaron Lindenberg and Ian Sellers
Wednesday Morning, May 11, 2022
Hawai'i Convention Center, Level 3, 304B

10:30 AM *QT01.05.01

Coupling of Coherent Magnons to Excitons in 2D [Xiaoyang Zhu](#); Columbia University, United States.

11:00 AM QT01.05.02

Magnetic Control of Soft Chiral Phonons [Andrey Baydin](#); Rice University, United States.

11:15 AM QT01.05.03

Strain-Enhanced Formation of 1D Coherent Exciton-Polaron States in Small Molecule Semiconductors [Madalina I. Furis](#)^{1,3,2}; ¹University of Oklahoma, United States; ²University of Vermont, United States; ³The University of Oklahoma, United States.

11:30 AM QT01.05.04

Electron-Phonon Coupling with the Soft Phonon Mode and Slow Electronic Dynamics in the Ferroelectric Semiconductor SbSI [Mark Ziffer](#); Columbia University, United States.

SESSION QT01.06: Charge Carrier Dynamics
Session Chairs: Ian Sellers and Xiaoyang Zhu
Wednesday Afternoon, May 11, 2022
Hawai'i Convention Center, Level 3, 304B

1:30 PM *QT01.06.01

Charge Carrier Transport in Hyperdoped Semiconductors [Meng-Ju Sher](#); Wesleyan University, United States.

2:00 PM QT01.06.02

Coherent Electronic Transport in 2D Superatomic Crystals [Milan Delor](#); Columbia University, United States.

2:15 PM BREAK

SESSION QT01.07: Ultrafast Phenomena in 2D Materials and Structures
Session Chairs: Michael Nielsen and Rupert Oulton
Wednesday Afternoon, May 11, 2022
Hawai'i Convention Center, Level 3, 304B

3:30 PM *QT01.07.01

Hot Electrons and Hot Phonons in 2D Semiconductors [Jonathan P. Bird](#); Univ at Buffalo, United States.

4:00 PM *QT01.07.02

Hot Phonon and Intervalley Effects on Ultrafast Carrier Relaxation in InGaAs Quantum Wells [Stephen M. Goodnick](#); Arizona State University, United States.

4:30 PM QT01.07.03

High Q-Factor Room Temperature GaAs/AlAs Phononic Nanocavities [Michael P. Nielsen](#); UNSW, Australia.

4:45 PM QT01.07.04

Exciton-Exciton Annihilation Enhanced Diffusion in Monolayer Semiconductors [Shiekh Zia Uddin](#)^{1,2}; ¹University of California, Berkeley, United States; ²Lawrence Berkeley National Laboratory, United States.

SESSION QT01.08: Poster Session: Non-Equilibrium Dynamics
Session Chairs: Michael Nielsen and Annamaria Petrozza
Wednesday Afternoon, May 11, 2022
5:00 PM - 7:00 PM
Hawai'i Convention Center, Level 1, Kamehameha Exhibit Hall 2 & 3

QT01.08.01

A Pressure Induced Reversal to the 9R Perovskite in $Ba_3MoNbO_{8.5}$ [Eve J. Wildman](#); University of Aberdeen, United Kingdom.

QT01.08.02

Non-Radiative Luminescence Decay with Self-Trapped Hole Migration in Strontium Titanate—Interplay Between Optical and Transport Properties [Miguel L. Crespillo](#)^{1,2}; ¹University Autonomous of Madrid, Spain; ²The University of Tennessee, Knoxville, United States.

QT01.08.03

Hidden Selection Rules for Understanding Exciton Fission and Dynamics in Organic Crystals [Aaron Altman](#); Stanford University, United States.

QT01.08.04

Far-From-Equilibrium Dynamics of Self-Trapped Excitons in the Wake of a Swift Ion [Joseph Graham](#); Missouri University of Science and Technology, United States.

QT01.08.05

Phonon Dispersion Curves and Eigenvector Analysis of Superionic Fluorites Using *Ab Initio* Molecular Dynamics Simulations [Yueqing Huang](#); North Carolina State University, United States.

QT01.08.06

Electronic Noise in Graphene from First Principles [Iretomiwa Esho](#); California Institute of Technology, United States.

QT01.08.07

Hot Carrier Solar Cells (HCSCs): Energy Transfer Between Carriers, Photons and Phonons [Kazimierz J. Plucinski](#); Military University of Technology, Poland.

SESSION QT01.09: Hot Carrier Optoelectronics
Session Chairs: Jonathan Bird and Michael Nielsen
Thursday Morning, May 12, 2022
Hawai'i Convention Center, Level 3, 304B

8:00 AM *QT01.09.01

Harvesting Hot Electrons in Optoelectronic Devices Using Shottky Barriers and Thermal Gradients [Rupert F. Oulton](#); Imperial College London, United Kingdom.

8:30 AM *QT01.09.02

Harnessing Hot Carriers in Semiconductor Nanowires [Jonatan Fast](#)^{1,2}; ¹Lund University, Sweden; ²Lund University, Sweden.

9:00 AM QT01.09.03

High-Field Transport and Noise in p-Si—A First-principles Study [David S. Catherall](#); California Institute of Technology, United States.

9:15 AM BREAK

SESSION QT01.10: Computing Non-Equilibrium Dynamics
Session Chair: Stephen Goodnick
Thursday Morning, May 12, 2022
Hawai'i Convention Center, Level 3, 304B

10:15 AM *QT01.10.01

Optically-Excited Nonequilibrium Dynamics in Quantum Matter [Prineha Narang](#); Harvard University, United States.

10:45 AM *QT01.10.02

***Ab Initio* Quantum Ultrafast Dynamics of Electrons in Materials** [Ravishankar Sundararaman](#); Rensselaer Polytechnic Institute, United States.

11:15 AM *QT01.10.03

Nonequilibrium Dynamics of Interacting Electrons, Phonons and Excitons from First Principles [Ivan Maliyov](#); California Institute of Technology, United States.

11:45 AM QT01.10.04

Investigating the Role of Microscopic Interactions in Electron Hydrodynamics [George Varnavides](#); Harvard University, United States.

SESSION QT01.11: Hot Carriers in Plasmonic and Metallic Systems
Session Chair: Rupert Oulton
Thursday Afternoon, May 12, 2022
Hawai'i Convention Center, Level 3, 304B

1:30 PM *QT01.11.01

Very Short and Yet Quite Eventful Life of Hot Carriers in Plasmonic Metals [Jacob Khurgin](#); Johns Hopkins University, United States.

SESSION QT01.12: Hot Carrier Plasmonics and Photochemistry
Session Chair: Jacob Khurgin
Thursday Afternoon, May 12, 2022
Hawai'i Convention Center, Level 3, 304B

3:00 PM *QT01.12.01

Pathways for Carbon Dioxide Reduction in Plasmonic Hot Carrier Photoelectrochemical Structures [Xueqian Li](#); California Institute of Technology, United States.

3:30 PM QT01.12.02

Selective Plasmon-Induced CO₂ Reduction Using AuPd Alloy Nanoparticle Catalysts [Alan X. Dai](#); Stanford University, United States.

3:45 PM QT01.12.03

WITHDRAWN 5/8/22 QT01.12.03 *In Situ* Observation of Electron-Phonon Coupling Dynamics in BiVO₄ Photoelectrochemical Cells [Zhu Meng](#); Imperial College London, United Kingdom.

4:00 PM QT01.12.04

Time-Dependent Excited-State Molecular Dynamics [Dmitri Kilin](#); North Dakota State University, United States.

SESSION QT01.13: Applications and Characterization of Nonequilibrium Electron, Phonon and Polaron Dynamics I
Session Chair: Michael Nielsen
Tuesday Afternoon, May 24, 2022
QT01-Virtual

8:40 PM *QT01.13.01

Hot Carrier Photovoltaic Devices [Nicholas Ekins-Daukes](#); University of New South Wales Sydney, Australia.

9:10 PM QT01.13.02

Non-Equilibrium Heat Transport of Metal-Insulator Superlattice Considering Electron-Phonon Coupling near the Interface [Kyoungjung Kim](#); Tokyo Univ., Japan.

9:25 PM QT01.13.03

Electron-Phonon Coupling in Metal/Dielectric Superlattices from Fully Coupled Monte Carlo Simulation [Cheng Shao](#); The University of Tokyo, Japan.

9:40 PM QT01.13.04

Hot Carrier Solar Cells in the Dark [Andreas Pusch](#); UNSW Sydney, Australia.

9:55 PM *QT01.13.05

Energy Conversion with Plasmonic Nanostructures—Launching of Acoustic Surface Waves and Activation of Chemical Enhancement of Raman Scattering [Stefan A. Maier](#)^{2,1}; ¹Imperial College London, United Kingdom; ²LMU Muenchen, Germany.

10:25 PM QT01.13.06

Examination of the Photo-Physical Properties of Single Layer and Multiple Layer Two-Dimensional Hybrid Lead Halide Perovskites [David R. Graupner](#); North Dakota State University, United States.

10:30 PM *QT01.13.07

Perovskite Hot Carrier Dynamics [Tze Chien Sum](#); Nanyang Technological University, Singapore.

SESSION QT01.14: Applications and Characterization of Nonequilibrium Electron, Phonon and Polaron Dynamics II
Session Chairs: Emiliano Cortés and Ian Sellers
Wednesday Morning, May 25, 2022
QT01-Virtual

8:00 AM *QT01.14.01

Plasmonic Hot Carriers—Materials and Devices [Giulia Tagliabue](#); École Polytechnique Fédérale de Lausanne, Switzerland.

8:30 AM *QT01.14.02

Transition-Metal Doping of Hybrid Perovskites for Ultrafast Spin Control [Felix Deschler](#); Technical University Munich, Germany.

9:00 AM *QT01.14.03

Momentum-Resolved Dynamics of Excitons, Electrons and Phonons in Low-Dimensional Materials and Heterostructures [Ralph Ernstorfer](#)^{1,2}; ¹Technical University Berlin, Germany; ²Fritz Haber Institute of the Max Planck Society, Germany.

9:30 AM QT01.14.04

WITHDRAWN 5/17/22 QT01.14.04 Photoluminescence of Undoped Cis- Polyacetylene Semiconductor Material [Kamrun Nahar Keya](#); North Dakota State University, United States.

9:45 AM QT01.14.05

Polarons in Highly-Polarizable, Chalcogenide Perovskites Semiconductors [Tommaso Salzillo](#)^{1,2}; ¹Weizmann Institute of Science, Israel; ²Università di Bologna, Italy.

SYMPOSIUM QT02

Quantum and Topological Phenomena in Two-Dimensional Systems
May 10 - May 25, 2022

Symposium Organizers

Kaveh Ahadi, North Carolina State University
Barry Bradlyn, University of Illinois at Urbana-Champaign
Ryan Need, University of Florida
Meenakshi Singh, Colorado School of Mines

* Invited Paper

SESSION QT02.01: Heat and Charge Transport in Low Dimensional Materials
Session Chair: Meenakshi Singh
Tuesday Afternoon, May 10, 2022
Hawai'i Convention Center, Level 3, 302B

1:30 PM *QT02.01.01

Quantum Interference Experiments on the Topological Insulator-Like Surface of Cadmium Arsenide [Susanne Stemmer](#); University of California, Santa Barbara, United States.

2:00 PM QT02.01.02

Non-Equilibrated to Fully Equilibrated Edge Heat Transport in Hole-Conjugate States of the Fractional Quantum Hall Effect [Francois Parmentier](#); Centre National de la Recherche Scientifique, France.

2:15 PM QT02.01.03

Engineering a Tunable Asymmetric Josephson Effect [Rupini Kamat](#); Stanford University, United States.

2:30 PM *QT02.01.04

AV₃Sb₅ (A=K, Rb, Cs)—A New Class of Topological Kagome Metals Hosting Intertwined Charge Density Wave Order and Superconductivity [Stephen Wilson](#); Univ of California-S Barbara, United States.

3:00 PM BREAK

3:30 PM QT02.01.06

Chalcogenide Spin Injection from Iron- and Nickel-Based Edge Modulation Doping [Gabriel Marcus](#); Wake Forest University, United States.

3:45 PM QT02.01.07

Gate-Defined Tellurium Nanowire Quantum Dots [Shiva Davari](#); University of Arkansas, United States.

4:00 PM QT02.01.08

Spatial Impact Range of Single Molecule Magnet on Magnetic Tunnel Junction-Based Molecular Spintronic Devices (MTJMSDs) [Pawan Tyagi](#); University of the District Columbia, United States.

4:15 PM QT02.01.09

Dynamics of Vacancy and Vacancy Lines Formation in Graphene for Qubit Arrays [Abdennaceur Karoui](#); NorthCarolina Central University, United States.

SESSION QT02.03: Topological Superconductivity I

Session Chair: Kaveh Ahadi

Wednesday Morning, May 11, 2022

Hawai'i Convention Center, Level 3, 302B

10:30 AM *QT02.03.01

Topological States in Iron-Chalcogenide Superconductors for Quantum Computing [Qiang Li](#)^{2,1}; ¹Stony Brook University, United States; ²Brookhaven National Laboratory, United States.

11:00 AM QT02.03.03

Witnessing Quantum Spin Entanglement and Criticality in 2D Triangular Magnet KYbSe₂ [Allen Scheie](#); Oak Ridge National Laboratory, United States.

11:15 AM QT02.03.04

Resolving Emergent Structure States in 2D Systems by High-Energy X-Ray Diffraction [Valeri Petkov](#); Central Michigan University, United States.

SESSION QT02.04: Novel Synthetic Approaches for Topological Films
Session Chair: Kaveh Ahadi
Wednesday Afternoon, May 11, 2022
Hawai'i Convention Center, Level 3, 302B

1:30 PM *QT02.04.01

Dirac Plasmon Polaritons in Topological Insulator Thin Films and Heterostructures [Stephanie Law](#); University of Delaware, United States.

2:00 PM QT02.04.02

Magneto-optical Landau Level Spectroscopy of $\text{Pb}_{1-x}\text{Sn}_x\text{Se}/\text{EuSe}$ Heterostructures [Jiashu Wang](#); University of Notre Dame, United States.

2:15 PM BREAK

3:00 PM *QT02.04.03

Thin-Film Synthesis and Characterization of Chalcogenides for Quantum and Topological Phenomena [Charles H. Ahn](#); Yale University, United States.

3:30 PM QT02.04.04

High Quality Growth of Cd_3As_2 in (112), (001), and (110) Orientations Using Molecular Beam Epitaxy [Anthony Rice](#); National Renewable Energy Lab, United States.

3:45 PM QT02.04.05

Interaction Induced Magnetism in 2D Kagome Metal-Organic Frameworks on Substrates [Nikhil Medhekar](#)^{2, 1}; ¹Monash University, Australia; ²ARC Centre of Excellence in Future Low Energy Electronics Technologies, Australia.

SESSION QT02.05: Topological Superconductivity II
Session Chair: Kaveh Ahadi
Thursday Morning, May 12, 2022
Hawai'i Convention Center, Level 3, 302B

8:00 AM QT02.05.01

Graphene/ α - RuCl_3 Lateral p-n Junctions [Sara Shabani](#); Columbia University, United States.

8:15 AM *QT02.05.02

Novel Epitaxial Superconductor-Semiconductors for Topological Superconductivity [Javad Shabani](#); New York University, United States.

8:45 AM QT02.05.03

Induced Superconducting Pairing in Integer Quantum Hall Edge Modes of InAs [Mehdi Hatefipour](#); New York University, United States.

9:00 AM QT02.05.04

At the Verge of Topology—2D Pt-Based Minerals [Felipe Crasto de Lima](#); Centro Nacional de Pesquisa em Energia e Materiais, Brazil.

9:15 AM QT02.05.05

Controllably Generating Antisite Defects for Monolayer Transitional Metal Dichalcogenides Qubits [Burcu Ozden](#); The Pennsylvania State University, United States.

9:30 AM BREAK

SESSION QT02.06: Characterizing Topological Behavior in 2D Materials
Session Chair: Ryan Need
Thursday Morning, May 12, 2022
Hawai'i Convention Center, Level 3, 302B

10:00 AM *QT02.06.01

2D Magnetic, Ferroelectric and Superconducting van der Waal's Structures [Stuart Parkin](#); Max Planck Institute of Microstructure Physics, Germany.

10:30 AM QT02.06.02

Two-Dimensional Heavy Fermion Material [Victoria Posey](#); Columbia University, United States.

10:45 AM QT02.06.03

Room Temperature Skyrmion in Layered Magnet [Hongrui Zhang](#); UC Berkeley, United States.

11:00 AM QT02.06.04

Visualizing Currents in the Quantum Anomalous Hall Regime [George M. Ferguson](#); Cornell University, United States.

11:15 AM *QT02.06.05

Direct Observation of Anyonic Braiding Statistics in the Fractional Quantum Hall Regime—Lessons from an old Topological System [Michael J. Manfra](#)^{1, 2}; ¹Purdue University, United States; ²Microsoft Quantum Lab Purdue, United States.

11:45 AM QT02.06.06

Detection of Time-Reversal Symmetry Breaking via Waveguide Mode Coupling [Ioannis Petrides](#); Harvard University, United States.

12:00 PM QT02.06.07

Highly Excited Rydberg Excitons in a Thin Film of Synthetic Cuprite [Jacob C. DeLange](#); Purdue University, United States.

SESSION QT02.07: Computational Approaches to Topological Materials

Session Chair: Ryan Need

Thursday Afternoon, May 12, 2022

Hawai'i Convention Center, Level 3, 302B

1:30 PM QT02.07.01

Ab Initio Studies of Electronic Structures and Magnetic Properties in RMn_6Sn_6 (R = Gd, Tb, Dy, Ho, and Er) [Liqin Ke](#); Ames Laboratory, United States.

1:45 PM QT02.07.02

Annihilation of Magnetic Skyrmion by Quantum Mechanical Tunneling [Hannes Jonsson](#)^{1,2}; ¹University of Iceland, Iceland; ²Faculty of Physical Sciences, Iceland.

2:00 PM QT02.07.03

Electrically and Magnetically Switchable Nonlinear Photocurrent in PT -Symmetric 2D Magnetic Topological Quantum Materials [Xiaofeng Qian](#); Texas A&M University, United States.

2:15 PM QT02.07.04

Spin-Valley Locked Edge States Through Staggered Chiral Photonic Crystals with Honeycomb Unit Cell [Yeseul Kim](#); Pohang University of Science and Technology, Korea (the Republic of).

2:30 PM BREAK

3:00 PM QT02.07.05

Topology and Dynamical Liquid Crystallinity in Optically Driven Two-Dimensional Materials [Netanel H. Lindner](#); Technion - Israel Institute of Technology, United States.

3:30 PM QT02.07.06

Realistic Amorphous Topological Insulators [Adalberto Fazzio](#); Centro Nacional de Pesquisa em Energia e Materiais, Brazil.

3:45 PM QT02.07.07

Dual Yin-Yang Flat Bands: Construction and Excitonic Insulator State [Feng Liu](#); The University of Utah, United States.

SESSION QT02.08: Quantum and Topological Phenomena in Two-Dimensional Systems I

Session Chairs: Kaveh Ahadi and Barry Bradlyn

Wednesday Morning, May 25, 2022

QT02-Virtual

8:00 AM *QT02.08.01

Understanding the Band Structure and Orbital Magnetism of the Twisted Bilayer Graphene Systems by Pseudo-Landau Level Description [Xi Dai](#)^{1,2}; ¹The Hong Kong University of Science and Technology, Hong Kong; ²University of California, Santa Barbara, United States.

8:30 AM QT02.08.02

Synthesis and Characterization of Thin-Film Antiferromagnetic Kagome Metal FeSn [Minyong Han](#); Massachusetts Institute of Technology (MIT), United States.

8:45 AM QT02.08.03

Theoretical Analysis of Electronic, Vibrational and Thermal Properties for Single-Layer and Chain Quasi 1D Materials (TaSe_3 and ZrTe_3) [Topojit Debnath](#); University of California, Riverside, United States.

9:00 AM QT02.08.04

Crystalline Responses for Rotation-Invariant Higher-Order Topological Insulators [Julian May-Mann](#); University of Illinois at Urbana-Champaign, United States.

9:15 AM QT02.08.05

Quasiparticle Interference of Monolayer $\text{FeSe}_x\text{Te}_{1-x}$ on Bi_2Te_3 [Mark Hirsbrunner](#); University of Illinois at Urbana-Champaign, United States.

9:30 AM QT02.08.06

Epitaxial Growth of Mn_3Sn on Sapphire Substrates Using Molecular Beam Epitaxy [Sneha Upadhyay](#); Ohio University, United States.

9:45 AM QT02.08.07

Molecular Beam Epitaxy and Structural Characterization of Chromium Distannide [Tyler Erickson](#); Ohio University, United States.

SESSION QT02.09: Quantum and Topological Phenomena in Two-Dimensional Systems II

Session Chair: Barry Bradlyn

Wednesday Morning, May 25, 2022

QT02-Virtual

10:30 AM QT02.09.01

Determining Intrinsic Defect Densities for High-quality Self-flux Synthesized Transition Metal Dichalcogenides from First Principles and Experimental Thermodynamics [Luke Holtzman](#); Columbia University, United States.

10:45 AM *QT02.09.02

Incoherent Cooper Pairing and Pseudogap Behavior in Monolayer $\text{FeSe}/\text{SrTiO}_3$ [Kyle Shen](#); Cornell University, United States.

SYMPOSIUM QT03

Higher-Order Topological Structures—From Charge to Spin
May 11 - May 25, 2022

Symposium Organizers

Michele Conroy, Imperial College London
Sinead Griffin, Lawrence Berkeley National Laboratory
Dennis Meier, Norwegian University of Science and Technology (NTNU)
Ramamoorthy Ramesh, University of California, Berkeley

* Invited Paper

SESSION QT03.01: Poster Session: Higher-Order Topological Structures—From Charge to Spin
Session Chair: Michele Conroy
Wednesday Afternoon, May 11, 2022
5:00 PM - 7:00 PM
Hawai'i Convention Center, Level 1, Kamehameha Exhibit Hall 2 & 3

QT03.01.01

Magnetic and Geometrical Control of Spin Textures in the Itinerant Kagome Magnet Fe_3Sn_2 [Markus Althaler](#)^{2,1,3}; ¹Norwegian University of Science and Technology, Norway; ²Universität Augsburg, Germany; ³Norwegian University of Science and Technology, Norway.

SESSION QT03.02: Higher-Order Topological Structures—From Charge to Spin I
Session Chairs: Miaofang Chi and Donald Evans
Thursday Morning, May 12, 2022
Hawai'i Convention Center, Level 3, 302A

8:30 AM *QT03.02.01

Nanoscale and Mesoscale Curvature in Multidomain Ferroelectric Superlattices [Pavlo Zubko](#); University College London, United Kingdom.

9:00 AM *QT03.02.02

Engineering Phase Transitions and Dielectric Properties of Nano-Ferroelectrics [Jorge Iniguez](#)^{1,2}; ¹Luxembourg Institute of Science and Technology, Luxembourg; ²University of Luxembourg, Luxembourg.

9:30 AM QT03.02.03

Multi-state Switching Dynamics in the Polar Vortex Phase [Piush Behera](#); University of California Berkeley, United States.

9:45 AM BREAK

10:15 AM *QT03.02.04

Tailoring the Non-Ising Internal Structure of Ferroelectric Domain Walls [Salia Cherifi-Hertel](#); Strasbourg University and CNRS, France.

10:45 AM QT03.02.05

High Electrical Conductivity from Strained Structural Domain Walls [Lukas R. Puntigam](#); University of Augsburg, Germany.

11:00 AM QT03.02.06

3D Geometry and Functional Properties of Ferroelectric Domain Walls [Erik Roede](#); Norwegian University of Science and Technology, Norway.

11:15 AM *QT03.02.07

Studies of Topological States and Proximity Effects in Functional Materials [Demic Kepaptsoglou](#)^{1,2}; ¹SuperSTEM, United Kingdom; ²University of York, United Kingdom.

SESSION QT03.03: Higher-Order Topological Structures—From Charge to Spin II
Session Chairs: Haidan Wen and Pavlo Zubko
Thursday Afternoon, May 12, 2022
Hawai'i Convention Center, Level 3, 302A

1:30 PM QT03.03.01

Controlling a.c. Signals using Charged Ferroelectric Domain Walls [Jan Schultheiß](#); Norwegian University of Science and Technology, Norway.

1:45 PM QT03.03.02

Insulating Improper Ferroelectric Domain Walls as Robust Barrier Layer Capacitors [Jan Schultheiß](#); NTNU Trondheim, Norway.

2:00 PM QT03.03.03

Superior Polarization Retention through Engineered Domain Wall Pinning [Jan Seidel](#); University of New South Wales, Australia.

2:15 PM QT03.03.04

Nanoengineering Conductivity with Low Dimensional Defects in a Functional Oxide [Donald M. Evans](#)^{1,2}; ¹University of Augsburg, Germany; ²Norwegian University of Science and Technology (NTNU), Norway.

2:30 PM BREAK

3:00 PM QT03.03.05

Opto-Electro-Mechanical control of Ferroelectric Topological Structures for Ultralow Power Topotronic Devices using Neural Network Quantum Molecular Dynamics [Thomas M. Linker](#); University of Southern California, United States.

3:15 PM QT03.03.06

New Antiferromagnetic Metal Phase and Large Zero-Field Planar Hall Effect in a Rare-Earth Nickelate [Spencer Doyle](#); Harvard University, United States.

3:30 PM *QT03.03.07

Direct Visualization of the Three-dimensional Shape of Skyrmion Strings [Shinichiro Seki](#); The University of Tokyo, Japan.

4:00 PM QT03.03.08

Noncollinear Magnetism in MnPtGa Thin Films [Ibarra Rebeca](#)^{1,2}; ¹Max Planck Institute for Chemical Physics of Solids, Germany; ²Technische Universität Dresden, Germany.

SESSION QT03.04: Higher-Order Topological Structures—From Charge to Spin III

Session Chairs: [Salia Cherifi-Hertel](#) and [Jan Schultheiß](#)

Friday Morning, May 13, 2022

Hawai'i Convention Center, Level 3, 302A

8:00 AM *QT03.04.01

An Ultrafast View of Topological Ferroelectric Nanostructures [Haidan Wen](#)^{1,2}; ¹Argonne National Laboratory, United States; ²Argonne National Laboratory, United States.

8:30 AM QT03.04.02

Direct Imaging of Emergent Chirality Changes in a Polar Meron to Skyrmion Transition in Oxide Superlattices [Yu-Tsun Shao](#); Cornell University, United States.

8:45 AM *QT03.04.03

Cryogenic Atomic and 4D-STEM Imaging for 2D Layered Quantum Materials [Miaofang Chi](#); Oak Ridge National Laboratory, United States.

9:15 AM QT03.04.04

Higher-Order Topological Superconductivity in Twisted Bilayer Graphene [Aaron Chew](#); Princeton University, United States.

9:30 AM BREAK

10:00 AM QT03.04.05

Hidden Higher-Order Topology in Monolayer Hexagonal TMDs [Jun Jung](#); Korea Advanced Institute of Science and Technology, Korea (the Republic of).

10:15 AM QT03.04.06

Lifetime of Large Magnetic Skyrmions and Antiskyrmions in Discrete Systems [Hannes Jonsson](#)^{1,2}; ¹University of Iceland, Iceland; ²Faculty of Physical Sciences, Iceland.

10:30 AM QT03.04.07

Transferring Orbital Angular Momentum to an Electron Beam Reveals Toroidal and Chiral Order [Kayla Nguyen](#); University of Illinois at Urbana-Champaign, United States.

10:45 AM QT03.04.08

Imaging the Controllable Rotation of a Skyrmion Crystal Driven by Femtosecond Laser Pulses [Phoebe Tengdin](#); École polytechnique fédérale de Lausanne, Switzerland.

11:00 AM QT03.04.09

Generation of Intense and Fast Magnetic Field Pulses Through Domain Wall Displacements in Planar Nanoconducts [Jose Maria Porro](#)^{1,2}; ¹BCMaterials, Basque Center for Materials, Applications and Nanostructures, Spain; ²Ikerbasque, the Basque Foundation for Science, Spain.

SESSION QT03.05: Higher-Order Topological Structures—From Charge to Spin IV

Session Chairs: [Michele Conroy](#) and [Demie Kepaptsoglou](#)

Friday Afternoon, May 13, 2022

Hawai'i Convention Center, Level 3, 302A

1:30 PM QT03.05.01

Imaging Emergent Functionality in 3D [Trygve M. Ræder](#); Technical University of Denmark, Denmark.

1:45 PM QT03.05.02

Long-Distance Spin Transport in an Antiferromagnetic Insulator [Hossein Taghinejad](#); University of California, Berkeley, United States.

2:00 PM QT03.05.03

Understanding Atomic Scale Electronic and Physical Properties in Polar Topologies [Sandhya Susarla](#); Lawrence Berkeley National Laboratory, United States.

2:15 PM QT03.05.05

Magnetic Properties of NdCuGa₃ Single Crystals [Binod K. Rai](#); Savannah River National Laboratory, United States.

2:30 PM BREAK

3:00 PM QT03.05.06

Spin Higher-Order Topological Insulators: A Phase-Space Perspective [Ioannis Petrides](#); Harvard University, United States.

3:15 PM QT03.05.07

Programmable Multi-Level Graphene/PZT Memristor Based on Highly Conductive Neutral Domain Walls [Felix Risch](#); École polytechnique fédérale de Lausanne, Switzerland.

SESSION QT03.06: Higher-Order Topological Structures—From Charge to Spin V

Session Chair: Sinead Griffin

Wednesday Morning, May 25, 2022

QT03-Virtual

8:00 AM *QT03.06.01

Electroskymionics: Polarization, Phonons and Photons [Jiri Hlinka](#); Czech Academy of Sciences, Czechia.

8:30 AM QT03.06.02

First-Principle Investigations of Topological Solitons in Multiferroic Cu_2OSeO_3 [Houssam Sabri](#); Université Paris-Saclay, CentraleSupélec, CNRS, Laboratoire SPMS, France.

8:45 AM *QT03.06.03

X-Ray Imaging of Three-Dimensional Magnetization Textures [Claire Donnelly](#); Max Planck Institute for Chemical Physics of Solids, Germany.

9:15 AM *QT03.06.04

Emergent Landau Levels of Topological Magnons in a Skyrmion Lattice [Christian Pfleiderer](#); Technical University of Munich, Germany.

9:45 AM QT03.03.09

Creating a Ferromagnetic Ground State with High T_c in a Paramagnetic Alloy Through Non-Equilibrium Nanostructuring [Xinglong Ye](#); Karlsruhe Institute of Technology, Germany.

SESSION QT03.07: Higher-Order Topological Structures—From Charge to Spin VI

Session Chair: Sinead Griffin

Wednesday Morning, May 25, 2022

QT03-Virtual

10:30 AM QT03.07.01

Nonvolatile Electric-Field Control of Inversion Symmetry [Lucas M. Caretta](#); University of California, Berkeley, United States.

10:45 AM QT03.07.02

From Vortex Labyrinths to Polar Bubbles—A Mean-Field Perspective [Sergei Prokhorenko](#); University of Arkansas, United States.

11:00 AM *QT03.07.03

Topology and Control of Ferroelectric Patterning [Yousra Nahas](#); University of Arkansas, United States.

11:30 AM QT03.05.08

Epitaxial Growth of Frustrated Kagome Lattice Fe-Sn Thin Films [Payel Chatterjee](#); Norwegian University of Science and Technology, Norway.

SYMPOSIUM QT04

Topology and Exotic Quantum Phases in 3D Materials
May 8 - May 24, 2022

Symposium Organizers

Sugata Chowdhury, Howard University
Anna Isaeva, University of Amsterdam
Xiaofeng Qian, Texas A&M University
Bahadur Singh, Tata Institute of Fundamental Research

* Invited Paper

SESSION QT04.01: Magnetic and Non-Magnetic Topological Insulators I
Session Chair: Anna Isaeva
Sunday Morning, May 8, 2022
Hawai'i Convention Center, Level 3, 302B

9:00 AM QT04.01.02

Neutron Investigations of $\text{Mn}(\text{Bi,Sb})_2\text{Te}_4$ [William Ratcliff](#)^{1,2}; ¹NIST, United States; ²University of Maryland, United States.

9:15 AM QT04.01.04

Comparing Cr-Doped $(\text{Bi,Sb}_{1-x})_2\text{Te}_3$ to Graphene as a Future Platform for Quantum Hall Resistance Standards [Angela Hight Walker](#); National Institute of Standards and Technology, United States.

9:30 AM BREAK

SESSION QT04.02: Magnetic and Non-Magnetic Topological Insulators II
Session Chair: William Ratcliff
Sunday Morning, May 8, 2022
Hawai'i Convention Center, Level 3, 302B

10:00 AM QT04.02.01

WITHDRAWN 5/6/22 QT04.02.01 Strongly Correlated Ferromagnetism and Superconductivity in NiTa_4Se_8 [Nikola Maksimovic](#)^{1,2}; ¹University of California, Berkeley, United States; ²Lawrence Berkeley National Laboratory, United States.

10:15 AM QT04.02.03

Magneto-resistance Studies of Defect Formation in Cd_3As_2 Thin Films [Jocienne Nelson](#); National Renewable Energy Laboratory, United States.

10:30 AM QT04.02.04

Growth of the Intrinsic Superlattice Material Bi_4Se_3 by DC Magnetron Sputtering: Layered to Faceted Growth [Joseph P. Corbett](#)^{1,4}; ¹UES Inc., United States; ⁴Air Force Research Laboratory, United States.

10:45 AM QT04.02.05

Effects of Dopants in Magnetic and Topological Properties of ZrMnP and HfMnP [Tej Nath N. Lamichhane](#); Massachusetts Institute of Technology, United States.

11:00 AM QT04.02.06

Topological Signatures in Nodal Semimetals through Neutron Scattering [Thanh Nguyen](#); Massachusetts Institute of Technology, United States.

11:15 AM QT04.02.07

Anisotropic Large Diamagnetism in Dirac Semimetals ZrTe_5 and HfTe_5 [Sukriti Singh](#); Max Planck Institute for Chemical Physics of Solids, Germany.

SESSION QT04.03: Non-Trivial Spin texture and Superconductivity
Session Chair: Bahadur Singh
Sunday Afternoon, May 8, 2022
Hawai'i Convention Center, Level 3, 302B

1:30 PM QT04.03.01

Crystal Growth and Characterization of the Topological Superconductor Candidate RhPb_2 and its Related Compounds [Nikola Subotic](#); University of Tsukuba, Japan.

1:45 PM QT04.03.02

Coexistence of Surface Superconducting and Three-Dimensional Topological Dirac States in Semimetal KZnBi [Junseong Song](#); Center for Integrated Nanostructure Physics,

Institute for Basic Science, Korea (the Republic of).

2:00 PM QT04.03.03

Electrodynamics of Spin Waves in Triplet Superconductors [Nicholas Poniatowski](#); Harvard University, United States.

2:15 PM BREAK

2:45 PM *QT04.03.04

Visualization of Topological Boundary Modes Manifesting Topological Nodal-Point Superconductivity [Nurit Avraham](#); Weizmann Institute of Science, Israel.

3:15 PM QT04.03.05

Nanowires of Topological Kondo Insulators as Conduits for Spin-Polarized Tunneling Currents [Anuva Aishwarya](#); University of Illinois, Urbana-Champaign, United States.

3:30 PM QT04.03.06

Microwave Response in a Topological Superconducting Quantum Interference Device [Wei Pan](#); Sandia National Labs, United States.

3:45 PM QT04.03.07

Fermi arc Criterion for Surface Majorana Modes in Superconducting Time-Reversal Symmetric Weyl Semimetals [Rauf O. Giwa](#); University of Houston, United States.

SESSION QT04.04: Topological Semimetal

Session Chair: Sugata Chowdhury

Monday Morning, May 9, 2022

Hawai'i Convention Center, Level 3, 302B

8:00 AM *QT04.04.01

Strongly Correlated Weyl Semimetals [Silke Buchler-Paschen](#); Vienna University of Technology, Austria.

8:30 AM QT04.04.02

In-Plane Lattice Tuning of Topological Semimetal Cd₃As₂ for Improved Electronic Properties [Thomas G. Farinha](#)^{1,2}; ¹The University of Maryland, United States; ²Laboratory for Physical Sciences, United States.

8:45 AM *QT04.04.03

Exotic Topological Phases of Quantum Matter for Fundamental Science Studies and Applications [Arun Bansil](#); Northeastern University, United States.

9:15 AM QT04.04.04

Surface-Driven Nonlinear Planar Hall Effect in Nominally Centrosymmetric Dirac Semimetal SrIrO₃ Thin Films [Yusuke Kozuka](#); National Institute for Materials Science, Japan.

9:30 AM BREAK

10:00 AM QT04.04.06

Molecular Beam Epitaxy Growth of Co₂FeSn: a Heusler Nodal Line Semimetal Candidate with Theorized Giant Room Temperature Anomalous Transport [Aaron Engel](#); University of California, Santa Barbara, United States.

10:15 AM QT04.04.07

Evaluating the Potential of Weyl Semimetals as Future Interconnect Metals [Sushant Kumar](#); Rensselaer Polytechnic Institute, United States.

10:30 AM QT04.04.08

Correlated Hund's Metallic Phase in Kagome Nodal Surface Semimetal: Sc₃Mn₃Al₇Sis [Fabrizio Cossu](#); Kangwon National University, Korea (the Republic of).

10:45 AM QT04.04.09

Method for Enhancing the Anomalous Nernst Effect in Magnetic Weyl Semimetals [Vsevolod Ivanov](#); Lawrence Berkeley National Laboratory, United States.

SESSION QT04.05: Optoelectronic Properties of Quantum Materials

Session Chair: Xiaofeng Qian

Monday Afternoon, May 9, 2022

Hawai'i Convention Center, Level 3, 302B

1:30 PM *QT04.05.01

High Spin-Chern-Number Insulator Phase in α -Antimonene [Hsin Lin](#); Academia Sinica, Taiwan.

2:00 PM QT04.05.02

Observation of the Chiral Phonon Activated Spin Seebeck Effect [Jun Liu](#); North Carolina State University, United States.

2:15 PM QT04.05.04

Geometrically Frustrated Phonons in a Topological Kagome Metal [Nathan C. Drucker](#)^{1,2}; ¹Harvard University, United States; ²Massachusetts Institute of Technology, United States.

2:30 PM BREAK

3:00 PM QT04.05.05

Leggett Modes in Dirac Semimetals [Joseph J. Cuzzo](#)^{1,2}; ¹William & Mary, United States; ²Sandia National Laboratories, United States.

3:15 PM QT04.05.06

Thermal Hall effect in Bi_{1-x}Sb_x topological insulator and Weyl Semimetal [Dung D. Vu](#); The Ohio State University, United States.

3:30 PM QT04.05.07

Quantum Oscillations and Topological Magnetotransport in Micron-Scale Hall Bars of the Chiral Semimetal CoSi [Alan Molinari](#); IBM Research Europe - Zurich, Switzerland.

SESSION QT04.06: Recent Developments on the Properties of Emergent Layered 2D Quantum Magnetic Materials and Heterostructures I

Session Chair: Sugata Chowdhury

Tuesday Morning, May 24, 2022

QT04-Virtual

8:00 AM *QT04.06.01

Second Order Nonlinear Optical Spectroscopy Studies on Magnetic Weyl Semimetal Co₃Sn₂S₂ [Liuyan Zhao](#); University of Michigan, United States.

8:30 AM QT04.06.02

Coexistence of Charge Density Wave and Quantum Hall Effect in Bulk CaCu₄As₂ single crystal [Souvik Sasmal](#); Tata Institute of Fundamental Research, India.

8:45 AM QT04.06.03

Magnetic Field-Induced Type-II Weyl Semimetallic State in Geometrically Frustrated Shastry-Sutherland Lattice [Jong-Soo Rhyee](#); Kyung Hee University, Korea (the Republic of).

9:00 AM QT04.06.04

Novel Alkali Metal Rare-Earth Dichalcogenide, LiYbSe₂: Structure and Magnetism in a Pyrochlore Lattice [Ranuri S. Dissanayaka Mudiyanse](#); Rutgers, The State University of New Jersey, United States.

9:15 AM *QT04.06.05

Spin Textures in Correlated Oxide Devices Probed by Electrical Transport [Tamalika Banerjee](#); University of Groningen, Netherlands.

SESSION QT04.07: Recent Developments on the Properties of Emergent Layered 2D Quantum Magnetic Materials and Heterostructures II

Session Chair: Sugata Chowdhury

Tuesday Morning, May 24, 2022

QT04-Virtual

10:30 AM *QT04.06.06

Intrinsic Magnetic Topological Insulators: Discovery and State-of-the-Art [Mikhail M. Otrokov](#)^{1,2}; ¹Centro de Física de Materiales, Spain; ²IKERBASQUE, Basque Foundation for Science, Spain.

11:00 AM *QT04.04.05

Engineering Topological Phases: A Materials Perspective [Tanusri Saha-Dasgupta](#); S.N.Bose National Centre for Basic Sciences, India.

11:30 AM *QT04.01.01

Tuning the Interplay of Magnetism and Band Topology in Intrinsic Magnetic Topological Insulators [Ni Ni](#); University of California, Los Angeles, United States.

12:00 PM *QT04.02.02

Layer Hall effect in Topological Axion Antiferromagnet MnBi₂Te₄ [Suyang Xu](#); Harvard University, United States.

SYMPOSIUM QT05

2D Topological Materials—Growth, Theoretical Models and Applications
May 9 - May 25, 2022

Symposium Organizers

Paolo Bondavalli, Thales Research and Technology
Judy Cha, Yale University
Adriana Figueroa, Catalan Institute of Nanoscience and Nanotechnology
Guy Lelay, Aix-Marseille University

* Invited Paper

SESSION Tutorial QT05.00: Theoretical and Experimental Aspects of 2D Topological Materials
Session Chairs: Paolo Bondavalli, Judy Cha, Adriana Figueroa, Guy Lelay and Marco Minissale
Tuesday Morning, May 24, 2022
QT05-Virtual

8:30 AM

The Kubo Formula, its Fundamental, and its Relevance in modern Material Science [Jose Hugo Garcia Aguilar](#); Catalan Institute of Nanoscience and Nanotechnology, Spain.

9:00 AM

Introduction to LSQUANT [Jose Hugo Garcia Aguilar](#); Catalan Institute of Nanoscience and Nanotechnology, Spain.

9:30 AM

Practical examples of LSQUANT [Jose Hugo Garcia Aguilar](#); Catalan Institute of Nanoscience and Nanotechnology, Spain.

10:00 AM Q&A

10:15 AM

Techniques of Epitaxy of 2D Materials Growth [Marco Minissale](#); Aix-Marseille Université, France.

10:45 AM

Analytical Techniques of Characterization [Marco Minissale](#); Aix-Marseille Université, France.

11:15 AM

Overview of the Different Studied 2D Materials and Emerging Applications and Limitations of 2D Materials [Marco Minissale](#); Aix-Marseille Université, France.

SESSION QT05.01: Emerging Properties: Theory and Modelling I

Session Chairs: Paolo Bondavalli, Guy Lelay and Alessandro Molle

Monday Morning, May 9, 2022

Hawai'i Convention Center, Level 3, 302A

10:30 AM *QT05.01.01

Two-Dimensional Topological Polymers - The Chemistry Way Towards Quasiparticle Physics [Thomas Heine](#); TU Dresden, Germany.

11:00 AM *QT05.01.02

Electronic Correlations and Nano-photocurrent in Nodal Semimetals [Yinming Shao](#); Columbia University, United States.

SESSION QT05.02: Emerging Properties: Theory and Modelling II

Session Chairs: Paolo Bondavalli, Guy Lelay and Alessandro Molle

Monday Afternoon, May 9, 2022

Hawai'i Convention Center, Level 3, 302A

1:30 PM *QT05.02.02

Magnetic Topological Phases in Dissipative Systems [Benedetta Flebus](#); Boston College, United States.

2:00 PM QT05.02.03

Effect of Thickness, External Magnetic Field, and Chemical Substitution on the Quantum Phase Transition of Antiferromagnetic MnBi_2Se_4 and Family of Materials [Sugata Chowdhury](#)^{1,2}; ¹Howard University, United States; ²National Institute of Standards and Technology, United States.

2:15 PM QT05.02.04

Atomically-Defined Topological Edge Modes in Functionalized Stanene [Jennifer Coulter](#); Harvard University, United States.

2:30 PM BREAK

3:00 PM QT05.02.05

Nonlinear Hall Effect and Berry Curvature Memory in Emergent 2D Ferroelectric Materials [Xiaofeng Qian](#); Texas A&M University, United States.

3:15 PM *QT05.02.06

Discovery of Topological Magnets in 2D and 3D and the New Frontiers [M. Zahid Hasan](#); Princeton Univ, United States.

SESSION QT05.03: Growth, Characterization and Potential Applications

Session Chairs: Paolo Bondavalli, Guy Lelay and Alessandro Molle

Tuesday Morning, May 10, 2022

Hawai'i Convention Center, Level 3, 302A

8:30 AM *QT05.03.01

Growth of Topological Materials from the 2D to the 3D Level: the Case of Xenon and Ditellurides [Alessandro Molle](#); Consiglio Nazionale delle Ricerche, Italy.

9:00 AM QT05.03.02

MBE Growth of Tin-Telluride Thin Films on (001) GaAs Substrates [Masakazu Kobayashi](#)^{1,2}; ¹Waseda University, Japan; ²Waseda University, Japan.

9:15 AM QT05.03.03

Si-Ag $2\sqrt{3}\times 2\sqrt{3}R(30^\circ)$ Surface Alloy Versus Silicene on Ag(111) [Guy Lelay](#); Aix-Marseille University, France.

9:30 AM BREAK

10:00 AM *QT05.03.04

Coexistence of Robust Edge States and Superconductivity in Few-Layer Stanene [Jinfeng Jia](#); Shanghai Jiao Tong Univ, China.

10:30 AM *QT05.03.05

Topology and Chirality [Claudia Felser](#); Max Planck Institute, Germany.

11:00 AM QT05.03.06

Realization of Internal Interfaces in Nanostructures of Chiral Weyl Semimetals [Nitish Mathur](#)^{2,1}; ¹University of Wisconsin--Madison, United States; ²Princeton University, United States.

SESSION QT05.04: Advanced Studies on 2D Topological Materials

Session Chairs: Paolo Bondavalli, Guy Lelay and Alessandro Molle

Tuesday Afternoon, May 10, 2022

Hawai'i Convention Center, Level 3, 302A

1:30 PM *QT05.04.01

Spinterface: Quantum Interface Effects with 2D Materials [Pierre Seneor](#); Unité Mixte de Physique, CNRS, Thales, Université Paris-Saclay, France.

2:00 PM *QT05.04.02

Dilute Magnetic Topological Insulators [Laurens Molenkamp](#); Würzburg University, Germany.

2:30 PM BREAK

3:00 PM *QT05.04.03

Large-Scale 2D Materials Integration for Spintronics [Bruno Dlubak](#); Unité Mixte de Physique CNRS/Thales, France.

3:30 PM QT05.04.04

Modulation of Electronic Structure and Thermoelectric Properties of Orthorhombic and Cubic SnSe by AgBiSe₂ Alloying [Sushmita Chandra](#); Jawaharlal Nehru Centre for Advanced Scientific Research (JNCASR), India.

3:45 PM QT05.04.05

Thermoelectric transport in the topological insulator Bi₂Se₃ [Lakshmi Amulya Nimmagadda](#); University of Illinois at Urbana-Champaign, United States.

4:00 PM *QT05.04.06

Transport in a Graphene Strain Superlattice [Nadya Mason](#); University of Illinois at Urbana-Champaign, United States.

4:30 PM QT05.04.07

Topological Band Engineering of Catalysts toward Highly Efficient Electrochemical Hydrogen Evolution [Claudia Felser](#); Max Planck Institute for Chemical Physics of Solids, Germany.

SESSION QT05.05: Poster Session: 2D Topological Materials: Growth, Theoretical Models and Applications

Session Chairs: Paolo Bondavalli, Guy Lelay and Alessandro Molle

Tuesday Afternoon, May 10, 2022

5:00 PM - 7:00 PM

Hawai'i Convention Center, Level 1, Kamehameha Exhibit Hall 2 & 3

Poster Spotlight: The Search for Persistent Currents on Doped 2D Dichalcogenide Platelets [Timothy W. Carlson](#); Wake Forest University, United States.

QT05.05.02

Poster Spotlight: Topological Insulator and Artificial Crystals for Hydro-Elastic Waves [Federigo Ceraudo](#); ESPCI, France.

QT05.05.03

Poster Spotlight: Magnetic Field Driven Metal-Insulator Transition in Bi₂Te₂Se Topological Insulators [Bushra Irfan](#); Aligarh Muslim University, India.

SESSION QT05.06: Functionalisation, Novel Physics and Chemical Properties I

Session Chairs: Paolo Bondavalli, Guy Lelay and Alessandro Molle

Wednesday Morning, May 11, 2022

Hawai'i Convention Center, Level 3, 302A

8:30 AM *QT05.06.01

2D Magnets with High Mobility [Nitish Mathur](#); Princeton University, United States.

9:00 AM QT05.06.02

Two-Dimensional Type-I, II and III Topological Dirac Semimetals in Group IV Transition Metal Ditelluride Family [Sotirios Fragkos](#)^{1,2}; ¹NCSR Demokritos, Greece; ²University of West Attica, Greece.

9:15 AM *QT05.06.03

Visualization of Topological States of Matter Using Microwave Impedance Microscopy [Monica Allen](#); University of California, San Diego, United States.

9:45 AM BREAK

10:15 AM *QT05.06.04

Chemical, Electrochemical, and Strain Modifications of Two-Dimensional Layers and Heterostructures [Daniel K. Bediako](#); University of California, Berkeley, United States.

10:45 AM QT05.06.05

Towards a More Accurate Determination of Thermoelectric Properties of Bi₂Se₃ Epifilms by Suspension via Micromachining Techniques [Donguk Kim](#); Seoul National University, Korea (the Republic of).

SESSION QT05.07: Functionalisation, Novel Physics and Chemical Properties II

Session Chairs: Paolo Bondavalli, Guy Lelay and Alessandro Molle

Wednesday Afternoon, May 11, 2022

Hawai'i Convention Center, Level 3, 302A

1:30 PM QT05.07.01

Nonlinear Analysis of 2D Topological Maxwell Lattices [Ian T. Frankel](#); UCSD, United States.

1:45 PM QT05.05.01

Poster Spotlight: Magnetic Field Driven Metal-Insulator Transition in Bi₂Te₂Se Topological Insulators [Bushra Irfan](#); Aligarh Muslim University, India.

1:50 PM QT05.05.02

Poster Spotlight: Topological Insulator and Artificial Crystals for Hydro-Elastic Waves [Federigo Ceraudo](#); ESPCI, France.

1:55 PM QT05.05.03

Poster Spotlight: The Search for Persistent Currents on Doped 2D Dichalcogenide Platelets [Timothy W. Carlson](#); Wake Forest University, United States.

SESSION QT05.08: 2D Topological Matter

Session Chairs: Paolo Bondavalli and Adriana Figueroa

Monday Morning, May 23, 2022

QT05-Virtual

8:00 AM *QT05.08.01

Atomic-Resolution Real-Space Tracking of Structural Phase Transformations in 2D Quantum Materials [Elisabeth Bianco](#); Cornell University, United States.

8:30 AM *QT05.08.02

Quantum Systems Based on Two-Dimensional Semiconductors [Amalia Patane](#); University of Nottingham, United Kingdom.

9:00 AM *QT05.08.03

Transversal Transport Coefficients and Topological Properties [Ingrid Mertig](#); MLU Halle, Germany.

9:30 AM *QT05.08.04

Orbital Engineering of Atomic Monolayers as Quantum Spin Hall Insulators [Ralph Claessen](#)^{1,2}; ¹Julius-Maximilians-Universität Würzburg, Germany; ²Julius-Maximilians-Universität Würzburg, Germany.

SESSION QT05.09: 2D Topological Materials—Growth, Theoretical Models and Applications I

Session Chairs: Paolo Bondavalli and Judy Cha

Monday Afternoon, May 23, 2022
QT05-Virtual

1:00 PM *QT05.09.01

Catalogues of Flat, Obstructed, and Topological Bands in Electron and Phonon Systems [Bogdan A. Bernevig](#); Princeton University, United States.

1:30 PM QT05.09.02

Co-Deposition of Bismuth and Nitrogen on Different Substrates Using Molecular Beam Epitaxy [Ashok Shrestha](#); Ohio University, United States.

1:45 PM QT05.09.03

Uncovering Hydrodynamic Transport in Topological Semimetals [Yaxian Wang](#); Harvard University, United States.

2:00 PM QT05.09.04

Dynamics Analysis of Topological Bistable Maxwell Lattices [Haning Xiu](#); Brigham and Women's Hospital/Harvard Medical School, United States.

2:15 PM *QT05.09.05

Signatures of Smaller Magic Angles in Twisted Bilayer Graphene [Jennifer Cano](#); Stony Brook University, United States.

SESSION QT05.10: 2D Topological Materials—Growth, Theoretical Models and Applications II
Session Chair: Judy Cha
Wednesday Morning, May 25, 2022
QT05-Virtual

8:00 AM *QT05.10.01

Beyond Silicene, from Germanene to Plumbene [Junji Yuhara](#); Nagoya University, Japan.

8:30 AM QT05.10.02

Influence of Te Composition on Magneto-Transport Behavior of the Bi₂Te₃ Thin Films Co-Sputtered on Si (100) [Lalit Pandey](#); Indian Institute of Technology Delhi, India.

8:45 AM *QT05.10.03

Direct Synthesis of 1T' WSe₂ Nanosheets [Cecilia Mattevi](#); Imperial College London, United Kingdom.

9:15 AM *QT05.06.06

Van der Waals Magnetic Topological Insulators (MnX₂Te₄)(X₂Te₃)_n, n = 0–3, X = Bi, Sb: Materials Optimization Towards Higher Ordering Temperatures [Anna Isaeva](#)^{1,2}; ¹University of Amsterdam, Netherlands; ²Leibniz Institute for Solid State and Materials Research Dresden, Germany.

SYMPOSIUM QT06

Recent Developments on the Properties of Emergent Layered 2D Quantum Magnetic Materials and Heterostructures
May 9 - May 23, 2022

Symposium Organizers

Angela Hight Walker, National Institute of Standards and Technology
Liqin Ke, Ames Laboratory
Je-Geun Park, Seoul National University
Srinivasa Rao Singamaneni, The University of Texas at El Paso

* Invited Paper

SESSION QT06.01: Spin Dynamics and Excitations
Session Chairs: Yafei Ren and Srinivasa Rao Singamaneni
Monday Afternoon, May 9, 2022
Hawai'i Convention Center, Level 3, 306A

1:30 PM *QT06.01.01

Ultrafast Spin Dynamics in 2D Antiferromagnets Xiao-Xiao Zhang; University of Florida, United States.

2:00 PM *QT06.01.02

Ambient-Stable 2D Transition Metal Halides via Organic-Inorganic Encapsulation Vinod K. Sangwan; Northwestern University, United States.

2:30 PM QT06.01.03

Magnons and Electromagnons in Dirac Antiferromagnet CoTiO_3 Rolando Valdes Aguilar; The Ohio State Univ, United States.

2:45 PM QT06.01.04

Magnon-Phonon Hybridization in a 2D Antiferromagnet MnPSe_3 Angela Hight Walker; National Institute of Standards and Technology, United States.

3:00 PM QT06.01.05

Self-Consistently Renormalized Spin-Wave Theory of Magnetic Two-Dimensional van der Waals Materials Liqin Ke; Ames Laboratory, United States.

3:15 PM BREAK

3:45 PM *QT06.01.06

The Magnetic Hamiltonians for the Layered Transition Metal- PS_3 Antiferromagnets Andrew Wildes; Inst Laue-Langevin, France.

4:15 PM QT06.01.07

Spin-Lattice Interaction in Two-Dimensional CrI_3 Computed from First Principles Anna Delin; KTH Royal Inst of Technology, Sweden.

4:30 PM QT06.01.08

Outcomes of Reduced Graphene Oxide on the Magnetic Properties of Barium Hexaferrite Deepak Basandraj; Lovely Professional University, India.

SESSION QT06.02: Exploration, Application, and Outlook

Session Chairs: Kenneth Burch and Liqin Ke

Tuesday Morning, May 10, 2022

Hawai'i Convention Center, Level 3, 306A

8:30 AM *QT06.02.01

Artificial Intelligence Guided Studies of Two-Dimensional Magnets Trevor D. Rhone; Rensselaer Polytechnic Institute, United States.

9:00 AM *QT06.02.02

Ferromagnetic 2D Materials Andrew T. Wee; National Univ of Singapore, Singapore.

9:30 AM BREAK

10:00 AM *QT06.02.03

Proximity Effect in the Heterostructures with 2D Magnetic Materials MC Wang; National Taiwan Univ, Taiwan.

10:30 AM QT06.02.04

Observation of Magnetic Proximity Effects in $\text{MoSe}_2/\text{CrBr}_3$ van der Waals Heterostructures Junho Choi; Los Alamos National Laboratory, United States.

10:45 AM QT06.02.05

Chemical Exfoliation and Magnetic Study of 2D VOCl [Graciela V. Villalpando](#); Princeton, United States.

SESSION QT06.03: Topological Magnetic Materials
Session Chairs: Angela Hight Walker and Xiao-Xiao Zhang
Tuesday Afternoon, May 10, 2022
Hawai'i Convention Center, Level 3, 306A

1:30 PM *QT06.03.01

Magnetic Interactions and Defects in Magnetic Topological Insulators [Rob McQueeney](#)^{1,2}; ¹Iowa State University, United States; ²Ames Laboratory, United States.

2:00 PM *QT06.03.02

Phonon Magnetic Moment and Chirality—Electronic Geometrical Phase Effect [Yafei Ren](#); University of Washington, United States.

2:30 PM *QT06.03.03

Magnetism on 2D Honeycomb and Kagome Lattices: CoPS₃ and YMn₆Sn₆ [Rebecca Dally](#); National Institute of Standards and Technology, United States.

3:00 PM BREAK

3:30 PM QT06.03.04

Long-Range Nuclear Magnetic Ordering in Nanoconfined H₂ at High Temperatures [Lui R. Terry](#); Univ of Bristol, United Kingdom.

3:45 PM *QT06.03.05

Axial Higgs Mode Detected by Quantum Pathway Interference in a 2D Material [Kenneth Burch](#); Boston College, United States.

SESSION QT06.04: Transport
Session Chairs: Liqin Ke and Je-Geun Park
Wednesday Morning, May 11, 2022
Hawai'i Convention Center, Level 3, 306A

8:30 AM *QT06.04.01

Recent Progress in Moiré Materials [Abhay Pasupathy](#)^{1,2}; ¹Columbia University, United States; ²Brookhaven National Laboratory, United States.

9:00 AM *QT06.04.02

Structural Phase Transformations and Nanoscale Magnetic Textures in the Layered Magnet CrSBr Revealed by Electron Microscopy [Julian Klein](#); Massachusetts Institute of Technology, United States.

9:30 AM QT06.04.03

Spontaneous Ferroelectric Polarization Tuned Magnon Transport in Multiferroic BiFeO₃ [Xiaoxi Huang](#); University of California Berkeley, United States.

9:45 AM QT06.04.04

Coupling between Magnetic Order and Charge Transport In a Two-Dimensional Magnetic Semiconductor [Xavier Roy](#); Columbia University, United States.

10:00 AM BREAK

10:30 AM *QT06.04.05

Electrical Control of a Layered Ferromagnetic Semiconductor [Goki Eda](#); National University of Singapore, Singapore.

11:00 AM QT06.04.06

Spin Injection in 2D Materials using Ferromagnetic Van der Waals Contacts [Soumya Sarkar](#); University of Cambridge, United Kingdom.

11:15 AM QT06.04.07

Structure–Property Correlations in Magnetic Two-Dimensional Intercalation Compounds [Samra Husremovic](#); University of California, Berkeley, United States.

SESSION QT06.05: Optics
Session Chairs: Angela Hight Walker and Srinivasa Rao Singamaneni
Wednesday Afternoon, May 11, 2022
Hawai'i Convention Center, Level 3, 306A

1:30 PM *QT06.05.01

Probing 2D Magnetism with Nanoscale Quantum Magnetometry [Brian Zhou](#); Boston College, United States.

2:00 PM QT06.05.02

Linear Polarized Photoluminescence from Crystalline Nanoflakes of NiPS₃ Antiferromagnet prepared by Wet-Chemical Synthesis [Vignesh Chandrasekaran](#); Los Alamos National Laboratory, United States.

2:15 PM QT06.05.03

Highly Chiral Quantum Light Emission in 2D Semiconductor/Magnet Heterostructures [Xiangzhi Li](#); Los Alamos National Laboratory, United States.

2:30 PM BREAK

3:00 PM QT06.05.04

WITHDRAWN 5/9/22 QT06.05.04 Layer-Dependent Refractive Index and Extinction Coefficient of Few-Layer CrI3 through In-Situ Optical Hyperspectral Imaging
Fernando Ramiro Manzano; Universitat de València, Spain.

3:15 PM *QT06.05.06

Exploring Few and Single Layer CrPS₄ with Near-Field Infrared Spectroscopy Janice Musfeldt; University of Tennessee, United States.

3:45 PM QT06.05.07

Photoluminescence Study of Fano Resonances in CrPS₄ Maurizio Riesner; University of Duisburg-Essen, Germany.

SESSION QT06.06: Ferromagnetic 2D Materials
Session Chairs: Angela Hight Walker and Liqin Ke
Monday Morning, May 23, 2022
QT06-Virtual

8:30 AM *QT06.06.01

Emergent 2D Ferromagnetism in MBE-Grown van der Waals Materials and Heterostructures Masaki Nakano^{1,2}; ¹University of Tokyo, Japan; ²RIKEN Center for Emergent Matter Science (CEMS), Japan.

9:00 AM QT06.06.02

Room Temperature Ferromagnetism in Organic Molecule-Intercalated Fe_{2.7}GeTe₂ Hector Iturriaga; The University of Texas at El Paso, United States.

9:15 AM QT06.06.03

Evolution of the Magnetic Properties of Bulk Fe_{2.7}GeTe₂ van der Waals Crystals with the Application of Hydrostatic Pressure Rubyann Olmos; University of Texas at El Paso, United States.

9:30 AM QT06.06.04

Half-Metallic Ferromagnetism in Layered 2D vdW Material CdOHCl Induced by Hole Doping and Electric Field Hrishit Banerjee; University of Cambridge, United Kingdom.

9:45 AM QT06.06.05

Proximity Control of Single Photon Emitting Heterointerfaces Steven T. Hartman; Los Alamos National Laboratory, United States.

10:00 AM *QT06.06.06

Collective Excitations in Two-Dimensional Magnetic Atomic Crystals and Moiré Superlattices Probed by Magneto-Raman Spectroscopy Liuyan Zhao; University of Michigan, United States.

SESSION QT06.07: Recent Developments on the Properties of Emergent Layered 2D Quantum Magnetic Materials and Heterostructures
Session Chairs: Liqin Ke and Srinivasa Rao Singamaneni
Monday Afternoon, May 23, 2022
QT06-Virtual

1:30 PM *QT06.07.01

Magnetic Imaging of Domain Walls and Surface Magnetism in Antiferromagnetic Topological Insulator MnBi₂Te₄ Weida Wu; Rutgers University New Brunswick, United States.

2:00 PM QT06.07.02

Fluence-Dependent Magnetic Properties of Proton Irradiated Antiferromagnets MPS₃ (M= Mn, Fe, and Ni) Samir A. Muniz; The University of Texas at El Paso, United States.

2:15 PM QT06.07.03

Trigonal Symmetry Reduction and Correlation Effects in 2D Transition Metal Dihalides MX₂ and Trihalides MX₃ Alexandru Georgescu; Northwestern University, United States.

2:30 PM *QT06.07.04

Exotic Magnons and Excitons in Quantum Two-Dimensional Magnets Probed by Terahertz and Optical Spectroscopies Jae Hoon Kim; Yonsei University, Korea (the Republic of).

3:00 PM QT06.07.05

Temperature-Dependent Raman Scattering, X-Ray Diffraction, and Magnetization Study of Phase Transitions in Layered Multiferroic CuCrP₂S₆ Michael A. Susner; Air Force Research Laboratory, United States.

SESSION QT06.08: Recent Developments on the Properties of Emergent Layered 2D Quantum Magnetic Materials and Heterostructures II
Session Chairs: Liqin Ke and Srinivasa Rao Singamaneni
Monday Afternoon, May 23, 2022
QT06-Virtual

4:00 PM *QT06.08.01

A Multimodal Approach to Illuminating Spin-Lattice Coupling Pathways in Layered Magnets Venkatraman Gopalan; The Pennsylvania State University, United States.

4:30 PM *QT06.08.02

Exploring the Limits of Magnetism in Two-Dimensional Materials Elton J. Santos^{1,2,3}; ¹The University of Edinburgh, United Kingdom; ²Higgs Centre for Theoretical Physics, United Kingdom; ³Institute for Condensed Matter and Complex Systems, United Kingdom.

VIRTUAL PRESENTATIONS ARE LISTED IN EASTERN TIME

Last Updated 5/18/22

SYMPOSIUM QT07

Atomic and Molecular Quantum Systems and Defect Engineering for Quantum Technologies
May 10 - May 24, 2022

Symposium Organizers

Chitrалеema Chakraborty, University of Delaware
Jeffrey McCallum, University of Melbourne
Andre Schleife, University of Illinois at Urbana-Champaign
Bruno Schuler, Empa - Swiss Federal Laboratories for Materials Science and Technology

* Invited Paper

SESSION QT07.01: Quantum Emitters in Diamond
Session Chair: Andre Schleife
Tuesday Morning, May 10, 2022
Hawai'i Convention Center, Level 3, 305B

8:30 AM *QT07.01.01

Point Defects in Semiconductors for Quantum Technologies [Chris G. Van de Walle](#); University of California, Santa Barbara, United States.

9:00 AM QT07.01.02

Hybrid Quantum Registers Based on Group IV Defects in Diamond [Katharina Senkalla](#); Quantum Optics, Ulm University, Germany.

9:15 AM QT07.01.03

Numerical Modeling of Multi-Defect Spin Dynamics in a Hyperfine Field [Christopher Ciccarino](#); Harvard University, United States.

9:30 AM QT07.01.04

Mechanical Control of a Single Nuclear Spin [Benjamin Pingault](#)^{1,2}; ¹Harvard University, United States; ²Delft University of Technology, Netherlands.

9:45 AM BREAK

10:30 AM *QT07.01.05

Spin Coherence and Control of Shallow Donors in Bulk ZnO and Single ZnO Nanowires [Kai-Mei Fu](#); University of Washington, United States.

11:00 AM QT07.01.06

Characterization of Color Centers Formed Under Extreme Conditions for Applications in Quantum Information Processing [Wei Liu](#); Lawrence Berkeley National Laboratory, United States.

11:15 AM QT07.01.07

Nanometer-scale Fabrication and Localization of Quantum Emitters in Diamond [Yuqin Duan](#)^{1,3}; ¹Massachusetts Institute of Technology, United States; ³Massachusetts Institute of Technology, United States.

SESSION QT07.02: Spin Qubits in Silicon Carbide
Session Chairs: Adam Gali and Jeffrey McCallum
Tuesday Afternoon, May 10, 2022
Hawai'i Convention Center, Level 3, 305B

1:30 PM *QT07.02.01

Creating Integrated Quantum Systems using Classical Silicon Carbide Devices [Christopher P. Anderson](#); University of Chicago, United States.

2:00 PM QT07.02.02

Electric-field Manipulation of Spin-defects in Ferroelectrics [Katherine Inzani](#); The University of Nottingham, United Kingdom.

2:15 PM QT07.02.03

Quantum Microscopy with a van der Waals Quantum Sensor [Alex Healey](#); University of Melbourne, Australia.

2:30 PM BREAK

SESSION QT07.03: Molecular Quantum Systems by Chemical Design
Session Chairs: Stephen Jesse and Jeffrey McCallum
Tuesday Afternoon, May 10, 2022
Hawai'i Convention Center, Level 3, 305B

3:30 PM *QT07.03.01

Chemical Synthesis for the Creation of Atomically Precise Qubits [Danna E. Freedman](#); Massachusetts Institute of Technology, United States.

4:00 PM QT07.03.02

Fundamental Mechanisms of Ultra-Low Loss Magnon Dynamics in Vanadium Tetracyanoethylene [Donley Cormode](#); The Ohio State University, United States.

4:15 PM QT07.03.03

Quantum Algorithms for the Dynamics of Molecular Quantum Systems [Kade Head-Marsden](#); Harvard University, United States.

4:30 PM *QT07.03.04

Electron Spin Resonance of Individual Spins on a Surface [Andreas Heinrich](#)^{1,2}; ¹Center for Quantum Nanoscience, Korea (the Republic of); ²Ewha Womans University, Korea (the Republic of).

SESSION QT07.04: Poster Session: Atomic and Molecular Quantum Systems and Defect Engineering for Quantum Technologies

Session Chairs: Chitraleema Chakraborty, Jeffrey McCallum and Andre Schleife

Tuesday Afternoon, May 10, 2022

5:00 PM - 7:00 PM

Hawai'i Convention Center, Level 1, Kamehameha Exhibit Hall 2 & 3

QT07.04.01

Magnetic Spectroscopy of the Silicon Vacancy Center in Diamond [Florian Frank](#); Ulm University, Germany.

QT07.04.02

The Origin of Antibunching in Resonance Fluorescence [Lukas Hanschke](#); Paderborn University, Germany.

QT07.04.03

Computational Modeling of Dyes for Excitonic Applications [Austin Biaggne](#); Boise State University, United States.

QT07.04.04

Active Space Wavefunction Methods for Defects in Solids [John P. Philbin](#); Harvard University, United States.

QT07.04.05

WITHDRAWN 5/6/22 QT07.04 Measurement of Current-induced Magnetic Fields in SiC Devices by Silicon Vacancy Quantum Sensor [Yuichi Yamazaki](#); National Institutes for Quantum Science and Technology, Japan.

SESSION QT07.06: Integrated Diamond Photonic Waveguides

Session Chairs: Andre Schleife and Nick Vamivakas

Wednesday Morning, May 11, 2022

Hawai'i Convention Center, Level 3, 305B

9:15 AM *QT07.06.01

Computational Materials Insights Into Solid-State Multiqubit Systems and Quantum Interfaces to Emitters at the Nanoscale [Prineha Narang](#); Harvard University, United States.

9:45 AM QT07.06.02

Diamond Nanophotonic Structures for Quantum Spin-Photon Interfaces [Nina Codreanu](#); Delft University of Technology, Netherlands.

10:00 AM QT07.06.03

Laser Inscription of Integrated Photonic Circuits in Diamond [Giulio Coccia](#); Politecnico di Milano, Italy.

10:15 AM BREAK

SESSION QT07.07: Quantum Emitters in 2D Transition Metal Dichalcogenides

Session Chairs: Igor Aharonovich and Jeffrey McCallum

Wednesday Morning, May 11, 2022

Hawai'i Convention Center, Level 3, 305B

10:45 AM QT07.07.01

Resonance Fluorescence from Waveguide-Coupled Strain-Localized Two-Dimensional Quantum Emitters [Eva Schöll](#)^{1,2}; ¹Paderborn University, Germany; ²KTH Royal Institute of Technology, Sweden.

11:00 AM QT07.07.02

Combined Theory and Scanning Tunnelling Experimental Study of Co-Filled Sulfur Vacancy in WS₂ [Geoffroy Hautier](#)^{2,1}; ¹University Catholique de Louvain, Belgium; ²Dartmouth College, United States.

SESSION QT07.08: Spin Qubits in Silicon Carbide from First Principles

Session Chairs: Kai-Mei Fu and Bruno Schuler

Wednesday Afternoon, May 11, 2022

Hawai'i Convention Center, Level 3, 305B

1:30 PM *QT07.08.01

Quantum Emitters in Three- and Two-Dimensional Materials [Adam Gali](#)^{2,3}; ²Wigner Research Centre for Physics, Hungary; ³Budapest University of Technology and Economics, Hungary.

2:00 PM QT07.08.02

Optical Properties of Vacancy-Related Qubit Centers in SiC [Michel G. Bockstedte](#); Johannes Kepler University, Austria.

2:15 PM QT07.08.03

First-Principles Study of Proton Irradiated Color Centers in 4H-SiC [Andre Schleife](#); University of Illinois at Urbana-Champaign, United States.

2:30 PM BREAK

SESSION QT07.09: Quantum Emitters in Boron Nitride

Session Chair: Bruno Schuler

Wednesday Afternoon, May 11, 2022

Hawai'i Convention Center, Level 3, 305B

3:30 PM QT07.09.02

Harnessing the Emission from the Quantum Emitters at a Twisted Interface of Hexagonal Boron Nitride [Cong Su](#)^{1,2}; ¹Lawrence Berkeley National Laboratory, United States; ²University of California, Berkeley, United States.

SESSION QT07.10: Generating Atomically-Precise Defects in 2D Materials

Session Chairs: Ute Kaiser and Bruno Schuler

Thursday Morning, May 12, 2022

Hawai'i Convention Center, Level 3, 305B

8:30 AM *QT07.10.01

Building Quantum Defects with Atomic Precision Using the Scanning Transmission Electron Microscope [Stephen Jesse](#); Oak Ridge National Laboratory, United States.

9:00 AM QT07.10.02

Near-infrared Quantum Emitters in 2D Semiconductor Heterobilayers [Huan Zhao](#); Los Alamos National Laboratory, United States.

9:15 AM QT07.10.03

Impact of Multiple Donors on NV⁻ Centers in Quantum Diamond [Dane W. DeQuilettes](#)^{1,2}; ¹Massachusetts Institute of Technology, United States; ²Lincoln Laboratory, Massachusetts Institute of Technology, United States.

9:30 AM BREAK

SESSION QT07.11: Solid-State Quantum Dot Emitters

Session Chairs: Chitrleema Chakraborty and Weibo Gao

Thursday Morning, May 12, 2022

Hawai'i Convention Center, Level 3, 305B

10:00 AM QT07.11.01

Stimulated Generation of Indistinguishable Single Photons from a Quantum Ladder System [Kai Müller](#); Technical University of Munich, Germany.

10:15 AM QT07.11.02

Decoherence Dynamics of Hole Spin Qubits in Self-Assembled Quantum Dots [Friedrich Sbresny](#); Technische Universität München, Germany.

10:30 AM QT07.11.04

A Markov Chain Monte Carlo Method for Statistically Meaningful Multi-Parameter Fits to Quantum Dot Spectroscopy Data [Prashant Ramesh](#); University of Delaware, United States.

SESSION QT07.12: Atomic and Molecular Quantum Systems and Defect Engineering for Quantum Technologies I

Session Chair: Chitrleema Chakraborty

Monday Morning, May 23, 2022

QT07-Virtual

8:00 AM *QT07.12.01

Dynamic widefield imaging with Color Defects in Diamond [Kasturi Saha](#); IIT Bombay, India.

8:30 AM QT07.12.02

Tailoring Quantum Oscillations of Excitonic Schrodinger's Cats as Qubits [Shouvik Datta](#); IISER-Pune, India.

8:45 AM QT07.12.03

Structural and Optical Characterization of Erbium-doped Anatase TiO₂ Thin Films on LaAlO₃ (001) [Kidae Shin](#); Yale University, United States.

9:00 AM QT07.12.04

Strain-Effects on Magnetism in Multidefect Graphene [Zubaer M. Hossain](#); University of Delaware, United States.

9:15 AM QT07.12.05

First Principle Characterization of the T-center — a Single Spin Quantum Emitter in Silicon [Oscar Balanca-Lindvall](#); Linköping University, Sweden.

9:30 AM QT07.12.06

Realisation of Electron-Spin-Pair Qubit in Diamond [Nicolas Demetriou](#); QuTech, Netherlands.

SESSION QT07.13: Atomic and Molecular Quantum Systems and Defect Engineering for Quantum Technologies II
Session Chair: Andre Schleife
Monday Afternoon, May 23, 2022
QT07-Virtual

4:00 PM QT07.13.01

Fabrication of Aligned Top Gates for Atomic Scale Dopant Devices [Pradeep Nambodiri](#); National Institute of Standards and Technology, United States.

4:15 PM QT07.13.02

Harnessing Polytypism for the Design of Point-Defects in SiC [Marco Govoni](#); Argonne National Laboratory, United States.

4:30 PM QT07.13.03

Understanding how Substrate and Intermolecular Interactions Influence the Properties of Supported Polyoxometalate Spin Qubits [Grant E. Johnson](#); Pacific Northwest National Laboratory, United States.

4:45 PM *QT07.13.04

Diamond Surface Functionalization for Nanoscale Magnetic Resonance Imaging and Spectroscopy [Nathalie P. de Leon](#); Princeton University, United States.

5:15 PM QT07.13.05

Electron Spin Decoherence Due to Phonons: Unified Many-Body Framework and First-Principles Calculations [Jinsoo Park](#); California Institute of Technology, United States.

5:30 PM QT07.13.06

Polaron Effects on the Optical Properties of Semiconductor Based Spin-Photon Interfaces [Leonard Ruocco](#); The University of British Columbia, Canada.

SESSION QT07.14: Atomic and Molecular Quantum Systems and Defect Engineering for Quantum Technologies III
Session Chair: Jeffrey McCallum
Monday Afternoon, May 23, 2022
QT07-Virtual

9:00 PM *QT07.14.01

Engineering Qubits in Silicon with Atomic Precision [Michelle Y. Simmons](#)^{1,2}; ¹University of New South Wales, Australia; ²Silicon Quantum Computing, Australia.

9:30 PM QT07.14.02

Theoretical Study of Spin Decoherence in Transition Metal Dichalcogenides [Taejoon Park](#); Ajou University, Korea (the Republic of).

9:45 PM QT07.14.03

Decoherence of Nitrogen-Vacancy Spin Ensembles in Diamond in the Nitrogen Electron-Nuclear Spin Bath [Huijin Park](#); Ajou university, Korea (the Republic of).

10:00 PM QT07.14.04

Extending the Coherence of Spin Qubits in Hexagonal Boron Nitride by Materials Engineering: A Cluster Expansion Theory [Hosung Seo](#); Ajou University, Korea (the Republic of).

10:15 PM *QT07.09.01

Quantum Defects in Hexagonal Boron Nitride - Origin and Applications [Igor Aharonovich](#); University of Technology-Sydney, Australia.

SESSION QT07.15: Atomic and Molecular Quantum Systems and Defect Engineering for Quantum Technologies IV
Session Chair: Chitrleema Chakraborty
Tuesday Morning, May 24, 2022
QT07-Virtual

8:00 AM *QT07.15.01

Localized Excitons in Two-Dimensional Transitional Metal Dichalcogenides [Sudipta Dubey](#); IIT Kanpur, India.

8:30 AM QT07.15.02

Antisite Defect Qubits in Monolayer Transition Metal Dichalcogenides [Jeng-Yuan Tsai](#); Temple University, United States.

8:45 AM QT07.15.03

The Role of Chalcogen Vacancies for Atomic Defect Emission in MoS₂ [Christoph Kastl](#); Technical University of Munich, Germany.

9:00 AM QT07.15.04

Creation of Single Photon Sources in WSe₂ Monolayers by Micrometer-Scaled Trenches [Xinxin Li](#)^{2,1}; ¹Argonne National Laboratory, United States; ²The University of Chicago, United States.

9:15 AM *QT07.15.05

VIRTUAL PRESENTATIONS ARE LISTED IN EASTERN TIME

Last Updated 5/18/22

Atomic Scale Imaging of Electron-Beam-Induced Structural, Chemical, and Number of Layer-Dependent Variations in 2D van der Waals Quantum Materials [Ute A. Kaiser](#); University of Ulm, Germany.

9:45 AM QT07.01.08

Voltage-Induced Modulation in the Charge State of Si-Vacancy Defects in Diamond using High Voltage Nanosecond Pulses [Steve Cronin](#); Univ of Southern California, United States.

SYMPOSIUM QT08

Group IV Quantum Engineering
May 9 - May 25, 2022

Symposium Organizers

Susan Coppersmith, University of New South Wales
Oussama Moutanabbir, Ecole Polytechnique de Montreal
Douglas Paul, University of Glasgow
Giordano Scappucci, TU Delft University of Technology

* Invited Paper

SESSION QT08.01: Si/SiGe Quantum Information Processing
Session Chairs: Susan Coppersmith and Oussama Moutanabbir
Monday Morning, May 9, 2022
Hawai'i Convention Center, Level 3, 305A

8:00 AM *QT08.01.01

Valley and Qubit States in a Si/SiGe Quantum Dot with a Spatially-Modulated Ge Concentration [Mark A. Eriksson](#); Univ of Wisconsin-Madison, United States.

8:30 AM *QT08.01.02

Tomography of Universal Two-Qubit Logic Operations in Exchange-Coupled Donor Electron Spin Qubits [Holly G. Stemp](#); University of New South Wales, Australia.

9:00 AM QT08.01.04

Field-Effect-Driven Synthetic Rashba Spin-Orbit Coupling in *n*-Si Metal-Oxide Semiconductor [Soobeom Lee](#)^{1,4}; ¹Kyoto University, Japan; ⁴Daegu Gyeongbuk Institute of Science and Technology, Korea (the Republic of).

9:15 AM QT08.01.05

Transition Metal Impurities in Silicon—A Computation Search for Semiconductor Qubits [Cheng-Wei Lee](#)^{1,2}; ¹Colorado School of Mines, United States; ²National Renewable Energy Laboratory, United States.

9:30 AM BREAK

SESSION QT08.02: Superconducting Quantum Information Processing
Session Chair: Mark Eriksson
Monday Morning, May 9, 2022
Hawai'i Convention Center, Level 3, 305A

10:30 AM *QT08.02.01

Tuning Andreev Bound States Using a Quantum Dot Embedded in a Superconducting Qubit [Angela Kou](#); University of Illinois at Urbana-Champaign, United States.

11:00 AM *QT08.02.02

Enhancing Coherence Properties of Superconducting Quantum Circuits via Materials Engineering [Yvonne Gao](#); National University of Singapore, Singapore.

11:30 AM QT08.02.03

Superconducting Proximity Effect in Planar Germanium [Alberto Tosato](#); QuTech, Netherlands.

11:45 AM QT08.02.04

Fabrication of Aluminum-Silicon-Aluminum Junctions on Si Fins—Towards Fin Based Merged Element Transmons – FinMET [Aranya Goswami](#); University of California, Santa Barbara, United States.

SESSION QT08.03: Photonic Quantum Information Techniques
Session Chairs: Yvonne Gao and Angela Kou
Monday Afternoon, May 9, 2022
Hawai'i Convention Center, Level 3, 305A

1:30 PM *QT08.03.01

Ge-on-Si Single-Photon Avalanche Diode Detectors for Short-Wave Infrared Wavelengths [Gerald Buller](#); Heriot-Watt University, United Kingdom.

2:00 PM QT08.03.02

First Principles Study of the T-Center in Silicon [Yihuang Xiong](#); Dartmouth College, United States.

2:15 PM BREAK

SESSION QT08.04: Semiconductor Quantum Information Techniques
Session Chairs: Gerald Buller and Holly Stemp
Monday Afternoon, May 9, 2022
Hawai'i Convention Center, Level 3, 305A

2:45 PM QT08.04.01

Atomic Precision Patterning and Alignment for Dopant-Based Quantum Devices [James H. Owen](#); Zyvex Labs LLC, United States.

3:00 PM QT08.04.02

Electric-Dipole Spin Resonance for Light-Holes in Germanium Quantum Well [Patrick Del Vecchio](#); Polytechnique Montréal, Canada.

3:15 PM QT08.04.03

Molecular Beam Epitaxy Grown SiGe Heterostructures for Ge Based Quantum Devices [Chomani K. Gaspe](#); Laboratory for Physical Sciences, United States.

3:30 PM QT08.04.04

Magnetotransport Characterization of P-Type, Gated Ge Quantum Wells Grown by Molecular Beam Epitaxy with Epitaxial Al Contacts [Joshua P. Thompson](#)^{1,2};

¹University of Arkansas, United States; ²Laboratory for Physical Sciences, United States.

SESSION QT08.05: Group IV Quantum Engineering
Session Chair: Oussama Moutanabbir
Wednesday Morning, May 25, 2022
QT08-Virtual

8:00 AM *QT08.05.01

Germanium Heterostructures Hosting Spin Qubit and High-Transparency JoFET Devices [Andrea Hofmann](#)^{1,2}; ¹Universität Basel, Switzerland; ²IST Austria, Austria.

8:30 AM *QT08.05.02

Broad Diversity of Near-Infrared Single-Photon Emitters in Silicon [Anais Dreau](#); CNRS & University of Montpellier, France.

9:00 AM *QT08.05.03

First-Principles Hyperfine Tensors and Pseudospin-Electric Coupling for Holes in GaAs and Silicon [Stefano Chesi](#); Beijing Computational Science Research Center, China.

9:30 AM *QT08.01.03

Quantum Information Processing Using Dopants in Silicon MOS Compatible Devices [Eva Dupont-Ferrier](#)^{1,2}; ¹Université de Sherbrooke, Canada; ²Institut Quantique, Canada.

SYMPOSIUM QT09

Light-Matter Strong Coupling in the Infrared and THz—Materials, Methods and New Phenomena
May 11 - May 25, 2022

Symposium Organizers

Hatice Altug, École Polytechnique Fédérale de Lausanne
Lauren Buchanan, Vanderbilt University
Joshua Caldwell, Vanderbilt University
Thomas Folland, University of Iowa

* Invited Paper

SESSION QT09.01: Poster Session: Light-Matter Strong Coupling in the Infrared and THz—Materials, Methods and New Phenomena
Session Chairs: Hatice Altug and Lauren Buchanan
Wednesday Afternoon, May 11, 2022
5:00 PM - 7:00 PM
Hawai'i Convention Center, Level 1, Kamehameha Exhibit Hall 2 & 3

QT09.01.01

Vibrational Strong Coupling in Nanoscale Hyperbolic Phonon Polariton Cavities [Alisa Shmidt](#)^{5,1}; ¹Vanderbilt University, United States; ⁵Vanderbilt University, United States.

QT09.01.02

Exploring the Effects of Vibrational Strong Coupling on Supramolecular Chemistry—Perylene Crystallization in a Fabry-Perrot Cavity [Federico Modesti](#); BASF SE, Germany.

SESSION QT09.02: Vibrational Strong Coupling
Session Chairs: Lauren Buchanan and Joshua Caldwell
Thursday Afternoon, May 12, 2022
Hawai'i Convention Center, Level 3, 305A

1:30 PM *QT09.02.01

Semi-Empirical Quantum Optics for Mid-Infrared Molecular Nanophotonics [Felipe Herrera](#); Universidad de Santiago de Chile, Chile.

2:00 PM QT09.02.02

Vibrational Strong Coupling in Direct Laser Printed Plasmonic MIM Nanopatch Antennas [Nicholas Proscia](#); U.S. Naval Research Laboratory, United States.

2:15 PM QT09.02.03

The Investigation of Polariton Reflection Phase in Hexagonal Boron Nitride [Siyuan Dai](#); Auburn University, United States.

2:30 PM BREAK

3:00 PM *QT09.02.05

Molecular Polaritons—Modulation, Impact on Chemistry and Modeling Their Density of States [Blake S. Simpkins](#); Naval Research Laboratory, United States.

3:30 PM QT09.02.06

Cavity-Modified Unimolecular Dissociation Reactions via Intramolecular Vibrational Energy Redistribution [Derek Wang](#); Harvard University, United States.

3:45 PM QT09.02.07

s-SNOM Imaging and Spectroscopy for Nanoscale Characterisation of Light-Matter Strong Coupling in the Infrared [Artem Danilov](#); Attocube Systems AG, Germany.

4:00 PM *QT09.02.08

Vibrational Polaritonics: Nonlinear Optics and Prospects of Condensation [Joel Yuen-Zhou](#); University of California, San Diego, United States.

SESSION QT09.03: Electronic Strong Coupling
Session Chairs: Lauren Buchanan and Joshua Caldwell
Friday Morning, May 13, 2022
Hawai'i Convention Center, Level 3, 305A

8:30 AM QT09.03.01

Highly Non-Linear Interlayer Exciton-Polaritons in Bilayer MoS₂ [Biswajit Datta](#); City university of New York, United States.

8:45 AM QT09.03.02

Cooperativity and Ultrastrong Coupling in Terahertz Metasurfaces [Zizwe Chase](#); University of Illinois at Chicago, United States.

9:00 AM *QT09.03.03

Singlet Fission Dynamics Under Strong Light-Matter Coupling [Clàudia Climent](#); University of Pennsylvania, United States.

9:30 AM BREAK

10:00 AM QT09.03.04

Nonequilibrium Spin-Orbital Dynamics in Mott Insulator YTiO₃ [Jonathan Curtis](#); Harvard University, United States.

10:15 AM *QT09.03.05

Exciton-Polaritons in 2D Semiconductors [Vinod Menon](#)^{1,2}; ¹The City College of New York, United States; ²CUNY Graduate Center, United States.

SESSION QT09.04: Strong Coupling and Nanoscale Cavities

Session Chairs: Lauren Buchanan and Joshua Caldwell

Friday Afternoon, May 13, 2022

Hawai'i Convention Center, Level 3, 305A

1:30 PM *QT09.04.01

Ultrastrong Coupling Phenomena in Extreme-Scale Resonant Nanocavities [Mingze He](#); Vanderbilt University, United States.

2:00 PM QT09.04.02

Development of an On-Chip THz Spectrometer with Metamaterial Waveguides [James Seddon](#); University College London, United Kingdom.

2:15 PM *QT09.04.03

Ultrastrong Light-Matter Coupling—Engineering Electronic Wavefunctions with Single Photons [Simone De Liberato](#); University of Southampton, United Kingdom.

SESSION QT09.05: Light-Matter Strong Coupling in the Infrared and THz—Materials, Methods and New Phenomena

Session Chair: Thomas Folland

Wednesday Afternoon, May 25, 2022

QT09-Virtual

4:00 PM *QT09.05.01

Enhanced Interactions Between Exciton-Polaritons in Semiconductor Microcavities [Meera Parish](#); Monash University, Australia.

4:30 PM *QT09.02.04

Nanoparticle Supercrystals for (Ultra)Strong Light-Matter Coupling [Stephanie Reich](#); Freie Universitaet Berlin, Germany.

5:00 PM QT09.05.03

Strong Light-Matter Interaction and Its Applications in Nonlinear and Quantum Optics [Davis Dave Welakuh Mbangheku](#); Harvard School of Engineering, United States.

5:15 PM QT09.05.04

Adiabatic Compression of Mid-IR Through THz Light in Diamond-Metal Campanile Probe for Ultrawide Spectral Range Nanospectroscopy [Rajasekhar Medapalli](#); Lancaster University, United Kingdom.

5:30 PM *QT09.05.02

Excitons and Polaritons in van der Waals Heterostructures [Hui Deng](#); Univ of Michigan, United States.

SYMPOSIUM QT10

Emerging Phenomena in Moiré Materials
May 10 - May 23, 2022

Symposium Organizers

Dmitri Efetov, Institut de Ciències Fotòiques
Jia Leo Li, Brown University
Giulia Pacchioni, Nature Reviews Materials
Matthew Yankowitz, University of Washington

* Invited Paper

SESSION QT02.02/QT10.03: Joint Session: Emerging Phenomena in Moiré Graphene Systems
Session Chairs: Ryan Need and Giulia Pacchioni
Wednesday Morning, May 11, 2022
Hawai'i Convention Center, Level 3, 305A

8:00 AM *QT02.02/QT10.03.01
Superconductivity at Magnetic Phase Transitions in Crystalline Graphene Allotropes [Andrea F. Young](#); University of California, Santa Barbara, United States.

8:30 AM *QT02.02/QT10.03.02
Correlated Electron States in Twisted Multilayer Graphene [Philip Kim](#); Harvard University, United States.

9:00 AM *QT02.02/QT10.03.03
Correlations, Topology and Unconventional Superconductivity in Magic Angle Twisted Bilayer Graphene [Ali Yazdani](#); Princeton University, United States.

9:30 AM *QT02.02/QT10.03.04
TBG=Topological Heavy Fermions [Bogdan A. Bernevig](#); Princeton University, United States.

10:00 AM BREAK

SESSION QT10.01: Magnetism and Symmetry Breaking in Moiré Systems
Session Chair: Matthew Yankowitz
Tuesday Morning, May 10, 2022
Hawai'i Convention Center, Level 3, 305A

9:00 AM QT10.01.02
Twisted Bilayer Dirac Spin Liquid [Zhu-Xi Luo](#); University of California, Santa Barbara, United States.

9:15 AM BREAK

9:45 AM *QT10.05.01
The Magic of Moiré Quantum Matter [Pablo Jarillo-Herrero](#); MIT, United States.

SESSION QT10.02: Moiré Phenomena in Transition Metal Dichalcogenides
Session Chairs: Jia Leo Li and Matthew Yankowitz
Tuesday Afternoon, May 10, 2022
Hawai'i Convention Center, Level 3, 305A

1:30 PM QT10.02.01
Twist Angle Controls Interlayer Exciton Lifetimes in van der Waals Heterostructures [Matthias Florian](#)^{3,1}; ¹University of Michigan–Ann Arbor, United States; ³University of Bremen, Germany.

1:45 PM QT10.02.02
Moiré-Localized Interlayer Exciton Visualized by Time- and Angle-Resolved Photoemission Spectroscopy [Ouri Karni](#); Stanford University, United States.

2:00 PM QT10.02.03
Pressuring-Tuning of Moiré Phonons in MoS₂/WSe₂ Heterostructures [Luiz G.P. Martins](#); MIT, United States.

2:15 PM QT10.02.04
Visualizing Moiré Excitons in WS₂/WSe₂ Heterostructures Using Low-Loss EELS [Sandhya Susarla](#); Lawrence Berkeley National Laboratory, United States.

2:30 PM *QT10.02.05

Twisted van der Waals Heterostructures with Real Time Control [Cory Dean](#); Columbia University, United States.

SESSION QT10.04: Imaging and Characterization
Session Chairs: Jonah Herzog-Arbeitman and Giulia Pacchioni
Wednesday Morning, May 11, 2022
Hawai'i Convention Center, Level 3, 305A

10:30 AM QT10.04.02

Twist Angle Dependent Strain Distribution in Stacked Transition Metal Dichalcogenide and Charge Density Mapping [Yunyeong Chang](#); Seoul National University, Korea (the Republic of).

10:45 AM QT10.04.03

WITHDRAWN 5/9/22 QT10.04.03 Mapping Strain in Moiré Materials with Interferometric Scanning Transmission Electron Microscopy [Isabel Craig](#); UC Berkeley, United States.

11:00 AM *QT10.04.04

Electron Correlation and Coupling with Phonon in an ABC Trilayer Graphene/hBN Moire Superlattice [Long Ju](#); Massachusetts Institute of Technology, United States.

SESSION QT10.05: Superconductivity in Moiré Systems
Session Chair: Bogdan Bernevig
Thursday Morning, May 12, 2022
Hawai'i Convention Center, Level 3, 305A

8:30 AM QT10.05.02

Probing Superconductivity in Magic Angle Twisted Trilayer Graphene with Artificial Josephson Junctions [Zeyu Hao](#); Harvard University, United States.

8:45 AM QT10.05.03

Twisted Bilayer Graphene at 2π Flux—Magnetic Bloch Theorem and Reentrant Correlated Insulators [Jonah Herzog-Arbeitman](#); Princeton University, United States.

9:00 AM *QT10.05.04

Evidence for Flat Band Dirac Superconductor Originating from Quantum Geometry [Chun Ning \(Jeanie\) Lau](#); The Ohio State University, United States.

9:30 AM *QT10.05.05

Collective Charge Fluctuations and Superconductivity in Twisted Bilayer Graphene and Related Materials [Francisco Guinea](#); IMDEA Materials Institute, Spain.

SESSION QT10.06: Emerging Phenomena in Moiré Systems I
Session Chair: Giulia Pacchioni
Monday Morning, May 23, 2022
QT10-Virtual

8:00 AM *QT10.06.01

Imaging Chern Mosaic and Berry-Curvature Magnetism in Magic-Angle Graphene [Eli Zeldov](#); Weizmann Institute of Science, Israel.

8:30 AM *QT10.06.02

Quantum Anomalous Hall Effect in Semiconductor Moiré Structures [Jie Shan](#); Cornell University, United States.

9:00 AM *QT10.06.03

WITHDRAWN 5/17/22 QT10.06.03 Imaging and Control of Wigner Crystal in Transition Metal Dichalcogenide Moire Superlattices [Feng Wang](#); Univ of California-Berkeley, United States.

9:30 AM QT10.06.04

Spectroscopy of Twisted Bilayer Graphene Correlated Insulators [Dumitru Calugaru](#); Princeton University, United States.

SESSION QT10.07: Emerging Phenomena in Moiré Systems II
Session Chair: Jia Leo Li
Monday Morning, May 23, 2022
QT10-Virtual

10:30 AM *QT10.07.01

From Strong Coupling Superconductivity to Fractionalization in Moire Materials [Ashvin Vishwanath](#); Harvard University, United States.

11:00 AM *QT10.07.02

Flavor Ferromagnetism and Superconductivity in Graphene Multilayers [Allan MacDonald](#); The University of Texas at Austin, United States.

11:30 AM QT10.04.01

Measuring Local Structural Distortions and Interlayer Spacings of 2D Moiré Materials by Interferometric 4D-STEM [Michael Zachman](#); Oak Ridge National Laboratory, United States.

VIRTUAL PRESENTATIONS ARE LISTED IN EASTERN TIME

Last Updated 5/18/22

SYMPOSIUM QT11

Superconducting Materials and Applications
May 9 - May 24, 2022

Symposium Organizers

Valeria Braccini, CNR - SPIN
Kazumasa Iida, Nagoya Univ
Qiang Li, Stony Brook University/Brookhaven National Laboratory
Paolo Mele, Shibaura Institute of Technology

* Invited Paper

SESSION QT11.02: Novel Superconductors
Session Chairs: Genda Gu and Jeong Min Park
Monday Afternoon, May 9, 2022
Hawai'i Convention Center, Level 3, 304A

1:30 PM *QT11.02.01
Superconductivity Near a Polar Instability in Incipient Ferroelectrics [Kaveh Ahadi](#); North Carolina State University, United States.

2:00 PM QT11.02.02
Double Dome Superconductivity in Kagome Metal $\text{CsV}_3\text{Sb}_5\text{xSn}_x$ [Yuzki M. Oey](#); UC Santa Barbara, United States.

2:15 PM QT11.02.03
Controllable Phase Slips in 3D Superconducting Diamond Microstructures [Georgina M. Klemencic](#); Cardiff University, United Kingdom.

2:30 PM BREAK

3:00 PM QT11.02.04
Photoreactions Create Superconducting Materials! [Dmitri Kilin](#); North Dakota State University, United States.

3:15 PM QT11.02.05
High Magnetic Field Probe of Novel Hydride Superconductors [Fedor Balakirev](#); Los Alamos National Laboratory, United States.

SESSION QT11.03: Topological Superconductors, Theory and Electronics
Session Chairs: Kaveh Ahadi and Qiang Li
Tuesday Morning, May 10, 2022
Hawai'i Convention Center, Level 3, 304A

8:30 AM *QT11.03.01
The Magic Family of Twisted Graphene Superlattices [Jeong Min Park](#); Massachusetts Institute of Technology (MIT), United States.

9:00 AM *QT11.03.02
Exploration of Topological Superconductors and Majorana Fermions [Takao Sasagawa](#); Tokyo Institute of Technology, Japan.

9:30 AM *QT11.03.03
Searching for Ideal Topological Crystalline Insulators and Topological Superconductors in Pb-Sn-In-Te System [Genda Gu](#); BNL, United States.

10:00 AM QT11.03.05
On Dimer Fluctuations and Phase Separation at the Dimer-Superconductor Transition in $\text{Ir}_{1-x}(\text{Pt/Rh})_x\text{Te}_2$ [Emil Bozin](#); Brookhaven National Laboratory, United States.

10:15 AM QT11.03.06
Investigation into Lattice Matching $\text{Nb}_x\text{Ti}_{1-x}\text{N}/\text{AlN}/\text{Nb}_x\text{Ti}_{1-x}\text{N}$ Josephson Junctions Using PAMBE [Austin Thomas](#)^{1,2}; ¹University of Maryland, United States; ²Laboratory for Physical Sciences, United States.

SESSION QT11.05: Nickelates Superconductors
Session Chairs: Harold Hwang and Jacques Noudem
Tuesday Afternoon, May 10, 2022
Hawai'i Convention Center, Level 3, 304A

2:00 PM *QT11.05.01

Superconductivity in Infinite-Layer Nickelates [Harold Y. Hwang](#)^{1,2}; ¹Stanford University, United States; ²SLAC National Accelerator Laboratory, United States.

2:30 PM QT11.05.02

Superconducting Quintuple-Layer Square-Planar Nickelates—Superconducting and Electronic Properties (Part I) [Grace A. Pan](#); Harvard University, United States.

2:45 PM QT11.05.03

Superconducting Quintuple-Layer Square-Planar Nickelates—Synthetic Strategies and Challenges (Part II) [Dan Ferenc Segedin](#); Harvard University, United States.

3:00 PM BREAK

3:30 PM QT11.05.04

Crystallinity Improvements in Infinite-Layer Nickelates—A Look at the Intrinsic Superconducting Phase Diagram [Kyuhoo Lee](#); Stanford University, United States.

3:45 PM QT11.05.05

Revealing the Role of the Interface for Superconductivity in Infinite-Layer Nickelate Films [Berit H. Goodge](#)^{1,3}; ¹Cornell University, United States; ³Cornell University, United States.

SESSION QT11.06: Poster Session: Superconductivity

Session Chairs: Valeria Braccini and Paolo Mele

Tuesday Afternoon, May 10, 2022

5:00 PM - 7:00 PM

Hawai'i Convention Center, Level 1, Kamehameha Exhibit Hall 2 & 3

QT11.06.01

The Hydrogenated Palladium–Gold Amorphous Alloys—An *Ab Initio* Computer Simulation of Their Structural and Electronic Properties [Alejandro de León Piña](#); Universidad Nacional Autónoma de México, Mexico.

QT11.06.02

Superconductivity in Amorphous Bismuth at Negative Pressures [Flor B. Quiroga Bañuelos](#); Instituto de Investigaciones en Materiales, UNAM, México, Mexico.

QT11.06.03

Ultrafast Light-Induced Lifshitz Transition in High T_c Superconductor Cuprates [Lukas Hellbrück](#)^{1,2,3}; ¹École Polytechnique Fédérale de Lausanne, Switzerland; ²École Polytechnique Fédérale de Lausanne, Switzerland; ³École Polytechnique Fédérale de Lausanne, Switzerland.

QT11.06.04

A McMillan Approach to the Superconductivity of Computer Simulated Amorphous Cu_xZr_{1-x} Alloys [Salvador Villarreal](#); Instituto de Investigaciones en Materiales, UNAM, Mexico.

QT11.06.05

Magnetotransport Measurements of Superconducting $CaMg_2H$ at High Pressure [Krista L. Sawchuk](#); Los Alamos National Laboratory, United States.

QT11.06.06

Superconducting Ground State of the Topological Superconducting Candidates Ti_3X ($X = Ir, Sb$) [Manasi Mandal](#)^{1,2}; ¹Massachusetts Institute of Technology, United States; ²Indian Institute of Science Education and Research Bhopal, India.

QT11.06.07

Superconductivity Induced in WB_2 by the Formation of Metastable Planar Defects [Ajinkya Hire](#)^{1,6}; ¹University of Florida, United States; ⁶University of Florida, United States.

SESSION QT11.07: High- T_c Superconductors Applications

Session Chairs: Andrea Malagoli and Martin Rupich

Wednesday Morning, May 11, 2022

Hawai'i Convention Center, Level 3, 304A

8:30 AM *QT11.07.01

Behavior of Bi-2212 Wires Above Liquid Helium Temperature—Critical Current, Irreversibility Field and Filaments Coupling [Andrea Malagoli](#); CNR-SPIN, Italy.

9:00 AM *QT11.07.02

Research, Development and Commercialization of Coated Conductors by SuperOx [Sergey Lee](#); SuperOx Japan LLC, Japan.

9:30 AM *QT11.07.03

Second Generation Wire Development at AMSC [Martin W. Rupich](#); American Superconductor Corp, United States.

10:00 AM QT11.01.02

The Potential of MgB_2 Superconductors for Magnetic Levitation of Maglev Vehicles [Jacques G. Noudem](#)^{1,2}; ¹Univ of Caen, France; ²CNRS, France.

SESSION QT11.08: $YBa_2Cu_3O_x$ and Related Compounds

Session Chairs: Sergey Lee and Paolo Mele

Wednesday Afternoon, May 11, 2022

Hawai'i Convention Center, Level 3, 304A

1:30 PM *QT11.08.01

Dimensional Influence on the Vortex Movement in Superconducting $YBa_2Cu_3O_{7-\delta}$ Quasi-One-Dimensional Microwires [Irene Lucas del Pozo](#)^{1,2}; ¹Universidad de Zaragoza,

Spain; ²Instituto de Nanociencia y Materiales de Aragón (INMA), Spain.

2:00 PM QT11.08.02

Critical Current Measurements of Cuprate Thin Films in Pulsed Magnetic Fields [Christopher Mizzi](#); Los Alamos National Laboratory, United States.

2:15 PM *QT11.08.03

Progress on REBCO Based Conductors for Nuclear Fusion Applications [Giuseppe Celentano](#); ENEA-Frascati, Italy.

SESSION QT11.09: Cavities and RF Applications
Session Chairs: Nathan Sitaraman and Sarah Willson
Thursday Morning, May 12, 2022
Hawai'i Convention Center, Level 3, 304A

8:00 AM QT11.09.01

Optimizing Nb₃Sn Growth for SRF Applications: Nanoscale Morphological and Electronic Characterization of Intermetallic Adlayers on a Highly Ordered Nb Oxide [Sarah A. Willson](#); University Of Chicago, United States.

8:15 AM QT11.09.02

Materials Investigation and Surface Design of Superconducting Radio-Frequency Accelerating Cavities at Cornell University [Zeming Sun](#); Cornell University, United States.

8:30 AM QT11.09.03

Theory Results on Novel Surface Preparations for Superconducting Radio-Frequency Cavities [Nathan S. Sitaraman](#); Cornell University, United States.

8:45 AM QT11.09.04

Mitigation of Dielectric Losses in NbN Resonators Using Thermal ALD with Hydrazine [Mahmut Sami Kavrik](#); Lawrence Berkeley National Laboratory, United States.

SESSION QT11.10: Iron-Based Superconductors
Session Chairs: Valeria Braccini and Gaia Grimaldi
Thursday Morning, May 12, 2022
Hawai'i Convention Center, Level 3, 304A

9:00 AM *QT11.10.01

Local Atomic Configuration Control of Superconductivity in BaFe₂As₂ Pnictide [Chang-Beom Eom](#); University of Wisconsin--Madison, United States.

9:30 AM *QT11.10.02

Fe(Se,Te) Superconductor is Facing HTS Materials in High Current and High Field Performance [Gaia Grimaldi](#); CNR, Italy.

10:00 AM QT11.10.03

Development of a Simple Architecture for the Realization of Fe(Se,Te) Coated Conductors [Valeria Braccini](#); CNR - SPIN, Italy.

SESSION QT11.11: Superconductivity I
Session Chairs: Valeria Braccini and Susannah Speller
Monday Morning, May 23, 2022
QT11-Virtual

8:00 AM *QT11.11.01

Microstructural Engineering of Bulk Superconductors [Susannah C. Speller](#); Univ of Oxford, United Kingdom.

8:30 AM QT11.11.02

TEM Microstructural Investigation of High Current Density YBCO Superconducting Thin Films Grown by Ultrafast Transient Liquid Assisted Growth (TLAG) [Kapil Gupta](#); Institut de Ciència de Materials de Barcelona, Spain.

8:45 AM QT11.11.03

Relevance and Opportunities of Liquid Tunability in TLAG YBa₂Cu₃O₇ High Performance Superconducting Films [Lavinia Saltarelli](#); Institut de Ciència de Materials de Barcelona, Spain.

9:00 AM QT11.11.04

Superconducting YBa₂Cu₃O_{7-δ} Nanocomposite Films Grown by TLAG-CSD with Embedded BaMO₃ and BaM₂O₆ Nanoparticles [Diana G. Franco](#)^{1,2}; ¹ICMAB-CSIC, Spain; ²Universitat Autònoma de Barcelona, Spain.

9:15 AM QT11.11.05

New Methodology for Cost Effective Coated Conductors—Transient Liquid Assisted Growth (TLAG-CSD) [Roxana Vlad](#); Institut de Ciència de Materials de Barcelona, Spain.

9:30 AM QT11.11.06

Modeling Study and Comparison of Hybrid MgB₂—Ferromagnetic Shielding Designs [Michela Fracasso](#)^{1,2}; ¹Politecnico di Torino, Italy; ²INFN Sezione di Torino, Italy.

9:45 AM *QT11.11.07

Wide Range E-J Constitutive Laws for High-Temperature Superconductors [Francesco Grilli](#); Karlsruhe Institute of Technology, Germany.

SESSION QT11.12: Superconductivity II
Session Chairs: Alex Gurevich and Qiang Li
Monday Morning, May 23, 2022
QT11-Virtual

10:30 AM *QT11.12.01

Tuning the High-Field rf Performance of Thick Superconducting Films by Pinning and Surface Nanostructuring. [Alex Gurevich](#); Old Dominion Univ, United States.

11:00 AM QT11.12.02

Learning from Disorder in Superconductors with Scanning Probe Microscopy and Data Analytics [Petro Maksymovych](#); Oak Ridge National Laboratory, United States.

11:15 AM *QT11.12.03

Correlation Between Superconducting Properties, Processing and Microstructure in Bi-2212 Round Wires [Chiara Tarantini](#); Florida State University, United States.

11:45 AM QT11.12.04

Soft Matter Enabled Superconducting Quantum Materials and Applications [Fei Yu](#); Cornell University, United States.

12:00 PM QT11.12.05

Reducing ABO_3 to Infinite Layer ABO_2 Perovskites—A First-Principles Study [Shree Ram Acharya](#); Oak Ridge National Laboratory, United States.

SESSION QT11.13: Superconductivity III
Session Chairs: Kazumasa Iida and Paolo Mele
Monday Afternoon, May 23, 2022
QT11-Virtual

6:30 PM *QT11.13.01

Angular Dependence of Vortex Pinning Properties in $YBa_2Cu_3O_7$ Nanocomposite Films [Tomoya Horide](#); Kyushu Inst of Technology, Japan.

7:00 PM QT11.13.02

Pairing Symmetry in Infinite-Layer Nickelate Superconductors [Lin Er Chow](#); National University of Singapore, Singapore.

7:15 PM *QT11.13.03

Fabrication of Small Magnets Using $(Ba_xA)Fe_2As_2$ (A : Na, K) Round Wire with Large Critical Current [Tsuyoshi Tamegai](#); Univ. of Tokyo, Japan.

7:45 PM QT11.13.04

K-Doped $BaFe_2As_2$ / $BaFe_2As_2$ Bilayer for Bi-Crystal Experiments [Kazumasa Iida](#)^{1,2}; ¹Nagoya Univ, Japan; ²JST CREST, Japan.

8:00 PM *QT11.13.05

Effect of Low-Energy Ion Irradiation on Flux Pinning and Microstructure in REBCO Coated Conductors [Toshinori Ozaki](#); Kwansei Gakuin University, Japan.

SESSION QT11.14: Superconductivity IV
Session Chairs: Jens Haenisch and Anna Palau
Tuesday Morning, May 24, 2022
QT11-Virtual

8:00 AM QT11.14.01

Characterization of a New Superconducting Magnetic Levitation System with a Large Levitation Force [Pierre Bernstein](#)^{1,2,3}; ¹CRISMAT, France; ²Normandy University, France; ³CNRS, France.

8:15 AM *QT11.14.02

Nano-Engineered High-Temperature Superconducting Materials and Hybrid Systems for Energy-Efficient Functional Devices [Anna Palau](#); Institut de Ciència de Materials de Barcelona, Spain.

8:45 AM *QT11.14.03

Recent Developments in Fe-Based Superconductors Towards Understanding Their Vortex Matter and Possible Applications [Jens Haenisch](#); Karlsruhe Institute of Technology, Germany.

9:15 AM QT11.14.04

Suppression of Oxides Growth in Superconducting Quantum Circuits Using Self-Assembled Monolayers [Mohammed Alghadeer](#)^{1,2}; ¹King Fahd University of Petroleum and Minerals, Saudi Arabia; ²King Abdullah University of Science and Technology, Saudi Arabia.

9:30 AM *QT11.01.01

Process Machine Learning of Iron-Based Superconducting Polycrystalline Bulks [Akiyasu Yamamoto](#); Tokyo University of Agriculture and Technology, Japan.

SYMPOSIUM SB01

Organic Electronics—Multimodal Characterization and Computation-Driven Material Design and Performance
May 9 - May 25, 2022

Symposium Organizers

* Invited Paper

SESSION SB01.01: The Computational Frontier
Session Chair: Lilo Pozzo
Monday Afternoon, May 9, 2022
Hilton, Mid-Pacific Conference Center, 6th Floor, Nautilus 1 & 2

1:30 PM *SB01.01.01

Machine Learning and Material Science—A Fruitful Integration [Alessio Gagliardi](#); Technische Universitat Munchen, Germany.

2:00 PM SB01.01.02

Predicting the Glass Transition of Conjugated Polymers via Integration of Machine Learning, Molecular Simulations, and Experiments [Wenjie Xia](#); North Dakota State University, United States.

2:15 PM SB01.01.03

Multiscale Simulations of DNA-Templated Dye Aggregates to Promote Molecular Excitonic Coupling [German Barcenas](#); Boise State University, United States.

2:30 PM *SB01.01.04

Gaussian-Process-Driven Optimal Autonomous Data Acquisition for Large-Scale Experimental Facilities [Marcus M. Noack](#); Lawrence Berkeley National Laboratory, United States.

3:00 PM BREAK

3:30 PM *SB01.01.05

Computationally-Assisted Design of Transparent and Color-Neutral Organic Solar Cells [Quinn C. Burlingame](#); Princeton University, United States.

4:00 PM SB01.01.06

Predicting Intricate Optical Spectra of Open-Shell Conjugated Organic Polymers [Neeraj Rai](#); Mississippi State University, United States.

4:15 PM *SB01.01.07

Computational Design of Organic Semiconductors [Harald Oberhofer](#); University of Bayreuth, Germany.

SESSION SB01.02: Poster Session: Organic Electronics—Multimodal Characterization and Computation-Driven Material Design and Performance
Session Chairs: Brian Collins and Xiaodan Gu
Monday Afternoon, May 9, 2022
5:00 PM - 7:00 PM
Hawai'i Convention Center, Level 1, Kamehameha Exhibit Hall 2 & 3

SB01.02.01

Multimodal Characterization of Non-Fullerene Organic Solar Cells Based to Assess the Effectiveness of Solvent Plasticizers [Obaid Alqahtani](#)^{1,2}; ¹Washington State University, United States; ²Prince Sattam bin Abdulaziz University, Saudi Arabia.

SB01.02.02

Photo-induced Charge Transfer of Fullerene and Non-Fullerene Conjugated Polymer Blends via Density Functional Theory [Amirhadi Alesadi](#); North Dakota State University, United States.

SB01.02.03

The Relative Roles of Triplet-to-Singlet Exciton Transfer and Reverse Intersystem Crossing in Hyperfluorescent OLED Materials [Leonardo E. Sousa](#); Technical University of Denmark, Denmark.

SB01.02.04

Crystallization and Epitaxy Study of Organic Molecules on Graphene from 4D Scanning Transmission Electron Microscopy [Zixuan Guo](#); The Pennsylvania State University, United States.

SB01.02.05

Tailoring the Interfacial Band Offset By the Molecular Dipole Orientation for a Molecular Heterojunction Selector [Jung Sun Eo](#); Korea University, Korea (the Republic of).

SB01.02.06

Molecular-Scale Photodiode with Two-Dimensional Semiconductor [Jaeho Shin](#); Korea University, Korea (the Republic of).

SB01.02.07

Design and Application of Novel Singlet Sink for the Facilitation of Photon Upconversion via Triplet-Triplet Annihilation in Glassy Polymer Films [Sonia Stanciu](#); The University of Southern Mississippi, United States.

SB01.02.08

Surface Doping of Rubrene Single Crystals by Molecular Electron Donors and Acceptors [Christos Gatsios](#); Humboldt-Universität zu Berlin, Germany.

SB01.02.09

Effect of Substituting Groups and Side Linkages on NIR Absorption and Emission of Cu(I) Dipyrrin Complexes [Svetlana V. Kilina](#); North Dakota State University, United States.

SB01.02.10

Charge Mobility Maximization in Organic Field-Effect Transistors via Design of Experiments and Machine Learning [Stefano Pecoraro](#)^{1,2}; ¹Istituto Italiano di Tecnologia, Italy; ²Politecnico di Milano, Italy.

SESSION SB01.03: Time Resolved Measurements
Session Chair: Eva M Herzig
Tuesday Morning, May 10, 2022
Hilton, Mid-Pacific Conference Center, 6th Floor, Nautilus 1 & 2

8:30 AM *SB01.03.01

Structural Evolution in Semiconducting Polymers During Excitations [Michael L. Chabynyc](#); University of California, Santa Barbara, United States.

9:00 AM SB01.03.02

Solution Aggregate Structure Drastically Modulates Electronic Properties of Donor-Acceptor Conjugated Polymers [Zhuang Xu](#); University of Illinois at Urbana-Champaign, United States.

9:15 AM SB01.03.03

Operando X-Ray Scattering of 3-Terminal Electrochemical Devices Based on Organic Mixed Ionic/Electronic Conductors [Tyler Quill](#); Stanford University, United States.

9:30 AM *SB01.03.04

Analysis of the Structure and Dynamics of Conjugated Polymers via Combined Neutron Scattering and Molecular Simulations [Lilo D. Pozzo](#)^{1,2}; ¹Univ of Washington, United States; ²University of Washington, United States.

10:00 AM BREAK**10:30 AM *SB01.03.05**

Understanding Chiral Liquid Crystal Mediated Assembly Pathway of Achiral Conjugated Polymers During Solution Processing [Ying Diao](#); University of Illinois at Urbana-Champaign, United States.

11:00 AM SB01.03.06

Revealing Temperature-Dependent Polymer Aggregation in Solution with Small-Angle X-Ray Scattering [Thomas P. Chaney](#); University of Colorado at Boulder, United States.

11:15 AM SB01.03.07

Effect of Processing Conditions on the Nanostructure Formation Process in Thin Films—A Multi-Modal Measurement Approach [Eva M Herzig](#); Universität Bayreuth, Germany.

11:30 AM SB01.03.08

Robust Aggregations Formed in Conjugated Ladder Polymers Solution Due to Rigid Backbone and Low Dissolve Entropy [Guorong Ma](#); The University of Southern Missis, United States.

11:45 AM SB01.03.09

A Virtual Photo-Conductive AFM Framework to Explore OPV Morphologies [Nirmal Baishnab](#); Iowa State University, United States.

SESSION SB01.04: Polymer Morphology
Session Chairs: Brian Collins and Xiaodan Gu
Tuesday Afternoon, May 10, 2022
Hilton, Mid-Pacific Conference Center, 6th Floor, Nautilus 1 & 2

1:30 PM *SB01.04.01

Understanding the Reliability of Y-Series Electron Acceptors Under Real-World Conditions [Derya Baran](#); King Abdullah University of Science and Technology, Saudi Arabia.

2:00 PM SB01.04.02

High-Spatial-Resolution Mapping of Organic Light Emitting Diodes (OLEDs) via Monochromated Electron Energy Loss Spectroscopy (EELS) [Kyun Seong Dae](#); Korea Basic Science Institute, Korea (the Republic of).

2:15 PM SB01.04.03

Understanding the Phase Behavior of Conjugated Polymer Blends Using Infrared Nanospectroscopy [Nathaniel L. Prince](#); The University of Southern Mississippi, United States.

2:30 PM SB01.04.04

Inelastic Neutron Scattering for Measuring Dynamic Disorder in Organic Semiconductors [Adam J. Moule](#); University of California, Davis, United States.

2:45 PM SB01.04.05

4D STEM Orientation Mapping in Anisotropic Molecular Glasses [Debaditya Chatterjee](#); University of Wisconsin--Madison, United States.

3:00 PM BREAK

3:30 PM *SB01.04.06

Multimodal Characterization Strategies of Organic Semiconductor/Electrolyte Interfaces for Energy Conversion/Storage and Biosensing [Erin L. Ratcliff](#); University of Arizona, United States.

4:00 PM SB01.04.07

Novel Spectroscopic Characterization Reveals Design Guidelines for High-Performing Redox-Active Polymers [Garrett LeCroy](#); Stanford University, United States.

4:15 PM SB01.04.08

Multimodal Characterization of Crystal Structure and Formation in Rubrene Thin Films Reveals Erasure of Orientational Discontinuities [Jenna Tan](#); University of California, Berkeley, United States.

4:30 PM SB01.04.09

Organic Semiconductor Structure Measurements by Polarized Soft X-Ray Scattering [Dean M. DeLongchamp](#); National Institute of Standards and Technology, United States.

4:45 PM SB01.04.10

Resonant Tender X-Ray Diffraction Studies of Anion Location in Organic Electrochemical Transistors [Lee Richter](#); National Institute of Standards and Technology, United States.

SESSION SB01.05: Mixed Conductor I

Session Chair: Jonathan Rivnay

Wednesday Morning, May 11, 2022

Hilton, Mid-Pacific Conference Center, 6th Floor, Nautilus 1 & 2

8:30 AM *SB01.05.01

Multimodal Probes of Charge Transport in Organic Mixed Ionic-Electronic Conductors—Interplay of Polymer Structure and Counterion Chemistry [David S. Ginger](#); University of Washington, United States.

9:00 AM SB01.05.02

Influence of Side Chains on the N-Type Organic Electrochemical Transistor Performance [David Ohayon](#); King Abdullah University of Science and Technology, Saudi Arabia.

9:15 AM SB01.05.03

The Effect of a Polymer Electrolyte on N-Type Bioelectronic Device Performance [Tania C. Hidalgo Castillo](#); King Abdullah University of Science and Technology, Saudi Arabia.

9:30 AM *SB01.05.04

To Pattern or Not to Pattern? Selecting Side-Chains for Mixed Conducting Polymers [Brett M. Savoie](#); Purdue University, United States.

10:00 AM BREAK

10:30 AM *SB01.05.05

Designing Mixed Electronic and Ionic Conductors for High Performance and Stable Electrochemical Devices [Jianguo Mei](#); Purdue University, United States.

11:00 AM SB01.05.06

Printing Dynamic Color Palettes and Layered Textures Through Modeling-Guided Stacking of Electrochromic Polymers [Ke Chen](#); Purdue University, United States.

11:15 AM SB01.05.07

Ionic Aromatic Dopant—Air Stable Dopants Enable Direct Write Patterning [Zhifan Ke](#); Purdue University, United States.

11:30 AM SB01.05.08

Low Molecular Mass Gelator Assisted Gelation of Conductive Polymers [Santanu Kundu](#); Mississippi State University, United States.

11:45 AM SB01.05.09

High-Performance Humidity Sensing in pi-Conjugated Molecular Assemblies Through the Engineering of Electron/Proton Transport and Device Interfaces [Nicholas Turetta](#); Université de Strasbourg, France.

SESSION SB01.06: Mixed Conductor II

Session Chair: Christine Luscombe

Wednesday Afternoon, May 11, 2022

Hilton, Mid-Pacific Conference Center, 6th Floor, Nautilus 1 & 2

1:30 PM SB01.06.01

Extraordinary Electrochemical Stability and Extended Polaron Delocalization of Ladder-Type Polyaniline-Analogous Polymers [Mingwan Leng](#); Texas A&M, United States.

1:45 PM SB01.06.02

A High-Conductivity n-Type Polymeric Ink for Printed Electronics [Chi-Yuan Yang](#); Linköping University, Sweden.

2:00 PM BREAK

2:30 PM *SB01.06.03

Structure and Transport in Organic Mixed Ionic-Electronic Conductors (OMIECs) During Operation [Jonathan Rivnay](#); Northwestern University, United States.

3:00 PM SB01.06.04

Nanoscale Electrical Characterisation of Functional Electrolyte-Gated Transistors by In-Liquid Scanning Dielectric Microscopy—Exploring Different Operating Regimes [Shubham Tanwar](#); Institute for Bioengineering of Catalonia, Spain.

3:15 PM SB01.06.05

Controlling Ionic Transport in Conducting Polymers via Chemical Gating [Tamanna T. Khan](#); Washington State University, United States.

3:30 PM SB01.06.06

Thermal Conductivity Measurements for Organic Electronic Materials [Haoyu Zhao](#); The University of Southern Mississippi, United States.

SESSION SB01.07: Materials Discover I
Session Chair: Simon Rondeau-Gagne
Thursday Morning, May 12, 2022
Hilton, Mid-Pacific Conference Center, 6th Floor, Nautilus 1 & 2

8:30 AM *SB01.07.01

Adaptable Semiconducting Polymer Networks—Exploiting Dynamic Bonds Towards Softer Materials for Organic Electronics [Simon Rondeau-Gagne](#); University of Windsor, Canada.

9:00 AM SB01.07.02

In Situ Characterization of Highly Aligned Conjugated Polymer Thin Films Revealing Unique Thermal Behavior and Packing Structure [Harry Schrickx](#); North Carolina State University, United States.

9:15 AM SB01.07.03

Kinetic Monte Carlo Simulation of Exciton Dynamics in Organic Non-Fullerene Electron Acceptors [Wenchao Yang](#); King Abdullah University of Science and Technology, Saudi Arabia.

9:30 AM SB01.07.04

Comparison of the Deformation Mechanism Between Glassy and Viscoelastic Conjugated Polymer Thin Films [Yunfei Wang](#); University of Southern Mississippi, United States.

9:45 AM SB01.07.05

Off-State Bias Stress Stability in Polymer Transistors—An Often Overlooked Prerequisite [Ulrike Kraft](#)^{1,2}; ¹University of Cambridge, United Kingdom; ²Max Planck Institute for Polymer Research, Germany.

10:00 AM BREAK

10:30 AM *SB01.07.06

Traps and Transport Resistance—The Next Frontier for Stable State-of-the-Art Non-Fullerene Acceptor Solar Cells [Carsten Deibel](#); Technische Universität Chemnitz, Germany.

11:00 AM SB01.07.07

Acceptors Ionization Energy Mixing Enables to Continuously Tune the Quantum Efficiency of Ternary Solar Cells [Julien F. Gorenflot](#); King Abdullah University of Science and Technology, Saudi Arabia.

11:15 AM SB01.07.08

Evidence That Sharp Donor-Acceptor Interfaces Suppress Recombination, Allowing for Thick Organic Photovoltaics [Obaid Alqahtani](#)^{1,2}; ¹Washington State University, United States; ²Prince Sattam bin Abdulaziz University, Saudi Arabia.

11:30 AM SB01.07.09

Accurate Measurements of Charge Generation in Bulk Heterojunction Solar Cells with Overpulse TDCF Charge Extraction [Awwad N. Alotaibi](#); Washington State University, United States.

11:45 AM SB01.07.10

Phase Behavior of a Polymer Semiconductor/Elastomer Blend and Connections to Field-Effect Transistor Performance [Shayla Nikzad](#); Stanford University, United States.

SESSION SB01.08: Materials Discovery II
Session Chairs: Jason Azoulay and Xiaodan Gu
Thursday Afternoon, May 12, 2022
Hilton, Mid-Pacific Conference Center, 6th Floor, Nautilus 1 & 2

1:30 PM *SB01.08.01

Cartography of the Composition-Performance Landscape in Ternary Organic Photovoltaics [Mariano Campoy-Quiles](#); ICMAB-CSIC, Spain.

2:00 PM SB01.08.02

Infrared Photodetection Using Narrow Bandgap Conjugated Polymers [Jason D. Azoulay](#); University of Southern Mississippi, United States.

2:15 PM *SB01.08.03

Climbing the Ladder to Advanced Rigid Ladder Polymers [Lei Fang](#); Texas A&M University, United States.

SESSION SB01.09: Frontier in Device I
Session Chair: Xiaodan Gu
Tuesday Morning, May 24, 2022
SB01-Virtual

8:00 AM *SB01.09.01

Side-Chain Engineering to Balance Ionic and Electronic Conductivities in Mixed Ionic/Electronic Conductors [Christine Luscombe](#); Okinawa Institute of Science and Technology, Japan.

8:30 AM SB01.09.02

Decoupling Complex Multi-Length-Scale Morphology in Non-Fullerene Photovoltaics with Nitrogen K-Edge Resonant Soft X-Ray Scattering [Wenkai Zhong](#); Shanghai Jiao Tong University, China.

SESSION SB01.10: Frontier in Device II
Session Chairs: Xiaodan Gu and Eva M Herzig
Tuesday Afternoon, May 24, 2022
SB01-Virtual

9:00 PM *SB01.10.01

A-DA'D-A Type Acceptor Based Organic Solar Cells [Yingping Zou](#); College of Chemistry and Chemical Engineering, Central South University, China.

9:30 PM SB01.10.02

Design of Highly Conductive N-Type Conjugated Polymers [Ting Lei](#); Peking University, China.

9:45 PM SB01.10.03

Supramolecular Assembly of Conjugated Polymers under Vibrational Strong Coupling [Kripa M. Joseph](#); University of Strasbourg, France.

10:00 PM SB01.10.04

Solution Process of Fullerene Thin Film by Mist-Vapor Deposition and Its Application to N-Type OFET [Yuto Nanba](#); Tsuyama College, Japan.

10:15 PM SB01.10.05

Using Design of Experiment and Machine Learning Approaches to Optimize the Effect of Solvent Additives and Processing Parameters on PM6:Y6 Organic Photovoltaics [Burcu Dursun](#); The Pennsylvania State University, United States.

10:30 PM SB01.10.06

Investigation on the Effect of Molecular Packing on Charge Transfer Characteristics of Y6 Non-Fullerene Acceptor Using Electroabsorption Spectroscopy [Sudhi Mahadevan](#); City University of Hong Kong, Hong Kong.

10:45 PM SB01.10.07

Prediction of Birefringence for Optical Polymer Materials [Paul Winget](#); Schrödinger, United States.

SESSION SB01.11: Frontier in Device III
Session Chairs: Xiaodan Gu and Ting Lei
Wednesday Morning, May 25, 2022
SB01-Virtual

8:00 AM *SB01.11.01

Achieving Efficient n-Doping of Conjugated Polymers by Molecular Dopants [Jian Pei](#); Peking University, China.

8:30 AM *SB01.11.02

WITHDRAWN 5/18/22 SB01.11.02 Organic Thin-Film Transistors for Adaptive Applications [Chong-an Di](#); Institute of Chemistry, Chinese Academy of Sciences, China.

9:00 AM *SB01.11.03

Two-Dimensional Crystals of Organic Semiconductors [Wenping Hu](#); Tianjin University, China.

9:30 AM SB01.11.04

Linear Hybrid Siloxane-Based Side Chains for Highly Stretchable Conjugated Polymers [Longzhen Qiu](#); Hefei University of Technology, China.

9:45 AM SB01.11.05

Simulation of Organic Field Effect Transistors In Presence of Stress/Strain Effects [Robert A. Nawrocki](#); Purdue University, United States.

SYMPOSIUM SB02

Materials, Power Sources, Sensors, Actuators and Mechanics for Untethered Soft Robots
May 9 - May 23, 2022

Symposium Organizers

* Invited Paper

SESSION SB02.01: Actuators

Session Chairs: Vito Cacucciolo, Yu Kuwajima and Shingo Maeda
Monday Afternoon, May 9, 2022
Hilton, Mid-Pacific Conference Center, 6th Floor, South Pacific 3

1:45 PM *SB02.01.01

Electrostatic Bellow Muscle—Multifunctional Transducer Based on Zipping Dielectric Liquids [Marco Fontana](#); Scuola Superiore Sant'Anna, Italy.

2:15 PM SB02.01.02

Fabricating 3D Soft Pneumatic Actuator with Overhang Features via 3D-Printed Sacrificial Molds [Joseph Lee](#); SUTD Singapore, Singapore.

2:30 PM SB02.01.03

High Spatial Resolution, Optical Addressing of Dielectric Elastomer Actuators [Ehsan Hajiesmaili](#); Harvard University, United States.

2:45 PM SB02.01.04

Nanocomposite Actuators with Dielectric Fluids [Jonathan Yaeger](#); Georgia Tech Reseach Institute, United States.

3:00 PM BREAK

3:30 PM *SB02.01.06

Untethered Pneumatic Rubber Actuators for Soft Robots [Hiroyuki Nabae](#); Tokyo Institute of Technology, Japan.

4:00 PM SB02.01.07

Smart Bioinspired Polymer Actuators [Moon Jeong Park](#); Pohang Univ. Sci.& Tech., Korea (the Republic of).

4:15 PM SB02.01.08

Fabrication of EHD Fiber Pumps for Soft Robots and Wearables [Michael Smith](#); École Polytechnique Fédérale de Lausanne (EPFL), Switzerland.

4:30 PM SB02.01.09

Programmable Microswimmers with Multifunctional Parts for Direction Control and Self-Propulsion Without External Stimuli [Yeongjae Choi](#); Gwangju Institute of Science and Technology, Korea (the Republic of).

4:45 PM SB02.01.10

Chemical Reactions for Gas-Driven Pneumatic Soft Actuators—From Catalysts to Neutralisation Reactions for Oscillating Pneumatic Systems [Marcos Villeda Hernandez](#)^{1,2}; ¹University of Bristol, United Kingdom; ²University of Bristol, United Kingdom.

SESSION SB02.06: Sensors and Electronics

Session Chairs: Kenjiro Fukuda and Xiaomin Xu
Wednesday Morning, May 11, 2022

Hilton, Mid-Pacific Conference Center, 6th Floor, South Pacific 3

8:30 AM *SB02.06.01

Passive Electronic 3D Microfliers with Designs Inspired by Wind-Dispersed Seeds [John A. Rogers](#); Northwestern University, United States.

9:00 AM SB02.06.02

Biocompatible Ag Reduction Polymer Composites Bending Sensor [Hyunjung Kim](#); Chungnam National University, Korea (the Republic of).

9:15 AM SB02.06.03

Shrink-Wrappable Electronics—Achieving Curved Electronics Using Shrinkable Substrates [Steven Rich](#); RIKEN, Japan.

9:30 AM SB02.06.04

A Plant-Based Robot Enabled by Conformal Electrodes [Wenlong Li](#)^{1,2,3}; ¹Nanyang Technological University, Singapore; ²Nanyang Technological University, Singapore; ³Nanyang Technological University, Singapore.

9:45 AM SB02.06.05

Development of the Flexible Conductive Bonding Method Without Any Adhesive for Wiring of Soft Robots [Masahito Takakuwa](#)^{1,2}; ¹Waseda University, Japan; ²RIKEN, Japan.

SESSION SB02.07: Artificial Intelligence
Session Chairs: Vito Cacucciolo and Shingo Maeda
Wednesday Afternoon, May 11, 2022
Hilton, Mid-Pacific Conference Center, 6th Floor, South Pacific 3

1:30 PM *SB02.07.01

Physical Reservoir Computing—Novel Techniques for Generating Computing Materials [Kohei Nakajima](#); The University of Tokyo, Japan.

2:00 PM SB02.07.02

Self-Powered Multi Channel Piezoelectric Acoustic Sensor for Speaker Recognition Based Machine Learning [Mingi Chung](#); Korea Advanced Institute of Science and Technology, Korea (the Republic of).

SESSION SB02.08: Poster Session: Materials, Power Sources, Sensors, Actuators and Mechanics for Untethered Soft Robots
Session Chairs: Vito Cacucciolo, Kenjiro Fukuda, Shingo Maeda and Xiaomin Xu
Wednesday Afternoon, May 11, 2022
5:00 PM - 7:00 PM
Hawai'i Convention Center, Level 1, Kamehameha Exhibit Hall 2 & 3

SB02.08.02

Sustainable Highly Charged Polyimide in Non-Contact Mode Triboelectric Nanogenerator [Jae Won Lee](#)^{1,2}; ¹Yonsei University, Korea (the Republic of); ²Yonsei University KIURI Institute, Korea (the Republic of).

SB02.08.03

Channel-Free Transportation of Liquid Metal Droplets by Magnetically Active Microwall Arrays [Saebohm Jhang](#); Inha University, Korea (the Republic of).

SB02.08.04

Performance-Enhancing Triboelectric Nanogenerator Device Based on PVDF-MOF Composite Nonofibers [BaDa On](#); Seoul National University of Science and Technology, Korea (the Republic of).

SB02.08.05

Non-Power Multifunctional Flexible Sensors Based on Piezoionic Effect [Tian Liang](#); University of Yamanashi, Japan.

SB02.08.07

Ionic Conductors with Ionic Side Chain for Thermally Stable and Water-Processable for Stretchable and Self-Healable Thermal Sensor and Actuator [Sungryong Kim](#); POSTECH, Korea (the Republic of).

SB02.08.08

Dual Terrafoil Appendage for Controlling Lift and Drag Forces on a Bioinspired Digging Robot [Dylan Drotman](#); University of California, San Diego, United States.

SB02.08.09

Towards Untethered Soft Robotic Systems for Industrial Inspection Applications—Challenges and Possibilities [Radislav A. Potyrailo](#); GE Research, United States.

SB02.08.10

Crosstalk Issues in Untethered Passive Arrays of Dielectric Elastomer Actuators [Ehsan Hajiesmaili](#); Harvard University, United States.

SB02.08.11

4D Precipitation Printing of Shape Memory Polymer Artificial Muscles [Kyra McLellan](#); University of Toronto, Canada.

SB02.08.12

A Programmable Soft Tensile Valve for Analog Control of Soft Actuators [Jun Kyu Choe](#); Ulsan National Institute of Science and Technology, Korea (the Republic of).

SB02.08.13

Control of Spontaneous Chiral States in Flocks of Active Magnetic Rollers [Alexey Snezhko](#); Argonne National Laboratory, United States.

SB02.08.14

A Crawling Piezoelectric Ribbon—Design, Modeling, Control and Performance [Zhiwu Zheng](#); Princeton University, United States.

SB02.08.16

Flexible Proximity Sensor Based on Magnetoelectric Complex-Oxide Heterojunction [Yong Jun Wang](#); National Tsing Hua University, Taiwan.

SB02.08.17

Beetle Inspired 3D-Printed Wings—Modulating Structure to Improve Performance Or File, Hagit Gilon, Gal Riback, Bat-El Pinchasik Or File; Tel Aviv University, Israel.

SB02.08.18

Enhanced Output Performances of Triboelectric Nanogenerators Based on Facile Phase Inversion Based-Patterning Process [GeonJu Choi](#); Seoul National University of Science and Technology, Korea (the Republic of).

SB02.08.19

Optical Fiber-Based Cholesteric Liquid Crystal Cell for Fiber-Optic Sensor Applications [Soyeon Ahn](#); Chungnam National University, Korea (the Republic of).

SB02.01.05

Phase Change in a Low Boiling Point Liquid Enables a Digging Soft Robot [Shivam Chopra](#); University of California, San Diego, United States.

SESSION SB02.09: Locomotion
Session Chairs: Vito Cacucciolo, Yu Kuwajima and Shingo Maeda
Thursday Afternoon, May 12, 2022
Hilton, Mid-Pacific Conference Center, 6th Floor, South Pacific 3

1:30 PM *SB02.09.01

Efficient Soft Robots with Embodied Intelligence [Cecilia Laschi](#); National University of Singapore, Singapore.

2:00 PM SB02.09.02

Photomechanical Jumping of Soft Robotic Liquid Crystalline Polymer Networks [Jisoo Jeon](#); Inha University, Korea (the Republic of).

2:15 PM SB02.09.03

Magnetically-Actuated Locomotion of Fiber-Based Three-Dimensional Soft Robots [Youngbin Lee](#); Massachusetts Institute of Technology, United States.

2:30 PM SB02.09.04

A Novel Mechanism for Untethered Crawling Gel Robots [Aishwarya Pantula](#); Johns Hopkins University, United States.

2:45 PM SB02.09.05

Controlled Actuation of Light-Activated Liquid Crystalline Elastomers Enabled by Tunable Disruption of Order [Tayler Hebner](#); University of Colorado Boulder, United States.

3:00 PM BREAK

SESSION SB02.10: Materials and Processing
Session Chairs: Vito Cacucciolo, Yu Kuwajima and Shingo Maeda
Thursday Afternoon, May 12, 2022
Hilton, Mid-Pacific Conference Center, 6th Floor, South Pacific 3

3:30 PM *SB02.10.01

High-Performance Soft Electrostatic Actuators for Untethered Robotics [Herbert R. Shea](#); Ecole Polytechnique Federale de Lausanne, Switzerland, Switzerland.

4:00 PM SB02.10.02

Functional Composites That Contain Liquid Metal—Toward Soft Machines with Physical Intelligence [Michael Ford](#); Lawrence Livermore National Laboratory, United States.

4:15 PM SB02.10.03

Untethered Photothermal Activation of Liquid Metal Polyurethane Nanocomposites for Soft Robotics [Matthew Tan](#); Nanyang Technological University, Singapore.

4:30 PM SB02.10.04

Development of Stimuli Responsive Intelligent Materials for 4D Printing [MD Nahin Islam Shiblee](#); Yamagata University, Japan.

4:45 PM SB02.10.05

Iron-Catalyzed Laser-Induced Graphene—A Novel Approach Towards Green Electronics [Christopher H. Dreimol](#)^{1,2}; ¹ETH Zürich, Switzerland; ²Empa—Swiss Federal Laboratories for Materials Science and Technology, Switzerland.

SESSION SB02.11: Power Sources
Session Chairs: Kenjiro Fukuda and Xiaomin Xu
Friday Morning, May 13, 2022
Hilton, Mid-Pacific Conference Center, 6th Floor, South Pacific 3

10:30 AM *SB02.11.01

Reinventing Batteries Through Materials Design [Yi Cui](#); Stanford University, United States.

11:00 AM SB02.11.02

Soft Thin-Film Battery Using Mixed-Conducting Particulate Composites for Bioelectronics [Jaehyo Park](#); Columbia University, United States.

SESSION SB02.12: Actuators and Mechanics
Session Chairs: Vito Cacucciolo and Shingo Maeda
Monday Morning, May 23, 2022
SB02-Virtual

8:00 AM *SB02.12.01

Assistive Soft Robotics and Exoskeleton for Empowering People [Kenji Suzuki](#); University of Tsukuba, Japan.

8:30 AM *SB02.12.02

Systems Paradigm for Soft Material Robotics [Yigit Menguc](#)^{1,2}; ¹Facebook, United States; ²Oregon State University, United States.

9:00 AM SB02.12.03

WITHDRAWN 5/17/22 SB02.12.03 Light-Powered Soft Steam Engines for Self-Adaptive Oscillators and Biomimetic Swimming Robotics [Zhiwei Li](#); University of California, Riverside, United States.

9:15 AM SB02.12.04

Magnetic Soft Robots Enabling New Biomedical Applications [Yoonho Kim](#); Massachusetts Institute of Technology, United States.

9:30 AM SB02.12.05

Using Inverse Learning for Controlling Bionic Soft Robot Fish with SMA Actuators [Kewei Ning](#); Waseda University, Japan.

9:45 AM SB02.08.15

Investigation of Magneto-Mechanical Behaviours of Magnetic-Elastomeric Membranes Using Fibre-Optic Interferometry [Zhi Li](#); University College London, United Kingdom.

SESSION SB02.13: Electronics and Energy Harvesting I

Session Chairs: Kenjiro Fukuda and Xiaomin Xu

Monday Afternoon, May 23, 2022

SB02-Virtual

6:30 PM *SB02.13.01

Flexible Triboelectric Nanogenerators for Energy and as Sensors [Zhong Lin Wang](#)^{1,2}; ¹Georgia Institute of Technology, United States; ²Beijing Institute of Nanoenergy and Nanosystems, Chinese Academy of Sciences, China.

7:00 PM *SB02.13.02

Electronic Skins with Ultrahigh Sensitivity and Tough Interfaces [Chuanfei Guo](#); Southern University of Science and Technology, China.

7:30 PM SB02.13.03

Machine-Washable and Breathable Pressure Sensors Based on Triboelectric Nanogenerators Enabled by Textile Technologies [Lanyue Gan](#); Peking University, China.

7:45 PM SB02.13.04

High-Performance Carbon Nanotube Based Transient Thin-Film Transistors with Good Uniformity for Complementary Electronics [Fan Xia](#); Peking University, China.

8:00 PM SB02.13.05

A Highly Sensitive Wearable Fiber-Optic Sensor for Pressure and Shear Force Measurement [Heeju Mun](#); Korea Advanced Institute of Technology (KAIST), Korea (the Republic of).

8:05 PM *SB02.13.06

Multimodal Flexible Sensor Sheet for Remote Healthcare Application [Kuni Takei](#); Osaka Metropolitan University, Japan.

SESSION SB02.14: Electronics and Energy Harvesting II

Session Chairs: Kenjiro Fukuda and Xiaomin Xu

Monday Afternoon, May 23, 2022

SB02-Virtual

9:00 PM *SB02.14.01

Bio-Inspired Artificial Vision Using Curved Ultrathin Image Sensor Array [Dae-Hyeong Kim](#)^{2,1}; ¹Seoul National University, Korea (the Republic of); ²Institute for Basic Science, Korea (the Republic of).

9:30 PM *SB02.14.02

Next Generation Smart Apparel "e-skin" Based on Novel Stretchable Electronics [Ichiro Amimori](#); Xenoma Inc., Japan.

10:00 PM SB02.14.03

Object Slippage Detection using Soft Sensor with Robotic Closed-Loop Feedback [Tomohito Sekine](#); Yamagata University, Japan.

10:15 PM SB02.14.04

Fully Printed Flexible Pressure Sensor with a Spontaneously Formed Porous Conductive Architecture [Yi-Fei Wang](#); Yamagata University, Japan.

10:30 PM SB02.11.03

Ultrathin and Efficient Organic Photovoltaics with Enhanced Air Stability by Suppression of Zinc Element Diffusion [Sixing Xiong](#)^{1,2}; ¹RIKEN, Japan; ²Huazhong University of Science & Technology, China.

10:35 PM SB02.08.06

54 cm² Large-Area Flexible Organic Solar Modules with Efficiency Above 13% [Lulu Sun](#); RIKEN, Japan, Japan.

10:40 PM SB02.08.01

Solution-Processed Electron-Transport Layer-Free Organic Photovoltaics with Liquid Metal Cathodes [Jiachen Wang](#)^{1,2}; ¹The University of Tokyo, Japan; ²RIKEN, Japan.

SYMPOSIUM SB03

Robotic Materials for Advanced Machine Intelligence
May 11 - May 25, 2022

[Symposium Organizers](#)

* Invited Paper

SESSION SB03.01: Bioinspired Actuators
Session Chairs: Michael Bartlett and Jeffrey Lipton
Wednesday Morning, May 11, 2022
Hilton, Mid-Pacific Conference Center, 6th Floor, South Pacific 1

9:00 AM *SB03.01.01

Plant-Inspired Soft Actuators Based on Shape-Memory Polymers [Andreas Lendlein](#)^{1,2}; ¹Helmholtz-Zentrum Hereon, Germany; ²University of Potsdam, Germany.

9:30 AM SB03.01.02

All-solid Redox-enabled Actuation of Polymer Artificial Muscles [Sevketcan Sarikaya](#); Texas A&M University, United States.

9:45 AM SB03.01.03

Multi-functional spiderweb robots for adhesion, actuating, and sensing [Younghoon Lee](#); Seoul National University, Korea (the Republic of).

10:00 AM BREAK

10:30 AM SB03.01.04

Analytical Solutions to the Inverse Problem of Designing Shape Morphing Dielectric Elastomer Actuators [Ehsan Hajiesmaili](#); Harvard University, United States.

10:45 AM SB03.01.05

3D Printing of Photoresponsive Gold Nanorod/Liquid Crystal Elastomer Composites [Shu Yang](#); University of Pennsylvania, United States.

11:00 AM SB03.01.06

Robust and Reprocessable Artificial Muscles Based on Liquid Crystalline Elastomers with Dynamic Thiourea Bonds [Suk-Kyun Ahn](#); Pusan National Univ, Korea (the Republic of).

11:15 AM SB03.01.07

On-demand Transient Silicone Elastomer Composites for Soft Robotics [Young Hwan Kim](#); Seoul National University, Korea (the Republic of).

SESSION SB03.02: Shape Morphing and Mechanics
Session Chairs: Qiguang He, Ryan Truby and Binbin Ying
Wednesday Afternoon, May 11, 2022
Hilton, Mid-Pacific Conference Center, 6th Floor, South Pacific 1

1:30 PM *SB03.02.01

Electronics-Free Soft Robot with Multi-Stimuli Responsive Control [Jordan R. Raney](#); University of Pennsylvania, United States.

2:00 PM SB03.02.02

Vital Signal Sensing Through Conformal, Variable Stiffness Gripping for Interlinkage with a Micro-Scale Organ [Yeonwook Roh](#); Ajou University, Korea (the Republic of).

2:15 PM SB03.02.03

An Anti-Freezing, Ambient-Stable and Highly Stretchable Ionic Skin with Strong Surface Adhesion for Wearable Sensing and Soft Robotics [Binbin Ying](#)^{2,1}; ¹University of Toronto, Canada; ²Massachusetts Institute of Technology, United States.

2:30 PM BREAK

3:00 PM SB03.02.04

Axial Point Group Auxetics with Emergent Rotational Responses [Jeffrey Lipton](#); University of Washington, United States.

3:15 PM SB03.02.05

Shape Morphing Mechanical Metamaterials for Soft Machines [Michael D. Bartlett](#); Virginia Tech, United States.

3:30 PM *SB03.02.06

Reconfigurable Soft Actuators That Can Hold a Load [Herbert R. Shea](#); Ecole Polytechnique Federale de Lausanne, Switzerland, Switzerland.

SESSION SB03.03: Poster Session: Actuation, Sensing, and Modeling in Robotic Materials
Session Chairs: Jeffrey Lipton and Barbara Mazzolai
Wednesday Afternoon, May 11, 2022
5:00 PM - 7:00 PM
Hawai'i Convention Center, Level 1, Kamehameha Exhibit Hall 2 & 3

SB03.03.01

Light Powered Liquid Crystal Elastomer Linear Actuators for Underwater Soft Robotics [Wonbin Seo](#); School of Mechanical Engineering, Pusan National University, Korea (the Republic of).

SB03.03.02

Subcritical Phase Transitions in Supramolecular Liquid Crystalline Elastomers [Kristin L. Lewis](#); University of Colorado Boulder, United States.

SB03.03.04

Pufferfish Inspired Wireless Pneumatic Capsule Actuated by Liquid-Vapor Phase Transition [Chong Zhang](#); The Chinese University of Hong Kong, China.

SB03.03.05

Material Parameters Identification, Modeling and Experimental Verification of the New Smart Material for Soft Robotics [Piotr Bartkowski](#); Warsaw University of Technology, Poland.

SB03.03.06

Reconfigurable, Self-Healing, 3D DLP Printed Soft Robots [Laura A. Sowards](#); Air Force Research Laboratory, United States.

SB03.03.07

Functional Hydrogels Integration in 3D Printed Microarchitectures for the Production of Magnetically Controlled Microdevices for Targeted Drug Delivery [Roberto Bernasconi](#); Politecnico di Milano, Italy.

SB03.03.08

Electrically Tunable Reflection in Liquid Crystalline Elastomers [Alexis T. Phillips](#); University of Colorado Boulder, United States.

SB03.03.09

High-Speed Gesture-Cognitive Exo-Glove via Electrosticktion [Yuri Cho](#); Chung-Ang University, Korea (the Republic of).

SB03.09.07

Sensitive and Stretchable Robot Safety Skin Based on Charge Accumulation Characteristics of PVC-Gel and Sintering-Free Liquid Metal Electrode [Hyoungsoo Kim](#); KAIST, Korea (the Republic of).

SESSION SB03.04: Small Scale Robotic Materials
Session Chairs: Mihai Duduta, Barbara Mazzolai, Ryan Truby and Huichan Zhao
Thursday Morning, May 12, 2022
Hilton, Mid-Pacific Conference Center, 6th Floor, South Pacific 1

9:00 AM *SB03.04.01

Programmable Magnetic Soft-Matter Robots at Small Scales [Li Zhang](#); Chinese University of Hong Kong, Hong Kong.

9:30 AM SB03.04.02

Reconfigurable Collective Swimming of Biomimetic Nanocomposite Robots [Sukyoung Won](#)^{1,3}; ¹Inha University, Korea (the Republic of); ³Inha University, Korea (the Republic of).

9:45 AM SB03.04.03

Agilely Reconfigurable Nanomotor Swarms Stimulated by Light in an Electric Field [Donglei \(Emma\) Fan](#)^{1,2}; ¹Materials Science and Engineering, The University of Texas at Austin, United States; ²The University of Texas at Austin, United States.

10:00 AM BREAK

SESSION SB03.05: Design and Fabrication
Session Chairs: Mihai Duduta, Barbara Mazzolai and Ryan Truby
Thursday Morning, May 12, 2022
Hilton, Mid-Pacific Conference Center, 6th Floor, South Pacific 1

10:30 AM *SB03.05.01

Granular Actuators—Soft Actuators Made of Discrete Grains [Rebecca Kramer-Bottiglio](#); Yale University, United States.

11:00 AM SB03.05.02

New Materials and Fabrication Strategies for Soft Robotics via Photopolymerization [Matthew Hausladen](#); University of Minnesota-Twin Cities, United States.

11:15 AM SB03.05.03

Embracing Complexity for Enduring and Adaptive Robots via Autonomous Materials and Additive Manufacturing [Robert Shepherd](#); Cornell University, United States.

SESSION SB03.06: Robotic Material Systems
Session Chairs: Mihai Duduta, Barbara Mazzolai and Ryan Truby
Thursday Afternoon, May 12, 2022
Hilton, Mid-Pacific Conference Center, 6th Floor, South Pacific 1

1:30 PM *SB03.06.01

Origami for Tunable Soft Sensors and Actuators [Kris L. Dorsey](#)^{1,2,3}; ¹Massachusetts Institute of Technology, United States; ²Northeastern University, United States; ³Northeastern University, United States.

2:00 PM SB03.06.02

Hydrogels as Sensors, Actuators and Drug Delivery Materials in a Combined Device [Jeffrey S. Bates](#); Univ of Utah, United States.

2:15 PM SB03.06.03

Electromagnetically-Controlled Shape Morphing Composite—New Material for Soft Robotics [Piotr Bartkowski](#); Warsaw University of Technology, Poland.

2:30 PM *SB03.06.04

Soft Aerial Robotics [Mirko Kovac](#)^{1,2}; ¹Imperial College London / Empa Robotics, United Kingdom; ²Empa–Swiss Federal Laboratories for Materials Science and Technology, Switzerland.

SESSION SB03.07: Plant-Inspired Robotic Materials

Session Chairs: Mihai Duduta, Barbara Mazzolai and Ryan Truby

Friday Morning, May 13, 2022

Hilton, Mid-Pacific Conference Center, 6th Floor, South Pacific 1

10:30 AM *SB03.07.01

Solar Tracking Plant Robots—The Soft and the Softer [Bilge Baytekin](#); Bilkent University, Turkey.

11:00 AM SB03.07.02

Climbing Plant-Like Miniature Machines for Improving Natural Ecosystems Preservation [Isabella Fiorello](#); Istituto Italiano di Tecnologia, Italy.

11:15 AM *SB03.07.04

Motile Plant Structures as Inspiration for Actuating and Sensing Materials Systems in Soft Robots and Soft Machines [Thomas Speck](#)^{1,2}; ¹University of Freiburg, Germany; ²University of Freiburg, Germany.

SESSION SB03.08: Electroprogrammable Robotic Materials

Session Chairs: Mihai Duduta, Barbara Mazzolai, Ryan Truby and Huichan Zhao

Friday Afternoon, May 13, 2022

Hilton, Mid-Pacific Conference Center, 6th Floor, South Pacific 1

1:30 PM *SB03.08.01

Electro-Mechanically Responsive Ionoelastomer Heterojunctions [Ryan C. Hayward](#); University of Colorado Boulder, United States.

2:00 PM SB03.08.02

Artificial Stimuli-Response System Capable of Conscious Response [Seongchan Kim](#); Sungkyunkwan University Advanced Institute of NanoTechnology, Korea (the Republic of).

2:15 PM *SB03.08.03

Computational E-Skin Using Next Generation Printed Electronics [Ravinder Dahiya](#); University of Glasgow, United Kingdom.

SESSION SB03.09: General Session I

Session Chairs: Ryan Truby and Huichan Zhao

Wednesday Morning, May 25, 2022

SB03-Virtual

8:00 AM SB03.09.01

Automated Manipulation of Miniature Objects Underwater Using Air Capillary Bridges—Pick-and-Place, Surface Cleaning and Underwater Origami [Bat-El Pinchasik](#); Tel Aviv University, Israel.

8:15 AM SB03.09.02

A Biomimetic Soft Robot with Constant-Volume Actuation Inspired by Octopus Muscular Hydrostats [Yiyuan Zhang](#); Beihang University, China.

8:30 AM SB03.09.03

3D Magnetic Liquid Crystal Elastomer Composite Structures for Untethered Soft Robotics [Xueju Wang](#); University of Connecticut, United States.

8:45 AM SB03.09.04

Genipin-Crosslinked Gelatin Bioplastics for Edible Origami Actuators [Spencer Matonis](#); Carnegie Mellon University, United States.

9:00 AM SB03.09.05

3D Integrated Neuromorphic Humanoid Hand by Multi-Axis Robot 3D Printing [Woo Soo Kim](#); Simon Fraser University, Canada.

9:15 AM SB03.09.06

Magnetic Catheter with Variable Stiffness and Self Sensing Using Electrically Conductive Polymer [Zhengxin Yang](#); The Chinese University of Hong Kong, Hong Kong.

9:20 AM SB03.09.08

A Fully Textile End-effector : Integrated Actuator and Sensor System [Ju-Hee Lee](#); Dongguk University, Korea (the Republic of).

9:25 AM SB03.09.09

Multi DOF Soft Manipulator that Mimics Elephant Trunk [Minchae Kang](#); Dongguk University, Korea (the Republic of).

SESSION SB03.10: General Session II

Session Chair: Mihai Duduta

Wednesday Morning, May 25, 2022

SB03-Virtual

10:30 AM *SB03.10.01

Thermally Activated Smart Materials for Artificial Muscles and Morphing Applications [Hani E. Naguib](#); University of Toronto, Canada.

11:00 AM SB03.10.02

Soft Multi-Responsive Actuators Based on Laser-Induced Graphene [Alexander Dallinger](#); Graz University of Technology, Austria.

SYMPOSIUM SB04

Advanced Soft Materials for Bioelectronic Interfaces
May 9 - May 24, 2022

Symposium Organizers

* Invited Paper

SESSION SB04.01: Poster Session I: Advanced Soft Materials for Bioelectronic Interfaces I
Session Chairs: Hyunhyub Ko and Myung-Han Yoon
Monday Afternoon, May 9, 2022
5:00 PM - 7:00 PM
Hawai'i Convention Center, Level 1, Kamehameha Exhibit Hall 2 & 3

SB04.01.01

Bacterial Cellulose Based Adhesive Platform for Oral Disease Management [Juhi Singh](#)^{1,2}; ¹Nanyang Technological University, Singapore; ²Nanyang Technological University, Singapore.

SB04.01.02

WITHDRAWN 5/9/22 SB04.01.02 Biocompatible Piezoelectric PLLA/Functionalized Boron Nitride Nanosheets Composite Nanofiber Scaffolds with Enhanced Mechanical Properties for Bone Tissue Engineering [Madeshwaran Sekkarapatti Ramasamy](#); Korea University of Technology and Education, Korea (the Republic of).

SB04.01.03

Thermally Drawn Flexible Fibers for Optical and Chemical Stimulation of the Enteric Nervous System [Rajib Mondal](#)^{1,2,3}; ¹Massachusetts Institute of Technology, United States; ²Massachusetts Institute of Technology, United States; ³Massachusetts Institute of Technology, United States.

SB04.01.04

Ex Situ Surface Modification of 3D Printed Biocompatible Polylactic Acid (PLA) Using Plasma Micro Discharge—Towards the Enhancement of Cell-Selective Surfaces and Scaffolds for Bioelectronic Interfaces [Mai Tser Yang](#); California State University, Fresno, United States.

SB04.01.05

Conformable Off-Stoichiometric-Thiol-ene Epoxy Polymer ECoG Array [Eleonora Borda](#); Ecole Polytechnique Federale de Lausanne, Switzerland.

SB04.01.07

A Novel Carbon Fiber Electrode Array for Deep Brain Recording and Stimulation [Megan N. Baker](#); University of Texas at Austin, United States.

SB04.01.08

Biocompatible Silk Sutures for Drug Delivery and Biosignal Acquisition [Onni Rauhala](#); Columbia University, United States.

SB04.01.09

Laser-Directed 3D Printing of Soft Microelectronics for Neural Interfaces and Biosensing [Omid Dadras-Toussi](#); University of Houston, United States.

SB04.01.10

Bundle of Thin Multifunctional Fibers Enables Multi-Colors and Multi-Drugs Delivery and Multi-Site Recordings [Jongwoon Kim](#); Virginia Tech, United States.

SB04.01.11

Development and Characterization of PLA-Graphene Composite Based Active Biocompatible Interfaces—Towards the Development of Electroactive Scaffolds and Interfaces for Targeted Drug Delivery [Subhadip Sarkar](#); California State University, Fresno, United States.

SB04.01.12

Superabsorbent Ion-Conductive Hydrogels with Predefined Nano/Microscale Geometry and Controlled Swelling Properties for Versatile 3D Cell Culture Scaffolds [Sungrok Wang](#); Gwangju Institute of Science and Technology, Korea (the Republic of).

SB04.01.13

eSee-Shells—Transparent Electrode Arrays on Polymer Skulls for Cortex-Wide Opto-Electrophysiological Recordings [Sarah L. Swisher](#); University of Minnesota, United States.

SB04.01.14

Thin, Wireless Photovoltaic Cortical Stimulator [Danashi I. Medagoda](#); Ecole Polytechnique Federale de Lausanne, Switzerland.

SESSION SB04.02: Soft Materials for Bioelectronic Interfaces I
Session Chairs: Pawan Jolly and Jeong-Yun Sun
Tuesday Morning, May 10, 2022
Hilton, Mid-Pacific Conference Center, 6th Floor, Coral 1

9:00 AM SB04.02.01

Influence of Molecular Weight on the Organic Electrochemical Transistor Performance of Ladder-Type Conjugated Polymers Han-Yan Wu^{1,2}; ¹Linköping University, Sweden; ²Linköping University, Sweden.

9:15 AM SB04.02.02

Molecular-Orientation-Dependent Ion Transport Dynamics in Organic Mixed Ionic Electronic Conductors Ji Hwan Kim; Gwangju Institute of Science & Technology, Korea (the Republic of).

9:30 AM *SB04.02.03

Impact of Doping on the Mechanical Properties of Conjugated Polymers Christian Muller; Chalmers University of Technology, Sweden.

SESSION SB04.03: Soft Materials for Bioelectric Interfaces II

Session Chairs: Sahika Inal and Christian Muller

Tuesday Afternoon, May 10, 2022

Hilton, Mid-Pacific Conference Center, 6th Floor, Coral 1

1:30 PM *SB04.03.04

A New Bioelectronic Approach to Continuous Monitoring of Protein Biomarkers Shana Kelley; Northwestern University, United States.

2:00 PM SB04.03.01

Ionic Liquid Incorporated Porous Polymers with Tunable Morphology and High Ionic Conductivity for Applications in 3D Printed Sensors Kumkum Ahmed; Shibaura Institute of Technology, Japan.

2:15 PM SB04.03.02

Template-Directed Synthesis of Tissue-Like Conductive Hydrogels for Bioelectronics Jooyeun Chong; Korea Advanced Institute of Science and Technology, Korea (the Republic of).

2:30 PM BREAK**3:00 PM *SB04.03.03**

eRapid: Antifouling Nanocomposite Coating Enables Multiplexed Electrochemical Detection of Biomarkers in Samples as Complex as Human Blood Pawan Jolly; Wyss Institute at Harvard, United States.

3:30 PM SB04.03.05

Electro-Responsive, Smart Adhesive Utilizing Mussel Adhesive Chemistry Bruce Lee; Michigan Technological Univ, United States.

3:45 PM SB04.03.06

Biodegradable Gelatin-Based Edible Electronics to Diagnose Eosinophilic Esophagitis Gaurav Balakrishnan; Carnegie Mellon University, United States.

SESSION SB04.04: Poster Session II: Advanced Soft Materials for Bioelectronic Interfaces II

Session Chairs: Michael Dickey and Suk-Won Hwang

Tuesday Afternoon, May 10, 2022

5:00 PM - 7:00 PM

Hawai'i Convention Center, Level 1, Kamehameha Exhibit Hall 2 & 3

SB04.04.01

Laser Enhancement of Pristine PEDOT:PSS Conductivity and Applications in Organic Electronics Joseph Troughton; Ecole des Mines de Sainte Etienne, France.

SB04.04.02

Rapid Electro-Assisted Crosslinking/Polymerization for Hybrid Conductive Soft Hydrogels Arua C. Da Silva; University of Sheffield, United Kingdom.

SB04.04.03

Ultrahigh Throughput On-Chip Synthesis of Microgels with Tunable Mechanical Properties Jingyu Wu; University of Pennsylvania, United States.

SB04.04.04

Plasmonic MXene Composites for Biomimetic Photothermoionic Nanochannel with Directional Ion Flow Jeonghee Ycom; Ulsan National Institute of Science and Technology, Korea (the Republic of).

SB04.04.05

Effects of Silica Nanospheres on the Sol-Gel Transition of Thermo-Responsive Hydrogels Based on poly(N-vinylcaprolactam) Lucas Ribeiro; Universidade Federal de São Carlos, Brazil.

SB04.04.06

Operation Mechanism of Organic Electrochemical Transistors as Redox Chemical Transducers Siew Ting Melissa Tan; Stanford University, United States.

SB04.04.07

Strain Sensor with Self-Healing Ability Using a Dry-Resistant Hydrogel-Based Conductive Composite Jungyoon Seo^{1,2}; ¹Hanyang University, Korea (the Republic of); ²Hanyang University, Korea (the Republic of).

SB04.04.08

Electrochemical Synthesis of Soluble Self-Doped poly(3,4-ethylenedioxythiophene) and Application to Flexible Biosensors Yuxin Jing; University of Yamanashi, Japan.

SB04.04.10

Alkyl- π Functional Molecular Liquids as Novel Optical and Electronic Soft Materials [Ravindra K. Gupta](#); National Institute for Materials Science (NIMS), Japan.

SB04.04.11

Rheological Properties of Cellulose Nano Fibrillar Hydrogels at Low Volume Fractions [Rebecca Östman](#); KTH Royal Institute of Technology, Sweden.

SB04.04.12

Electrically and Ionically Conductive Supramolecular Hydrogels for Bioelectronic Applications [Stephen J. O'Neill](#); University of Cambridge, United Kingdom.

SB04.04.14

Gel-Gated Graphene Transistor Tattoo Sensors [Nandu Koripally](#); The University of Texas at Austin, United States.

SB04.04.15

A Rapidly Stabilizing Water-Gated Field-Effect Transistors Based on Printed Single-Walled Carbon Nanotubes for Biosensing Applications [Fabrizio A. Viola](#); Italian Institute of Technology, Italy.

SESSION SB04.05: Soft Materials for Bioelectronic Interfaces III

Session Chairs: Kenjiro Fukuda and Sang-Woo Kim

Wednesday Morning, May 11, 2022

Hilton, Mid-Pacific Conference Center, 6th Floor, Coral 1

9:00 AM SB04.05.01

Integrating Molecular Pendulums with Laser-Engraved Graphene for Continuous Wearable Biosensing [Alam Mahmud](#); University of Toronto, Canada.

9:15 AM *SB04.05.02

Laser-Engraved Wearable Bioelectronics [Wei Gao](#); California Institute of Technology, United States.

9:45 AM BREAK**10:15 AM *SB04.05.04**

Air-Permeable Waterproofing Stretchable Electrodes for Healthcare Devices [Unyong Jeong](#); Pohang University of Science and Technology, Korea (the Republic of).

10:45 AM SB04.05.05

Strategies to Functionalized Liquid Metal Surfaces For Biostable and High Performance Bioelectronic Applications. [Huanan Zhang](#); University of Utah, United States.

SESSION SB04.06: Soft Materials for Bioelectronic Interfaces IV

Session Chairs: Wei Lin Leong and Myung-Han Yoon

Wednesday Afternoon, May 11, 2022

Hilton, Mid-Pacific Conference Center, 6th Floor, Coral 1

1:30 PM *SB04.06.01

Strategies of Ultraflexible Organic Devices Toward Self-Powered Bioelectronic Applications [Kenjiro Fukuda](#); RIKEN, Japan.

2:00 PM SB04.06.02

Design of Advanced Wearable EEG Electrodes for Brain-Computer Interface [Huiliang Wang](#); The University of Texas at Austin, United States.

2:15 PM SB04.06.03

Self-Adhesive Intrinsically Conducting Polymer Blends as Conformal Dry Electrodes for High-Quality Epidermal Biopotential Monitoring [Jianyong Ouyang](#); National University of Singapore, Singapore.

2:30 PM *SB04.06.04

Triboelectric Nanogenerator as a New Energy Solution for Biomedical Applications [Sang-Woo Kim](#); Sungkyunkwan University, Korea (the Republic of).

3:00 PM BREAK**3:30 PM SB04.06.05**

Soft Thermoelectric Materials for Human Skin—Self-Healing, Stretching and Thermal Contact Properties [Jaeyoung Jang](#); Hanyang University, Korea (the Republic of).

3:45 PM SB04.06.06

Flexible and Transparent Reduced Graphene Oxide Strain Gauges with Tuneable Piezoresistivity for Wearable Sensing Applications [Joe Neilson](#); The University of Manchester, United Kingdom.

4:00 PM SB04.06.07

Mechanical Characterization of Collagen Hydrogels by Quasi-static Uniaxial Tensile Experiments [Dongchan Jang](#); Korea Advanced Institute of Science and Technology, Korea (the Republic of).

4:15 PM SB04.06.08

A Self-Powered Pulse Monitoring System Based on Triboelectric Nanogenerator and Supercapacitor for Carotid Artery Pulse Wave Sensing [Hyejun Kil](#); Yonsei University, Korea (the Republic of).

SESSION SB04.07: Poster Session III: Advanced Soft Materials for Bioelectronic Interfaces III

Session Chairs: Sahika Inal and Unyong Jeong

Wednesday Afternoon, May 11, 2022

5:00 PM - 7:00 PM

Hawai'i Convention Center, Level 1, Kamehameha Exhibit Hall 2 & 3

SB04.07.01

Noble Stretchable Nanomembrane Electrode with Exceptional Performance [Chaehong Lim](#); Seoul National University, Korea (the Republic of).

SB04.07.02

Multimodal Monitoring of Electrocardiogram and Oximetry by Wearable Textile Bands [Jiayi Liu](#); University of California, San Diego, United States.

SB04.07.03

Piezoelectric Nanofiber Membrane for Reusable, Stable and Highly Functional Face Mask Filter with Long-Term Biodegradability [Thinh T. Le](#); University of Connecticut, United States.

SB04.07.04

Beyond Gallium Oxide—Modifying Liquid Metal Core-Shell Mechanical Properties via SiO₂-Coatings [Wilson Kong](#)^{1,3}; ¹Air Force Research Laboratory, United States; ³National Research Council, United States.

SB04.07.05

Stretchable PVA/LiCl Composite Hydration Sensor for Touchless Human-Machine Interface [Sangyun Na](#); Ulsan National Institute of Science and Technology, Korea (the Republic of).

SB04.07.06

Engineered Strain Gradients for Hybrid Integration of Rigid Electronics on Soft Biointerfaces [Valentina M. Paggi](#); École Polytechnique Fédérale de Lausanne, Switzerland.

SB04.07.07

Binary Spiky/Spherical Nanoparticle Films with Hierarchical Micro/Nanostructures for High-Performance Flexible Pressure Sensors [Young-Ryul Kim](#); Ulsan National Institute of Science and Technology, Korea (the Republic of).

SB04.07.08

Frequency-Selective Acoustic and Haptic Smart Skin for Dual-Mode Dynamic/Static Human-Machine Interface [Dong-hee Kang](#); UNIST, Korea (the Republic of).

SB04.07.09

Triboelectric Array by Selective UV Irradiation of Thermoplastic Block Copolymer for Tactile Sensor [Junho Jang](#); POSTECH, Korea (the Republic of).

SB04.07.10

Highly Elastic and Biodegradable Metallic Glass for Stretchable Disposable Electronics [Jae-Young Bae](#); Seoul National University, Korea (the Republic of).

SB04.07.11

Two-Dimensional Mono-Layered MXene for Flexible Electronic Devices [Jinyoung Kim](#); Ulsan National Institute of Science and Technology, Korea (the Republic of).

SB04.07.12

An e-Body Painting by Printable Liquid Metal for Biometric Measurement [Hisaya Yamane](#); Keio university, Japan.

SB04.07.13

Fabrication of Porous poly(vinylidene fluoride) Fiber via Phase Separation with Low-Toxic Diluent During Thermal Drawing Process [Namhun Her](#); Chung-Ang University, Korea (the Republic of).

SB04.07.14

Antagonistic Diatom Interface for Biotic Triboelectric Nanogenerators [Jeehee Lee](#); Korea Advanced Institute of Science and Technology, Korea (the Republic of).

SB04.07.15

Stretchable Shape Memory Alloy Thin Films for Bioelectronics [Sabrina M. Curtis](#)^{1,2}; ¹Kiel University, Germany; ²University of Maryland, United States.

SB04.07.16

High Elastic Modulus, Ion Responsive Hydrogel as a Wearable Sensor Material [Abhishek Pachauri](#); The University of Utah, United States.

SB04.07.17

Study of Electronic Platforms with Controlled Stretchability [Reihaneh Jamshidi](#); University of Hartford, United States.

SB04.07.18

Formulating Conductive Inks of Nanowires Built from Silver Nanoparticle Precursors [Brian M. Cole](#); Duke University, United States.

SB04.07.19

Optimization of the Crystalline Structure of Interlocked Polymer for Piezoelectric Elastomer [Bitgaram Kim](#); Korea University, Korea (the Republic of).

SB04.07.20

Fabrication of Conductive Polymer-Conjugated Citrate-Based Elastic Cardiac Patch [Xinlong Wang](#); Northwestern University, United States.

SB04.07.21

Designing Elastomers for Flexible Intracranial Pressure Sensors [Razieh Khalifehzadeh](#); Stanford University, United States.

SESSION SB04.08: Soft Materials for Bioelectronic Interfaces V

Session Chairs: Mary Donahue and Sheng Xu

Thursday Morning, May 12, 2022

Hilton, Mid-Pacific Conference Center, 6th Floor, Coral I

9:30 AM SB04.08.01

3D Printed Dopamine Biosensor [Matteo Massetti](#); Linköping University, Sweden.

9:45 AM SB04.08.02

Characterizing Mechanical Properties of PEGDA-Silica Hydrogels for Bone Wound Healing [Jose Luis Leon](#); California State University, Chico, United States.

10:00 AM BREAK

10:30 AM *SB04.08.04

The Material-Tissue Interface is Key to Bioelectronic Implant Performance [Thomas Stieglitz](#)^{2,1,3}; ¹University of Freiburg, Germany; ²University of Freiburg, Germany; ³University of Freiburg, Germany.

11:00 AM *SB04.08.05

Sustainable Soft Electronic and Robotic Systems [Martin Kaltenbrunner](#); Johannes Kepler University, Austria.

11:30 AM SB04.08.06

Chronic Neuromodulation and Recording Tools for Freely Moving Subjects [Philipp Gutruf](#); University of Arizona, United States.

11:45 AM SB04.08.07

Towards Dynamic Bioelectronic Implants for Neural Interfaces [Christopher M. Proctor](#); University of Cambridge, United Kingdom.

SESSION SB04.09: Soft Materials for Bioelectronic Interfaces VI

Session Chairs: Sahika Inal and Martin Kaltenbrunner

Thursday Afternoon, May 12, 2022

Hilton, Mid-Pacific Conference Center, 6th Floor, Coral 1

1:30 PM *SB04.09.01

Peripheral Nerve Interfaces—Optimizing Wireless Optoelectronic Stimulation [Mary J. Donahue](#); Linköping University, Sweden.

2:00 PM *SB04.09.02

Fiber-Based Interfaces with Central and Peripheral Neural Circuits [Polina Anikeeva](#); Massachusetts Institute of Technology, United States.

2:30 PM SB04.09.03

Multifunctional Ferromagnetic Fiber Robots for Navigation, Sensing and Modulation in Biomedical Applications [Yujing Zhang](#); Virginia Tech, United States.

2:45 PM SB04.09.04

Self-Healing Liquid Metal Composite for Reconfigurable and Recyclable Soft Electronics [Michael D. Bartlett](#); Virginia Tech, United States.

3:00 PM BREAK

3:30 PM *SB04.09.05

Soft Ultrasonic Technologies for Deep Tissue Sensing [Sheng Xu](#); University of California, San Diego, United States.

4:00 PM SB04.09.06

The Dark Side of the Spine—Using Flexible Bioelectronics to Interface with the Spinal Cord [Ben Woodington](#); University of Cambridge, United Kingdom.

4:15 PM SB04.09.07

Calcium-Modified Silk-Based Ultrasound Coupling Medium for Ultrasound Applications [Sang-Mok Lee](#); Korea Advanced Institute of Science and Technology, Korea (the Republic of).

4:30 PM SB04.09.08

One-Step Fabrication of Doped-Graphene Flexible Biosensors for Electrochemical Detection of Neurotransmitters with Nanomolar Sensitivity [Mostafa Bedewy](#); University of Pittsburgh, United States.

4:45 PM SB04.09.09

Label-Free Sensing of Neuropeptide Y Using AC-Mode Graphene Field Effect Transistors in Physiologically Relevant Fluids [Biddut Sarker](#)^{1,2}; ¹Air Force Research Laboratory, United States; ²UES, Inc., United States.

SESSION SB04.10: General Session I
Session Chairs: Hyunhyub Ko and Myung-Han Yoon
Monday Morning, May 23, 2022
SB04-Virtual

10:30 AM *SB04.08.03

Miniaturized Dopamine Sensor for Midbrain Organoids [Hyunjoon J. Lee](#); KAIST, Korea (the Republic of).

11:00 AM *SB04.10.01

Organic Electronic Devices for Interfacing Cells in Microphysiological Systems [Anna Herland](#)^{1,2}; ¹Karolinska Inst, Sweden; ²KTH Royal Institute of Technology, Sweden.

11:30 AM SB04.10.03

Wearable Electrochemical Platform for Non-Invasive Biofluids Analysis Based on Laser-Induced Graphene [Alexander Dallinger](#); Graz University of Technology, Austria.

11:45 AM SB04.10.04

Tuning the Impedance of Flexible Neural Interfaces by Controlled Polymerization of PEDOT:PSS to Resolve Epileptic Fast Ripples [Seyedeh Hajar Mousavi](#); École des Mines de Saint-Étienne, France.

11:50 AM SB04.10.05

3D Printing Multifunctional Hydrogels for Controlled Vapor Release [Aikifa Raza](#); Khalifa University of Science and Tehcnology, United Arab Emirates.

11:55 AM SB04.10.06

Soft Polymers and Microbial Photosynthesis [Massimo Trotta](#); Consiglio Nazionale delle Ricerche, Italy.

12:00 PM SB04.05.03

Enzymatically Polymerized Organic Conductors on Model Membranes [Diana Priyadarshini](#); Linköping University, Sweden.

12:15 PM SB04.10.02

Autonomous Self-Healing Interfaces and Devices [Benjamin C. Tee](#)^{1,2}; ¹National University of Singapore, Singapore; ²iHealthtech, Singapore.

SESSION SB04.11: General Session II
Session Chairs: Hyunhyub Ko and Myung-Han Yoon
Tuesday Morning, May 24, 2022
SB04-Virtual

8:00 AM *SB04.11.01

Intrinsically-Soft Electronic Materials for Skin-Mountable Electronics [Dae-Hyeong Kim](#)^{2,1}; ¹Seoul National University, Korea (the Republic of); ²Institute for Basic Science, Korea (the Republic of).

8:30 AM *SB04.11.02

Ion-to-Ion Amplification Through an Open Junction Ionic Diode [Jeong-Yun Sun](#); Seoul National University, Korea (the Republic of).

9:00 AM *SB04.11.03

Engineering Mixed Ionic/Electronic Materials for On-Skin Electronics and Robotics [Wei Lin Leong](#); Nanyang Technological University, Singapore.

9:30 AM *SB04.02.05

Soft, Resorbable Bioelectronics [Suk-Won Hwang](#); Korea University, Korea (the Republic of).

SESSION SB04.12: General Session III
Session Chairs: Hyunhyub Ko and Myung-Han Yoon
Tuesday Afternoon, May 24, 2022
SB04-Virtual

4:00 PM *SB04.12.01

Wearable Sweat Sensors—Towards Big Data for Human Health [Ali Javey](#); University of California, Berkeley, United States.

4:30 PM *SB04.12.02

A Novel Electrochemical Conductive Polymer Interface for Controlled Capture/Release of Biological Entities [Jadranka Travas-Sejdic](#)^{1,2}; ¹The University of Auckland, New Zealand; ²The MacDiarmid Institute of Advanced Materials and Nanotechnology, New Zealand.

5:00 PM SB04.12.03

Wireless, Battery-Free Push-Pull Microsystems for Membrane-Free Neurochemical Sampling in Freely Moving Animals [Yi Zhang](#); University of Connecticut, United States.

5:15 PM SB04.12.04

Soft Biosensing Harnessing Nanoporous Conductive Wires [Momena Monwar](#); University of Nevada, Reno, United States.

5:20 PM SB04.04.13

Specific Ion Effects on the Assembly of Ionic Amphiphilic Oligomers Elucidated by Spectroscopy and Neutron Reflectivity [Zening Liu](#); Oak Ridge National Laboratory, United States.

5:25 PM *SB04.02.04

Bio-Sourced Organic Materials for Biodegradable Electronics [Clara Santato](#); Ecole Polytechnique de Montreal, Canada.

SYMPOSIUM SB05

Tissue-Like Bioelectronics and Living Bioelectronic Interfaces
May 9 - May 24, 2022

Symposium Organizers

* Invited Paper

SESSION SB05.01: Tissue-Like Bioelectronics and Conducting Hydrogels
Session Chairs: Ivan Minev, Alexandra Rutz and Christina Tringides
Monday Afternoon, May 9, 2022
Hilton, Mid-Pacific Conference Center, 6th Floor, Sea Pearl 1

1:30 PM *SB05.01.01

Stretchable and Highly Conductive Polymer Hydrogels Hidenori Okuzaki; University of Yamanashi, Japan.

2:00 PM *SB05.01.02

Soft Mixed Conductors Towards Enhanced Sensing and Tissue Regeneration Jonathan Rivnay; Northwestern University, United States.

2:30 PM SB05.01.03

Tissue-Like Conductive Hydrogel Materials Christina M. Tringides^{1,3}; ¹Harvard University, United States; ³Wyss Institute, United States.

2:45 PM SB05.01.04

New Strategies for the Preparation of Electronically-Conductive Hydrogels Laure V. Kayser^{1,2}; ¹University of Delaware, United States; ²University of Delaware, United States.

3:00 PM BREAK

3:30 PM *SB05.01.05

Electrically Conductive Hydrogels for Multimodal Bioelectronic Interfaces Ivan Minev; University of Sheffield, United Kingdom.

4:00 PM SB05.01.06

Hydrogel Neural Interfaces—A Robust and Modular Toolbox for Neuroscience Anthony Tabet; Massachusetts Institute of Technology, United States.

4:15 PM SB05.01.07

Ion-Based Conformable Integrated Neural Implant Zifang Zhao; Columbia University, United States.

SESSION SB05.06 Poster Session: Tissue-Like Bioelectronics and Living Bioelectronic Interfaces
Session Chairs: Alexandra Rutz and Christina Tringides
Tuesday Afternoon, May 10, 2022
5:00 PM - 7:00 PM
Hawai'i Convention Center, Level 1, Kamehameha Exhibit Hall 2 & 3

SB05.06.01

Electrophoretic Hybrid Devices for Brain Cancer Therapy Tobias Naegele; University of Cambridge, United Kingdom.

SB05.06.02

Printing of Wireless Soft Neural Interface Systems for Recording Neural Activities in the Brain Yong Won Kwon^{1,2}; ¹Yonsei University, Korea (the Republic of); ²Yonsei-IBS Institute, Korea (the Republic of).

SB05.06.03

Development of a Transient and Minimally Invasive Neural Interface Adele Fanelli; Ecole Polytechnique Federale de Lausanne, Switzerland.

SB05.06.04

Chronically Stable Thin-Film PEDOT: PSS Electrodes for Neurostimulation Poppy J. Oldroyd; University of Cambridge, United Kingdom.

SB05.06.05

Target Frequency Controllable Vibration Damping Hydrogel Filter for Bio-Attachable Sensors Jehyung Ok; Sungkyunkwan University, Korea (the Republic of).

SB05.06.06

Key Factors for Maximizing the Stability of PEDOT:PSS Organic Electrochemical Transistors Sophia Bidinger; University of Cambridge, United Kingdom.

SESSION SB05.09: Tissue-Interfacing and Cell-Mimicking Bioelectronics
Session Chairs: Alejandro Carnicer Lombarte, Damia Mawad and Alexandra Rutz
Thursday Morning, May 12, 2022
Hilton, Mid-Pacific Conference Center, 6th Floor, Sea Pearl 1

8:45 AM *SB05.09.01

Bioelectronic Tools to Study the Gut-Brain Axis [Róisín M. Owens](#); University of Cambridge, United Kingdom.

9:15 AM SB05.09.02

Seamless Integration of Bioelectronic Interface in an Animal Model via *In Vivo* Polymerization of Conjugated Oligomers [Eleni Stavrinidou](#); Linköping University, Sweden.

9:30 AM SB05.09.03

***In Situ* Electrochemical Generation of Signaling Molecules for Neuronal Modulation** [Jimin Park](#); Massachusetts Institute of Technology, United States.

9:45 AM BREAK

10:15 AM SB05.09.04

Thin-Film Peripheral Nerve Cuffs for Chronic High-Resolution Interfacing and Long-Term Stability [Alejandro Carnicer Lombarte](#); University of Cambridge, United Kingdom.

10:30 AM SB05.09.05

Enzymatic Polymerization of Cell-Templated Electrodes [Hanne Biesmans](#); Linköping University, Sweden.

10:45 AM SB05.09.06

***In Vivo* Polymerization of Thiophene Oligomers in Plants for Energy and Sensing Applications** [Gwennaëlle R. Duffil](#); Linköping University, Sweden.

SESSION SB05.10: General Session I
Session Chairs: Antonio Lauto and Damia Mawad
Monday Afternoon, May 23, 2022
SB05-Virtual

9:00 PM *SB05.10.01

WITHDRAWN 5/18/22 SB05.10.01 Viral Vector-Delivery Probes for Spatially Precise Integration of Optogenetics and Electrophysiology [Ying Fang](#); National Center for Nanoscience and Technology, China.

9:30 PM *SB05.10.02

Biocompatible Wireless Device for Stimulation and Repair of Peripheral Nerves Without Electrodes [Antonio Lauto](#); Western Sydney University, Australia.

10:00 PM SB05.10.03

Soft, Stretchable and Conformable Bioelectronic Device for Neural Modulation [Tao Zhou](#); Massachusetts Institute of Technology, United States.

10:15 PM SB05.10.04

Growth-Adaptive Biodevices for Pediatric Electronic Medicine [Yuxin Liu](#); Institute of Materials Research and Engineering, Singapore.

10:30 PM SB05.10.05

Screen-Printed Electric Cellular-Substrate Impedance Sensing System [Bryan Ibarra](#); Materic Group, United States.

10:35 PM *SB05.10.06

Integrated Bioelectronic Proton-Gated Logic Elements Utilizing Nanoscale Patterned Nafion [Adam P. Micolich](#); UNSW Australia, Australia.

SESSION SB05.11: General Session II
Session Chairs: Alexandra Rutz and Christina Tringides
Tuesday Morning, May 24, 2022
SB05-Virtual

10:30 AM SB05.11.01

Integrating Protein Pores into Ultrathin Polydopamine Films for Mimicking Cell Membrane [Tommaso Marchesi](#); Max Planck Institute for Polymer Research, Germany.

10:45 AM *SB05.11.02

Designing Bioelectronic Materials for Regenerative Medicine [Molly Stevens](#); Imperial College London, United Kingdom.

11:15 AM *SB08.09/SB05.07.01

Wireless Organic Neuroprostheses [Diego Ghezzi](#); Ecole Polytechnique Federale de Lausanne, Switzerland.

SESSION SB08.09/SB05.07: Joint Session: Bioelectronics for In Vivo Interfaces I
Session Chairs: Mary Donahue and Alexandra Rutz
Wednesday Morning, May 11, 2022
Hilton, Mid-Pacific Conference Center, 6th Floor, South Pacific 2

8:45 AM *SB08.09/SB05.07.02

Magnetolectric Nanomaterials for Wireless Neuronal Modulation [Kristen Kozielski](#); Technical University of Munich, Germany.

9:15 AM SB08.09/SB05.07.03

Miniature, Wireless and Battery-Free Neural Interfaces Enabled by Magnetolectric Materials [Joshua Chen](#); Rice University, United States.

9:30 AM SB08.09/SB05.07.04

Wireless Magnetolectrically-Driven Organic Light-Emitting Diodes for Optogenetic Stimulation [Julian Butscher](#)^{1,2}; ¹University of St Andrews, United Kingdom; ²University of Cologne, Germany.

9:45 AM SB08.09/SB05.07.05

Controlling Cell Signaling via Calcium Influx Modulation Using Magnetic Nanoparticles and Alternating Magnetic Fields [Dekel Rosenfeld](#)^{1,2}; ¹Massachusetts Institute of Technology, United States; ²Massachusetts Institute of Technology, United States.

10:00 AM BREAK

10:30 AM *SB08.09/SB05.07.06

In Vivo Interrogation of Human Organoids Implanted in Mice Using Transparent Microgrids [Duygu Kuzum](#); University of California, San Diego, United States.

11:00 AM SB08.09/SB05.07.07

Passive Drug Delivery Monitoring via Intra Body Communication [Leonardo Lamanna](#); Istituto Italiano di Tecnologia, Italy.

11:15 AM SB08.09/SB05.07.08

NeuroString—A Tissue-Like Neurotransmitter Sensor for Interfacing with Brain and Gut [Jinxing Li](#)^{1,2}; ¹Michigan State University, United States; ²Stanford University, United States.

11:30 AM SB08.09/SB05.07.09

Flexible Organic Electrochemical Transistor-Based Psychrometer for In Vivo Monitoring of Plant Health [Megan N. Renny](#); University of Colorado, Boulder, United States.

SESSION SB08.10/SB05.08: Joint Session: Bioelectronics for In Vivo Interfaces II

Session Chairs: Mary Donahue and Damia Mawad

Wednesday Afternoon, May 11, 2022

Hilton, Mid-Pacific Conference Center, 6th Floor, South Pacific 2

1:30 PM *SB08.10/SB05.08.01

Multimaterial Fibers as Bioinspired Actuators [Polina Anikeeva](#); Massachusetts Institute of Technology, United States.

2:00 PM SB08.10/SB05.08.02

Flexible Multifunctional Fiber-Based Optoacoustic Emitter for Non-Genetic Bidirectional Neural Communication [Nan Zheng](#); Boston University, United States.

2:15 PM SB08.10/SB05.08.03

WITHDRAWN 5/6/2 SB05.08.03 Multifunctional Microelectronic Fibers Enable Wireless Modulation of Gut and Brain Neural Circuits [Atharva Sahasrabudhe](#)^{1,2,3}; ¹Massachusetts Institute of Technology, United States; ²Massachusetts Institute of Technology, United States; ³Massachusetts Institute of Technology, United States.

2:30 PM BREAK

3:00 PM *SB08.10/SB05.08.04

Soft Bioelectronic Interfaces from 2D MXene Materials [Flavia Vitale](#); University of Pennsylvania, United States.

3:30 PM SB08.10/SB05.08.05

Fully Implantable, Ion-Gated, Organic Integrated-Circuits for Chronic, Closed-Loop Epileptic Interventions [Claudia Cea](#); Columbia University, United States.

3:45 PM SB08.10/SB05.08.06

Bioelectronic Neuroimmune Interfaces for Studying Brain Tumors [Anthony Tabet](#); Massachusetts Institute of Technology, United States.

4:00 PM SB08.10/SB05.08.07

High Density, High Channel Count Flexible Neural Probes Realized by Integration to CMOS Chips [Eric T. Zhao](#); Stanford University, United States.

SYMPOSIUM SB06

Bioelectronic Materials and Devices for In Vitro Systems
May 9 - May 24, 2022

Symposium Organizers

* Invited Paper

SESSION SB06.02: Bioelectronic Materials and Devices for in vitro Interfacing

Session Chairs: Gerwin Dijk and Paschalis Gkoupidenis
Monday Afternoon, May 9, 2022

Hilton, Mid-Pacific Conference Center, 6th Floor, Coral 2

1:30 PM *SB06.02.01

Graft and Random Copolymers Based on Functionalized PEDOT [Damia Mawad](#); University of New South Wales, Australia.

2:00 PM *SB06.02.02

Inkjet-Printing of PEDOT:PSS for Bioelectronics [Sungjune Jung](#); Pohang University of Science and Technology, Korea (the Republic of).

2:30 PM SB06.02.03

Controlling the Neuromorphic Behavior of Organic Electrochemical Transistors [Shunsuke Yamamoto](#)^{1,2}; ¹Tohoku University, Japan; ²University of Cambridge, United Kingdom.

2:45 PM SB06.02.04

Impacts of Gate Voltage on the Stability of Crosslinked PEDOT:PSS Organic Electrochemical Transistors [Song Guo](#); Univ of Southern Mississippi, United States.

3:00 PM BREAK

3:30 PM *SB06.02.05

Highly Conductive/Capacitive Three-dimensional Mesh Structures Based on Crystalline PEDOT:PSS Microfibers for Bioelectronic Interfaces [Myung-Han Yoon](#); Gwangju Institute of Science and Technology, Korea (the Republic of).

4:00 PM SB06.02.06

Fast and Long-Term Stable Nanofiber Channel Organic Electrochemical Transistor Sensor [Seung-Hyun Oh](#); Seoul National University, Korea (the Republic of).

4:15 PM SB06.03.01

High-Capacitance Nanoporous Noble Metal Thin Films via Reduction of Metal Oxides [Maciej Gryszel](#); Linköping University, Sweden.

4:30 PM SB06.02.08

Semiconducting Nanowires for Engineering Functional Neural Networks *In Vitro* [Vini Gautam](#); University of Melbourne, Australia.

4:45 PM SB06.02.09

Flexible and Hollow Micro Ring Electrode Arrays for Multi-Directional Monitoring of 3D Neuronal Networks [Venkata s. Vajrala](#); Laboratory for Analysis and Architecture of Systems, France.

SESSION SB06.03: Poster Session I: Bioelectronic Materials and Devices for In Vitro Systems I

Session Chairs: Róisín Owens and Anna-Maria Pappa

Monday Afternoon, May 9, 2022

5:00 PM - 7:00 PM

Hawai'i Convention Center, Level 1, Kamehameha Exhibit Hall 2 & 3

SB06.03.02

Magnetoelastic Sensor-Based Circulating Tumor Cell Capture [Alana MacLachlan](#); Auburn University, United States.

SB06.03.03

Protein Redox by Piezoelectric Acousto-Nanodevice [Eunjeong Byun](#); Sookmyung Women's University, Korea (the Republic of).

SB06.03.04

Monolithic Inkjet-Printed Plasmonic Structures Incorporated Microfluidics [HyunJi Shim](#); Sookmyung Women's University, Korea (the Republic of).

SB06.03.05

Interfacing Stretchable Electronics and Engineered Neuronal Cultures for *In Vitro* Mechano-Neurobiology [Léo Siffringer](#); ETH Zürich, Switzerland.

SB06.03.07

Hybrid Nanotubes (HyNTs)-Based Intracellular Molecule Delivery [Kazuhiro Oyama](#); Waseda University, Japan.

SB06.03.08

Micropillar Electrode Array for Enhancing the Maturation of Reprogrammed Cardiac Spheroids [HyoJung Lee](#); Yonsei University, Korea (the Republic of).

SB06.03.09

Tattoo-Like Epidermal Microneedle Electrode for Long-term Electrophysiology Measurement in Daily Life [JooHwan Shin](#); Sungkyunkwan University, Korea (the Republic of).

SB06.03.10

Electrochemical Cytosensor for Cancer Cell Detection and Evaluation of Anticancer Drug [Won Hur](#); Hanyang University, Korea (the Republic of).

SB06.03.11

Bioelectronic Ion Pumps for Long Term *In Vitro* Applications [Harika Dechiraju](#); University of California, Santa Cruz, United States.

SB06.03.12

Affinity Filter-Integrated Hydrogel Transistor to Monitor Specific Ion Signals [Hyebin Yoo](#); Pohang University of Science and Technology, Korea (the Republic of).

SB06.03.13

Microfluidic Impedance Spectroscopy for *In Vitro* Biological Sensing [Thomas J. Wade](#); University of Cambridge, United Kingdom.

SB06.03.14

Enhanced Sensitivity of Graphene Probes in Detection of Electrical Activities of Retina [Xiaosi Zhang](#); Vanderbilt University, United States.

SB06.03.15

Photobiomodulation Sequentially Triggered Intracellular Angiogenic Molecular Mechanisms to Enhance the Therapeutic Efficacy of Adult Stem Cells [Yu-Jin Kim](#); Sungkyunkwan University, Korea (the Republic of).

SB06.03.16

3D Liquid Microelectrode Arrays for Electrophysiological Analysis of Brain Organoids [Enji Kim](#)^{1,2}; ¹Yonsei University, Korea (the Republic of); ²Yonsei University, Korea (the Republic of).

SB06.03.17

Functionalization of Microfluidic Devices for Protein Detection by Aerosol-Jet Printing [Nordin Catic](#); University of Cambridge, United Kingdom.

SB06.03.19

A Novel, Hand-Held, Fast, Small Volume Blood Diagnostics Device to Correlate Biomarkers with Mild Cognitive Impairment and Alzheimer's Disease [Jennifer C. Wong](#)^{2,1}; ¹Arizona State University, United States; ²Alzheimer Bio-Sensors, LLC, United States.

SESSION SB06.04/SB05.02: Joint Session: Bioelectronics for Complex Tissues

Session Chairs: Damia Mawad, Anna-Maria Pappa and Alexandra Rutz

Tuesday Morning, May 10, 2022

Hilton, Mid-Pacific Conference Center, 6th Floor, Coral 2

8:30 AM *SB06.04/SB05.02.01

A Novel Tissue Engineered Organic Bioelectronic Device to Host and Monitor 3D Cell Cultures *In Vitro* [Charalampos Pitsalidis](#)^{2,1}; ¹University of Cambridge, United Kingdom; ²Khalifa University of Science and Technology, United Arab Emirates.

9:00 AM *SB06.04/SB05.02.02

2D and 3D Analytical Tools for *In Vitro* Testing of Electroactive Cells [Annalisa Bonfiglio](#); University of Cagliari, Italy.

9:30 AM SB06.04/SB05.02.03

Electrically Programming Tissue Healing and 3D Organoid Morphology Using Electrobioreactors [Daniel J. Cohen](#); Princeton University, United States.

9:45 AM SB06.04/SB05.02.06

An Organic Bioelectronic Platform for Detecting Tumour-Derived Exosome-Induced Metastasis [Róisín M. Owens](#); University of Cambridge, United Kingdom.

10:00 AM BREAK

10:30 AM *SB06.04/SB05.02.05

GelPin Microphysiological Systems for 3D Neural Interfacing [Abigail Koppes](#); Northeastern Univ, United States.

11:00 AM *SB06.04/SB05.02.04

Multifunctional Conducting Polymer Composite Scaffolds for Human Stem Cell Cultures [Achilleas Savva](#); University of Cambridge, United Kingdom.

SESSION SB06.05/SB05.03: Keynote Presentation

Session Chairs: Damia Mawad, Anna-Maria Pappa and Alexandra Rutz

Tuesday Morning, May 10, 2022

Hilton, Mid-Pacific Conference Center, 6th Floor, Coral 2

11:30 AM *SB06.05/SB05.03.01

Input/Output (I/O) Bioelectrical Interfaces with Cells and Tissue Using Nanocarbons [Tzahi Cohen-Karni](#); Carnegie Mellon University, United States.

SESSION SB06.06/SB05.04: Joint Session: Bioelectronic Monitoring of Cells and Tissues in vitro
Session Chairs: Damia Mawad, Róisín Owens and Alexandra Rutz
Tuesday Afternoon, May 10, 2022
Hilton, Mid-Pacific Conference Center, 6th Floor, Coral 2

1:45 PM SB06.06/SB05.04.00

Light Stimulation of Organic Photocapacitors Induces Action Potentials in Neurons and Ion Channel Gating in Mammalian Cells [Tony Schmidt](#); Medical University of Graz, Austria.

2:00 PM *SB06.06/SB05.04.01

Conducting Polymers for *In Vitro* Microelectrode Arrays [George G. Malliaras](#); University of Cambridge, United Kingdom.

2:30 PM *SB06.06/SB05.04.03

Functional Neuroelectronic Interfaces Through Artificial Biomembranes [Francesca Santoro](#); Istituto Italiano di Tecnologia, Italy.

3:00 PM BREAK

3:30 PM SB06.06/SB05.04.02

Understanding Biological Membranes Using Bioelectronics [Anna-Maria Pappa](#); Khalifa University, United Arab Emirates.

3:45 PM SB06.06/SB05.04.04

Thin-Film Organic Electronic Devices Integrated into Increasingly Complex and More Realistic Glioblastoma Models [Marie Lefevre](#); EMSE, France.

4:00 PM SB06.06/SB05.04.05

Electrical Stimulation with PEDOT:PSS—Explorations Beyond the Water Window [Gerwin Dijk](#)^{1,2,3}; ¹Stanford University, United States; ²EMSE, France; ³Panaxium SAS, France.

4:15 PM SB06.06/SB05.04.06

***In Vitro* Model for Retinal Ganglion Cell Reinnervation of Thalamic Target Structures** [Tobias Ruff](#); ETH Zürich, Switzerland.

SESSION SB06.07/SB05.05: Keynote Presentation
Session Chairs: Damia Mawad, Róisín Owens and Alexandra Rutz
Tuesday Afternoon, May 10, 2022
Hilton, Mid-Pacific Conference Center, 6th Floor, Coral 2

4:30 PM *SB06.07/SB05.05.01

Organic Electrochemical Transistors for Protein Detection in Physiological Media [Sahika Inal](#); King Abdullah University of Science and Technology, Saudi Arabia.

SESSION SB06.08: Poster Session II: Bioelectronic Materials and Devices for In Vitro Systems II
Session Chairs: Susan Daniel, Anna-Maria Pappa and Alberto Salleo
Tuesday Afternoon, May 10, 2022
5:00 PM - 7:00 PM
Hawai'i Convention Center, Level 1, Kamehameha Exhibit Hall 2 & 3

SB06.08.01

Detecting Methamphetamine with Organic Electrochemical Transistor (OECT) [Xuyang He](#); The University of Southern Mississippi, United States.

SB06.08.02

Electrochemical Aptasensor for Sensitive Dopamine Detection Based on DNA Intercalation of Methylene Blue Using Highly Reliable Low Temperature Co-Fired Ceramic Chip [Sang-Heon Park](#)^{1,2}; ¹Yonsei University, Korea (the Republic of); ²Yonsei University, Korea (the Republic of).

SB06.08.04

Hydrogel Biomaterial Embedded Bioelectronics for Clinical Application of Serological Alzheimer's Disease Diagnosis [Hye Jin Kim](#); Seoul National University, Korea (the Republic of).

SB06.08.05

Impedimetric Flexible SPCE Biosensor for the Evaluation and Analysis of the Hemostasis Process Based on the Blood Factors [Yong-Sang Kim](#); Sungkyunkwan University, Korea (the Republic of).

SB06.08.06

COVID-19 Electrochemical Sensor Using Loop-Mediated Isothermal Amplification with Methylene Blue [Yong-Sang Kim](#); Sungkyunkwan University, Korea (the Republic of).

SB06.08.07

Electrochemical Synthesis of Conductive Melanin-Like Polymers for Non-Enzymatic Glucose Biosensors [Busra Ozlu](#); Inha University, Korea (the Republic of).

SESSION SB06.09: Bioelectronics for Subcellular Biophysics
Session Chairs: Susan Daniel and Sahika Inal
Wednesday Morning, May 11, 2022
Hilton, Mid-Pacific Conference Center, 6th Floor, Coral 2

8:30 AM *SB06.09.01

Lateral Black Lipid Membranes for Studying Peptide-Lipid Interactions [Kaori Sugihara](#); Institute of Industrial Science, the University of Tokyo, Japan.

9:00 AM *SB06.09.02

Nanopore Sensors for Topographical and Chemical Imaging of Living Cells [Craig Aspinwall](#); University of Arizona, United States.

9:30 AM SB06.09.03

Control of Bioelectricity Using Bipolar Nanoelectrodes—A New Bioelectronic Tool [Frankie J. Rawson](#); University of Nottingham, United Kingdom.

9:45 AM SB06.09.04

RNA Biomolecular Electronics for Biophysics and Biosensors [Juan M. Artes Vivancos](#); University of Massachusetts-Lowell, United States.

10:00 AM BREAK

10:30 AM *SB06.09.05

Controlled Ion Transport in Highly-Confined 1D and 2D Materials [Aleksandr Noy](#)^{1,2}; ¹Lawrence Livermore National Laboratory, United States; ²University of California, Merced, United States.

11:00 AM SB06.09.06

Ionic Contrast Across a Lipid Membrane for Debye Length Extension—Towards an Ultimate Bioelectronic Transducer [Yong-Sang Ryu](#)^{1,2}; ¹Korea Institute of Science and Technology, Korea (the Republic of); ²Korea University, Korea (the Republic of).

11:15 AM SB06.09.07

Strategies for Wireless Bioelectronics Actuation Inside a Cell [Jihun Rho](#); Stanford, United States.

11:30 AM SB06.09.00

Biomembranes on Bioelectronic Devices: Functional Transmembrane Proteins for Sensing Applications [Susan Daniel](#); Cornell University, United States.

11:45 AM SB06.09.08

Controlled Intracellular Cargo Delivery Using a Polypyrrole-Silicon Nanowire Hybrid Platform [Daniel Loh](#); Harvard University, United States.

SESSION SB06.10: in vitro Bioelectronics—Beyond Mammalian Cells

Session Chairs: Anna-Maria Pappa and Charalampos Pitsalidis

Wednesday Afternoon, May 11, 2022

Hilton, Mid-Pacific Conference Center, 6th Floor, Coral 2

1:30 PM *SB06.10.01

Optical and Bioelectronic Means to Study Copper Transporter Function in Plants [Miriam Huerta](#); Cornell University, United States.

2:00 PM SB06.10.02

Photosynthesis Re-Wired on the Pico-Second Timescale [Tomi K. Baikie](#); University of Cambridge, United Kingdom.

2:15 PM SB06.10.03

Magnetic Field Interactions in Redox Cofactor Solutions are Dominated by the Magnetohydrodynamic Effect [Florian Koehler](#); Massachusetts Institute of Technology, United States.

2:30 PM SB06.10.04

Screening SARS-CoV-2 Variant at a Molecular Diagnostic Level Using a Virus Receptor-Based Electrical Biosensor [Hojun Kim](#); Korea Institute of Science and Technology, Korea (the Republic of).

2:45 PM *SB06.02.07

Novel Biocompatible Self-Healable Hydrogel Electronics [Eloise Bihar](#); University of Colorado, United States.

SESSION SB06.11: Bioelectronics-on-a-Chip—Cell-Based Assays

Session Chairs: Miriam Huerta and Donata Iandolo

Thursday Morning, May 12, 2022

Hilton, Mid-Pacific Conference Center, 6th Floor, Coral 2

8:30 AM *SB06.11.01

Lab on a Chip Bioelectronics for Closed Loop Monitoring and Control of Physiological Processes [Marco Rolandi](#); University of California, Santa Cruz, United States.

9:00 AM SB06.11.02

PEDOT:PSS Electrodes for Dielectrophoretic Cell Positioning and Electropermeabilization [Asmaysinh Gharia](#)^{1,2}; ¹University of Cambridge, United Kingdom; ²National Institutes of Health, United States.

9:15 AM SB06.11.03

Tumour Treating Fields Effect on Cell Viability is Determined by Cell Orientation and Field Direction [Elise Jenkins](#); University of Cambridge, United Kingdom.

9:30 AM SB06.11.04

Wireless Intracellular Nanoactuators—Bioelectronic Therapy for Glioblastoma Multiforme [Akhil Jain](#); University Nottingham, United Kingdom.

9:45 AM BREAK

10:15 AM SB06.11.05

Electrophoretic Delivery of Anaesthetic Drug Towards Local, On-Demand Pain Therapy [Arghyamalya Roy](#); Linköping University, Sweden.

10:30 AM *SB06.11.06

Augmenting the Functionality of Bioelectronics—Sensitivity, Integration and Biomimicry Paschalis Gkoupidenis; Max Planck Institute for Polymer Research, Germany.

11:00 AM SB06.11.08

Perpetual Antioxidant Nanoparticles as Anti-inflammatories for Chronic Applications of Neural Recording Electrodes Vicki L. Colvin; Brown University, United States.

SESSION SB06.12: Bioelectronics-on-a-Chip—Biosensors

Session Chairs: Eloise Bihar and Anna-Maria Pappa

Thursday Afternoon, May 12, 2022

Hilton, Mid-Pacific Conference Center, 6th Floor, Coral 2

1:30 PM SB06.12.01

Integration of Organic Electrochemical Transistor with Electrochemical Aptamer-Based Sensor for Transforming Growth Factor Beta 1 Sensing Xudong Ji^{1,2}; ¹Northwestern University, United States; ²Northwestern University, United States.

1:45 PM SB06.12.02

Antibiotic Susceptibility Testing in Blood Using Vertical Capacitance Aptasensors KyoSeok Lee; Yonsei University, Korea (the Republic of).

2:00 PM SB06.12.03

Faradaic Pixels for Precise Manipulation of Physiological Oxygen—On-Demand Hypoxia or Oxidative Stress Eric D. Glowacki; Brno University of Technology, Czechia.

2:15 PM SB06.12.04

On-Demand Modifications of Thin-Film Transistors for Label-Free Biosensing Applications Yu Shu; University of Oxford, United Kingdom.

2:30 PM SB06.12.05

Thermal Detection of Glucose in Urine Using a Molecularly Imprinted Polymer as Recognition Element Manlio Caldara; Maastricht University, Netherlands.

2:45 PM SB06.12.06

WITHDRAWN 5/6/22 SB06.12.06 Portable Sensing Platforms Based on Organic Electrochemical Transistors for Ultrasensitive Detection of Ribonucleic Acid Biomarkers Ying Fu^{1,2}; ¹University of Strathclyde, Department of Pure and Applied Chemistry, United Kingdom; ²Department of Applied Physics, Hong Kong.

SESSION SB06.13: Bioelectronic Materials and Devices for in vitro Systems I

Session Chair: Alberto Salleo

Monday Afternoon, May 23, 2022

SB06-Virtual

1:00 PM *SB06.13.01

Opto-Electronically Active Materials for Infection Detection and Control Susanne Löffler; Karolinska Institutet, Sweden.

1:30 PM SB06.13.02

A Novel Platform for Cell Impedance Spectroscopy Thomas Chalklen; University of Cambridge, United Kingdom.

1:45 PM SB06.13.03

Designing Sensitivity—A Comparative Analysis of Microelectrode Topologies for Dissolved Oxygen Sensing Evan Strittmatter; Yale University, United States.

SESSION SB06.14: Bioelectronic Materials and Devices for in vitro Systems II

Session Chair: Anna-Maria Pappa

Monday Afternoon, May 23, 2022

SB06-Virtual

6:30 PM *SB06.14.01

Electrochemically Tapping into the Photosynthetic Electron Transport Chain Jenny Zhang; University of Cambridge, United Kingdom.

7:00 PM *SB06.14.02

Soft Organic Bioelectronics for Biomedical Innovation Shiming Zhang; The University of Hong Kong, China.

7:30 PM *SB06.14.03

Flexible Organic Thin Film Transistors for High-Performance Biosensors Feng Yan; Hong Kong Polytechnic University, China.

8:00 PM SB06.14.04

A Comprehensive Study of the Effect of Electropolymerization Parameters on Surface Morphology, Electrical Properties and Biocompatibility of Conducting Polymers Anthony Kisucky; University of Houston, United States.

8:05 PM SB06.14.05

Rapid Pathogen Detection from Fluid Drops via a New *In Vitro* Handheld, Low-Cost, Accurate, Small Fluid Volume Diagnostic (SFVD) Device Using Macroscopic Epi-Fluorescence—Proof-of-Concept Tanvi K. Sathish^{1,2,3}; ¹Arizona State University, United States; ²SiO2 Innovates, LLC, United States; ³Microdrop Diagnostics, United States.

8:10 PM SB06.14.06

Brain-on-Chip Platform for Studying the Optimum Parameter of Ultrasound Neuromodulation Gandhi Wardhana; Delft University of Technology, Netherlands.

8:15 PM SB06.14.07

Image-Based Spatially-Resolved Laser-Activated Cell Sorting Amos C. Lee; Seoul National University, Korea (the Republic of).

8:30 PM SB06.14.08

High Efficiency Organic Photovoltaics Based on Non-Fullerene Acceptors (PCE10:ITIC:Y6) for Retinal Prosthesis Hyunsun Song; Korea Institute of Science and Technology, Korea (the Republic of).

SESSION SB06.15: Bioelectronic Materials and Devices for in vitro Systems III

Session Chair: Susan Daniel
Tuesday Morning, May 24, 2022
SB06-Virtual

8:00 AM *SB06.15.01

Sensing Smells Wolfgang Knoll^{1,2}; ¹AIT Austrian Institute of Technology, Austria; ²Danube Private University, Austria.

8:30 AM SB06.15.02

Cell-Silicon Nanowire Hybrids for Bioelectrical Interrogation with Sub-Cellular Resolution in 3D Tissues Menahem Y. Rotenberg; Technion, Israel.

8:45 AM SB06.15.03

Development of Ultrasensitive Sweet Taste Sensor Based on Venus Flytrap Domain of Human Sweet Taste Receptor Jin-Young Jeong; Korea Institute of Science and Technology, Korea (the Republic of).

9:00 AM SB06.15.04

Neurites Whispering at Adaptive Sensors—High Spike-Signal-to-Noise Ratio Recorded with Electropolymerized Microelectrode Arrays Mahdi Ghazal; Institut d'Electronique de Microélectronique et de Nanotechnologie, France.

9:15 AM SB06.08.03

Wireless, Highly Sensitive and Diagnostic Contact Lens Sensors Te Xiao; Waseda University, Japan.

9:20 AM SB06.08.03

ATP Synthase and Ion Channel-Integrated Biotransducer Yukun Chen; Waseda University, Japan.

SYMPOSIUM SB07

Bioresponsive Nanotheranostics
May 9 - May 25, 2022

Symposium Organizers

* Invited Paper

SESSION SB07.01: Sensors and Devices
Session Chairs: Weibo Cai and Liangfang Zhang
Monday Morning, May 9, 2022
Hilton, Mid-Pacific Conference Center, 6th Floor, South Pacific 1

10:30 AM SB07.01.01

Specific and Portable Graphene Field Effect Biosensor for Simultaneous Detection of Diverse Viruses Neelotpal Kumar; The University of Texas at Austin, United States.

10:45 AM SB07.01.02

Theranostics Enabled by the Giant Susceptibility of Magnetic Nanoclusters Vicki L. Colvin; Brown University, United States.

11:00 AM *SB07.01.03

Extracellular Matrix Targeted Activity-Based Nanosensors to Visualize Protease Activity in Traumatic Brain Injury Ester J. Kwon; University of California, San Diego, United States.

SESSION SB07.02: Nanomaterials in Oncology (and Beyond)
Session Chairs: Weibo Cai and Zhongmin Tang
Monday Afternoon, May 9, 2022
Hilton, Mid-Pacific Conference Center, 6th Floor, South Pacific 1

1:45 PM *SB07.02.01

Designed Synthesis and Assembly of Inorganic Nanomaterials for Medical Applications Taeghwan Hyeon^{1,2}; ¹Seoul National University, Korea (the Republic of); ²Institute for Basic Science (IBS), Korea (the Republic of).

2:15 PM SB07.02.02

"Chemical Factory"-Guaranteed Chemodynamic Therapy of Orthotopic Liver Cancer Zhongmin Tang; University of Wisconsin, United States.

2:30 PM SB07.02.03

X-Ray Induced Photodynamic Therapy by Novel Scintillator Nanoparticles Fangchao Jiang; University of Georgia, United States.

2:45 PM SB07.02.04

Polymeric Antitumor Systems with Dual Mechanism of Action Libor Kostka; Institute of Macromolecular Chemistry CAS, Czechia.

3:00 PM BREAK

3:30 PM *SB07.02.05

Tumor-Targeted Polymer Theranostics for Navigated Surgery, Photodynamic Therapy and Tumor Imaging Tomáš Etrych; Institute of Macromolecular Chemistry CAS, Czechia.

4:00 PM SB07.02.06

A Novel Microbubble Platform for Immunotherapy—Using MUSIC to Activate the STING Pathway Sina Khorsandi; UT Southwestern Medical Center, United States.

SESSION SB07.03: Poster Session I: Bioresponsive Nanotheranostics I
Session Chairs: Weibo Cai and Jie Zheng
Monday Afternoon, May 9, 2022
5:00 PM - 7:00 PM
Hawai'i Convention Center, Level 1, Kamehameha Exhibit Hall 2 & 3

SB07.03.01

Influence of Anisotropic Micro-Structured Surfaces to Neuronal Cell Morphology and Motility Thi Thuy Chau Nguyen; Chungnam National University, Korea (the Republic of).

SB07.03.02

De Novo Generation of Hybrid Ligands with an Ultra-High Affinity to Desired Targets [Minjong Lee](#); Pohang University of Science and Technology, Korea (the Republic of).

SB07.03.03

HPMA-Based Nanomaterials as Tumor-Targeted Theranostics [Marina R. Tavares](#); Institute of Macromolecular Chemistry of the Czech Academy of Sciences, Czechia.

SB07.03.04

Designing BF₂ Complexed Smaragdyrin Dye Loaded Liposomes for NIR Triggered Photothermal Therapy Towards a Theranostic Agent for Cancer Treatment [Suditi Neekhra](#); Indian Institute of Technology, India.

SB07.03.05

Systematic Comparison of Platinum-Group Metal Nanomaterials as Efficient Enzyme-Mimetics in Biosensing [Alexander Biby](#); University of Central Florida, United States.

SB07.03.06

Molecular Design Strategy of the Efficient Generation of Reactive Oxygen Species and Their Protein Dysfunction Mechanism for Photodynamic Therapy [Chae Gyu Lee](#); Ulsan National Institute of Science and Technology, Korea (the Republic of).

SB07.03.07

Synthesis of Different Geometries of Iron Oxide Nanoparticles as Cancer Theranostic Agent [Alexis G. Lavin](#); Universidad de Puerto Rico, United States.

SB07.03.08

Direct Synthesis of Monodisperse Water-Soluble Iron Oxide Nanoparticles for Bioimaging [Yongfeng Zhao](#); Jackson State University, United States.

***SB07.03.09**

Highly Efficient Theranostic Nano Vehicles with a Dual Therapeutic Approach Against Triple-Negative Breast Cancer [Shaista Ilyas](#); University of Cologne, Germany.

SB07.03.10

Nanoparticle-Crosslinked Hydrogels as an Injectable Myocardial Infarction Therapy [Renato S. Navarro](#); Stanford University, United States.

SB07.03.11

Inverse Opals as Diagnostic Sensors [Natalie Nicolas](#); Harvard University, United States.

***SB07.03.12**

Tumor-Specific Localization of Multivariate Nanoparticles [Shaista Ilyas](#); University of Cologne, Germany.

SB07.03.13

Particle Elasticity and Tumor Cell Uptake [Chung-Fan Kuo](#); University of Houston, United States.

SB07.03.14

Self-Expanding Polymeric Foams for Point-of-Care Hemostatic Treatment of Acute Trauma and Injury [Pritha Sarkar](#); University of Central Florida, United States.

SB07.03.15

Protein Assembly on Iron Oxide Nanoparticles for Enhanced *In Vivo* Delivery in HeLa Cells [Hendrik Heinz](#); University of Colorado at Boulder, United States.

SB07.03.16

Cross-Platform Bio-Inks for 3D Printing Seamless Hydrogels as *In Vivo* Pressure Sensing Devices [Ashwin Velraj](#); University of Utah, United States.

SB07.03.17

pH-Triggered Cellulose Nanofibrils-Reinforced Hydrogel Bioadhesives for Tissue Sealant [Seulgi Kim](#); Sungkyunkwan University, Korea (the Republic of).

SB07.03.18

A Digestion-and-Turn-on Probe Based on DNA-Templated Silver Nanoclusters [Tim Yeh](#); Univ of Texas, United States.

SB07.03.19

Neutralizing the Systemic Toxicity of Co-Formulations of Chemotherapeutics Using Magneto-Electric Silica Nanocarriers for Specific Therapeutic Action Against Metastatic Cancer Cells [Prakash Nallathambiy](#); University of Notre Dame, United States.

SB07.03.20

Designing Nanoparticles for Image-Guided and Depth-Independent Magnetothermal Therapy of the Brain Tumors [Hamed Arami](#); University of Washington, United States.

SB07.03.21

Magnetic Gold Nanoparticles with Idealized Coating (MAGIC) for Enhanced Point-of-Care Sensing [Isabel Gessner](#); Massachusetts General Hospital - Harvard Medical School, United States.

SB07.03.22

Multicompartmental Scaffolds for Coordinated Periodontal Tissue Engineering [Yao Yao](#)^{2,3}; ²University of Michigan–Ann Arbor, United States; ³University of Michigan–Ann Arbor, United States.

SB07.03.23

Immunostimulant Nanogel Carrier (INC) for Multipotent Cancer Immunotherapy [Jongseong Kim](#)^{1,2}; ¹Korea University, Korea (the Republic of); ²Scholar Foxtrot, Korea (the Republic of).

9:15 AM SB07.04.02

Lipid Nanoparticles for Broad-Spectrum Nucleic Acid Delivery [Petr Cigler](#); IOCB AS CR vvi, Czechia.

9:30 AM SB07.04.03

Membrane-Assisted Fugogenic Delivery of Ribonucleoprotein for Efficient CRISPR-Based Gene Therapy [Jinmyoung Joo](#); Ulsan National Institute of Science and Technology, Korea (the Republic of).

9:45 AM BREAK

10:45 AM SB07.04.06

Theranostic Miniature Fiber for Immunotherapeutics Delivery and Tumor Impedance Measurement [Rong Tong](#); Virginia Tech, United States.

11:00 AM SB07.04.08

Inorganic/Organic Nanocomposite Particles (I/O-NP)—A Platform Technology for Future Healthcare Applications [Marco Giardiello](#); University of Liverpool, United Kingdom.

11:15 AM SB07.04.09

Crafting Designer Nanoreactors for Bioorthogonal Catalysis [Amit Kumar](#); Pohang University of Science and Technology (POSTECH), Korea, Korea (the Republic of).

SESSION SB07.05: Nano-Bio Interactions
Session Chairs: Weibo Cai and Teri Odom
Tuesday Afternoon, May 10, 2022
Hilton, Mid-Pacific Conference Center, 6th Floor, South Pacific 1

1:30 PM *SB07.05.01

Cellular Nanosponges for Biological Neutralization [Liangfang Zhang](#); University of California, San Diego, United States.

2:00 PM SB07.05.02

Challenging RBC Hitchhiking as a Generic Concept for Targeted Delivery:—Towards an Understanding of the Bionano-Interface [Vincent Lenders](#); KU Leuven, Belgium.

2:15 PM SB07.05.03

Optimisation of UV Enhanced Core-Shell Lanthanide-Doped Upconversion Nanoparticles for Integration with UV-Responsive Polymers to Achieve Optimal Drug Release Under NIR Excitation [Elena Ureña-Horno](#); University of Liverpool, United Kingdom.

2:30 PM *SB07.05.04

Gold Nanostar Optical Probes for Interrogating Targeted Cell Membrane Interactions [Teri W. Odom](#); Northwestern University, United States.

3:00 PM BREAK

3:30 PM *SB07.05.05

Cell-Based Approaches for Therapeutic Selection in Oncology [Shana Kelley](#); Northwestern University, United States.

4:00 PM *SB07.05.06

In Vivo Transport and Biochemical Interactions of Gold Nanoparticles [Jie Zheng](#); Univ of Texas-Dallas, United States.

SESSION SB07.06: Poster Session II: Bioresponsive Nanotheranostics II
Session Chairs: Weibo Cai and Jie Zheng
Tuesday Afternoon, May 10, 2022
5:00 PM - 7:00 PM
Hawai'i Convention Center, Level 1, Kamehameha Exhibit Hall 2 & 3

SB07.06.01

Metal-Doped Graphene Quantum Dots as Ultrasound Contrast Agents [Alina Valimukhametova](#); Texas Christian University, United States.

SB07.06.02

Gene Regulation Using Nanodiscs Modified with HIF-1- α Antisense Oligonucleotides [Radhika Sharma](#); Emory University, United States.

SB07.06.03

Sodium Chloride Nanoparticle as a Therapeutic for Bladder Cancer [Shuyue Zhan](#); University of Georgia, United States.

SB07.06.04

Developing Upconverting Nanoparticle-Based Force Sensors for *In Vivo* Gastrointestinal Imaging [Cindy Shi](#); Stanford University, United States.

SB07.06.05

Sniffing Bacteria with a Carbon-Dot Artificial Nose [Nitzan Shauloff](#); Ben-Gurion University of the Negev, Israel.

SB07.06.06

Nanoconjugates to Enhance PDT-Mediated Cancer Immunotherapy by Targeting the Indoleamine-2,3-Dioxygenase Pathway [Wei Yang](#); University of Georgia, United States.

SB07.06.07

Microneedles-on-Bioelectronics for Localized Delivery of Theranostic Nanoparticles and High-Energy Photons to Treat Brain Tumor [Taegyung Kang](#)^{1,2}; ¹Center for Nanoparticle Research, Institute for Basic Science (IBS), Korea (the Republic of); ²Seoul National University, Korea (the Republic of).

SB07.06.08

Biocompatible Lanthanide Nanoparticles for Immune Synapse Force Sensing [Ariel Stiber](#); Stanford University, United States.

SB07.06.09

Magnetically Guided Drug Delivery into Cardiac Myocytes [Seong D. Kong](#); California Baptist University, United States.

SB07.06.10

7-dehydrocholesterol Encapsulated Nanoparticles to Enhance Radiotherapy [Jianwen Li](#); University of Georgia, United States.

SB07.06.11

Gold-Iron Nanowires for Radiotherapy and Magneto-Mechanical Therapy of Glioblastoma Multiforme [Jonathan Taylor](#); Imperial College London, United Kingdom.

SB07.06.12

Redox-Sensitive Polyglycerol Nanogels Stimulate the Photo-Responsive Cytotoxicity of an Ir(III) Complex [Chae Gyu Lee](#); Ulsan National Institute of Science and Technology, Korea (the Republic of).

SB07.06.13

Functionalized Graphene Quantum Dots as Chemotherapy Enhancers and Photothermal Converting Agents Against Glioblastoma Multiforme [Giordano Perini](#); Università Cattolica del Sacro Cuore, Italy.

SB07.06.14

Versatile, Solvent-Free Technique to Synthesize Polymer Nanoparticles [Trevor Franklin](#); Cornell University, United States.

SB07.06.15

Delivery of HIF1a siRNA for Atherosclerosis Plaques Using Targeted Polyelectrolyte Complex Micelles [Ge Zhang](#); The University of Chicago, United States.

SB07.06.16

Glucose Oxidase/Prussian Blue-Integrated Metal-Organic Frameworks for Effective Cancer Therapy [Won Hur](#); Hanyang University, Korea (the Republic of).

SB07.06.17

In Vitro Studies of Gold Nanoparticles in Cancer Radiotherapy [Daniel Traynor](#); University of Liverpool, United Kingdom.

SB07.06.18

Novel Theranostic Nanocarriers for Combined Drug Delivery and Diagnostic Monitoring by Magnetic Resonance Imaging (MRI) [Neve Thomson](#); University of Liverpool, United Kingdom.

SB07.06.19

Nano Cell-Biopsy Using Nanostraws [Frida E. Ekstrand](#); Lund University, Sweden.

SB07.06.20

Development of Iron Oxide Nanoparticles with Paramagnetic Metal Ion Dopants for Magnetic Resonance Imaging (MRI) Applications [Isis P. Carmona-Sepúlveda](#)^{1,2}; ¹University of Puerto Rico, Río Piedras, Puerto Rico; ²Molecular Sciences Research Center, Puerto Rico.

SB07.06.21

Hydrogel-Based Rapid Cellular Staining for Point-of-Care Diagnostic Applications [Hyungsoon Im](#); Massachusetts General Hospital, United States.

SB07.06.22

InP QD Based Oil-in-Water Micelles for Photon Upconversion in Biology [Paulina Jaimes](#); The University of Utah, United States.

SB07.06.23

Anti-Senescence Ion-Delivering Nanocarrier for Recovering Therapeutic Properties of Long-Term-Cultured Human Adipose-Derived Stem Cells [Yeong Hwan Kim](#); Sungkyunkwan University, Korea (the Republic of).

SB07.06.24

Copper-Based Nanoparticle for Controlling Stem Cells Functions and Enhancing Angiogenesis [Gwang-Bum Im](#); Sungkyunkwan University, Korea (the Republic of).

SB07.06.25

Correlating PEG-Depsipeptide Cross-Linking and Degradation Kinetics Using Ultrathin Hydrogel Networks at the Air-Water Interface [Shivam Saretia](#)^{1,2}; ¹Institute of Active Polymers and Berlin-Brandenburg Center for Regenerative Therapies, Hereon, Germany; ²Institute of Chemistry, University of Potsdam, Germany.

SESSION SB07.07: General Session I
Session Chairs: Sophia Gu and Dawei Jiang
Tuesday Morning, May 24, 2022
SB07-Virtual

8:00 AM *SB07.07.01

Engineering Responsive Metal-Phenolic Materials via Supramolecular Assembly [Frank Caruso](#); University of Melbourne, Australia.

8:30 AM SB07.07.02

WITHDRAWN 5/19/22 SB07.07.02 Magnetic Nanochains Enabled ELISA for Rapid and Ultrasensitive Detection of Acute Myocardial Infarction Biomarkers [Qirong Xiong](#); Nanyang Technological University, Singapore.

8:35 AM SB07.07.03

Versatile Metal-Phenolic Network for Multitargeted Combination Therapy and Magnetic Resonance Imaging in Glioblastoma [Xuemeng Liu](#); Shandong University Qilu hospital, China.

8:40 AM SB07.07.04

Lanthanide-Doped Materials as Probes for Hyperspectral Imaging—A Powerful Combination to Assess Nano-Bio Interactions [Eva Hemmer](#); University of Ottawa, Canada.

8:55 AM *SB07.07.05

Bioresponsive Drug Delivery [Zhen Gu](#); Zhejiang University, China.

9:25 AM *SB07.07.06

Designing Biomaterials for Disease Detection and Exploration [Molly Stevens](#); Imperial College London, United Kingdom.

9:55 AM SB07.07.07

Bioinspired Patch for Prevention of Gastrointestinal Anastomotic Leaks [Jingjing Wu](#); Massachusetts Institute of Technology, United States.

SESSION SB07.09: General Session III
Session Chairs: Dawei Jiang and Dalong Ni
Tuesday Afternoon, May 24, 2022
SB07-Virtual

9:00 PM *SB07.02.07

Black Phosphorus Nanotheranostics [Wei Tao](#)^{1,2}; ¹Harvard Medical School, United States; ²Brigham and Women's Hospital, United States.

9:30 PM *SB07.04.05

Utilising Endogenous and Exogenous Stimuli to Control and Understand Drug Delivery from Polymeric Nanomedicines. [Kristofer J. Thurecht](#); The University of Queensland, Australia.

10:00 PM *SB07.04.01

Targeted Polyelectrolyte Complex Micelles Treat Vascular Complications *In Vivo* [Matthew V. Tirrell](#); Univ of Chicago, United States.

SESSION SB07.08: General Session II
Session Chairs: Sophia Gu and Dalong Ni
Wednesday Morning, May 25, 2022
SB07-Virtual

8:00 AM *SB07.08.01

Molecular Optical Imaging Probes as Artificial Urinary Biomarkers for Early Diagnosis [Kanyi Pu](#); Nanyang Technological University, Singapore.

8:30 AM *SB07.08.02

Cornell Dots—Bioresponsive Multifunctional Nanomaterials for Theranostic Applications in Oncology [Ulrich Wiesner](#); Cornell University, United States.

9:00 AM SB07.08.03

***In Situ* Remote Control of Nanobiomaterials for Regenerative and Immune Engineering** [Heemin Kang](#); Dept of Materials Science and Engineering, Korea University, Korea (the Republic of).

9:15 AM SB07.08.04

Gallium Nanodroplets for Anti-Inflammatory Without Interfering with Iron Homeostasis [Chengchen Zhang](#); University of New South Wales Sydney, Australia.

9:20 AM SB07.08.05

Effect of Particle Rigidity on Transport across a Blood-Brain Barrier Model [Chung-Fan Kuo](#); University of Houston, United States.

9:25 AM SB07.08.06

Modification of Silk Protein at Nanoscale for a Versatile Drug Delivery System [Anh T. Dao](#); Tohoku University, Japan.

9:30 AM *SB07.08.07

Synthesis and biofunctionalization of Plasmonic and Magnetic Nanoparticles for Biomedical Applications [Nguyen T. Thanh](#); Univ College London, United Kingdom.

SYMPOSIUM SB08

Soft Embodiments of Electronics and Devices for Healthcare Applications
May 9 - May 25, 2022

Symposium Organizers

* Invited Paper

SESSION SB08.01: Soft Bioelectronics
Session Chairs: Mary Donahue and Dion Khodagholy
Monday Morning, May 9, 2022
Hilton, Mid-Pacific Conference Center, 6th Floor, South Pacific 2

10:30 AM *SB08.01.01
Soft Microfluidic Systems As Bio-Interfaces [John A. Rogers](#); Northwestern University, United States.

11:00 AM SB08.01.02
Flexible, Implantable, Pulse Oximetry Sensors for Continuous Monitoring of Arterial Blood Oxygen Levels [Joseph Troughton](#); Ecole des Mines de Sainte Etienne, France.

11:15 AM SB08.01.03
In Vivo Formation of Organic Bioelectronic Hydrogels [Xenofon Strakosas](#); Linköping University, Sweden.

11:30 AM SB08.01.04
Development of Iontronic Implants Using Hyperbranched Polymeric Membranes for Localized Drug Delivery in Chemotherapy [Linda Waldherr](#); Medical University of Graz, Austria.

SESSION SB08.02: Neurotechnology for Stimulation
Session Chairs: Mary Donahue and Martin Kaltenbrunner
Monday Afternoon, May 9, 2022
Hilton, Mid-Pacific Conference Center, 6th Floor, South Pacific 2

1:45 PM *SB08.02.01
Organic Thin-Film Photocapacitors for Stimulation of the Central and Peripheral Nervous System [Eric D. Glowacki](#); Brno University of Technology, Czechia.

2:15 PM SB08.02.02
Laser-Driven Wireless Deep Brain Stimulation Using Temporal Interference and Organic Electrolytic Photocapacitors [Florian Missey](#); Institut de Neurosciences des Systèmes, France.

2:30 PM SB08.02.03
A Soft and Conformal Cuff Electrode for Selective Stimulation of the Sciatic Nerve in Pigs [Samuel Lienemann](#); Linköping Universitet, Sweden.

2:45 PM BREAK

SESSION SB08.03: Soft and Stretchable Bioelectronics
Session Chairs: Mary Donahue and Martin Kaltenbrunner
Monday Afternoon, May 9, 2022
Hilton, Mid-Pacific Conference Center, 6th Floor, South Pacific 2

3:30 PM *SB08.03.01
Tactile Perception and Wearable Energy Systems via Elastomeric Composites [Robert Shepherd](#); Cornell University, United States.

4:00 PM SB08.03.02
Elastic Fabric Nanocomposite Sensors for Movement and Muscle Assessment for Physical Therapy and Rehabilitation [Kenneth J. Loh](#); University of California San Diego, United States.

4:15 PM SB08.03.04
Ultraflexible and Bio-Conformable Organic Circuits for Healthcare Applications [Takafumi Uemura](#)^{1,2}; ¹SANKEN, Osaka University, Japan; ²PhotoBIO-OIL, AIST, Japan.

4:30 PM SB08.03.05

Electrocardiogram Patch to Monitor Full-Day Activities for Multiple Days [Joosung Oh](#); Pohang University of Science and Technology, Korea (the Republic of).

SESSION SB08.04: Poster Session I: Soft Embodiments of Electronics and Devices for Healthcare Applications I
 Session Chairs: Mary Donahue and Takafumi Uemura
 Monday Afternoon, May 9, 2022
 5:00 PM - 7:00 PM
 Hawai'i Convention Center, Level 1, Kamehameha Exhibit Hall 2 & 3

SB08.04.01

Direct Ink Writing 3D Printing for Fabricating Ultra-Deformable Microfluidic Antennas [Michinao Hashimoto](#); Singapore University of Technology and Design, Singapore.

SB08.04.02

Fabrication of Cortisol- and Sodium Lactate-Selective Molecularly Imprinted Polymers for Biomaterial Sensors Informed by Molecular Dynamics Simulations [Yasemin L. Mustafa](#)^{1,2}; ¹University of Bath, United Kingdom; ²University of Bath, United Kingdom.

SB08.04.03

Rapid Meniscus-Guided Printing of Stable Semi-Solid-State Liquid Metal Microgranular-Particles for Soft Electronics [Gun-Hee Lee](#); KAIST, Korea (the Republic of).

SB08.04.04

Fully Degradable, Soft and Biocompatible Tungsten/Beeswax Conductive Interconnection for Implantable Bioelectronics [Kyung Su Kim](#); Korea University, Korea (the Republic of).

SB08.04.05

Superelastic Auxetic Structures For Deployable Stretchable Implants [Duygu Dengiz](#); Kiel University, Germany.

SB08.04.06

Materials Chemistry Approaches to Generate Tactile Sensations in Haptic Interfaces and Tactile Aids [Charles Dhong](#)^{1,2}; ¹University of Delaware, United States; ²University of Delaware, United States.

SB08.04.07

Macromesh-Shaped Gold Nanowire Network Electrodes with Low Resistance Under Tensile Strain [Satoshi Takane](#)^{1,2,3}; ¹Osaka University, Japan; ²Osaka University, Japan; ³National Institute of Advanced Industrial Science and Technology (AIST), Japan.

SB08.04.08

Ionogel Based Self-Healing, Air-Stable and Flexible Electronics [Jiyeon Kim](#); Korea University, Korea (the Republic of).

SB08.04.09

Fabrication of Stretchable, Self-Healable, and Water-Resistant Electronic Devices Based on Dynamic Covalent Bonding Polyurethane [Somin Kim](#); Korea University, Korea (the Republic of).

SESSION SB08.05/SB02.02: Joint Session: Energy Harvesting and Storage
 Session Chairs: Takafumi Uemura and Xiaomin Xu
 Tuesday Morning, May 10, 2022
 Hilton, Mid-Pacific Conference Center, 6th Floor, South Pacific 2

8:45 AM *SB08.05/SB02.02.01

Self-Powered On-Skin Electronics with Ultrathin Organic Devices [Takao Someya](#)^{1,2}; ¹The University of Tokyo, Japan; ²Riken, Japan.

9:15 AM SB08.05/SB02.02.02

Development of a Self-Driven Lactate Biosensing System Based on Paper-Based Lactate Biofuel Cell [Isao Shitanda](#); Tokyo University of Science, Japan.

9:30 AM SB08.05/SB02.02.03

Piezoelectric Nanofiber Yarns for Wearable Energy Harvesting Textiles [Michael A. Pallotta](#)^{2,1}; ¹Dipole Materials, United States; ²Materic Inc, United States.

9:45 AM SB08.05/SB02.02.04

In Vivo Self-Powered Wireless Transmission Using Biocompatible Flexible Energy Harvester [Jaehun An](#); Korea Advanced Institute of Science and Technology, Korea (the Republic of).

10:00 AM BREAK

SESSION SB08.06/SB02.03: Joint Session: Electronics, Integrated Devices
 Session Chairs: Kenjiro Fukuda and Takafumi Uemura
 Tuesday Morning, May 10, 2022
 Hilton, Mid-Pacific Conference Center, 6th Floor, South Pacific 2

10:30 AM SB08.06/SB02.03.01

Towards Real-Time Blood Pressure Monitoring via High-Fidelity Iontronic Tonometric Sensors with High Sensitivity and Large Dynamic Ranges [Qingzhou Wan](#); University of Pittsburgh, United States.

10:45 AM SB08.06/SB02.03.02

Multifunctional Wearable Sensor for Early Detection of Decubitus Ulcer [Seung-Rok Kim](#); Yonsei University, Korea (the Republic of).

11:00 AM SB08.06/SB02.03.03

Self-Powered Real-Time Arterial Pulse Monitoring Using Ultrathin Piezoelectric Sensors Min SeongWook; Korea Advanced Institute of Science and Technology, Korea (the Republic of).

11:15 AM SB08.06/SB02.03.04

Battery-Free, Wireless, Crack-Activated Pressure Sensor and Movable System for Pressure Injury Prevention Seokjoo Cho; KAIST, Korea (the Republic of).

SESSION SB08.07/SB02.04: Joint Session: Sensors for Robots/Healthcare

Session Chairs: Shingo Maeda and Takafumi Uemura

Tuesday Afternoon, May 10, 2022

Hilton, Mid-Pacific Conference Center, 6th Floor, South Pacific 2

2:00 PM *SB08.07/SB02.04.01

Biosymbiotic, Personalized, 3D Printed, Wireless and Chronic Recording of Biosignals Philipp Gutruf; University of Arizona, United States.

2:30 PM SB08.07/SB02.04.02

Self-Powered Piezo-Transmittance Type Strain Sensor Based on an Auxetic Structure Jimin Gu; Korea Advanced Institute of Science and Technology, Korea (the Republic of).

2:45 PM SB08.07/SB02.04.03

Omni-Directional Tactile Profiling Using a Deformable Pressure Sensor Array Based on Localized Piezoresistivity Jaehyun Kim; Pohang University of Science and Technology, Korea (the Republic of).

3:00 PM BREAK

SESSION SB08.08/SB02.05: Joint Session: Soft Actuators for Human/Machine Interfaces

Session Chairs: Vito Cacucciolo and Takafumi Uemura

Tuesday Afternoon, May 10, 2022

Hilton, Mid-Pacific Conference Center, 6th Floor, South Pacific 2

3:30 PM *SB08.08/SB02.05.01

HASEL Artificial Muscles—Towards Untethered Soft Robotic Devices that are Fast and Efficient Christoph Keplinger; Max Planck Institute for Intelligent Systems, Germany.

4:00 PM SB08.08/SB02.05.02

Hybrid Artificial Muscles Advances Necessary for the Practical Application of Soft Actuators Michael P. Rowe^{1,2}; ¹Toyota Research Institute of North America, United States; ²Toyota IP Solutions, United States.

4:15 PM SB08.08/SB02.05.04

Untethered Biomimetic Soft Robots by Kirigami of Thin-Film Polymer and 3D-Printed Silicone Actuators Terry T. Ching^{1,2}; ¹Singapore University of Technology and Design, Singapore; ²National University of Singapore, Singapore.

SESSION SB08.11: Poster Session II: Soft Embodiments of Electronics and Devices for Healthcare Applications II

Session Chairs: Martin Kaltenbrunner and Dion Khodagholy

Wednesday Afternoon, May 11, 2022

5:00 PM - 7:00 PM

Hawai'i Convention Center, Level 1, Kamehameha Exhibit Hall 2 & 3

SB08.11.01

Stretchable and Electrochromic PDMS/PEDOT:PSS/P3MT Composite Films ChanYoung Kim; Seoul National University, Korea (the Republic of).

SB08.11.02

miRNA Sensing Based on a Signal-Amplifiable Lipoplex-Composite Hydrogel for Early Diagnosis of Alzheimer's Disease Jaewoo Lim^{1,2}; ¹Korea Research Institute of Bioscience and Biotechnology, Korea (the Republic of); ²University of Science and Technology, Korea (the Republic of).

SB08.11.03

Organic Semiconducting Nanoparticles for Neural Interfacing—Combining Neuroprotective Drug Delivery with Optically Generated Bioelectronic Charge for Enhanced Neuron Growth and Stimulation Matthew J. Griffith; The University of Sydney, Australia.

SB08.11.04

Bidirectional Venturi Flowmeter with Capacitive Foam Sensing for Spirometry Measurements Laura L. Becerra; University of California, San Diego, United States.

SB08.11.05

Analysis of Mechanical Interlocking Between Intestinal Villi and Synthetic Elastomeric Microposts via Mechanical Simulations Durva A. Naik; Carnegie Mellon University, United States.

SB08.11.06

A Multiple Crosslinked Network Hydrogel (MCNH)-Based Self-Healing Strain Responsive Electrochromic Display Jung Wook Kim; Korea University, Korea (the Republic of).

SB08.11.07

NeuroModular—A Modular Backend for Fiber-Based Wireless Bioelectronic Interfaces Harrison Allen^{1,5,6}; ¹Massachusetts Institute of Technology, United States; ²Massachusetts Institute of Technology, United States; ³Massachusetts Institute of Technology, United States; ⁴Massachusetts Institute of Technology, United States; ⁵Massachusetts Institute of Technology, United States; ⁶Massachusetts Institute of Technology, United States.

SB08.11.08

Snake Fang-Inspired Microneedle Patch with Groove Architectures for Transdermal Delivery of Liquid Formulations [Minsu Kang](#); Ulsan National Institute of Science and Technology, Korea (the Republic of).

SB08.11.09

Multifunctional Fiber-Based Neurotechnology Enables Cortical Recording and Modulation in Non-Human Primates [Indie Garwood](#); Massachusetts Institute of Technology, United States.

SB08.11.10

Magnetothermal Stimulation of Nerve Growth via Remotely Controlled Magnetic Nanoparticles [Hannah Field](#); Massachusetts Institute of Technology, United States.

SB08.11.11

Simultaneous Electrical Stimulation for Inhibiting Bacteria Near Deep Tissue Using Ultrasound-Driven Triboelectric Nanogenerator [Bosung Kim](#); Sungkyunkwan University, Korea (the Republic of).

SB08.11.12

Delivery of a Spheroids Incorporated Cell Sheet-Laden Flexible Skin Patch Increases Angiogenesis and M2 Polarization for Wound Healing [Sung-Won Kim](#); Sungkyunkwan University (SKKU), United States.

SESSION SB08.12: Metabolite Sensors for Healthcare
Session Chairs: Dion Khodagholy and Takafumi Uemura
Thursday Morning, May 12, 2022
Hilton, Mid-Pacific Conference Center, 6th Floor, South Pacific 2

8:30 AM *SB08.12.01

Soft Materials and Devices for Bioelectronic Medicine [George G. Malliaras](#); University of Cambridge, United Kingdom.

9:00 AM SB08.12.02

Conformal Wearable Sensor Devices for Wireless Monitoring of Physiological State [Liam Gillan](#); VTT Technical Research Centre of Finland Ltd, Finland.

9:15 AM SB08.12.03

Analysis of Correlation between Blood Glucose and Tear Glucose Using Smart Contact Lenses [Wonjung Park](#); Yonsei University, Korea (the Republic of).

9:30 AM SB08.12.04

Rapid Battery-Free Glucose Sensing with Phenylboronic Acid Hydrogel and Flexible Interdigitated Capacitor [Hajime Fujita](#); Tokyo Institute of Technology, Japan.

9:45 AM SB08.12.05

Utilising Stereolithography Based 3D Printing for the Fabrication of Polymeric Swellable Microneedles for Transdermal Drug Delivery [Joe Turner](#)^{2,1}; ¹University of Bath, United Kingdom; ²Department of Chemical Engineering, United Kingdom.

10:00 AM BREAK

SESSION SB08.13: Soft Neural Interfaces
Session Chairs: Mary Donahue and Martin Kaltenbrunner
Thursday Morning, May 12, 2022
Hilton, Mid-Pacific Conference Center, 6th Floor, South Pacific 2

10:30 AM SB08.13.01

Large-Scale Integrated Organic Electronics for Epilepsy [Dion Khodagholy](#); Columbia University, United States.

10:45 AM SB08.13.02

Design and Development of Bidirectional Multifunctional Neural Probes Through Fiber Drawing [Marc-Joseph Antonini](#); Massachusetts Institute of Technology, United States.

11:00 AM SB08.13.03

Biodegradable Silicon Nanoneedles for Ocular Drug Delivery [Woohyun Park](#); Purdue University, United States.

11:15 AM SB08.13.04

Ion-Based Communication for Implantable Bioelectronics [Zifang Zhao](#); Columbia University, United States.

11:30 AM SB08.13.05

Flexible Interdigitated Electrode for Selective Stimulation of Small Fibers in Humans [Santiago Velasco Bosom](#); University of Cambridge, United Kingdom.

11:45 AM SB08.13.06

Smart Hydrogel Ultrasound Resonators for Biomedical Sensing Applications [Christopher F. Reiche](#); The University of Utah, United States.

SESSION SB08.14: Liquid and Flexible Metals for Bioelectronics
Session Chairs: Mary Donahue and Martin Kaltenbrunner
Thursday Afternoon, May 12, 2022
Hilton, Mid-Pacific Conference Center, 6th Floor, South Pacific 2

1:30 PM *SB08.14.01

Soft Electronics and Sensors Using Liquid Metals [Michael Dickey](#); North Carolina State University, United States.

2:00 PM SB08.14.02

Retinal Prosthesis with Three-Dimensional Soft Bioelectrodes Won Gi Chung; Yonsei University, Korea (the Republic of).

2:15 PM SB08.14.03

Liquid 3D Microneedles for Cardiac Recording and Stimulation Sumin Kim; Yonsei University, Korea (the Republic of).

2:30 PM SB08.14.04

An Intrinsically Stretchable Polymer Diode That Can Operate at 13.56 MHz Naoji Matsuhisa^{1,2,3}; ¹Keio University, Japan; ²JST, Japan; ³Stanford University, United States.

2:45 PM SB08.14.05

Imperceptible Circuits for Wearable and Wireless Reconfigurable Electronic Devices S  verine C. de Mulatier; Ecole des Mines de Saint Etienne, France.

3:00 PM BREAK

SESSION SB08.15: Wearable and Skin Electronics
Session Chairs: Dion Khodagholy and Takafumi Uemura
Thursday Afternoon, May 12, 2022
Hilton, Mid-Pacific Conference Center, 6th Floor, South Pacific 2

3:30 PM SB08.15.01

In Situ Cardiac Disease Diagnosis and Treatment Using Multifunctional Epicardium Patch Device with Biomimetic Tissue Adhesive Jae Chul Hwang; Yonsei University, Korea (the Republic of).

3:45 PM SB08.15.02

Directly Printed Soft Three-Dimensional Electrode for High-Density Electromyography Recording Moohyun Kim; Yonsei university, Korea (the Republic of).

4:00 PM SB08.15.03

Wireless Textile Moisture and pH Sensor for Wound Care Beatrice Fraboni; Univ of Bologna, Italy.

4:15 PM SB08.15.04

Kirigami-enabled Electrochromic Wearable Variable Emittance (WeaVE) Device for Energy-Efficient Adaptive Personal Thermoregulation Po-Chun Hsu; Duke University, United States.

SESSION SB08.16: Novel Materials for Bioelectronics
Session Chairs: Mary Donahue and Takafumi Uemura
Friday Morning, May 13, 2022
Hilton, Mid-Pacific Conference Center, 6th Floor, South Pacific 2

9:00 AM SB08.16.01

Additive Manufacturing of Transient Metal for Bioresorbable Sensing Implants Nicolas Fumeaux; Ecole Polytechnique Federale de Lausanne, Switzerland.

9:15 AM SB08.16.02

Affordable, Wireless, Patch-Type Wearable Transcutaneous Oxygen Sensor Ross Emmanuel Triambulo^{2,1}; ¹Asen Company, Korea (the Republic of); ²Yonsei University, Korea (the Republic of).

9:30 AM SB08.16.03

Quipu-Inspired, Liquid Metal-Enabled Pressure Transducers (QUILT) for Low-Cost Gastrointestinal Manometry Kewang Nan^{1,2}; ¹Massachusetts Institute of Technology, United States; ²Brigham and Women's Hospital, United States.

9:45 AM SB08.16.04

Ultrathin Organic Microsupercapacitors for E-Skin and Implantable Electronics Mehmet G. Say; Linkoping University, Sweden.

SESSION SB08.17: General Session I
Tuesday Afternoon, May 24, 2022
SB08-Virtual

9:00 PM SB08.03.03

A Closed-Loop Network Of Wireless, Body-Integrated Devices for Temporary Electrotherapy Yeon Sik Choi; Northwestern University, United States.

9:15 PM SB08.08/SB02.05.03

Fabrication of Batteryless Soft Control Actuator Using Microfluidics and Contactless Power Supply Ryosuke Matsuda; Yokohama National University, Japan.

9:30 PM SB08.18.04

Ultra-Stretchable and Transparent Biocompatible Electrodes Toward Remote Acquisition of Multimodal Physiological Signals Teppe Araki; Osaka University, Japan.

9:45 PM SB08.18.03

Copolymerized Dopamine Enables the Enhancement of Anti-Oxidation, Conductivity and Adhesion of the Platinum-Coated Silver Nanowires/Polyacrylamide Hydrogel Electrode Fang-Min Lin; National Yang Ming Chiao Tung University, Taiwan.

SESSION SB08.18: General Session II
Session Chairs: Mary Donahue and Takafumi Uemura
Wednesday Morning, May 25, 2022
SB08-Virtual

8:00 AM SB08.18.01

Wearable Printed PEDOT:PSS Sensor for Face Mask Barrier Integrity and Respiration Rate Monitoring in Covid-19 Pandemics [Marina Galliani](#); EMSE, France.

8:15 AM SB08.18.02

Liquid-Metal Based Strain Sensors for Human Activity Monitoring [Shawn L. Wang](#); Episcopal Academy, United States.

8:30 AM *SB08.18.05

Hybrid Response Pressure Sensor (HRPS) for Wearable and Robotic-Finger-Based Pulse Wave Sensing [Nanshu Lu](#); The University of Texas at Austin, United States.

9:00 AM *SB08.18.06

Deployable Soft Microelectrode Arrays for the Brain [Stephanie P. Lacour](#); Ecole Polytechnique Federale de Lausanne, Switzerland.

9:30 AM SB08.18.07

Soft Devices for Tactile Sensing in Healthcare and Virtual Medical Training Applications [Benjamin C. Tee](#)^{1,2}; ¹National University of Singapore, Singapore; ²iHealthtech, Singapore.

9:45 AM SB08.17.01

Gold-Polydimethylsiloxane Nanocomposites for All-Optical Multimodality Imaging and Therapy [Sacha Noimark](#); University College London, United Kingdom.

SYMPOSIUM SB09

Genetically-Encoded and Bioinspired Materials Science
May 9 - May 25, 2022

Symposium Organizers

* Invited Paper

SESSION SB09.01: Nanomedicine I

Session Chair: Ritchie Chen
Monday Morning, May 9, 2022

Hilton, Mid-Pacific Conference Center, 6th Floor, Coral 4

10:30 AM *SB09.01.01

Theranostics with Radiolabeled Nanomaterials [Weibo Cai](#); University of Wisconsin--Madison, United States.

11:00 AM SB09.01.02

Membrane Opening on Nanostraws Revealed By Live-Cell STED Microscopy Imaging [Christelle Prinz](#); Lund University, Sweden.

11:15 AM *SB09.01.03

Carbon Based Nanoscience [Hongjie Dai](#); Stanford University, United States.

SESSION SB09.02: Nanomedicine II

Session Chairs: Polina Anikeeva and Molly Stevens
Monday Afternoon, May 9, 2022

Hilton, Mid-Pacific Conference Center, 6th Floor, Coral 4

1:30 PM SB09.02.01

Genetically-Controlled Protein-Based Polymeric Materials Towards Mimicking Erythrocyte Mechanics [Minkyu Kim](#)^{1,2,3}; ¹The University of Arizona, United States; ²The University of Arizona, United States; ³The University of Arizona, United States.

1:45 PM SB09.02.02

Designer Protein Chimeras for Next-Generation Cell Therapies [Adam W. Perriman](#); University of Bristol, United Kingdom.

2:00 PM *SB09.02.03

Genetically Engineered Cell-Mimicking Nanoparticles for Targeted Drug Delivery [Liangfang Zhang](#); University of California, San Diego, United States.

SESSION SB09.03: Bio-Inspired, Biomaterials and Bioelectronics

Session Chairs: Ester Kwon and Molly Stevens
Monday Afternoon, May 9, 2022

Hilton, Mid-Pacific Conference Center, 6th Floor, Coral 4

3:45 PM SB09.03.01

Hydrogel-Based Artificial Cells for Energy Generation and Communication [Isabella N. Westensee](#); Interdisciplinary Nanoscience Center, Aarhus University, Denmark.

4:00 PM SB09.03.03

The Living Artificial Muscle: Design and Development of a Light Switchable Biohybrid Gel [Andrea Diaz-Gaxiola](#); University of Bristol, United Kingdom.

4:15 PM DISCUSSION TIME

4:30 PM SB09.03.05

A Cell-Based Drug Factory with Sense and Respond Peptide Production via a Bioelectric Device Interface [Samantha Fleury](#); Rice University, United States.

4:45 PM SB09.03.06

Biomimetic Coatings on Thin-Film Electrodes for Neurotransmitter Sensing Applications [Steve Kim](#); Air Force Research Laboratory, United States.

SESSION SB09.04: Poster Session I: Genetically-Encoded and Bioinspired Materials I

Session Chairs: Polina Anikeeva, Ritchie Chen, Ester Kwon and Molly Stevens
Monday Afternoon, May 9, 2022

5:00 PM - 7:00 PM

Hawai'i Convention Center, Level 1, Kamehameha Exhibit Hall 2 & 3

SB09.04.01**3D Bioprinting of Engineered Living Materials** [Mark Shannon](#); University of Bristol, United Kingdom.**SB09.04.02****Membrane Modification of Extracellular Vesicles for Cardiac Disease Therapy** [Raquel Cruz Samperio](#); University of Bristol, United Kingdom.**SB09.04.03****Effect of Surface Modification via Silica Shells on Magnetic Properties of Iron Oxide Nanoparticles** [Keisuke Nagao](#)^{1,2,3}; ¹Massachusetts Institute of Technology, United States; ²Massachusetts Institute of Technology, United States; ³Massachusetts Institute of Technology, United States.**SB09.04.04****Development of Artificial Membrane Binding Proteins for the Enhancement of Adoptive Cell Therapies** [Valeria Sandoval Torres](#)^{1,3,2}; ¹University of Bristol, United Kingdom; ²Consejo Nacional de Ciencia y Tecnologia Mexico, Mexico; ³Cytoseek, United Kingdom.**SB09.04.05****3D Bioprinted Tumor Spheroid Model for the Assessment of Adoptive Cell Therapy** [Ximena G. Vasto Anzaldo](#)^{1,2,3}; ¹University of Bristol, United Kingdom; ²Consejo Nacional de Ciencia y Tecnologia, Mexico; ³Cytoseek Ltd., United Kingdom.**SB09.04.06****Development of Peptide-Based Hydrogel Scaffolds for the Extended Maintenance of Mesenchymal Stem Cell Phenotype *In Vitro*** [Claudia V. Leyva Aranda](#); Rice University, United States.**SB09.04.07****The Efficacy of Multi-Domain Peptides in Electrospun Conduits For Regenerating Transected Sciatic Nerves** [Cheuk Sun Edwin Lai](#); Rice University, United States.**SB09.04.08****Molecular Engineering of Liquid Crystal-Poly(Ethylene Glycol) (LC-PEG) Block Copolymers for 3D Printed Biomaterial Scaffolds** [Nathaniel Skillin](#)^{1,2,3}; ¹University of Colorado Boulder, United States; ²University of Colorado Anschutz Medical Campus, United States; ³University of Colorado Boulder, United States.**SB09.04.09****Developing an Empirical Model for Designing Tunable Collagen and Hyaluronic Acid Blended Hydrogels** [Paulina Babiak](#); Purdue University, United States.**SB09.04.10****Influence of Polymerization Conditions on Collagen I, II and III Blend Hydrogels** [Carly Battistoni](#); Purdue University, United States.

SESSION SB09.05: Tissue Engineering and Biomaterials I

Session Chairs: Ritchie Chen and Ester Kwon

Tuesday Morning, May 10, 2022

Hilton, Mid-Pacific Conference Center, 6th Floor, Coral 4

8:30 AM SB09.05.01**From Tuneable Peptide Self-Assembly to Biologically Instructive Materials** [Jacek K. Wychowaniec](#)^{1,3,6}; ¹AO Research Institute, Switzerland; ³The University of Manchester, United Kingdom; ⁶University College Dublin, Ireland.**8:45 AM SB09.05.02****Bioorthogonal Click Intracellular Hydrogelation to Control Cell Cycle Behavior** [Laura Macdougall](#)^{1,2}; ¹University of Colorado Boulder, United States; ²University of Colorado Boulder, United States.**9:00 AM SB09.05.03****Injectable Hydrogels for Mechanically Active Tissues** [Narelli de Paiva Narciso](#); Stanford University, United States.**9:15 AM BREAK****9:45 AM *SB09.05.04****MAPing Principles, Properties and Applications to Tissue Regeneration** [Tatiana Segura](#); Duke University, United States.**10:15 AM SB09.05.05****3D Bioprinting of Dynamic Covalent Hydrogels Enabled by Small Molecule Competitor and Catalyst** [Sarah Hull](#); Stanford University, United States.**10:30 AM SB09.05.06*****In Situ* Super-Resolution Imaging of Organoids and Extracellular Matrix Interactions via Photoexpansion Microscopy** [Michael Blatchley](#); University of Colorado Boulder, United States.**10:45 AM SB09.05.07****Programming Complex Cellular Alignment in Engineered Cardiac Tissue** [John Ahrens](#); Harvard University, United States.**11:00 AM *SB09.05.08****4D Optogenetic Regulation of the Cellular Niche** [Cole DeForest](#); Univ of Washington, United States.

SESSION SB09.06: Bio-Inspired and Self-Assembly

Session Chairs: Ritchie Chen and Molly Stevens

Tuesday Afternoon, May 10, 2022
Hilton, Mid-Pacific Conference Center, 6th Floor, Coral 4

2:00 PM SB09.06.02

Switchable Nano-Object Arrays for Material Reconfiguration and Information Representation [Yan Xiong](#); Columbia University, United States.

2:15 PM SB09.06.03

Bioinspired Underwater Adhesives Using Amyloids from Commercial Proteins [Christopher So](#); U.S. Naval Research Laboratory, United States.

2:30 PM *SB09.06.04

Bioinspired Engineering of Living Material Systems [Shu Yang](#); University of Pennsylvania, United States.

3:00 PM BREAK

SESSION SB09.07: Bioelectronics
Session Chairs: Polina Anikeeva and Ritchie Chen
Tuesday Afternoon, May 10, 2022
Hilton, Mid-Pacific Conference Center, 6th Floor, Coral 4

3:30 PM *SB09.07.01

Towards Implantable Artificial Electric Organs [Michael Mayer](#); University of Fribourg, Switzerland.

4:00 PM SB09.07.02

Using Photovoltaic Nanowires as a Cell Dormancy Switch [Therese Johansson](#); Lund University, Sweden.

4:15 PM SB09.07.03

Miniaturization of Hydrogel-Based Neural Probes Mediated by Nanoscale Crystallization [Siyuan Rao](#); University of Massachusetts Amherst, United States.

4:30 PM *SB09.07.04

Tissue-Like and Genetically Targeted Nanoelectronics for Biology and Medicine [Jia Liu](#); Harvard University, United States.

SESSION SB09.08: Self-Assembly, Biophysics and Biomaterials I
Session Chairs: Polina Anikeeva and Ritchie Chen
Wednesday Morning, May 11, 2022
Hilton, Mid-Pacific Conference Center, 6th Floor, Coral 4

8:15 AM SB09.08.01

Templating of Calcium Phosphate via Patterned Protein Nanoribbons—A Biomimetic Approach to Enamel Tissue Engineering [Susrut Akkineni](#); University of Washington, United States.

8:30 AM SB09.08.02

Controlling Assembly and Reorganization of 2D Protein Polymorphs at Mineral Interfaces [Ying Xia](#); University of Washington, United States.

8:45 AM SB09.08.03

β -Amyloid Fibrils are Biocatalytic [Elad Arad](#)^{1,2}; ¹Ben Gurion University of the Negev (BGU), Israel; ²Ben Gurion University of the Negev, Israel.

9:00 AM SB09.08.05

Programming Analytic, Mechanochemical Sensing and Response in Hydrogels with Biochemical Circuits [Lei Zhang](#); Johns Hopkins University, United States.

9:15 AM SB09.08.06

Assemblies of DNA-Functionalized Nanoparticles Respond to Wide Ranges of Salt Concentrations [Roger J. Reinertsen](#); Northwestern University, United States.

9:30 AM BREAK

10:00 AM *SB09.08.07

Incorporating Hierarchical Structure into Hydrogels with Bioinspired Peptoid Polymers [Adrienne M. Rosales](#); The University of Texas at Austin, United States.

10:30 AM SB09.08.08

Design of Silk Biomaterials via Protein Self-Assembly [Ulyana Shimanovich](#); Weizmann Institute of Science, Israel.

10:45 AM SB09.08.09

Programmable Dynamic Control of DNA Condensates [Siddharth Agarwal](#); University of California, Los Angeles, United States.

11:00 AM SB09.08.10

Tailored Surface Functionalization of Porous Silicon Nanoparticles for Efficient Intracellular Delivery [Jinmyoung Joo](#); Ulsan National Institute of Science and Technology, Korea (the Republic of).

11:15 AM SB09.08.11

Patient-derived Tumoroids Determine Roles of the Tumor Microenvironment in Cancer Stem Cell Regulation and the Development of Chemoresistance in Ovarian Cancers [Geeta Mehta](#); University of Michigan, United States.

SESSION SB09.09: Self-Assembly, Biophysics and Biomaterials II
Session Chairs: Polina Anikeeva and Molly Stevens

Wednesday Afternoon, May 11, 2022
Hilton, Mid-Pacific Conference Center, 6th Floor, Coral 4

3:30 PM *SB09.09.01

Exploring Methods to Control Actin Dynamics with Implications in Synapse Formation [Jerry Yang](#); University of California, San Diego, United States.

4:00 PM SB09.09.02

Design of Light-Responsive Protein Assemblies [Zhiyin Zhang](#); University of California, San Diego, United States.

4:15 PM SB09.09.03

Supramolecular Copolymers of Peptides and Peptide Amphiphiles and Their Therapeutic Potential [Ruomeng Qiu](#); Northwestern University, United States.

4:30 PM *SB09.09.04

Biophysical and Genetic Cues Regulating the Structural Remodeling of Adipose Tissue Upon Caloric Excess [Cecilia Leal](#); University of Illinois, Urbana-Champaign, United States.

SESSION SB09.10: Poster Session II: Genetically-Encoded and Bioinspired Materials II

Session Chairs: Polina Anikeeva, Ritchie Chen, Ester Kwon and Molly Stevens

Wednesday Afternoon, May 11, 2022

5:00 PM - 7:00 PM

Hawai'i Convention Center, Level 1, Kamehameha Exhibit Hall 2 & 3

SB09.10.02

Squid Suckerin-Spider Silk Fusion Protein Hydrogel for Stem Cell-Secretome Delivery in Chronic Wounds [Kenrick Koh](#)^{1,2}; ¹Nanyang Technological University, Singapore; ²Nanyang Technological University, Singapore.

SB09.10.03

Towards Osteogenesis—Utilizing the Power of Cell-Free Protein Synthesis for Regenerative Medicine [Agata Jakimowicz](#); University of Bristol, United Kingdom.

SB09.10.05

Phenylalanine-Derived Supramolecular Hydrogels for Sustained Release [Brittany L. Abraham](#); University of Rochester, United States.

SB09.10.06

Nano-Sized Graphene Oxide as Biocompatible Gene Delivery Carrier for Peptide Nucleic Acid [Ahruem Baek](#); Korea Research Institute of Standards and Science, Korea (the Republic of).

SB09.10.07

Development of 4D Cell Culture Platform with Reversibly Photocontrolled Stiffness [Boyeong Kang](#); Northwestern University, United States.

SB09.10.08

Dynamic Communication Systems Based on Soft Hydrogel Microbial Modulators [Yoon Jeong](#); University of Illinois, United States.

SB09.10.09

Universal Coating for Spheroid Culturing on Arbitrary Materials [Jingxian Wu](#); Korea Advanced Institute of Science and Technology, Korea (the Republic of).

SB09.10.10

Artificially Engineered Protein as Material Platform for Antimicrobial Peptides [Minkyu Kim](#)^{1,2,3}; ¹The University of Arizona, United States; ²The University of Arizona, United States; ³The University of Arizona, United States.

SB09.10.11

Corneal Tissue Engineering by Using Peptide Hydrogel/Elastomer Membrane Lamellar Structures [Sibel Cetinel](#); SUNUM, Turkey.

SB09.10.12

Injectable Hydrogel Biosensors Based on Fluorogenic DNA and RNA Probes [Irina Drachuk](#)^{1,2}; ¹Wright Patterson AFRL, United States; ²UES, Inc., United States.

SB09.10.13

Regeneration of Electrophysiologically Functional Atrial Cardiac Tissues on Anisotropic Fibrillar Fibronectin Matrix [Do Hoon Kim](#)^{1,2}; ¹University of Michigan, United States; ²University of Michigan, United States.

SB09.10.14

Tumor-Mimetic Fibrillar Fibronectin Constructs Decorated with Hyaluronan Govern the Metastatic Potential of Breast Tumor Cells [Dylan B. Neale](#)^{1,2}; ¹University of Michigan, United States; ²University of Michigan, United States.

SB09.10.15

Protein Analogous Micelles for Intracellular Delivery of Stapled Peptide Therapeutics [Yu Tian](#); University of Chicago, United States.

SESSION SB09.11: Genetically-Encoded and Bioinspired Materials Science I

Tuesday Afternoon, May 24, 2022

SB09-Virtual

6:30 PM *SB09.11.01

Mimicking Tumors as a S.M.A.R.T.E.R. Way to Treat Transplant Rejection [Steven Little](#); University of Pittsburgh, United States.

7:00 PM SB09.12.06

Oxygen-Releasing Cryogels with Hemostatic Efficacy for Accelerated Wound Healing [Sol Kim](#); Incheon National University, Korea (the Republic of).

7:15 PM SB09.11.03

Fabrication of Neurovascular Organoids in Microdevices [Tomoki Asaba](#); Yokohama National University, Japan.

7:30 PM SB09.11.04

Large-scale Preparation of Hair Follicle Germs Using Bioprinting and Spontaneous Microgel Contraction [Ayaka Nanmo](#); Yokohama National University, Japan.

7:45 PM *SB09.11.05

Electrogenetic Control of Microbial Consortia via Natural and Synthetic Protein Nanowires [Nikhil S. Malvankar](#)^{1,2}; ¹Yale University, United States; ²Yale University, United States.

8:15 PM *SB09.06.01

Bio-Inspired Soft Materials for Energy and Medicine [Samuel I. Stupp](#); Northwestern University, United States.

SESSION SB09.12: Genetically-Encoded and Bioinspired Materials Science II

Session Chairs: Ritchie Chen, Ester Kwon and Molly Stevens

Wednesday Morning, May 25, 2022

SB09-Virtual

10:30 AM *SB09.12.01

Emergence of Complexity in Chiral Nanostructures [Nicholas A. Kotov](#); University of Michigan, United States.

11:00 AM SB09.03.04

Development of an Inflammation-Responsive Hydrogel for On-Demand Local Immunomodulation via Epigenetic Modulation of Macrophages in Acute Wound Healing [Hyerim Kim](#); Seoul National University, Korea (the Republic of).

11:15 AM SB09.12.02

Mix & Gel—A New Strategy for the Development of Nanofibrous Cell Scaffolds Through Co-Assembly of Charge Complementary Binary Peptides [Mohamed Elsayy](#); De Montfort University, United Kingdom.

11:30 AM SB09.12.03

Engineered Polymeric Surfaces and Matrices to Investigate Structure-Function Relationships in Biomaterials Science [Fabio Variola](#); University of Ottawa, Canada.

11:45 AM SB09.12.04

Tailoring the Nanoscale Environment of Enzymatic Cascades on 3D DNA Scaffolds [Jason Kahn](#); Brookhaven National Laboratory, United States.

12:00 PM SB09.12.05

Using a Quasi-3D *Ex Vivo* Skin Dermis Model to Investigate the Potential of Biomaterials to Reprogram Gene Expression in Human Dermal (Myo)Fibroblasts [Anna Rhodes](#); Imperial College London, United Kingdom.

12:15 PM SB09.11.02

Cost and Time Effective Nanolithography of Reusable Millimeter Size Bone Tissue Replicas for Induced MSCs Differentiation [Alessandra Zanutt](#); NYU Tandon School of Engineering, United States.

SYMPOSIUM SB10

Complex States in the Observation, Control and Utilization of Biomimetic Functionalities—From Fundamentals to Applications
May 10 - May 24, 2022

Symposium Organizers

* Invited Paper

SESSION SB10.01: Biogenic Synthesis I
Session Chairs: Michio Suzuki and Yoriko Tominaga
Tuesday Morning, May 10, 2022
Hilton, Mid-Pacific Conference Center, 6th Floor, Sea Pearl 2

9:15 AM *SB10.01.01
Biogenic Nanoparticles—The Morphology is Controlled Even by BIM (Biological Induced Mineralization) [Yoshiko Okamura](#); Hiroshima University, Japan.

9:45 AM SB10.01.02
Biomimetic Functionalization of Gold Nanoparticles and Nanopyramids with Keratin [Giovanni Perotto](#); Italian Inst of Technology, Italy.

10:00 AM BREAK

10:30 AM *SB10.01.03
Mesocrystalline Ordering and Phase Transformation of Iron Oxide Biominerals in the Ultrahard Teeth of *Cryptochiton stelleri* [David Kisailus](#); University of California, Irvine, United States.

11:00 AM *SB10.01.04
Organic Molecules in the Molluscan Shells Regulate the Fine Microstructures of Biominerals [Michio Suzuki](#); the University of Tokyo, Japan.

11:30 AM SB10.01.05
Recombinant Collagen-Like Protein and Hyaluronic Acid Hybrid Gels Mimic Pancreatic Cancer Extracellular Matrix Environment [Stephanie Nemece](#); UNSW, Australia.

11:45 AM SB10.01.06
Dual-Stimuli-Responsive Polymer Composite with Ultrawide Tunable Stiffness Range Triggered by Water and Temperature [Erin Askounis](#); University of California, Los Angeles, United States.

SESSION SB10.02: Neuroengineering
Session Chairs: Antal Berényi and Brandon Mitchell
Tuesday Afternoon, May 10, 2022
Hilton, Mid-Pacific Conference Center, 6th Floor, Sea Pearl 2

1:30 PM *SB10.02.01
Translational Neuroelectronics [Dion Khodagholy](#); Columbia University, United States.

2:00 PM *SB10.02.02
Fiberless Optogenetic Probes for Selective Neuromodulation at Cellular Resolution [Euisik Yoon](#); University of Michigan, United States.

2:30 PM SB10.02.03
High-Density Micro-OLEDs on Shank-Shaped CMOS Chips for Optogenetic Implants [Sabina Hillebrandt](#)^{1,2}; ¹University of Cologne, Germany; ²University of St Andrews, United Kingdom.

2:45 PM SB10.02.04
Microfluidics within a Well—Vascularization of Tumor Spheroids and Organoids for Drug Screening [Noo Li Jeon](#); Seoul National University, Korea (the Republic of).

3:00 PM BREAK

SESSION SB10.03: Sensing
Session Chairs: Brandon Mitchell and Yoriko Tominaga
Tuesday Afternoon, May 10, 2022
Hilton, Mid-Pacific Conference Center, 6th Floor, Sea Pearl 2

3:30 PM *SB10.03.01

Machine Learning-Based Self-Powered Acoustic Sensor for Speaker Recognition [Keon Jae Lee](#); Korea Advanced Institute of Science and Technology, Korea (the Republic of).

4:00 PM SB10.03.02

Real-Time *In Vivo* Detection of Nitric Oxide Using Photonic Microring Resonator [Sakib N. Hassan](#); Rice University, United States.

4:15 PM SB10.03.03

Direct Visualization of Complex Binding States of Molecular Biomarkers on the Surface of Graphene FET Biosensors [Lawrence F. Drummy](#); Air Force Research Laboratory, United States.

4:30 PM SB10.03.04

Microcapsules in Granular Hydrogels for Spatial Control of Cellular Activity [Thomas G. Molley](#); University of New South Wales, Australia.

4:45 PM SB10.03.05

Live Streaming of a Single Cell's Life Over a Local pH-Monitoring Nanowire Waveguide [Moon-Jung Yong](#)^{1,3}; ¹X-ray Imaging center, Korea (the Republic of); ³Pohang University of Science and Technology, Korea (the Republic of).

SESSION SB10.04: Poster Session: Complex States in the Observation, Control and Utilization of Biomimetic Functionalities

Session Chairs: Brandon Mitchell and Yoriko Tominaga

Tuesday Afternoon, May 10, 2022

5:00 PM - 7:00 PM

Hawai'i Convention Center, Level 1, Kamehameha Exhibit Hall 2 & 3

SB10.04.01

Thin-Film Crystalline and Spherical Nanocrystalline Biogenic PbS [Yoriko Tominaga](#); Hiroshima University, Japan.

SB10.04.02

Directed Evolution of Metal-Organic-Zymes for Artificial Photosynthesis [Guangxu Lan](#)^{2,1}; ¹Lawrence Berkeley National Laboratory, United States; ²The University of Chicago, United States.

SB10.04.03

Accelerating DNA-Streptavidin Hydrogel Formation via Base-Pair Mismatch for Enzyme-Free Picomolar MicroRNA Detection [Hyebin Na](#); Korea Advanced Institute of Science and Technology, Korea (the Republic of).

SB10.04.04

Self-Assembled Nanostructure Based on M13 Bacteriophage Color Sensor for Stem Cell Differentiation Monitoring [Yujin Lee](#); Pusan National University, Korea (the Republic of).

SB10.04.05

Multi-Array Color Sensor Based on Self-Assembled Nanostructure M13 Bacteriophage for Salmonella Detection [Ye-Ji Kim](#); Pusan National University, Korea (the Republic of).

SB10.04.06

Discrimination of the Exhaled Compound of Lung Cancer Patients and Healthy Subjects by a Biosensor Based on Essential 20 Amino Acids [Gyeong Ha Bak](#); Pusan National University, Korea (the Republic of).

SB10.04.07

A Three-Dimensional Structured Brain-Injectable Device with a Curved Pathway [JuSeung Lee](#); Sungkyunkwan University, Korea (the Republic of).

SB10.04.08

A Novel Sensing Method for COVID-19 (SARS-CoV-2 gRNA) on Personal Glucose Meter Utilizing Oxidative Activity of Cerium Oxide Nanoparticles [Sang Mo Lee](#); Korea Advanced Institute of Science and Technology, Korea (the Republic of).

SB10.04.09

A Study on the Fabrication of a Portable Colorimetric Sensor for Evaluation of Freshness of Fruits [Nayeong Kim](#); Pusan National University, Korea (the Republic of).

SB10.04.10

Dynamically Controllable Gap Plasmonic Film for VOCs Gas Sensing Based on Thickness Modulation of M13 Phage [Thanh Mien Nguyen](#); Pusan National University, Korea (the Republic of).

SB10.04.11

Using Intracellular Redox-Reaction to Modulate Cytotoxicity of Photosensitizer Encapsulated in Polyglycerol Nanogels [Tae-Hyuk Kwon](#); Ulsan National Institute of Science and Technology, Korea (the Republic of).

SB10.04.12

Material Characterization of High-Energy Electron Irradiated Agarose Hydrogels [Catharina Krömmelbein](#)^{1,2}; ¹Leibniz Institute of Surface Engineering (IOM), Germany; ²University of Leipzig, Germany.

SESSION SB10.05: Complex States in Observations

Session Chairs: Antal Berényi and Brandon Mitchell

Tuesday Morning, May 24, 2022

SB10-Virtual

10:30 AM *SB10.05.01

High-Resolution Microelectrode Arrays to Interface with Human iPSC-Derived Neuronal Cultures and Brain Organoids [Urs Frey](#); MaxWell Biosystems AG, Switzerland.

11:00 AM *SB10.05.02

Hydrogen Bonds Affect the Energy, the Coupling and the Ultrafast Dynamics of Interacting Chromophores in Biological and Biomimetic Complexes [Elisabetta Collini](#); University of Padova, Italy.

11:30 AM SB10.05.03

Ultrasmall, Bright and Photostable Probes for Live-Cell Optical Super-Resolution Microscopy Based Interrogation of Complex Biological Processes [Ulrich Wiesner](#); Cornell University, United States.

11:45 AM SB10.05.04

Bright, Non-Iridescent Structural Coloration from 2D Clay Nanosheet Suspensions [Paulo H. Michels Brito](#); Norwegian University of Science and Technology, Norway.

SESSION SB10.06: Bioelectronics I

Session Chairs: Jun Ohta and Yoriko Tominaga

Tuesday Afternoon, May 24, 2022

SB10-Virtual

6:30 PM *SB10.06.01

Visual Prostheses—Principle and Technology from Biomimetics Perspective [Yasuo Terasawa](#); Nidek Co., Ltd., Japan.

7:00 PM *SB10.06.02

Breath Odor Biometrics by Artificial Olfaction Sensor Array and Machine Learning [Kazuki Nagashima](#)^{1,2}; ¹The University of Tokyo, Japan; ²Japan Science and Technology Agency, Japan.

7:30 PM SB10.06.03

Needle-Shape Multifunctional Neural Probe Integrated with Light-Emitting Diodes and Fluidic Channel [Kakeru Oya](#); Toyohashi University of Technology, Japan.

7:45 PM SB10.06.04

Development of Micro-Electrocorticography Device Covering Wide Area of Cortex in Mice [Ryota Kanda](#); Toyohashi University of Technology, Japan.

8:00 PM SB10.06.05

CuO Nanoparticulate Modified Microelectrode for Neurotransmitters Detection by Fast-Scan Cyclic Voltammetry [Nicha Sato](#); Nara Institute of Science and Technology, Japan.

SESSION SB10.07: Bioelectronics II

Session Chairs: Kazuki Nagashima and Hiroto Sekiguchi

Tuesday Afternoon, May 24, 2022

SB10-Virtual

9:00 PM *SB10.07.01

Implantable Optoelectronic Devices for Observation and Control of Biological Functions [Jun Ohta](#); Nara Institute of Science and Technology, Japan.

9:30 PM *SB10.07.02

Non Label Neurotransmitter Image Sensor Based on CMOS Technology [Kazuaki Sawada](#); Toyohashi University of Technology, Japan.

10:00 PM *SB10.07.03

Biodegradable Materials for Electronic Medicine and Biosensors [Lan Yin](#); Tsinghua University, China.

10:30 PM SB10.07.04

Zr-Based Metal-Organic Frameworks-Assisted Ice-Recrystallization Inhibition [Nayeong Jeon](#); Gwangju Institute of Science and Technology, Korea (the Republic of).

SYMPOSIUM SF01

Materials Research Needs to Advance Nuclear Fuels, Structural Materials and Wasteforms
May 9 - May 25, 2022

Symposium Organizers

* Invited Paper

SESSION SF01.01: Radiation Effects I
Session Chairs: Maria Okuniewski and Par Olsson
Monday Morning, May 9, 2022
Hawai'i Convention Center, Level 3, 327

10:30 AM *SF01.01.01

Surface Near Helium Damage in Materials Studied with a High Throughput Implantation Method [Peter Hosemann](#)^{1,2}; ¹University of California, Berkeley, United States; ²Lawrence Berkeley National Laboratory, United States.

11:00 AM SF01.01.02

Radiation Tolerance of Hollandite Ceramics as Waste Forms for Cs and Transuranic Elements [Lumin Wang](#); Univ of Michigan, United States.

11:15 AM *SF01.01.03

Diffusion of Light Elements (He, T, Li) in B₄C Boron Carbide—A Comparative Study Using Ion Beams [Nathalie Moncoffre](#); IP2I CNRS and Lyon 1 University, France.

11:45 AM SF01.01.04

Uranium onto Boron-Doped Diamond (U/BDD) Electro-Assembling for Neutron Detection Applications [Armando Pena-Duarte](#)^{2, 1}; ¹University of Puerto Rico at Rio Piedras, United States; ²The University of Texas at El Paso, United States.

SESSION SF01.02: Fuels I
Session Chairs: Michel Freyss and Maria Okuniewski
Monday Afternoon, May 9, 2022
Hawai'i Convention Center, Level 3, 327

1:30 PM *SF01.02.01

Lower Length Scale Fuel Performance Modeling of U-Mo Fuel [Benjamin Beeler](#)^{1,2}; ¹North Carolina State University, United States; ²Idaho National Laboratory, United States.

2:00 PM SF01.02.02

Radiation-Enhanced Diffusion of U, Mo and Xe in γ -U-10Mo Alloy [Gyuchul Park](#); Purdue University, United States.

2:15 PM SF01.02.03

Molecular Dynamics Simulations of Xenon Bubbles in Uranium Mononitride [Jade Li](#); Lancaster University, United Kingdom.

2:30 PM SF01.02.04

Uranium Mononitride (UN) Properties from First-Principles Calculations and *Ab Initio* Molecular Dynamics Simulations [Vancho Kocevski](#); Los Alamos National Laboratory, United States.

2:45 PM SF01.02.05

Finite Element Analysis of the Residual Stresses Arising During the Fabrication of TRISO Coated Nuclear Fuel [Angelo Battistini](#); Imperial College London, United Kingdom.

3:00 PM BREAK

3:30 PM *SF01.02.06

Computational Thermodynamics—An Invaluable Tool for Predicting the Thermochemical Behavior of Nuclear Materials in All State [Christine Gueneau](#); French Alternative Energies and Atomic Energy Commission (CEA), France.

4:00 PM SF01.02.07

Multimodal Serial Sectioning and Synchrotron Micro-Computed Tomography Characterization of High-Burnup U-Mo Fuel [Alejandro L. Figueroa](#); Purdue University, United States.

4:15 PM SF01.02.08

Simulated Advanced Gas-Cooled Reactor Spent Nuclear Fuels—An XRD, XPS and Raman Study [Richard Wilbraham](#); Lancaster University, United Kingdom.

4:30 PM SF01.02.09

Cermet Surrogate Nuclear Fuels from Coated Powders [Jonathan A. Johnson](#); University of Alabama, United States.

SESSION SF01.03: Fuels II
Session Chairs: Gianguido Baldinozzi and Ming Tang
Tuesday Morning, May 10, 2022
Hawai'i Convention Center, Level 3, 327

8:30 AM *SF01.03.01

The Dissolution of UO₂-Based Spent Nuclear Fuel Under Storage and Disposal Conditions—Insights from SIMFUEL Studies [Colin Boxall](#); Lancaster University, United Kingdom.

9:00 AM SF01.03.02

Constituent Redistribution in U-Pu-Zr Fuels and Its Dependence on Zr Content [Assel Aitkaliyeva](#); University of Florida, United States.

9:15 AM SF01.03.03

Corrosion Behaviour of High-Density Advanced Technology Fuels [Ghebrehiwot Berhane](#); Lancaster University, United Kingdom.

9:30 AM SF01.03.04

Corrosion Studies of Legacy AGR Spent Nuclear Fuel and AGR Simulant Fuels (SIMFuels) [Yifeng Huang](#); Lancaster University, United Kingdom.

9:45 AM SF01.03.05

Accurate First-Principles Prediction of Thermal Conductivity of UO₂ Over a Wide Temperature Range [Tianli Feng](#); University of Utah, United States.

10:00 AM BREAK

10:30 AM *SF01.03.06

How Can Raman Spectroscopy be Used to Study Nuclear Fuel? [Lionel Desgranges](#); CEA, France.

11:00 AM SF01.03.07

Fuel Pulverization Mechanisms Using Cluster and Molecular Dynamics Simulations [Michael W. Cooper](#); Los Alamos National Laboratory, United States.

11:15 AM SF01.03.08

Diffusion in Undoped and Cr₂O₃ Doped Crystalline and Amorphous UO₂ [Megan W. Owen](#); Bangor University, United Kingdom.

11:30 AM *SF01.03.09

Fundamental and Systematic Methods to Characterise and Explore Materials Relevant to Spent Nuclear Fuel [Gabriel Murphy](#); FZ Juelich, Germany.

SESSION SF01.04: Radiation Effects II
Session Chairs: Gianguido Baldinozzi and Lumin Wang
Tuesday Afternoon, May 10, 2022
Hawai'i Convention Center, Level 3, 327

1:30 PM *SF01.04.01

Molecular Dynamics Simulations of Radiation Damage Effects in Disordered Waste Forms [Kostya O. Trachenko](#); Queen Mary University of London, United Kingdom.

2:00 PM SF01.04.02

Radiation Resistance in Multicomponent Equiatomic Alloys [Fei Gao](#); Univ of Michigan, United States.

2:15 PM *SF01.04.03

Role of Electronic Energy Dissipation on Radiation Damage Production and Evolution in Nuclear Ceramics [William J. Weber](#); University of Tennessee, United States.

2:45 PM SF01.04.04

Rate Theory Modeling of Defect Evolution in Fluorite Oxides [Marat Khafizov](#); The Ohio State University, United States.

3:00 PM BREAK

3:30 PM *SF01.04.05

Positron Annihilation Spectroscopy Reveals New Mechanisms and Emerging Phenomena in Radiation Induced Defect Interactions [Farida Selim](#); Bowling Green State Univ, United States.

4:00 PM SF01.04.06

Three-Dimensional Imaging of Radiation-Induced Defects in Metals [Ericmoore Jossou](#); Brookhaven National Laboratory, United States.

4:15 PM SF01.04.07

Effect of Defects on the Thermal Conductivity of Ceramic Breeder Blanket Materials [Megha Sanjeev](#); Lancaster University, United Kingdom.

SESSION SF01.05: Disorder and Microstructures
Session Chairs: David Andersson and Gianguido Baldinozzi
Wednesday Morning, May 11, 2022
Hawai'i Convention Center, Level 3, 327

8:30 AM *SF01.05.01

Complex Oxides in the Nuclear Fuel Cycle—From Advanced Fuel Candidates to Nuclear Waste Forms [Sarah C. Finkeldej](#); University of California, Irvine, United States.

9:00 AM SF01.05.02

Cluster Dynamics Simulations of Point Defects and Fission Gas Evolution in Irradiated UO₂-Based Nuclear Fuels [David Andersson](#); Los Alamos National Laboratory, United States.

9:15 AM SF01.05.03

Anion Excess Bixbyite Gd₂Ce₂O₇: Effect of Radiation on Anion Sublattice [Jeffery Aguiar](#)^{2,3}; ²The University of Utah, United States; ³Lockheed Martin, United States.

9:30 AM *SF01.05.04

Characterization of Radiation Effects in Ceramics with Spallation Neutron Probes [Maik K. Lang](#); University of Tennessee, United States.

10:00 AM BREAK

10:30 AM *SF01.05.05

FUTURE—Fundamental Understanding of Transport Under Reactor Extremes [Blas P. Uberuaga](#); Los Alamos National Laboratory, United States.

11:00 AM SF01.05.06

A Modified Two-Temperature Molecular Dynamics for Simulating Radiation Damage Cascades [Samuel Murphy](#); Lancaster University, United Kingdom.

11:15 AM SF01.05.07

Atomistic-Scale Simulations Used to Simulate Creep in Oxide Fuel [Conor Galvin](#); Los Alamos National Laboratory, United States.

11:30 AM *SF01.05.08

Gaining a Mechanistic Understanding of Nuclear Fuel Material Performance by Combining Modelling and Experiment [Simon C. Middleburgh](#); Bangor University, United Kingdom.

SESSION SF01.06: Cladding Interactions and Oxidation
Session Chairs: [Gianguido Baldinozzi](#) and [Christine Gueneau](#)
Wednesday Afternoon, May 11, 2022
Hawai'i Convention Center, Level 3, 327

1:30 PM SF01.06.01

A Study for the Development of Accident Tolerant Fuel Cladding [Sung Eun Kim](#); Korea Atomic Energy Research Institute, Korea (the Republic of).

1:45 PM SF01.06.02

Surface and Grain Boundary Interdiffusion During the Sintering of Mixed Oxides Fuels—A Finite Volume Method Simulation [Jacques L  chelle](#); Commissariat    l'  nergie atomique et aux   nergies alternatives, France, France.

2:00 PM SF01.06.03

Hydrothermal Corrosion of PVD and Cold Spray Cr-Coatings on Zircaloy-4 in Different LWR Coolant Environment [Rajnikant Umretiya](#); GE Research, United States.

2:15 PM SF01.06.04

Understanding Impacts of Chemistry on Oxidation of FeCrAl Alloys in Multiple Environments [Andrew K. Hoffman](#); GE Research, United States.

2:30 PM BREAK

SESSION SF01.07: Fuels III
Session Chairs: [Gianguido Baldinozzi](#) and [Blas Uberuaga](#)
Wednesday Afternoon, May 11, 2022
Hawai'i Convention Center, Level 3, 327

3:30 PM SF01.07.01

Atomistic Modeling of Point Defects in Mixed Oxide Fuels—Effect of the U-Pu Distribution [Marjorie Bertolus](#); CEA, DES, IRESNE, France.

3:45 PM SF01.07.02

Neutron Scattering Experiments and Electronic Structure Calculations on U₃O₇ and U₃O₈ [Gianguido Baldinozzi](#); Universit   Paris-Saclay, France.

4:00 PM SF01.07.04

Prompt Elimination of Alpha-Decay-Induced Damage in Fuel-Like Actinides Dioxides [Yehuda Eyal](#); Technion-Israel Institute of Technology, Israel.

SESSION SF01.08: Poster Session: Materials Research Needs to Advance Nuclear Fuels, Structural Materials and Wasteforms
Session Chairs: [Gianguido Baldinozzi](#) and [Maria Okuniewski](#)
Wednesday Afternoon, May 11, 2022
5:00 PM - 7:00 PM
Hawai'i Convention Center, Level 1, Kamehameha Exhibit Hall 2 & 3

SF01.08.01

In Situ Cathodoluminescence in Gadolinia Doped Ceria Under High Energy Electron Irradiation [Pooreun Seo](#); Kyushu University, Japan.

SF01.08.02

Tailoring High Entropy Alloy (HEA) Thermal Expansion for Advanced Technology Fuel (ATF) Coatings [Jack A. Wilson](#); Bangor University, United Kingdom.

SF01.08.03

Unraveling the Early-Stage Ordering of Krypton Solid Bubbles in Molybdenum—A Multimodal Study [Eric Moore Jossou](#); Brookhaven National Laboratory, United States.

SF01.08.04

Quantifying Radiation Damage Through Stored Energy Released During Defect Annealing in Metals [Charles Hirst](#); Massachusetts Institute of Technology, United States.

SF01.08.05

Metastability of Lanthanide Sesquioxide (Ln₂O₃) Polymorphs [Vancho Kocovski](#); Los Alamos National Laboratory, United States.

SF01.08.06

Structural Relations in the Nd₂O₃-CeO₂ Pseudo Binary System [Henry Charlton](#); University of Liverpool, United Kingdom.

SF01.08.07

Rationalization of the Influence of the Chemical Bonds on the Radiation Tolerance of Compounds Related to the M₇O₁₂ Oxygen-Deficient Fluorite System [Gianguido Baldinozzi](#); University of Paris Saclay, France.

SF01.08.08

New Insights into UK Base Glass Structure from X Ray and Neutron Scattering Data Combined with NMR [Natasha A. Brown](#); University of Manchester, United Kingdom.

SF01.08.09

Experimental Characterization of the Chemical Behaviour of Cs, I and Te in UO₂ [Chantal Riglet-Martial](#); CEA.DES.IRESNE.DEC, Cadarache, France.

SF01.08.10

Stabilization of Superionic Delta Bi₂O₃ Phase at Room Temperature by Thermal Nanocrystallization of Bismuth Oxide Glasses [Tomasz K. Pietrzak](#); Warsaw Univ. of Technology, Poland.

SF01.08.11

Elucidating Radiation Damage in Concrete via Multi-Modal Imaging [Nishant Garg](#); University of Illinois at Urbana-Champaign, United States.

SF01.08.12

A Study on Behavior of Te/TeN Thin Film as the Corrosion Protect Layer in Chlorine Based-Salt Nuclear Reactor [Jisu Na](#); Gachon University, Korea (the Republic of).

SF01.08.13

An Alternative Method for Accident Tolerant Fuel Cladding Using Room Temperature Based Drawing Process [Jong Woo Kim](#); Gachon University, Korea (the Republic of).

SF01.08.14

A Study on Synthesis of Li_{4+x}SiO₄ with Single Phase as an Alternative Tritium Breeder for Applying Nuclear Fusion Energy [Park Young ah](#); Gachon University, Korea (the Republic of).

SESSION SF01.09: Mechanical Properties
Session Chairs: Maria Okuniewski and Blas Uberuaga
Thursday Morning, May 12, 2022
Hawai'i Convention Center, Level 3, 327

8:45 AM *SF01.09.01

Dislocation Changes Under Irradiation—A Separate-Effect Study [Claire Onofri-Marroncle](#); CEA, DES, IRESNE, DEC, SA3E, LCPC, France.

9:15 AM SF01.09.02

4D-STEM Strain Mapping of Nanometre-Scaled Defect Clusters [Eric Prestat](#); UK Atomic Energy Authority, United Kingdom.

9:30 AM SF01.09.03

In Situ Micro Cantilever Beam Bending Tests to Explore the Adherence Strength of Cr Coatings on Zry - 4 [Nan Li](#); Los Alamos National Laboratory, United States.

9:45 AM SF01.09.04

Computational Search BCC Refractory Alloys with Enhanced Strength, Ductility and Corrosion Resistance [Aditya Sundar](#); University of Michigan, United States.

10:00 AM BREAK

10:30 AM *SF01.09.05

Dislocation Loops in Ceramic Nuclear Fuels [Lingfeng He](#); Idaho National Laboratory, United States.

11:00 AM SF01.09.06

Modulation of the Electron-Phonon Coupling in 3C-SiC by Lattice Defects and its Ramifications on the Thermal Spike [Joseph Graham](#); Missouri University of Science and Technology, United States.

11:15 AM SF01.09.07

Surface Condition Effects on Fatigue Behavior of Additive Manufactured 304L/316L Steel [Daniel Morrall](#); SRNL, United States.

SESSION SF01.10: Defects and Models
Session Chairs: Michael Cooper and Maria Okuniewski
Thursday Afternoon, May 12, 2022
Hawai'i Convention Center, Level 3, 327

1:30 PM SF01.10.01

Coupled Experimental-Modelling Development of High Performance Composite UN-UO₂ Fuels [Par Olsson](#); KTH Royal Inst of Technology, Sweden.

1:45 PM SF01.10.02

Diffusion Between Zr–(Cr, Nb, Ta, Mo) and Cr–(Nb, Mo, Ta) Binary Systems for Accurate Lifetime Prediction of ATF [Ji-Cheng Zhao](#); University of Maryland, United States.

2:00 PM SF01.10.04

Hypervelocity Impacts on Plasma Facing Materials through Molecular Dynamics Simulations [Simon C. Middleburgh](#); Bangor University, United Kingdom.

2:15 PM SF01.11.06

Interactions of Selected Fission Products with Uranium Diboride [Fabio Martini](#); Bangor University, United Kingdom.

2:30 PM BREAK

SESSION SF01.11: Chemical Interactions
Session Chairs: Gianguido Baldinozzi and Maria Okuniewski
Thursday Afternoon, May 12, 2022
Hawai'i Convention Center, Level 3, 327

3:00 PM SF01.11.01

Phosphate Glass Waste Forms to Immobilize Salt Waste Stream for Advanced Reactor Applications [Ming Tang](#); Clemson University, United States.

3:15 PM SF01.11.02

Nanomaterial Extraction of Radioactive Metals from Wastewater [Miriyana Hémadi](#); Université de Paris, France.

3:30 PM SF01.11.03

Defect Chemistry and Tritium Accommodation in Li8PbO6 from Density Functional Theory [Andrew W. Davies](#); Lancaster University, United Kingdom.

3:45 PM SF01.11.04

Modelling the Oxidation of W and W-Alloys in Fusion Reactor First Walls [Ryan D. Kerr](#); Lancaster University, United Kingdom.

4:00 PM SF01.11.05

Impact of Lithium Accommodation on Defect Chemistry in ZrO₂ [Gareth F. Stephens](#); Bangor University, United Kingdom.

SESSION SF01.12: Advanced Reactors and Modeling of Radiation Damage I
Session Chairs: Unho Lee and Di Yun
Tuesday Afternoon, May 24, 2022
SF01-Virtual

9:00 PM *SF01.12.02

A Novel Metallic Fuel Conceptual Design for Ultra-High Burn-Up Liquid Metal Cooled Fast Reactors [Di Yun](#); Xi'an Jiaotong University, China.

9:30 PM SF01.12.03

Applicability to FeCrAl in Viewpoint of Corrosion Barrier Behavior and Neutron Absorber in Structural Materials for 4th Generation Nuclear Reactor [Unho Lee](#); Gachon University, Korea (the Republic of).

SESSION SF01.13: Advanced Reactors and Modeling of Radiation Damage II
Session Chairs: Chaitanya Deo and Thierry Wiss
Wednesday Morning, May 25, 2022
SF01-Virtual

8:00 AM *SF01.13.01

Computational Study of Radiation-Induced Segregation Mechanisms In Metallic Alloys [Chaitanya Deo](#); Georgia Institute of Technology, United States.

8:30 AM SF01.13.02

Atomistic Study of Radiation Damage in Ni/Inconel Multimetallc Layered Composite for Molten-Salt Reactor [Shiddartha Paul](#); The University of Alabama, United States.

8:45 AM SF01.13.03

Advanced Modeling of Tritium Embrittlement in Stainless Steels [Eric Hoar](#); Savannah River National Laboratory, United States.

9:00 AM SF01.13.04

Radiation Effects on Nuclear Waste Forms—How Does the Crystallinity of a Glass-Ceramic Affect Radiation Tolerance? [Tamás Zagyva](#); Dalton Cumbrian Facility, The University of Manchester, United Kingdom.

9:15 AM SF01.13.05

Near- and Off-Equilibrium Phase Transformations in U-(10 and 30)wt.%Zr Samples Measured Using Neutron Diffraction with *In Situ* Heating [Walter J. Williams](#)^{1,2}; ¹Idaho National Laboratory, United States; ²Purdue University, United States.

9:30 AM SF01.07.03

WITHDRAWN 5/17/22 SF01.07.03 Scalability of Self-Irradiation Effects Measured with Raman Spectroscopy in ²³⁸Pu-Doped UO₂ (and Comparison with Ion Irradiated UO₂ Samples) [Emanuele De Bona](#)^{3,1}; ¹Helmholtz-Zentrum Dresden-Rossendorf eV, Germany; ³European Commission Joint Research Centre, Germany.

VIRTUAL PRESENTATIONS ARE LISTED IN EASTERN TIME

Last Updated 5/18/22

SYMPOSIUM SF02

Actinide Materials—From Basic Science to Applications
May 9 - May 24, 2022

Symposium Organizers

* Invited Paper

SESSION SF02.01: Physics and Spectroscopy I
Session Chairs: Krzysztof Gofryk and Ladislav Havela
Monday Morning, May 9, 2022
Hilton, Kalia Conference Center, 2nd Floor, Kahili 1

11:00 AM *SF02.01.01
Direct Measurement of 5f Delocalization with U XES JG Tobin; University of Wisconsin-Oshkosh, United States.

11:30 AM SF02.01.03
Magnetoelastic Properties of 5f Ferromagnet UCu₂P₂ Volodymyr Buturlin; Charles University, Czechia.

11:45 AM SF02.01.04
Lanthanide and Actinide Electronic Structure Explored Through Soft X-Ray Spectromicroscopy of Ln/An-2,2':6,2'-terpyridine Coordination Compounds. David Shuh; Lawrence Berkeley National Laboratory, United States.

SESSION SF02.02: Physics and Spectroscopy II
Session Chairs: Ladislav Havela and JG Tobin
Monday Afternoon, May 9, 2022
Hilton, Kalia Conference Center, 2nd Floor, Kahili 1

2:00 PM *SF02.02.02
The Electronic and Lattice Dynamics Related Properties of Uranium and Thorium Based Systems Dominik Legut; VSB - Technical University of Ostrava, Czechia.

2:30 PM SF02.02.03
Thermodynamics for Actinide Monocarbides and Mononitrides Per Söderlind; Lawrence Livermore National Laboratory, United States.

2:45 PM BREAK

SESSION SF02.03: Plutonium
Session Chair: Paul Tobash
Monday Afternoon, May 9, 2022
Hilton, Kalia Conference Center, 2nd Floor, Kahili 1

3:15 PM *SF02.03.01
Lattice Distortions and Swelling Resilience in Aged δ -Phase Plutonium Jason Jeffries; Lawrence Livermore National Lab, United States.

3:45 PM *SF02.03.02
Thermodynamic and Dynamic Studies of $\delta^{239}\text{Pu}$ and Its Alloys Boris Maiorov; Los Alamos National Laboratory, United States.

4:15 PM SF02.03.03
A First-Principles Study on X- δ -Pu (X=Al, Ga, In, and Tl) Alloys for Stabilizing δ -Pu Sajib K. Barman; Los Alamos National Laboratory, United States.

SESSION SF02.04: Condensed Matter Physics
Session Chairs: Jason Jeffries and Jindrich Kolorenc
Tuesday Morning, May 10, 2022
Hilton, Kalia Conference Center, 2nd Floor, Kahili 1

9:00 AM *SF02.04.01
Symmetry of Hidden Ordering and Superconductivity in URu₂Si₂ S. Kambe; Japan Atomic Energy Agency, Japan.

9:30 AM SF02.04.03

Uranium Hydrides—From Polar Bonds to Magnetism [Ladislav Havela](#); Charles University, Czechia.

9:45 AM BREAK

SESSION SF02.05: Theory and Electronic Structure
Session Chairs: S. Kambe and Per Söderlind
Tuesday Morning, May 10, 2022
Hilton, Kalia Conference Center, 2nd Floor, Kahili 1

10:15 AM *SF02.05.01

Dynamical Mean-Field Theory of Uranium Compounds: Magnetism and Spectroscopy [Jindrich Kolorenc](#); Czech Academy of Sciences, Czechia.

10:45 AM SF02.05.02

Uranium Hydride Thin Films—Tools of Phase Composition Determination [Oleksandra Koloskova](#); Charles University, Czechia.

11:00 AM SF02.05.03

~~WITHDRAWN 5/9/22~~ SF02.05.03 *Ab Initio* Study of Ga Migration in δ -Pu Based on the Five-Frequency Model [Sarah C. Hernandez](#); Los Alamos National Laboratory, United States.

11:15 AM SF02.05.04

Modelling the High Temperature Magnetic Order of Plutonium Dioxide [Corey Bevan](#); Nuclear Futures Institute Bangor, United Kingdom.

SESSION SF02.06: Compounds
Session Chairs: Oleksandra Koloskova and Dominik Legut
Tuesday Afternoon, May 10, 2022
Hilton, Kalia Conference Center, 2nd Floor, Kahili 1

1:30 PM *SF02.06.01

Complex Compounds from the Bottom of the Periodic Table [Eteri Svanidze](#); Max Planck Institute for Chemical Physics of Solids, United States.

2:00 PM *SF02.06.02

Thermodynamic Modeling of Impurities in Actinide Alloys—Assessment of the U-Pu-Fe-Ni-Ga-Al System [Emily E. Moore](#); Lawrence Livermore National Laboratory, United States.

2:30 PM SF02.06.03

Probing the Defect Structure in Single-Phase UO_{2+x} Systems [William Cureton](#); University of Tennessee, Knoxville, United States.

2:45 PM SF02.06.04

DFT Investigation of the Properties of Plutonium Dioxide Nanoparticles [William Neilson](#); Lancaster University, United Kingdom.

3:00 PM BREAK

SESSION SF02.07: Forensics
Session Chairs: Nicholas Butch and Paul Tobash
Tuesday Afternoon, May 10, 2022
Hilton, Kalia Conference Center, 2nd Floor, Kahili 1

3:30 PM *SF02.07.01

Nuclear Forensics—Fission Track Analysis—Simulation and Image Analysis [Itzhak Halevy](#); NRCN, Israel.

4:00 PM SF02.07.02

Multiplatform Microanalysis of Actinide Materials for Nuclear Forensics [Brandon W. Chung](#); Lawrence Livermore National Laboratory, United States.

4:15 PM SF02.07.03

Controlled Growth and Functional Properties of Epitaxial Uranium Oxide Thin Films [Aiping Chen](#); Los Alamos National Laboratory, United States.

SESSION SF02.08: Chemistry
Session Chairs: Sarah Hernandez and Eteri Svanidze
Wednesday Morning, May 11, 2022
Hilton, Kalia Conference Center, 2nd Floor, Kahili 1

9:00 AM SF02.08.01

Reduction Reactions of Neptunium & Neptunium Analogues with Nitrogen Oxide Species [Michael Chimes](#); Lancaster University, United Kingdom.

9:15 AM SF02.08.02

Atomic Scale Investigation of Americium Bearing Mixed Oxide Compounds [Marjorie Bertolus](#); CEA, DES, France.

9:30 AM SF02.08.03

Molecular 5 f-Elements Precursors Designed for the Synthesis of Actinide Binary and Ternary Oxide Nanomaterials [Anna K. Schmidt-Verma](#); University of Cologne,

Germany.

9:45 AM SF02.08.04

Characterizing the Morphology and Chemistry of Oxides Formed on Plutonium Metal Alloys [Scott Donald](#); Lawrence Livermore National Laboratory, United States.

10:00 AM BREAK

SESSION SF02.09: Nuclear Fuels and Materials
Session Chairs: Volodymyr Buturlim and Rory Kennedy
Wednesday Morning, May 11, 2022
Hilton, Kalia Conference Center, 2nd Floor, Kahili 1

10:30 AM *SF02.09.01

The Combinatorial Approach to Testing and Characterization of Irradiated Fuels and Reactor Structural Materials [Colin Judge](#); Idaho National Laboratory, United States.

11:00 AM *SF02.09.02

Accelerating Development of Nuclear Fuels and Materials [Daniel Wachs](#); Idaho National Laboratory, United States.

11:30 AM SF02.09.03

The Role of Mass Transfer and Chemical Kinetics in Advanced Nuclear Fuel Partitioning and Reprocessing [Colin Boxall](#); Lancaster University, United Kingdom.

SESSION SF02.10: Poster Session: Actinide Materials—From Basic Science to Applications
Session Chairs: Emily Moore and David Shuh
Wednesday Afternoon, May 11, 2022
5:00 PM - 7:00 PM
Hawai'i Convention Center, Level 1, Kamehameha Exhibit Hall 2 & 3

SF02.10.01

Accommodation of Nitrogen in PuO₂ Under Storage Conditions [Reece T. Bedford](#); Lancaster University, United Kingdom.

SF02.10.02

Studies into the Effect of Insoluble Fission Products on the Generation of Ag(II) for the Dissolution of MOx Fuel [Michael Chimes](#); Lancaster University, United Kingdom.

SF02.10.03

Rapid Photochemical Reduction of U(VI) for the Development of New Mixed Metal Oxide Fuel Production Processes [Michael Bromley](#); Lancaster University, United Kingdom.

SF02.10.04

Experimental and Computational Thermal Conductivity Reduction in Single Crystal Thorium Dioxide From Lattice Defects [Cody A. Dennett](#); Idaho National Laboratory, United States.

SESSION SF02.11: General Session
Session Chairs: Krzysztof Gofryk and Ladislav Havela
Tuesday Afternoon, May 24, 2022
SF02-Virtual

1:00 PM *SF02.11.01

Water Plasma-Induced Redox Reactions on Thin Uranium (IV, V and VI) Oxide Films—A Surface Science Model Study of Nuclear Fuel Surface Corrosion. [Thomas Gouder](#); European Commission, Germany.

1:30 PM SF02.11.02

Tunable Correlated Disorder and Disorder-Phonon Coupling in the pseudo-*bcc* Uranium Molybdenum System γ -(U_{1-x}Mo_x) [Daniel A. Chaney](#)^{1,2}; ¹European Synchrotron Radiation Facility, France; ²The University of Bristol, United Kingdom.

1:45 PM SF02.11.03

Defining Qubit Properties in the Early Actinides [Stephanie Gamble](#); Savannah River National Laboratory, United States.

2:00 PM SF02.11.04

The PreCalc Project—Software Framework for Plutonium Processing [Eric Hoar](#); Savannah River National Laboratory, United States.

2:15 PM SF02.11.05

Electronic Properties of Unconventional Superconductors, U₆X (X = Fe, Co, Mn) [Firoza Kabir](#); Idaho National Laboratory, United States.

2:20 PM *SF02.01.02

Limits of 5*f* Magnetism and 5*f*-Based Superconductivity Probed by High Pressures [Fuminori Honda](#)^{1,2}; ¹Central Institute of Radioisotope Science and Safety, Kyushu University, Japan; ²Tohoku University, Japan.

2:50 PM *SF02.02.01

Thermodynamics of Plutonium Defect Structures [Franz J. Freibert](#); Los Alamos National Laboratory, United States.

SYMPOSIUM SF03

Paper-Based Packaging—21st Century Perspectives on an Ancient Material
May 11 - May 24, 2022

Symposium Organizers

* Invited Paper

SESSION SF03.02: Functional Coatings on Paper
Session Chairs: Douglas Coffin and Beko Mesic
Wednesday Afternoon, May 11, 2022
Hilton, Kalia Conference Center, 2nd Floor, Kahili 1

3:30 PM SF03.02.01

Novel Waterborne Dispersion for Paper Based Flexible Packaging Coating—Mechanical Dispersion Process and Improved Properties Luqing Qi; The Dow Chemical Company, United States.

3:45 PM SF03.02.02

Waterborne Barrier Coating for Water and Oil on Paperboard Sterre Bakker; Eindhoven University of Technology, Netherlands.

4:00 PM SF03.02.03

Lignocellulosic Biomass as a Sustainable Substrate for Robust Fabrication of Metal-Organic Frameworks (MOFs) Tahira Pirzada; North Carolina State University, United States.

SESSION SF03.03: Poster Session: Paper-Based Packaging—21st Century Perspectives on an Ancient Material
Session Chairs: Douglas Coffin and Beko Mesic
Wednesday Afternoon, May 11, 2022
5:00 PM - 7:00 PM

Hawai'i Convention Center, Level 1, Kamehameha Exhibit Hall 2 & 3

SF03.03.01

Enhancement of Oxygen and Water-Vapor Permeability with Mesoporous Silica Hybrid Packaging Films Jeong-Ho Chang; Korea Institute of Ceramic Engineering and Technology, Korea (the Republic of).

SF03.03.02

Hydrophobic Mesoporous Silica Particles Modified with Non-Fluorinated Alkyl Silanes Jeong-Ho Chang; Korea Institute of Ceramic Engineering and Technology, Korea (the Republic of).

SESSION SF03.01: Paper-Based Electronics
Session Chairs: Robert Abbel and Beko Mesic
Thursday Morning, May 12, 2022
Hilton, Kalia Conference Center, 2nd Floor, Kahili 1

9:00 AM SF03.01.01

Reinventing Paper—A Sustainable Green Deal and World Prosperity Rodrigo Martins; FCT-UNL, Portugal.

9:15 AM SF03.01.02

Fabrication of 10-meter Rolls of Paper Electrodes for Energy Storage on a Pilot-Scale Paper Machine Patrik A. Isacson; Linköping University, Sweden.

9:30 AM *SF03.01.03

Laser Assisted Roll-to-Roll Manufacturing of Low Cost Wireless Chipless Sensors for Intelligent Food Packaging Rahim Rahimi; Purdue University, United States.

10:00 AM BREAK

SESSION SF03.04: Non-Traditional Fibers
Session Chairs: Robert Abbel and Rahim Rahimi
Thursday Morning, May 12, 2022
Hilton, Kalia Conference Center, 2nd Floor, Kahili 1

11:00 AM SF03.04.02

A Study of Parametric Effects and Deformation Anisotropy in Stretch Forming of Palm-Leaf Materials [Debapriya Pinaki Mohanty](#); Purdue University, United States.

11:15 AM SF03.04.03

Biodegradable, Hygienic and Compostable Tableware from Sugarcane and Bamboo Fibers as Plastic Alternative [Hongli Zhu](#); Northeastern University, United States.

11:30 AM SF03.04.04

Cottonid—A New Old Paper-Based Material System [Matthias Langhans](#); Technische Universität München, Germany.

SESSION SF03.05: General Session I
Session Chairs: Robert Abbel and Hongbin Liu
Monday Afternoon, May 23, 2022
SF03-Virtual

6:30 PM *SF03.05.01

The Strength of Cellulose Nanofibre Sheets [Warren Batchelor](#); Monash University, Australia.

7:00 PM SF03.05.02

Study of Nanocellulose Crosslinking with Organic Acids for Improved Proton Conductivity in Nanocellulose Paper-Based Proton Exchange Membranes [Olena Selyanchyn](#)^{1,2}; ¹Department of Automotive Science, Graduate school for Intergrated Frontier Sciences, Japan; ²Kyushu University, Japan.

7:05 PM *SF03.05.03

Papertronics and Paperfluidics [Seokheun Choi](#); Binghamton University, The State University of New York, United States.

SESSION SF03.06: General Session II
Session Chairs: Robert Abbel and Hongbin Liu
Tuesday Morning, May 24, 2022
SF03-Virtual

8:00 AM *SF03.06.01

Lignin Oil Emulsion as Water Barrier Coatings [Peter Rättö](#); RISE, Sweden.

8:30 AM *SF03.06.02

Enhance the Performance of Lightweight Linerboard by Substitution of Recycled Fibers (OCC) with High-Yield Pulps (HYP) [Xuejun Zou](#); FPIInnovations, Canada.

9:00 AM SF03.06.03

On the Water Transport Through Nanocellulose and PBS Films [Peter Rättö](#); RISE, Sweden.

9:15 AM *SF03.06.04

Relating Papermaking Process Parameters to Properties of Paperboard with Special Attention to Through Thickness Design [Mikael Nygård](#)^{2,1}; ¹KTH Royal Institute of Technology, Sweden; ²BillerudKorsnäs, Sweden.

SYMPOSIUM SF04

Progress in Materials Genomics, Synthesis and Characterization of Functional Polymers and Polymer Nanocomposites
May 9 - May 24, 2022

Symposium Organizers

* Invited Paper

SESSION SF04.09: General Session II
Session Chairs: Dale Huber and Olin Mefford
Tuesday Afternoon, May 24, 2022
SF04-Virtual

9:00 PM *SF04.09.01

Machine-Learning-Assisted Discovery of High Thermal Conductivity of Polymers with Processability [Junko Morikawa](#); Tokyo Institute of Technology, Japan.

9:30 PM *SF04.09.02

Leveraging Polymer Theory for Improved Machine Learning [Debra Audus](#); NIST, United States.

10:00 PM SF04.09.03

Accelerating the Data-Driven Discovery of Biomaterials by Ultrafast Controlled Ring Opening Polymerizations [Tim Erdmann](#); IBM Research, United States.

10:15 PM SF04.09.04

Utilizing Continuous Flow Reactors and Real Time Process Monitoring for the Synthesis of Tailored Segmented Polyurethanes [Tim Erdmann](#); IBM Research, United States.

10:30 PM SF04.09.05

Advancing Polymeric Material Design Towards Enhanced Sour Gas Separations [John Yang](#); Aramco Research Ctr, United States.

10:45 PM SF04.06.06

Stimuli-Responsive Nanostructured Polymer Particles—From Synthesis to Application [Kang Hee Ku](#); UNIST, Korea (the Republic of).

10:50 PM SF04.06.04

Highly Conductive PEDOT Core-Shell Nanofiber for Electromagnetic Shielding with Ultraflexible and Lightweight. [Sol Lee](#); Chungnam National University, Korea (the Republic of).

SESSION SF04.01: Designing Functional Nanoparticles
Session Chairs: Olin Mefford and Linda Schadler
Monday Morning, May 9, 2022
Hawai'i Convention Center, Level 3, 324

10:30 AM *SF04.01.01

Designing Optical Metamaterials from Colloidal Noble Metal Nanocrystal Assemblies [Cherie R. Kagan](#); University of Pennsylvania, United States.

11:00 AM SF04.01.02

Preparing Chiral Hydrogel by Using Coordination-Assembly Complex of Cobalt Oxide Nanoparticles for Chiromechanical Response [Chung Man Lim](#); University of Michigan, United States.

11:15 AM SF04.01.03

Tunable Two-Dimensional Self-Assembly of Ag Nanocubes with Binary Ligands—A Computational and Experimental Study [Yufei Wang](#); UC San Diego, United States.

11:30 AM SF04.01.04

hybrid FePt/Fe₃O₄ Synthesis with Short Duration for Multifunctional Application [Yumin Kang](#); DGIST, Korea (the Republic of).

11:45 AM SF04.01.05

Synthesis of Shape-Controlled Polymer Nano/Microstructures Using Initiated Chemical Vapor Deposition (iCVD) Polymerization in Structured Liquids [Apoorva Jain](#); Cornell University, United States.

SESSION SF04.02: Materials Genome and Design of Polymer Nanocomposites
Session Chairs: Catherine Brinson and Linda Schadler

Monday Afternoon, May 9, 2022
Hawai'i Convention Center, Level 3, 324

1:30 PM *SF04.02.01

Polymer Informatics—Beyond Homopolymers [Rampi Ramprasad](#); Georgia Institute of Technology, United States.

2:00 PM *SF04.02.02

Phase Behavior of Polymer-Grafted Nanoparticles [Amalie L. Frischknecht](#); Sandia National Laboratories, United States.

2:30 PM SF04.02.03

Accelerated Polymer Electrolyte Discovery Enabled by an Automated High Throughput Tool [Michael A. Stolberg](#); Massachusetts Institute of Technology, United States.

2:45 PM SF04.02.04

Synthesis of Polymer Modified Substituted Ferrite Nanomaterials Guided by Density Functional Theory and Machine Learning [Olin T. Mefford](#); Clemson University, United States.

3:00 PM BREAK**3:30 PM SF04.02.05**

A Mesoscale Computational Approach to Study Non-Solvent Phase Separation Toward Inducing CNT-Polymer Blending [Yichen Deng](#); Northeastern University, United States.

3:45 PM SF04.02.06

Using Simulations and Data to Understand the Effect of the Interphase on Polymer Nanocomposite Properties [Boran Ma](#); Duke University, United States.

4:00 PM SF04.02.07

Integrating High-Throughput Experiments with Machine Learning Models for Macromolecule-Based Nanomaterials—A Case Study in DNA-Stabilized Metal Clusters [Stacy Copp](#)^{1,2,3}; ¹University of California, Irvine, United States; ²University of California, Irvine, United States; ³University of California, Irvine, United States.

4:15 PM SF04.02.08

Solution Behavior of Single-Chain Amphiphilic Random Heteropolymers [Shayna Hilburg](#); Massachusetts Institute of Technology, United States.

SESSION SF04.03: Advances in the Synthesis and Functionalization of Polymer Nanocomposites

Session Chairs: Catherine Brinson and Dale Huber

Tuesday Morning, May 10, 2022

Hawai'i Convention Center, Level 3, 324

9:00 AM *SF04.03.01

Exploration of Photoresponsive Materials [Javier Read de Alaniz](#); University of California, Santa Barbara, United States.

9:30 AM SF04.03.03

Advancing Rewarming for Cryopreservation Through Scalable Polymer Coating of Iron Oxide Nanoparticles [Jacqueline Pasek-Allen](#); University of Minnesota, United States.

9:45 AM BREAK**10:15 AM SF04.03.04**

Supramolecular “Bandwagoning”—From Symmetry Breaking in Polymer Grafting on Nanoparticles to Their Assembly into Reconfigurable Open Networks [Ahyoung Kim](#); University of Illinois at Urbana-Champaign, United States.

10:30 AM SF04.03.05

Macroscopic Materials Assembled from Nanoparticle Superlattices [Robert J. Macfarlane](#); Massachusetts Institute of Technology, United States.

10:45 AM SF04.03.06

Functional Nanocomposites of Lead Telluride Percolating Networks [Drew Vecchio](#); University of Michigan, United States.

11:00 AM SF04.03.07

Light-Induced Stacking of Metal-Free 2,2'-Bipyridine Derivatives and Polymers [Ying Yang](#); University of Nevada, Reno, United States.

11:15 AM SF04.03.08

Enhancing the Dielectric Breakdown Strength and Energy Density of Solid-State Polymeric Capacitors by Chain End Manipulations [Maninderjeet Singh](#); University of Houston, United States.

11:30 AM SF04.03.09

Burn-Dry—Fabrication of Porous Carbon Networks via Polymer-Templated Rapid Thermal Annealing [James Nicolas M. Pagaduan](#); University of Massachusetts Amherst, United States.

11:45 AM SF04.03.10

Modification of Thermo-Responsive Smart Hydrogels by Embedding Prefabricated Gold and Silver Nanoparticles [Julia Koerner](#); Leibniz University Hannover, Germany.

SESSION SF04.04: Nanocomposite Synthesis and Characterization

Session Chairs: Dale Huber and Olin Mefford

Tuesday Afternoon, May 10, 2022

Hawai'i Convention Center, Level 3, 324

1:30 PM *SF04.04.01

Templated and Nanostructured Polymer Layered Colloids—From Non-Lithographic Patterning to Melt Processing [Rigoberto C. Advincula](#)^{1,2,3}; ¹Case Western Reserve University, United States; ²The University of Tennessee, Knoxville, United States; ³Oak Ridge National Laboratory, United States.

2:00 PM SF04.04.02

Simultaneous Nanocrystalline and Amorphous Phase Mapping of Polymer Blend Using Cryogenic 4D-STEM [Jennifer Donohue](#); University of California, Berkeley, United States.

2:15 PM SF04.04.03

Utilizing Self-Assembled Mesoporous Metal Oxide Matrices as a Platform for Specific, Isolated Studies of Polymer-Surface Adsorption and Interactions [David W. Collinson](#); Stanford University, United States.

2:30 PM SF04.04.04

Investigating the Dielectric Constant of Functionalized Barium Titanate Within a Polymer Nanocomposite [Zoe Kedzierski](#); Harvey Mudd College, United States.

2:45 PM BREAK

SESSION SF04.05: Polymer Nanocomposites for Sustainability

Session Chairs: Dale Huber and Olin Mefford

Tuesday Afternoon, May 10, 2022

Hawai'i Convention Center, Level 3, 324

3:15 PM SF04.05.01

Bioplastic Nanocomposites—Effects of Nanofillers in Biomass Matrix Materials [Eleftheria Roumeli](#); University of Washington, United States.

3:30 PM SF04.05.02

Tailoring the Surface Modification of Cellulose Nanofibrils for Nanocomposite Applications [Rosella Telaretti](#); KTH Royal Institute of Technology, Sweden.

3:45 PM SF04.05.03

Chemical Control Over Nanoscale Pore Networks in Polymer Aerogels for Carbon Capture [Stephen M. Meckler](#); PARC, a Xerox Company, United States.

4:00 PM SF04.05.04

Sustainable Added-Value Lignin-Based Hybrid Composites for Specific Molecules Separation [Tetyana Budnyak](#)^{1,2}; ¹Stockholm University, Sweden; ²Uppsala University, Sweden.

SESSION SF04.06: Poster Session: Materials Genomics and Characterization of Functional Polymers and Polymer Nanocomposites

Session Chairs: Catherine Brinson, Dale Huber, Olin Mefford and Linda Schadler

Tuesday Afternoon, May 10, 2022

5:00 PM - 7:00 PM

Hawai'i Convention Center, Level 1, Kamehameha Exhibit Hall 2 & 3

SF04.06.01

Sub-100-nm Nearly Monodisperse n-Paraffin/PMMA Phase Change Nanobeads [Ho Young Woo](#); Chung-Ang University, Korea (the Republic of).

SF04.06.02

Formation of SAM(Self-Assembled Monolayers) on an Electroplated Hard Au-Ni Alloy Layer by Thiol-Based Sealing Agent for Enhancing Anti-Corrosive Property [Subin Kim](#); Kyungpook National University, Korea (the Republic of).

SF04.06.03

Reversible Color Transitions of Polydiacetylene Under Heating-UV Irradiation Cycles [Hee Yeon Sagong](#); Inje University, Korea (the Republic of).

SF04.06.05

Functional MOF/Polymer Nanocomposites with Improved Processability for Sustainable Energy Applications [Chiara Petrillo](#); University of Bristol, United Kingdom.

SF04.06.07

Elaborate Microencapsulation of Thermochromic Chiral Mesogens for Colorimetric Temperature Microprobes [Yoonjin Oh](#); KAIST, Korea (the Republic of).

SF04.06.08

Rheological Properties for Printability of Graphene-PDMS Nanocomposites [Ioanna Katsamba](#); Purdue University, United States.

SF04.06.09

Designing Transparent and Durable Polymeric Coatings for Dust Mitigation [Andrea Molina Moreno](#); University of Central Florida, United States.

SF04.06.10

Controlling Functionality and Self-Assembly of PDI-Based Supramolecular Polymers by Targeted Modification [Maximilian J. Hagemann](#); University of Bristol, United Kingdom.

SF04.06.11

Bicontinuous Nanoporous Frameworks Supported Metal Nanocatalysts—A New Type of Catalytic Nano-Reactors for Continuous Selective Hydrogenation of Alkynes [Dawoon Jeong](#); Gwangju Institute of Science and Technology, Korea (the Republic of).

SF04.06.12

Establishing Molecular Interactions Between Conjugated Polymers and Catalytic Enzymes for High Performance Biosensors [David Ohayon](#); King Abdullah University of

Science and Technology, Saudi Arabia.

SF04.06.13

Data-Driven Soft Material Design [Juyoung Leem](#); Stanford University, United States.

SF04.06.14

Differential Composition and Gene Expression Among Microbiomes of Military Aircraft and Vehicles Potentially Associated with Variable Biocorrosion and Biodeterioration [Dominique Wagner](#)^{2,1}; ¹UES, Inc., United States; ²Air Force Research Laboratory, United States.

SF04.06.15

Multiplex Electrospinning for Polymer Deposition and Novel Macroscale Structures [Harold W. Pearson-Nadal](#); Montana Technological University, United States.

SF04.06.16

Continuous Mesoporous Framework with Entrapped Enzymes—A Structural and Analytical Platform for Nanofluidic Biocatalysis [Wangsuk Oh](#); Gwangju Institute of Science and Technology, Korea (the Republic of).

SF04.06.17

From Polyethylene Coated MOF Nanoparticles to a New Screening Method for Optimized Polymer-MOF Hybrid Materials—Reducing Stealth Effects and Enhancing Drug Delivery Processes [Ilona Wagner](#); Karlsruhe Institute of Technology, Germany.

SF04.06.18

Quantitative Measurements of the Influence of Polymer Brush Length on Magnetic Nanoparticle Interactions and Signal Enhancement During Linear Aggregation via Magnetic Particle Spectroscopy [Arabella R. Hunter](#); Clemson University, United States.

SF04.06.20

Orientated Self-Assembly and Phase Transition of Silk Fibroin Observed by *In Situ* Atomic Force Microscopy [Chenyang Shi](#)^{1,2,3}; ¹Pacific Northwest National Laboratory, United States; ²University of Washington, United States; ³Xiamen University, China.

SF04.06.21

Designing Transition Metal/Polymer Nanocomposite Derived Macroscopic Carbon Fiber Towards Highly Stable Catalysis [Ga-Hyeun Lee](#); Ulsan National Institute of Science and Technology (UNIST), Korea (the Republic of).

SF04.06.22

3D-Printed Biomass-Based Nanocomposite Structures [Eleftheria Roumeli](#); University of Washington, United States.

SF04.06.23

3D-Structured Polymers for Water Treatment From Strontium and Cesium Ions [Alzhan Baimenov](#)^{1,2}; ¹Al Farabi Kazakh National University, Kazakhstan; ²National Laboratory Astana, Nazarbayev University, Kazakhstan.

SF04.06.24

Polymeric Conductive Microneedles for Real-Time Monitoring of Biomarkers [Tony Keirouz](#)^{1,2}; ¹Department of Chemical Engineering, University of Bath, United Kingdom; ²University of Bath, United Kingdom.

SF04.06.25

Processing-Structure-Property Relationships in ABS Nanocomposites [Evan Flitz](#); Pomona College, United States.

SF04.06.26

Heterobifunctional RAFT Polymers for Simultaneous, Orthogonal Bioconjugations [Anthony Berardi](#)^{1,2}; ¹University of Michigan, United States; ²University of Michigan, United States.

SF04.06.27

Effect of Agglomerations on Dielectric Properties of Polymer Nanocomposites [Prajakta V. Prabhune](#); Duke University, United States.

SESSION SF04.07/EN07.06: Joint Session: Achieving Functionality by Polymeric Material Structure

Session Chairs: Rainhard Machatschek, Olin Mefford and Ying Yang

Wednesday Morning, May 11, 2022

Hawai'i Convention Center, Level 3, 324

8:30 AM SF04.07/EN07.06.01

Predicting Optical Properties of Cellulose-Based Materials Using Multiscale Modeling [Yaroslava G. Yingling](#); North Carolina State University, United States.

9:00 AM SF04.07/EN07.06.02

Cellulose Derived Hierarchical Nanopore-Spaced Membranes by Murray's Law for Gas Capture and Storage [Haiyan Mao](#); University of California, Berkeley, United States.

9:15 AM SF04.07/EN07.06.03

Using Cellulose as a Template for Zinc Oxide Formation [Billy Hoogendoorn](#); KTH Royal Institute of Technology, Sweden.

9:30 AM SF04.07/EN07.06.04

Antioxidant Technology for Lifetime Enhancement in Polymer Electrolyte Membranes for Fuel Cell Applications [Jin Young Kim](#); Korea Institute of Science and Technology (KIST), Korea (the Republic of).

9:45 AM BREAK**10:15 AM *SF04.07/EN07.06.05**

Degradable Polymer Synthesis via Photopolymerization [Brent Sumerlin](#); University of Florida, United States.

10:45 AM SF04.07/EN07.06.06

Contributions of Boronic Ester Substituents to the Dynamics and Mechanical Properties of Elastic Vitrimer Networks [Zoriana Demchuk](#); Oak Ridge National Lab, United States.

11:00 AM SF04.07/EN07.06.07

Nanoscale PDMS Brushes as a Replacement for Perfluoroalkyl Substances (PFAS) [Kevin Golovin](#); University of Toronto, Canada.

11:15 AM SF04.07/EN07.06.08

Real-Time Assessment of Mechanical Integrity in Self-Healing Polymers [Wenle Li](#); China University of Petroleum, China.

SESSION SF04.08: General Session I

Session Chairs: Catherine Brinson, Dale Huber, Olin Mefford and Linda Schadler

Tuesday Morning, May 24, 2022

SF04-Virtual

8:00 AM *SF04.08.01

Synthesis of Inorganic and Hybrid Functional Nanostructures Using Polymer Templates [Elena Shevchenko](#)^{1,3}; ¹Argonne National Laboratory, United States; ³The University of Chicago, United States.

8:30 AM *SF04.08.02

Life-Like “Self-Oscillating” Polymer Gels as Functional Softmaterials [Ryo Yoshida](#); The University of Tokyo, Japan.

9:00 AM SF04.08.04

Lightweight PVDF Nanocomposites for EMI Shielding Applications Using Copper Sulphide ‘Flowers’ on ‘*In Situ*’ Reduced Graphene Oxide Template [Devansh Sharma](#); IISc, India.

9:05 AM *SF04.08.05

Metastable Self-Assembled Structures Formed During Dynamic Processes [Xiao-Min Lin](#); Argonne National Laboratory, United States.

9:35 AM SF04.08.06

Resource Recovery from Lithium-Ion Batteries with Macromolecules [Xiong Xiao](#); KTH – Royal Institute of Technology, Sweden.

SYMPOSIUM SF05

Autonomous Materials for the Next-Generation of Smart Systems
May 8 - May 24, 2022

Symposium Organizers

* Invited Paper

SESSION SF05.01: Material Advances in 3D Printing
Session Chair: Yoav Matia
Sunday Morning, May 8, 2022
Hawai'i Convention Center, Level 3, 319A

10:15 AM *SF05.01.01

Collective Cell Behavior in 3D Cell Assemblies—3D Printed Structures, Random Aggregates and Perfectly Precise Arrays [Thomas Angelini](#); University of Florida, United States.

10:45 AM *SF05.01.02

Designing Robotic Materials from Sensorized Soft and Architected Matter [Ryan L. Truby](#); Northwestern University, United States.

11:15 AM SF05.01.03

Effects of External Acoustic Stimuli Applied to Electrochemical Surfaces and Interfaces [Luis A. Chavez Atayde](#); Los Alamos National Laboratory, United States.

11:30 AM SF05.01.04

Cellulose Nanocrystals-Based All-3D Printed Pyroelectric Nanogenerator for Thermal Energy Harvesting [Kuntal Maity](#); University of Oklahoma, India.

SESSION SF05.02: Material Based Autonomous Control
Session Chair: Amir Gat
Sunday Afternoon, May 8, 2022
Hawai'i Convention Center, Level 3, 319A

1:30 PM *SF05.02.01

Power Amplification of Soft Artificial Muscles for Rapid Actuation [Michael Tolley](#); University of California, San Diego, United States.

2:00 PM SF05.02.02

A Dynamically Reconfigurable Metasurface with Self-Evolving Shape Morphing [Xiaoyue Ni](#); Duke University, United States.

2:15 PM SF05.02.03

A Metafluid With Multistable Density and Internal Energy States [Ofek Peretz](#); Technion - Israel Institute of Technology, Israel.

2:30 PM BREAK

SESSION SF05.03: Advances in Autonomous Materials
Session Chair: Hyeon An
Sunday Afternoon, May 8, 2022
Hawai'i Convention Center, Level 3, 319A

3:15 PM *SF05.03.01

2D, 3D and 4D Printing of Smart Materials [Shlomo Magdassi](#); Hebrew Univ of Jerusalem, Israel.

3:45 PM *SF05.03.02

Programming Tangible World [Jiyun Kim](#); Ulsan National Institute of Science and Technology, Korea (the Republic of).

4:15 PM SF05.03.03

Programmable Architectures Using Highly Deformable Elastic Lattice for Multidimensional Soft Actuators [Seonggun Joe](#); Istituto Italiano di Tecnologia, Italy.

4:30 PM SF05.03.04

Temperature Responsive Smart Photonic Polymers for Printable Autonomous Sensors [Yari Foelen](#); Eindhoven University of Technology, Netherlands.

4:45 PM SF05.03.05

Design of Polymeric Thin Films to Direct Microbial Biofilm Growth, Virulence and Metabolism Rong Yang; Cornell University, United States.

SESSION SF05.04: Smart System
Session Chair: Amir Gat
Monday Morning, May 9, 2022
Hilton, Mid-Pacific Conference Center, 6th Floor, Coral 5

10:30 AM

Viscous Flow in 1D Metamaterials and Soft Robots Amir Gat; Technion–Israel Institute of Technology, Israel.

10:45 AM DISCUSSION TIME

11:00 AM SF05.04.02

Autonomous Microinjectors for Enteral Insulin Delivery Wangqu Liu; Johns Hopkins University, United States.

11:15 AM SF05.04.03

Ultrathin Skin-Attachable TiO_x Synaptic Array Integrated with an Organic Photodiode for Finger Gesture Recognition Haein Cho; Korea University, Korea (the Republic of).

11:30 AM SF05.04.04

Real-Time Monitoring of Local Intraocular Pressure Distributions Applied to Retina for Diagnosis and Treatment of Glaucoma Hunhyu Seo; Yonsei University, Korea (the Republic of).

11:45 AM SF05.04.05

Multifunctional Adaptive Sensing of Complex Ambient Environments Using Reconfigurable Material-Electrodes Circuits Radislav A. Potyrailo; GE Global Research, United States.

12:00 PM SF05.04.06

Skin Integrated Electronic Interfaces for Augmentative and Alternative Communication Jin Pyo Lee; Ulsan National Institute of Science and Technology, Korea (the Republic of).

SESSION SF05.05: Material Advances for Soft Robotics
Session Chair: Lucia Beccai
Monday Afternoon, May 9, 2022
Hilton, Mid-Pacific Conference Center, 6th Floor, Coral 5

1:30 PM *SF05.05.01

Robust Collective Locomotion with and Without Coordination Daniel I. Goldman; Georgia Institute of Technology, United States.

2:00 PM *SF05.05.02

Embodied and Distributed Energy Circulation, Powering and Computing Network for Soft Robots Hyeon Seok An; Cornell University, United States.

2:30 PM SF05.05.03

Microvascular-Based, Tunable Stiffness Elastomers Caroline M. Schell; The University of Tulsa, United States.

2:45 PM SF05.05.04

Magnetohydrodynamic Levitation for High-Performance Flexible Pumps Yoav Matia^{1,2}; ¹U.S. Army Research Laboratory, United States; ²Cornell University, United States.

3:00 PM SF05.05.05

Highly NIR-Reflective Coatings for Soft Robotics Sensing Simone Lantean; Istituto Italiano di Tecnologia, Italy.

3:15 PM BREAK

SESSION SF05.06: Self Powered Devices
Session Chair: Robert Shepherd
Monday Afternoon, May 9, 2022
Hilton, Mid-Pacific Conference Center, 6th Floor, Coral 5

3:30 PM SF05.06.01

Graphene-Based Pyroelectric System for Near-Field Energy Conversion Ivan Latella^{1,2}; ¹Laboratoire Charles Fabry, France; ²Universitat de Barcelona, Spain.

3:45 PM SF05.06.02

Janus Wood Membranes for Autonomous Water Transport and Fog Collection Yong Ding^{1,2}; ¹ETH Zurich, Switzerland; ²Empa–Swiss Federal Laboratories for Materials Science and Technology, Switzerland.

4:00 PM SF05.06.03

Ultrasensitive Self-Powered Pressure Sensor by Triboelectric Nanogenerator for Acoustic Sensing Soyeon Lee; Yonsei University, Korea (the Republic of).

4:15 PM SF05.06.04

Self-Powered Electrochemical Microwave Devices for Wireless Chemical Sensing Siew Ting Melissa Tan; Stanford University, United States.

4:30 PM SF05.06.05

Autonomous Resonance-Tuning Energy Harvesters Based on Adaptive Clamping Systems Hyun-Cheol Song; Korea Institute of Science and Technology, Korea (the

Republic of).

4:45 PM SF05.06.06

Generalized Weisskopf-Wigner Model of Triboelectroluminescence [Lok C. Lew Yan Voon](#); University of West Georgia, United States.

SESSION SF05.07: Poster Session: Autonomous Materials for the Next-Generation of Smart Systems

Session Chairs: Lucia Beccai and Yoav Matia

Monday Afternoon, May 9, 2022

5:00 PM - 7:00 PM

Hawai'i Convention Center, Level 1, Kamehameha Exhibit Hall 2 & 3

SF05.07.01

Fabrication of Printable Colorimetric Food Sensor Based on Hydrogel at Low Concentration of Ammonia [Mirim Ham](#); Kookmin University, Korea (the Republic of).

SF05.07.02

Programming Self-Powered Soft Magnetic Systems [Hyeonseong Song](#); UNIST, Korea (the Republic of).

SF05.07.03

Triboelectric Yarns with Electrospun Functional Polymer Coatings for Wearable Energy Harvesting and Sensing Applications [Tommaso Busolo](#); University of Cambridge, United Kingdom.

SF05.07.05

WITHDRAWN 5/17/22 SF05.07.05 Tailoring the Triboelectric Output of Poly-L-Lactic Acid Nanotubes Through Control of Polymer Crystallinity [Kalliopi Margaritis](#); University of Cambridge, United Arab Emirates.

SF05.07.06

Spider Silk Inspired PEBA/Goethite Nanocomposite for Stronger Triboelectrification [Andris Šutka](#); Riga Technical University, Latvia.

SF05.07.07

Rationally Nanoengineered Tough-Gels for Sustainable Atmospheric Water Harvesting [Hyunchul Park](#); ETH Zurich, Switzerland.

SF05.07.08

Design of Soft Magnetic Materials [Ananya Renuka Balakrishna](#); University of Southern California, United States.

SF05.07.09

Graphene Oxide polylactide-co-glycolide 3D-Printable Scaffold with Photothermal Effect for Tumor Therapy [Massimiliano Papi](#); Catholic University of SH, Italy.

SF05.07.11

Heat Resistant and Robust Superhydrophobic Coatings Fabricated by Functionalized Nanoparticles [Anna K. Schmidt-Verma](#); Universität zu Köln, Germany.

SF05.07.12

Gel Time Engineering in Bacteria-Embedded Silk Hydrogels [Rhett L. Martineau](#); UES, Inc/Air Force Research Laboratory, United States.

SF05.07.13

Magnetic Responsive Tubular Scaffolds Printed by Means of Melt Electrowriting [Paula G. Saiz](#)^{2,1}; ¹UPV/EHU, Spain; ²BCMaterials, Spain.

SF05.07.14

Magnetophoretic Decoupling Element for Controlling Interaction Between Magnetic Particles [Byeonghwa Lim](#); DGIST, Korea (the Republic of).

SF05.07.15

Novel Eco-Friendly Chalcogenide Glass Systems and Their Lenses for Infrared Thermal Imaging Systems [Karam Han](#); KOREA PHOTONICS TECHNOLOGY INSTITUTE, Korea (the Republic of).

SF05.07.16

Effect of Lanthanum Oxide on Glass Formation Range and Properties of B₂O₃-ZnO-WO₃ Glass System for Optical Lens [Yoon Hee Nam](#); Korea Photonics Technology Institute, Korea (the Republic of).

SESSION SF05.08: Functional Hydrogel

Session Chair: Lucia Beccai

Tuesday Morning, May 10, 2022

Hilton, Mid-Pacific Conference Center, 6th Floor, Coral 5

11:15 AM SF05.08.02

Biomimetic Microanalytical System for On-Demand Analyte Detection [Katharina Cu](#); Karlsruhe Institute of Technology, Germany.

11:30 AM SF05.08.03

Electro-Actuators Based on Polycationic Hydrogel Networks [Annael M. Sort-Montenegro](#); Trinity College Dublin, Ireland.

11:45 AM SF05.08.04

Controllable Clustering Transition Based on Temperature-Response Hydrogel by Optimizing Elastic Modulus [Jiseong Choi](#); Chungnam National University, Korea (the Republic of).

12:00 PM SF05.08.05

Thermo-Responsive Smart Gating Wood Membranes [Yong Ding](#)^{1,2}; ¹ETH Zurich, Switzerland; ²Empa-Swiss Federal Laboratories for Materials Science and Technology,

Swaziland.

SESSION SF05.09: Self Healing Materials
Session Chair: Robert Shepherd
Tuesday Afternoon, May 10, 2022
Hilton, Mid-Pacific Conference Center, 6th Floor, Coral 5

1:30 PM SF05.09.00

Autonomous Materials, Forming the Smart Systems of the Future [Robert Shepherd](#); Cornell University, United States.

1:45 PM DISCUSSION TIME

2:00 PM SF05.09.02

Sustained Self-Healing of Fiber-Reinforced Polymer Composites via *In situ* Thermal Remending [Jason Patrick](#); North Carolina State University, United States.

2:15 PM SF05.09.03

Self-Healing for Microvascular Seals in Gas Transmission [MD Mahfujul H. Khan](#); The University of Tulsa, United States.

2:30 PM SF05.09.04

Molecular Examination of Healable Polymers with Covalent Adaptive Networks [Aniruddh Vashisth](#); University of Washington, United States.

2:45 PM SF05.09.05

Self-Healing Materials to Reduce Unintended Methane Release [Anna E. Williams](#); The University of Tulsa, United States.

3:00 PM BREAK

SESSION SF05.10: Material Based Computation
Session Chair: Amir Gat
Tuesday Afternoon, May 10, 2022
Hilton, Mid-Pacific Conference Center, 6th Floor, Coral 5

3:15 PM *SF05.10.01

Printable Robots Integrated in a Robot-Ecosystem for Measuring the Oceanic Margins of Ice Sheets [Markus Nemitz](#); WPI, United States.

3:45 PM *SF05.10.02

Mechanics-Based Material Computing using Physical ReLU Spring Networks [Phil Buskohl](#); Air Force Research Laboratory, United States.

4:15 PM SF05.10.03

Self-Folding Shape-Memory Elastomer Composites with Controlled Topographies [Oscar Rabaux](#); University of Liege, Belgium.

4:30 PM SF05.10.04

Tunable Response in Liquid Crystalline Elastomers for Complex and Reprogrammable Actuations [Taylor Hebnner](#); University of Colorado Boulder, United States.

4:45 PM SF05.10.05

Multi-State Soft Machine Programmed by DNA Oligonucleotide Codes [Ruohong Shi](#); Johns Hopkins University, United States.

5:00 PM SF05.10.06

Smart Materials with Tunable Properties Based on Low Melting Point Alloys [Wanliang Shan](#); Syracuse University, United States.

SESSION SF05.11: General Session I
Session Chairs: Hyeon Seok An and Robert Shepherd
Tuesday Afternoon, May 24, 2022
SF05-Virtual

6:30 PM *SF05.11.01

Triboelectric Nanogenerator for Self-Powered Sensors and Systems [Zhong Lin Wang](#); Georgia Institute of Technology, United States.

7:00 PM *SF05.11.02

Electrochemistry for Autonomous Navigation of Small Vehicles and Healing of Metal Parts [James H. Pikul](#); University of Pennsylvania, United States.

7:30 PM SF05.11.03

A Continuously Operated Electrochemical System Driven by Low-Grade Thermal Energy [Xiaoya Li](#); Nanyang Technological University, Singapore.

7:45 PM SF05.11.04

Shape-Programmable Three-Dimensional Microfluidics [Xueju Wang](#); University of Connecticut, United States.

8:00 PM SF05.11.05

Designing Plasmonic Nanostructures for Smart Materials [Yadong Yin](#); University of California, Riverside, United States.

8:15 PM SF05.11.06

Magnetoelastic Instabilities in Soft Magnetorheological Elastomers with Layered Microstructure [Nitesh Arora](#); UW Madison, United States.

8:20 PM SF05.11.07

VIRTUAL PRESENTATIONS ARE LISTED IN EASTERN TIME

Last Updated 5/18/22

Autonomous Self-Healing Effect of Thermoplastic Polyurethane Containing Multiple Self-Healing Moieties [Hyojin Kim](#); Sookmyung Women's University, Korea (the Republic of).

SESSION SF05.12: General Session II
Session Chairs: Hyeon Seok An and Lucia Beccai
Tuesday Afternoon, May 24, 2022
SF05-Virtual

9:00 PM *SF05.12.01

Biomimetic Approaches with Stretchable Ionics [Jeong-Yun Sun](#); Seoul National University, Korea (the Republic of).

9:30 PM *SF05.04.01

Smart Contact Lenses for Wireless Medical Diagnosis [Jang-ung Park](#)^{1,2}; ¹Yonsei University, Korea (the Republic of); ²Institute for Basic Science (IBS), Korea (the Republic of).

SYMPOSIUM SF06

Recent Advances in Structural Materials from Bulk to Nanoscale
May 9 - May 24, 2022

Symposium Organizers

* Invited Paper

SESSION SF06.01: 3D Hierarchical Structures Composed of Metal Nanostructures I
Session Chairs: Heung Nam Han, Ju-Young Kim, Hyuck Mo Lee and Sang Ho Oh
Monday Morning, May 9, 2022
Hawai'i Convention Center, Level 3, 313A

8:30 AM *SF06.01.01

Enhanced Mechanical Properties of Nanoporous Gold by Controlling External and Internal Microstructures [Ju-Young Kim](#); UNIST (Ulsan National Institute of Science and Technology), Korea (the Republic of).

9:00 AM SF06.01.02

The Role of Twin Boundaries and other Microstructural Features in Mechanical Behavior of Additively Manufactured Metal and Metal Alloy Microlattices [Rebecca A. Gallivan](#); California Institute of Technology, United States.

9:15 AM SF06.01.03

Scalable Fabrication of Thin-Shell Oxide Nanoarchitectures via Proximity-Field Nanopatterning—Toward Ultrahard and Flexible Nanocomposite Film [Gwangmin Bae](#); Korea Advanced Institute of Science and Technology, Korea (the Republic of).

9:30 AM SF06.01.04

Temperature-Dependent Deformation Behavior of Nanostructured Tungsten Scaffolds and Interpenetrating Tungsten–Silicon Oxycarbide Nanocomposites [Andreas Stein](#); Univ of Minnesota, United States.

9:45 AM SF06.01.05

Heterogeneous Metallic Nanoporous Structures Obtained via Nanoscale Low-Temperature Welding [Bruno Azeredo](#); Arizona State University, United States.

10:00 AM BREAK

10:30 AM SF06.01.08

Toughness Amplification via Bioinspired Nanoarchitecture [Zainab S. Patel](#); University of Washington, United States.

10:45 AM SF06.01.09

Anomalous Elastic Limit of ZnO from a Uniform and Aligned 3D Nanoshell Structures for Piezoelectric Applications [Kisun Kim](#); Korea Advanced Institute of Science and Technology, Korea (the Republic of).

11:00 AM SF06.01.10

Nanoscale Sculptured Stainless Steel with Electrochemically Deposited Copper for Mechanically Stable Joints and Optimal Electrical Properties [Catarina Schmidt](#); Kiel University, Germany.

SESSION SF06.02: 3D Hierarchical Structures Composed of Metal Nanostructures II
Session Chairs: Karsten Durst and Gi-Dong Sim
Monday Afternoon, May 9, 2022
Hawai'i Convention Center, Level 3, 313A

2:00 PM *SF06.02.01

Accelerated Development of Al Alloys for Additive Manufacturing [Ryan T. Ott](#); Ames Laboratory (USDOE), United States.

2:30 PM SF06.02.02

Influence of Heat Treatment on the Hydrogen Embrittlement of Inconel 718 Fabricated by Laser Powder Bed Fusion [Dong-Hyun Lee](#); Chungnam National University, Korea (the Republic of).

2:45 PM SF06.02.04

Tunable On-Wafer Porous Anodic Aluminum Substrates for Advanced Nanomaterials Design Templates for Nanomaterial Synthesis [Nam Kim](#); University of Maryland, United States.

3:00 PM BREAK

SESSION SF06.03: Alloy Fabrication and Processing Methods/Bulk Alloy I

Session Chairs: Heung Nam Han and Ill Ryu

Monday Afternoon, May 9, 2022

Hawai'i Convention Center, Level 3, 313A

3:30 PM SF06.03.01**Matrix-Dispersoid Mechanical Interaction in Microstructurally Stable Hierarchical and Nanocrystalline Alloys—A SAXS/WAXS Study** Shruti Sharma; Arizona State University, United States.**3:45 PM SF06.03.02****The Influence of Aging on the Mechanical Behavior of Sputter Deposited Ni-Mo-W Thin Films with Mo Content Above the Solubility Limit** Yuhyun Park; Korea Advanced Institute of Science and Technology, Korea (the Republic of).**4:00 PM SF06.03.03****Strengthening and Thermal Stability of MgLiCa Alloys Processed by Severe Plastic Deformation** Suveen N. Mathaudhu^{1,3}; ¹Colorado School of Mines, United States; ³Pacific Northwest National Laboratory, United States.**4:15 PM SF06.03.04****Solid-State Dissimilar Bulk Joining of Additively Manufactured Maraging Steel and Conventional Martensitic Stainless Steel** Sung Tae Hong; University of Ulsan, Korea (the Republic of).**4:30 PM SF06.03.05****Multi-Scale Mechanical Characterization of Additively Manufactured Inconel 718** Kwanghyeok Lim; Korea Advanced Institute of Science and Technology, Korea (the Republic of).

SESSION SF06.04: Poster Session I: Recent Advances in Structural Materials from Bulk to Nanoscale I

Session Chairs: Heung Nam Han and Seung Min Han

Monday Afternoon, May 9, 2022

5:00 PM - 7:00 PM

Hawai'i Convention Center, Level 1, Kamehameha Exhibit Hall 2 & 3

SF06.04.01**Elastic Wave Characteristics from Crack Initiation and Propagation of High-Strength Steel (HV550) Immersed in Acetic Acid Solution** Kyounghee Gu; Pukyong National University, Korea (the Republic of).**SF06.04.02****Tensile Mechanical Behavior of Fine-Grained Magnesium Under Subfreezing Testing Temperatures** Qizhen Li; Washington State University, United States.**SF06.04.03****Nanoscale Ductile Deformation by Nanoscratch Test at Extremely Low Load of Brittle Materials** Dong-Hyun Seo; University of Ulsan, Korea (the Republic of).**SF06.04.04****Interface Engineering of Ceria Nanoparticles for High Removal Rate of SiO₂ in Chemical Mechanical Planarization** Hojin Jeong; Hanyang University, Korea (the Republic of).**SF06.04.05****Controlled Phase Separation of Supercritically Dried Polymer-Based and Polymer Nanocomposite-Based Aerogels** Ying Mu; Northeastern University, United States.**SF06.04.06****Micro- and Nano-Structural Analysis of the Interfaces Critical to the Mechanical Performance of SiC Monofilaments** Nathan Sutemire^{1,2}; ¹University of Surrey, United Kingdom; ²TISICS Ltd., United Kingdom.**SF06.04.08****Effect of Mono- and Divalent Extra-Framework Cations on the Structure and Accessibility of Porosity in Chabazite Zeolites** Huan Doan; University of Bristol, United Kingdom.**SF06.04.09****Enhanced Low-Temperature Ferrimagnetic Coupling in Epitaxial High Entropy Oxide Thin Film** Wei-En Ke; National Yang Ming Chiao Tung University, Taiwan.**SF06.04.10****Consolidation of Ni-Ti Based Metallic Glass and Its Pseudoelasticity After Crystallization** Jeongsoo Kim; Yonsei University, Korea (the Republic of).**SF06.04.11****Application of Neutron Grating Interferometry in Metal Additive Manufacturing** Jacob LaManna; National Institute of Standards and Technology, United States.**SF06.04.12****Analysis of Geometric Factors for Higher Young's Modulus in an Open Structure** Sang Joon Lee; Yonsei University, Korea (the Republic of).

SESSION SF06.05: Strength and Plasticity at Different Length Scales and the Deformation Mechanisms I

Session Chairs: Seung Min Han and George Pharr

Tuesday Morning, May 10, 2022

Hawai'i Convention Center, Level 3, 313A

8:30 AM *SF06.05.01

Progress in the Development of High Strain Rate Nanoindentation Testing [George M. Pharr](#); Texas A&M University, United States.

9:00 AM SF06.05.02

Novel Mechanisms for the Formation of Dislocation Cell Patterns in BCC Metal [Jaehyun Cho](#)^{1,2}; ¹NASA Ames Research Center - AMA Inc., United States; ²Lawrence Livermore National Laboratory, United States.

9:15 AM SF06.05.03

Graphene-Induced Surface Stiffening of Copper Studied by Nanoindentation [Jad Yaacoub](#); University of Illinois at Urbana Champaign, United States.

9:30 AM SF06.05.04

Role of Graphene in Deformation Behavior of Cu-Graphene Nanolayered Composite [Seung Min J. Han](#); Korea Advanced Institute of Science and Technology, Korea (the Republic of).

9:45 AM SF06.05.05

Atomic-Scale Unique Interface Observation of η -Precipitates in Al-Zn-Mg Alloy [Hwangsun Kim](#); Seoul National University, Korea (the Republic of).

10:00 AM BREAK

SESSION SF06.06: Numerical Model for Designing of New Alloys and Mechanical Behaviour Analysis I

Session Chairs: Wei Cai and Seunghwa Ryu

Tuesday Morning, May 10, 2022

Hawai'i Convention Center, Level 3, 313A

10:30 AM *SF06.06.01

Entropic Effects on the Rate of Thermally Activated Dislocation Cross-Slip in FCC Nickel [Wei Cai](#); Stanford University, United States.

11:00 AM SF06.06.02

Transfer Learning for Enhancing the Homogenization-Theory-Based Prediction of Elasto-Plastic Response of Particle/Fiber-Reinforced Composites [Seunghwa Ryu](#); KAIST, Korea (the Republic of).

11:15 AM SF06.06.04

Modulating Hardness in $\text{Sc}_2(\text{Ru}_{5-x}\text{TM}_x)\text{B}_4$ Through Empirical Considerations and Computational Analysis [Jacob Hickey](#); University of Houston, United States.

SESSION SF06.07: Strength and Plasticity at Different Length Scales and the Deformation Mechanisms II

Session Chairs: Jaafar El-Awady and Ju-Young Kim

Tuesday Afternoon, May 10, 2022

Hawai'i Convention Center, Level 3, 313A

2:15 PM SF06.07.02

Twining and Phase Transformation in Ti and Mg [Lei Cao](#); University of Nevada, Reno, United States.

2:30 PM SF06.07.03

Size Effect of Shape Memory Nanoparticles Studied by Constructing Size-Stress-Temperature Phase Diagram [Ji Young Kim](#); Seoul National University, Korea (the Republic of).

2:45 PM SF06.07.05

Strain-Modulated Ferroelectricity in SrMnO_3 Thin Films via *In Situ* Strain Engineering [SeongMin a. Park](#); Gwangju Institute of Science and Technology, Korea (the Republic of).

3:00 PM BREAK

SESSION SF06.08: Alloy Fabrication and Processing Methods/Bulk Alloy II

Session Chairs: Seung Min Han and Douglas Stauffer

Tuesday Afternoon, May 10, 2022

Hawai'i Convention Center, Level 3, 313A

3:30 PM SF06.08.01

Interfacial Plasticity Mediated by Lath Boundaries in Reduced-Activation Ferritic/Martensitic Steels [Dongchan Jang](#); Korea Advanced Institute of Science and Technology, Korea (the Republic of).

3:45 PM SF06.08.02

Investigating the Plastic Deformation Kinetics in Ultrafine Grained and Nanocrystalline Metal Thin-Films Using *In Situ* TEM Nanomechanical Testing [Sandra Stangeby](#); Georgia Institute of Technology, United States.

4:00 PM SF06.08.03

Microcantilever Bending Experiments and Measurement of the Elastic Size Effect Based on Gradient Elasticity [Jae-Hoon Choi](#); Korea Advanced Institute of Science and Technology, Korea (the Republic of).

4:15 PM SF06.08.04

Analysis of the Matrix/Precipitates Interface According to the Growth Behavior of Aluminum Nitride Formed on the Subsurface of NAK80 Steel During Laser Nitriding [Won Sang Shin](#); Inha University, Korea (the Republic of).

4:30 PM SF06.08.05

How Solute-Contaminant Structures Alter Nanocrystalline Stability and Strength [Jonathan Priedeman](#); The University of Alabama, United States.

SESSION SF06.09: Strength and Plasticity at Different Length Scales and the Deformation Mechanisms III
Session Chairs: David Bahr and Gi-Dong Sim
Wednesday Morning, May 11, 2022
Hawai'i Convention Center, Level 3, 313A

8:30 AM *SF06.09.01

Effect of Carbon Addition and Passivation on the Mechanical Behavior of Freestanding Al Thin Films [Gi-Dong Sim](#); Korea Advanced Institute of Science and Technology, Korea (the Republic of).

9:00 AM SF06.09.02

Surface Engineering to Form Ultra-Fine Grains and a Hardened Surface in Ti Alloys [David F. Bahr](#); Purdue University, United States.

9:15 AM SF06.09.03

Plasticity in bcc Metals is Controlled by Integrated Thermally-Activated Smooth Flow and Athermal Avalanche Flow [Robert Maass](#)^{1, 2}; ¹Federal Institute of Materials Research and Testing (BAM), Germany; ²University of Illinois at Urbana-Champaign, United States.

9:30 AM SF06.09.04

Shaping Amorphous Silica at Nanoscale by Controlling E-Beam Induced Plasticity [In-Suk Choi](#); Seoul National University, Korea (the Republic of).

9:45 AM SF06.09.05

Temperature Dependence of Dislocation Core Configuration in Pure Ti [David Jany](#); UC Berkeley, United States.

10:00 AM BREAK

SESSION SF06.10: Numerical Model for Designing of New Alloys and Mechanical Behaviour Analysis II
Session Chairs: Hojun Lim and Ill Ryu
Wednesday Morning, May 11, 2022
Hawai'i Convention Center, Level 3, 313A

10:30 AM *SF06.10.01

Investigating Plastic Anisotropy Using Crystal Plasticity Simulations and Machine Learning Techniques [Hojun Lim](#); Sandia National Laboratories, United States.

11:00 AM SF06.10.02

Neural Networks Approach to Correlate Plastic Properties with Indentation Data in Anisotropic Metals [Heung Nam Han](#); Seoul National University, Korea (the Republic of).

11:15 AM SF06.10.03

Atomistic Simulations on Phase Transformation and Deformation Behaviors of Shape-Memory Alloys at the Nanoscale [Won-Seok Ko](#); University of Ulsan, Korea (the Republic of).

11:30 AM SF06.10.04

Multiscale Modeling of Size-Dependent Plasticity [Ill Ryu](#); The University of Texas at Dallas, United States.

11:45 AM SF06.10.05

Accurate Atomistic Simulations of Oxides and Hydroxides Up to the Large Nanometer Scale [Krishan Kanhaiya](#); University of Colorado, United States.

SESSION SF06.11: Advanced Characterization Tools for Microstructure Analysis I
Session Chairs: In-Suk Choi and Seung Min Han
Wednesday Afternoon, May 11, 2022
Hawai'i Convention Center, Level 3, 313A

1:30 PM *SF06.11.01

Dislocation and Crack Avalanche Characteristics from Coupled Acoustic Emission Measurements and *In Situ* Experiments in Metals [Jaafar A. El-Awady](#); Johns Hopkins University, United States.

2:00 PM SF06.11.02

Investigation of the Cracking Threshold of Silicate Glasses Using Nanoindentation [Yvonne C. Dieudonné](#); Texas A&M University, United States.

2:15 PM SF06.11.03

Predict the Temperature Dependence of the Elastic Limit in Metallic Glasses from the Energy-Strain Landscape Picture [Yifan Wang](#); Stanford University, United States.

2:30 PM BREAK

SESSION SF06.12: Alloy Fabrication and Processing Methods/Bulk Alloy III
Session Chairs: Eun Soo Park and Ill Ryu
Wednesday Afternoon, May 11, 2022
Hawai'i Convention Center, Level 3, 313A

3:45 PM SF06.12.01

Role of Interlath Austenite in Microstructural Strain Localization in Martensitic Stainless Steels [Hyunseok Oh](#); Massachusetts Institute of Technology, United States.

4:00 PM SF06.12.03

Endorsing Deformability of Brittle Hf-Based Bulk Amorphous Alloy by Controlling Effective Strain [Min-Ha Lee](#)^{1,2}; ¹KITECH North America, United States; ²Korea Institute of Industrial Technology, Korea (the Republic of).

4:15 PM SF06.12.04

Microstructure Engineering in Metastable Beta Titanium Alloys by Tuning Highly-Indexed Deformation Twinning [Yufeng Zheng](#); University of Nevada, Reno, United States.

4:30 PM SF06.12.05

Effects of Thermo-Mechanical Processing on the Mechanical Properties and the Nanoscale Precipitates in a Ni-Based Superalloy [Vitor V. Rielli](#); University of New South Wales, Australia.

4:45 PM SF06.12.06

Investigation of Self-Healing Property in Co-Based Superalloy by Autonomous B Segregation [Kooknoh Yoon](#); Seoul National University, Korea (the Republic of).

SESSION SF06.13: Poster Session II: Recent Advances in Structural Materials from Bulk to Nanoscale II

Session Chairs: Ju-Young Kim and Ill Ryu

Wednesday Afternoon, May 11, 2022

5:00 PM - 7:00 PM

Hawai'i Convention Center, Level 1, Kamehameha Exhibit Hall 2 & 3

SF06.13.01

Microstructure Characterisation of cp-Ti and Metastable β Titanium Alloy Ti-15Mo Processed by Rotational Constrained Bending [Tomas Krainak](#); Charles University, Czechia.

SF06.13.02

Strong and Ductile High Mn-Low Cr Based Austenitic Steel Resistant Against Corrosion in Neutral and Slightly Acidic Solutions [Jin Sung Park](#); Suncheon National University, Korea (the Republic of).

SF06.13.03

Atom Probe Investigation of Early Stage Clustering by Cyclic Ageing and Conventional Heat Treatment Methods in Al-Zn-Mg-(Cu) Alloy System [Sohail Shah](#); NTNU, Norway.

SF06.13.04

Investigation of Solidification Sequence and Mechanical Properties on 9-component Refractory High Entropy Alloy [Jackwon Kim](#); Seoul National University, Korea (the Republic of).

SF06.13.06

Effect of Mo Content on Mechanical Properties and Microstructure of Ti-Mo-Fe Alloys by Powder Metallurgy [Hyo-Woon Hwang](#); Suncheon National University, Korea (the Republic of).

SF06.13.07

On the Kinetics of Dynamic Recrystallization Mechanism of AZ31-0.5Ca Alloy During Warm Rolling [Umer Masood CH](#); Incheon National University, Korea (the Republic of).

SF06.13.08

Harmless Crack Characteristics by Shot Peening of Steels with Different Carbon Content [Kyounghee Gu](#); Pukyong National University, Korea (the Republic of).

SF06.13.09

Effect of Laser Surface Cleaning of Corroded 304L Stainless Steel on Microstructure and Mechanical Properties [Seungwoo Baek](#); Inha University, Korea (the Republic of).

SF06.13.10

Quantitative Phase-Field Modeling Microstructural Evolution of Fe-Cr: A GPU-Accelerated Study [Jeonghwan Lee](#); Kyung Hee university, Korea (the Republic of).

SF06.13.11

Assessment of Interpolation Schemes of Elasticity at Particle-Matrix Interface in the Phase-Field Method [Wooseob Shin](#); Kyung Hee University, Korea (the Republic of).

SF06.13.12

Structural Evolution of Pre ceramic Polymers Precursors upon Thermal Treatment by Synchrotron Radiation Techniques and Reverse Monte Carlo Simulations [Haira G. Hackbarth](#); UNSW, Australia.

SESSION SF06.14: High and Medium Entropy Alloys I

Session Chair: Eun Soo Park

Thursday Morning, May 12, 2022

Hawai'i Convention Center, Level 3, 313A

8:30 AM *SF06.14.01

Engineering Atomic-Level Complexity in 3D Transition Metal-Based Complex Concentrated Alloys [Eun Soo Park](#); Seoul National University, Korea (the Republic of).

9:00 AM SF06.14.02

Nano-scale Heterogeneous Medium-entropy Alloy with High Yield Strength Fabricated by Laser-Powder Bed Fusion Additive Manufacturing [HeeChan Jung](#); Korea University, Korea (the Republic of).

9:15 AM SF06.14.03

Gradient Interface in High Entropy Alloy Reinforced Ti-Nb-Zr Heterostructure Alloys for Improved Strength and Wear Resistance without Sacrificing Ductility Muhammad Akmal; Department of Materials Science and Engineering, Korea Advanced Institute of Science and Technology (KAIST), Korea (the Republic of).

9:30 AM SF06.14.04

Effects of Amorphous Formation by Si Addition on Microstructure, Mechanical and Tribological Properties for CrCoNiSi Film Fabricated by Magnetron Sputtering Young Mok Kim; Korea University, Korea (the Republic of).

9:45 AM SF06.14.05

Investigation on the Resistance of Hydrogen Embrittlement of FCC Single-Phase Medium-Entropy Alloys with Controlled Solid-Solution Strengthening and Stacking Fault Energy Dae Cheol Yang; Korea university, Korea (the Republic of).

10:00 AM BREAK

SESSION SF06.15: Alloy Fabrication and Processing Methods/Bulk Alloy IV

Session Chairs: Heung Nam Han and Michael Mills

Thursday Morning, May 12, 2022

Hawai'i Convention Center, Level 3, 313A

10:30 AM *SF06.15.01

Local Phase Transformations—A New Creep Strengthening Mechanism in Ni-Base Superalloys Michael Mills^{1,2}; ¹The Ohio State University, United States; ²The Ohio State University, United States.

11:00 AM SF06.15.02

Room Temperature Crack-Healing in an Atomically Layered Ternary Carbide Ankit Srivastava; Texas A&M University, United States.

11:15 AM SF06.15.03

Free Volume Redistribution in Amorphous Interfaces During Relaxation of a Spray Deposited Amorphous Alloy Jonathan M. Gentile; Stony Brook University, United States.

11:30 AM SF06.15.05

TEM Study of Friction Stir Welding Joints of 316L Steel and 5083 Al Alloy Mayerling Martinez^{1,2}; ¹CRISMAT Laboratory, France; ²Charles University, Czechia.

SESSION SF06.16: Advanced Characterization Tools for Microstructure Analysis II

Session Chairs: Dongchan Jang and Ill Ryu

Thursday Afternoon, May 12, 2022

Hawai'i Convention Center, Level 3, 313A

2:00 PM *SF06.16.01

Exploring Strength and Ductility of Non-Equilibrium Microstructures Using Nano- and Micromechanics Douglas D. Stauffer; Bruker Nano Surfaces, United States.

2:30 PM SF06.16.02

Investigation of Stress Corrosion Cracking in CMSX-4 Turbine Blade Alloys Using Deep Learning Assisted X-Ray Microscopy and Correlated Microscopy Hrishikesh Bale; Carl Zeiss Research Microscopy Solutions, United States.

2:45 PM SF06.16.03

Rapid Characterization of Cyclic Response of Small-Volume Metal Samples Using Spherical Microindentation Stress-Strain Camilla Johnson; Georgia Institute of Technology, United States.

3:00 PM BREAK

SESSION SF06.17: Alloy Fabrication and Processing Methods/Bulk Alloy V

Session Chairs: Dongchan Jang and Seong-Woong Kim

Thursday Afternoon, May 12, 2022

Hawai'i Convention Center, Level 3, 313A

3:30 PM SF06.17.01

Investigation of Alloy Grain Boundary Effects in the High-Temperature Oxidation & Cr Volatilization of 22 wt.% Cr Ferritic Stainless Steel Using 3D EBSD Analysis Yoon Seok Ko^{1,2}; ¹Korea Institute of Science and Technology, Korea (the Republic of); ²Seoul National University, Korea (the Republic of).

3:45 PM SF06.17.02

Thermal Stability of the Microstructure of Mg Alloys with Segregated Stacking Faults Daria Drozdenko; Charles University, Czechia.

4:00 PM SF06.17.03

Kinetics of Direct Iron Reduction Using Hydrogen in Steelmaking Xueli Zheng; Stanford University, United States.

4:15 PM SF06.17.05

A Study on Joint Fabrication of Dissimilar Copper and Aluminum Alloys by Electrically Assisted Pressure Joining Tu-Anh T. Bui; University of Ulsan, Korea (the Republic of).

4:30 PM SF06.17.06

Effect of Microstructure Features of Rapidly Solidified Ribbon-Consolidated Mg-Zn-RE Alloys on Mechanical and Corrosion Performance Daria Drozdenko; Charles

University, Czechia.

4:45 PM SF06.18.04

Bone-Inspired Composites—A Path Towards Multifunctionality [Flavia Libonati](#); University of Genoa, Italy.

SESSION SF06.18: Nanocomposites and Multilayers
Session Chairs: Ryan Ott and Jian Wang
Friday Morning, May 13, 2022
Hawai'i Convention Center, Level 3, 313A

10:30 AM *SF06.18.01

Amorphous Ceramic and Metallic Composites for the Applications in Extreme Environments [Jian Wang](#); University of Nebraska--Lincoln, United States.

11:00 AM SF06.18.02

Probing Structure-Property Relationships in Cu-Ni and Cu-Zn alloys in Nanofoam Form with Nanoindentation [Alexandra Loaiza Lopera](#); Purdue University, United States.

11:15 AM SF06.18.03

Surface Modification of Carbon Fiber Towards Enhanced Interfacial Adhesion in Epoxy Composites [Zoriana Demchuk](#); Oak Ridge National Lab, United States.

SESSION SF06.19: General Session I
Session Chairs: Dong-Woo Suh and Ohmura Takahito
Monday Morning, May 23, 2022
SF06-Virtual

8:00 AM *SF06.19.01

Heterogeneity Based Microstructure Control in Advanced High Strength Steels [Dong-Woo Suh](#); Pohang University of Science and Technology, Korea (the Republic of).

8:30 AM SF06.19.02

Microstructure and Mechanical Properties of Hard-Faced-Surface by Direct Energy Deposition [Jong Bae Jeon](#); Dong-A University, Korea (the Republic of).

8:35 AM SF06.19.03

Combinatorial Mechanical Investigation of Thin-Film Alloys Through High-Throughput Membrane Deflection Experiment [Donghyun Park](#); Sungkyunkwan University, Korea (the Republic of).

8:50 AM SF06.19.04

Pure Copper 3D Architectures Fabricated Using Laser Powder Bed Fusion [Sung-gyu Kang](#); Max-Planck-Institut für Eisenforschung, Germany.

9:05 AM SF06.19.05

Optimization for Strength and Conductivity of Cu-Ni-Si Alloy with Discontinuous Precipitation [Jee Hyuk Ahn](#)^{1,2}; ¹Korea Institute of Materials and Science, Korea (the Republic of); ²Seoul National University, Korea (the Republic of).

9:20 AM SF06.19.06

Development of Microstructural Control for Laser-PBF Ti-6Al-4V [Sayaka Maruta](#); Mitsubishi Heavy Industries, LTD, Japan.

9:35 AM SF06.19.07

Property Degradation of Helium Ion Irradiated Tungsten Thin-Film Alloys [Haechan Jo](#); Sungkyunkwan University, Korea (the Republic of).

9:50 AM SF06.19.08

Mechanical Characteristics of High Pressure Sintered ZrB₂-TiB₂ and ZrB₂-SiC Composite Materials [Tetiana Prikhna](#); V. Bakul Institute for Superhard Materials of the National Academy of Sciences of Ukraine, Ukraine.

9:55 AM SF06.13.13

Advanced Physical Properties of Natural Vermiculite Clay [Barbara Pacakova](#); Norwegian University of Science and Technology, Norway.

10:00 AM SF06.15.04

Comprehensive Studies into Microstructural Modifications and Corresponding Electrochemical Behaviors of Metal Alloys from Solid-State Joining and Processing Methods [Sam Y. Anaman](#); Hanbat National University, Korea (the Republic of).

SESSION SF06.20: General Session II
Session Chairs: Ihor Radchenko and Masato Wakeda
Tuesday Morning, May 24, 2022
SF06-Virtual

8:00 AM *SF06.20.01

Atomistic Evaluation of Strengthening Factors in Iron Alloys Based on Computational Interaction Analysis of Lattice Defects [Masato Wakeda](#); National Institute for Materials Science, Japan.

8:30 AM SF06.20.02

Workflow Consisting of DNN-Based Segmentation Method and Persistent Homology Analysis for Feature Extraction from Microstructural Images [Takayuki Kanda](#); Hitachi Ltd., Japan.

8:45 AM SF06.20.03

Size Dependent Strengthening of Highly Textured Cu-BN Multilayers [Nai q. Chen](#); Shanghai Jiao Tong University, China.

9:00 AM SF06.20.04

Multiscale Investigation of Shear Relaxation in Shock Loading—A Top-Down Perspective [Jingnan Liu](#); Shanghai Jiao Tong University, China.

9:15 AM SF06.20.05

Development of Coupled Crystal Plasticity Finite Element-Phase Field (CPFE-PF) Model for Studying Microstructure Evolution and Designing High Performance Hexagonal Metals and Alloys [Hanxuan Mo](#); The State Key Lab of Metal Matrix Composites, School of Materials Science and Engineering, Shanghai Jiao Tong University, China.

9:30 AM SF06.20.06

Interface Rotation in Cu/Nb Accumulative Roll Bonded (ARB) Nanolaminates [Ihor Radchenko](#)^{2,1}; ¹Singapore University of Technology and Design, Singapore; ²Xi'an Jiaotong University, China.

9:45 AM SF06.20.07

Machine Learning Guided Exploration of High Strength Thin-Film Alloys [Taeyeop Kim](#); Sungkyunkwan University, Korea (the Republic of).

SESSION SF06.21: General Session III
Session Chairs: Kyung-suk Kim and Gi-Dong Sim
Tuesday Morning, May 24, 2022
SF06-Virtual

10:30 AM *SF06.21.01

Roles of Hard Nanophases in Dynamic Toughening of Self-Healing Structural Nanocomposites [Kyung-suk Kim](#); Brown University, United States.

11:00 AM SF06.21.02

Studies on the Effect of Crystallographic Orientation on Scratch Characteristics of Single Crystal Nickel [Vamsi K. Majeti](#); Indian Institute of Technology Delhi, India.

11:15 AM SF06.21.03

Multifunctional Nanostructured Thin-Film Polyimide Aerogels with Ultra High Thermal Insulation Properties [Omid Aghababaei Tafreshi](#); University of Toronto, Canada.

11:30 AM *SF06.07.01

Nanoindentation Constant Contact Pressure Creep Experiments—A New Approach for Studying Thermally Activated Dislocation Mechanism [Karsten Durst](#); Technische Universitaet Darmstadt, Germany.

SYMPOSIUM SF07

In Situ Material Performance and Dynamic Structure Characterization Under Coupled Extremes
May 9 - May 25, 2022

Symposium Organizers

* Invited Paper

SESSION SF07.01: Metals—In Situ Microscopy
Session Chairs: Cody Dennett and Khalid Hattar
Monday Morning, May 9, 2022
Hilton, Kalia Conference Center, 2nd Floor, Kahili 2

10:30 AM SF07.01.01
Utilizing *In Situ* TEM to Decipher the Nanomechanical Properties of Helium Implanted Metals [Eric Lang](#); Sandia National Laboratories, United States.

10:45 AM SF07.01.02
Advanced Characterization of Irradiation Induced Defects in Tungsten Using STEM Optical Sectioning [Eric Prestat](#)^{1,2,3}; ¹SuperSTEM Laboratory, United Kingdom; ²The University of Manchester, United Kingdom; ³UK Atomic Energy Authority, United Kingdom.

11:00 AM *SF07.01.03
Nuclear Materials and Ion Irradiation Studies Using the JANNuS-Orsay *In Situ* Dual Ion Beam Transmission Electron Microscope [Aurelie Gentils](#); Universite Paris-Saclay, CNRS/IN2P3, IJCLab, France.

SESSION SF07.02: Ceramics—In Situ Microscopy
Session Chairs: Cody Dennett and Khalid Hattar
Monday Afternoon, May 9, 2022
Hilton, Kalia Conference Center, 2nd Floor, Kahili 2

1:30 PM *SF07.02.01
Characterizing Interfacial Properties Using Ultrahigh Temperature *In Situ* TEM Based Mechanical Loading and Coupled Ion Irradiation [Shen J. Dillon](#)^{2,1}; ¹University of Illinois at Urbana Champaign, United States; ²University of California, Irvine, United States.

2:00 PM SF07.02.02
Light Induced Structural Alterations in Ni/NiO Core-Shell Co-Catalysts on Rh-Doped SrTiO₃ for Solar Hydrogen Evolution [Piyush Haluai](#); Arizona State University, United States.

2:15 PM SF07.02.03
Highly Stable Nanolamellar MXene-Derived Carbides by Phase Transformation of Ti₃C₂T_x and Mo₂TiC₂T_x MXenes for Extreme Environments [Brian Wyatt](#); Indiana University - Purdue University of Indianapolis, United States.

2:30 PM *SF07.02.04
The Role of Interfaces in Ceramics Exposed to Extreme Environments [Izabela Szlufarska](#); University of Wisconsin, United States.

3:00 PM BREAK

SESSION SF07.03: Fusion Materials—Simulation and Computation
Session Chairs: Khalid Hattar and Samuel Murphy
Monday Afternoon, May 9, 2022
Hilton, Kalia Conference Center, 2nd Floor, Kahili 2

3:30 PM *SF07.03.01
Multiscale Simulations of Irradiation Defects—From the Electronic Scale to Continuum [Pui Wai Ma](#); United Kingdom Atomic Energy Authority, United Kingdom.

4:00 PM SF07.03.02
Molecular Dynamics Simulations of Radiation Damage in YBa₂Cu₃O₇ [Samuel Murphy](#); Lancaster University, United Kingdom.

4:15 PM SF07.03.03
Predicting Spall Strength of Metals and Alloys Using Data Analytics and Machine Learning Techniques [Keara Frawley](#); Georgia Institute of Technology, United States.

SESSION SF07.04: Fusion Materials—Plasma and Radiation Exposure
Session Chairs: Cody Dennett and Flyura Djurabekova
Tuesday Morning, May 10, 2022
Hilton, Kalia Conference Center, 2nd Floor, Kahili 2

8:45 AM SF07.04.01

Ultrafast Time-Resolved Measurement of Phonon Dynamics in Radiation-Damaged Tungsten [Mianzhen Mo](#); SLAC National Accelerator Lab, United States.

9:00 AM *SF07.04.02

Burning Plasma Relevant Fusion Materials Research Using the PISCES Linear Plasma Devices [Matt J. Baldwin](#); University of California at San Diego, United States.

9:30 AM *SF07.04.03

Advanced Material and Component Behavior Under Fusion Loading Conditions [Christian Linsmeier](#); Forschungszentrum Julich GmbH, Germany.

10:00 AM BREAK

SESSION SF07.05: Ceramics—Thermophysical Properties
Session Chairs: Cody Dennett and Flyura Djurabekova
Tuesday Morning, May 10, 2022
Hilton, Kalia Conference Center, 2nd Floor, Kahili 2

10:30 AM *SF07.05.01

Piezomagnetism in Uranium Dioxide [Krzysztof Gofryk](#); Idaho National Laboratory, United States.

11:00 AM SF07.05.02

Luminescence Mechanisms of Amorphous Silica Under Low-Temperature Ion-Beam Irradiation—Role of High Electronic Excitation Density and Collisional Processes on Complex Interplay Between Emitting Centers [Joseph Graham](#); Missouri University of Science and Technology, United States.

11:15 AM SF07.05.03

Modeling of Chloride Effect on Localized Corrosion Initiation at Grain Boundary Sites of Passive Oxide Surfaces [Aditya Sundar](#); Univ of Michigan, United States.

11:30 AM SF07.05.04

Operando Analysis of a Solid Oxide Fuel Cell in Environmental Transmission Electron Microscopy [Thierry Epicier](#); Université de Lyon, UCBL, France.

SESSION SF07.06: Method Advances for In Situ Microscopy
Session Chairs: Cody Dennett and Khalid Hattar
Tuesday Afternoon, May 10, 2022
Hilton, Kalia Conference Center, 2nd Floor, Kahili 2

1:45 PM *SF07.06.01

In Situ TEM Investigation of Irradiation-Induced Defect Formation and Evolution in Fe/Fe-Oxide Heterostructures—Evidence of Surprisingly High Mobility of Defects in the Fe Oxide Scale [Djamel Kaoumi](#); North Carolina State University, United States.

2:15 PM SF07.06.02

STEM-Based Techniques to Characterize Nano-Scale Defects Under Coupled Irradiation and Temperature [Sean Mills](#)^{1,2}; ¹University of California, Berkeley, United States; ²Lawrence Berkeley National Laboratory, United States.

2:30 PM *SF07.06.03

What is the Physical Limit of Coupled In Situ Microscopy Experiments? [Khalid Hattar](#); Sandia National Laboratories, United States.

3:00 PM BREAK

SESSION SF07.07: Corrosion, Diffraction and Scattering
Session Chairs: Cody Dennett and Khalid Hattar
Tuesday Afternoon, May 10, 2022
Hilton, Kalia Conference Center, 2nd Floor, Kahili 2

3:30 PM SF07.07.01

WITHDRAWN 5/6/22 SF07.07.01 The Hydrogen Charging-Induced Surface Degradation on High-Entropy Alloys Studied by In Situ Electrochemical Nanoindentation [Dong Wang](#); Norwegian University of Science and Technology, Norway.

3:45 PM SF07.07.02

Molecular Examination of Ion Pairs Formation and Competition in Highly Concentrated Electrolyte Solutions Using In Situ Liquid SIMS [Xin Zhang](#); Pacific Northwest National Laboratory, United States.

4:00 PM *SF07.07.03

Beam-On Coupled Effects in Nuclear Materials—Irradiation-Slowed Corrosion, In Situ Void Swelling Detection, and Plasma-Facing Component Monitoring [Michael P. Short](#); Massachusetts Institute of Technology, United States.

4:30 PM SF07.07.04

WITHDRAWN 5/9/22 SF07.07.04 Operando X-Ray Diffraction and Imaging During Laser Powder Bed Fusion [Steven Van Petegem](#); Paul Scherrer Institute, Switzerland.

4:45 PM SF07.07.05

Insights into Hydrogen Storage in Porous Materials from Neutron Scattering Under Extreme Conditions [Valeska Ting](#)^{1,2}; ¹University of Bristol, United Kingdom; ²Bristol Composites Institute, United Kingdom.

SESSION SF07.08: Poster Session: In Situ Coupled Extremes

Session Chairs: Cody Dennett and Samuel Murphy

Tuesday Afternoon, May 10, 2022

5:00 PM - 7:00 PM

Hawai'i Convention Center, Level 1, Kamehameha Exhibit Hall 2 & 3

SF07.08.01

Development of Fast Scanning Calorimetry Methods to Characterize Ion-Irradiation Effects on Thermal Properties [Rachel Connick](#); Massachusetts Institute of Technology, United States.

SF07.08.02

Mechanical Deformation-Induced Precipitation and Increase in Strength of Al7075 Alloy [Abhinav Parakh](#); Stanford University, United States.

SF07.08.03

Effect of the Incommensurate Bi-III Phase on the Bi-Sb System Under Extreme Condition [Moran Emuna](#)^{1,2}; ¹Ben-Gurion University of the Negev, Israel; ²NRCN, Israel.

SESSION SF07.09: High Strain Rates and Positrons

Session Chairs: Cody Dennett and Samuel Murphy

Wednesday Morning, May 11, 2022

Hilton, Kalia Conference Center, 2nd Floor, Kahili 2

8:30 AM *SF07.09.01

In Situ Positron Beam for Material Characterization Under Coupled Extremes [Farida Selim](#); Bowling Green State Univ, United States.

9:00 AM SF07.09.02

Atomistic Simulations of Growth Mechanisms of Hydrogen Blisters in Copper [Alvaro Lopez Cazalilla](#); University of Helsinki, Finland.

9:15 AM SF07.09.03

In Situ X-Ray Phase Contrast Imaging of an Additively Manufactured High-Solids Loaded Polymer Composite Under Shock-Compression [Karla Wagner](#); Georgia Institute of Technology, United States.

9:30 AM SF07.09.04

Laser-Driven High-Velocity Microparticle Impacts on Polymeric Materials [Steven E. Kooi](#); Massachusetts Institute of Technology, United States.

9:45 AM SF07.09.05

Spectroscopic Characterizations of Polymers Under Ultrahigh Strain Rate Loading [Nha Uyen Huynh](#); San Diego State University, United States.

SESSION SF07.10: In Situ Coupled Extremes Virtual Presentations

Session Chairs: Cody Dennett and Yuanyuan Zhu

Wednesday Morning, May 25, 2022

SF07-Virtual

10:30 AM *SF07.10.01

Understanding Radiation Damage of High Temperature Superconductors Under Relevant Operating Conditions for Fusion Magnets [Susannah C. Speller](#); Univ of Oxford, United Kingdom.

11:00 AM *SF07.10.02

Size Affected Toughening and Strain Rate Sensitivity of Silicon [Daniel Kiener](#); Montanuniversität Leoben, Austria.

11:30 AM SF07.10.03

Temperature and Irradiation Behavior of Piezoelectric Materials for Nuclear Reactor Sensors [Ryan Chesser](#); The Ohio State University, United States.

11:45 AM SF07.10.04

In Situ Thermal Oxidation Process of Tungsten Under Fusion Relevant Accidental Conditions [Yuanyuan Zhu](#)^{1,2}; ¹University of Connecticut, United States; ²Pacific Northwest National Laboratory, United States.

SYMPOSIUM SF08

Far from Equilibrium Microstructure Evolution in Metals
May 9 - May 24, 2022

Symposium Organizers

* Invited Paper

SESSION SF08.01: Rapid Deformation I
Session Chairs: Saryu Fensin and Mitra Taheri
Monday Morning, May 9, 2022
Hilton, Kalia Conference Center, 2nd Floor, Lehua Suite

10:30 AM *SF08.01.01
New Regimes of High Energy Density Materials Science* [Bruce Remington](#); Lawrence Livermore Nat Lab, United States.

11:00 AM SF08.01.02
Modeling the Shock-Induced Phase Transformation Behavior in Fe Microstructures at the Atomic Scales and Mesoscales [Ke Ma](#); University of Connecticut, United States.

11:15 AM SF08.01.03
High Strain-Rate Nanoindentation Testing of Single-Crystal FCC and BCC Metals [Benjamin Hackett](#); Texas A&M University, United States.

11:30 AM SF08.01.04
Dynamic Transmission Electron Microscopy for Non-Equilibrium Microstructure Evolution [Joseph McKeown](#); Lawrence Livermore National Laboratory, United States.

11:45 AM SF08.01.05
Virtual Texture Analysis Approach to Characterize Atomistic Microstructures Under High-Rate Deformation [Avinash M. Dongare](#); University of Connecticut, United States.

SESSION SF08.02: Rapid Solidification I
Session Chairs: Allison Beese and Remi Dingreville
Monday Afternoon, May 9, 2022
Hilton, Kalia Conference Center, 2nd Floor, Lehua Suite

1:30 PM SF08.02.01
Microstructure of Additively Manufactured Al Alloys Effects the as-Built Mechanical Properties [Richard Woods](#); University of Liverpool, United Kingdom.

1:45 PM *SF08.02.02
Metallic Alloy Microstructure Development Under Additive Manufacturing Conditions [Amy Clarke](#); Colorado School of Mines, United States.

2:15 PM SF08.02.03
WITHDRAWN 5/9/22 SF08.02.03 *In Situ* Alloying of Ti Alloys Studied by *Operando* X-Ray Diffraction During Laser Powder Bed Fusion [Steven Van Petegem](#); Paul Scherrer Institute, Switzerland.

2:30 PM *SF08.02.04
Controlling the Thermal Stability of Additively Manufactured Alloys—A New Materials Design Paradigm [Matteo Seita](#); Nanyang Technological University, Singapore.

3:00 PM BREAK

SESSION SF08.03: Radiation I
Session Chairs: Benjamin Hackett and Maylise Nastar
Monday Afternoon, May 9, 2022
Hilton, Kalia Conference Center, 2nd Floor, Lehua Suite

3:30 PM SF08.03.01
Defect Buildup and Microstructural Evolution in High-Entropy Alloys Under High Fluence Irradiation [Flyura Djurabekova](#); University of Helsinki, Finland.

3:45 PM *SF08.03.02
Generalized Self-Organization of Alloy Microstructure Induced by Irradiation [Pascal M. Bellon](#); Univ of Illinois-Urbana-Champ, United States.

4:15 PM SF08.03.03

In Situ Thermoelastic Property Evolution of Ni-Based Concentrated Solid Solution Alloys Under Extremes [Cody A. Dennett](#); Idaho National Laboratory, United States.

4:30 PM SF08.03.04

WITHDRAWN 5/7/22 SB08.03.04 Experimental Determination of Interdiffusion Coefficients in Ni/Ni20Cr at Low Temperatures and Under Irradiation [Thomas Rieger](#); Commissariat à l'énergie atomique et aux énergies alternatives, France.

SESSION SF08.04: Severe Plasticity I
Session Chairs: Zachary Cordero and Thomas Niendorf
Tuesday Morning, May 10, 2022
Hilton, Kalia Conference Center, 2nd Floor, Lehua Suite

8:30 AM *SF08.04.01

Extreme Stress Gradients in Cyclically Loaded Polycrystalline Alloys [Michael Sangid](#); Purdue University, United States.

9:00 AM *SF08.04.02

Local Deformation Mapping of Microstructures [Arindam Raj](#); Yale University, United States.

9:30 AM SF08.04.03

Characterization of Dislocations Evolution in Microscale Compression and Torsion of Cu [Bin Zhang](#); Louisiana State University, United States.

9:45 AM SF08.04.04

Transformation-Mediated Twin Nucleation in Hexagonal Close-Packed Metals [Lei Cao](#); University of Nevada, Reno, United States.

10:00 AM BREAK

SESSION SF08.05: Nanostructure Evolution
Session Chairs: Eric Detsi and Michael Sangid
Tuesday Morning, May 10, 2022
Hilton, Kalia Conference Center, 2nd Floor, Lehua Suite

10:30 AM SF08.05.01

The Effect of Grain Boundaries on the Evolution of Microstructure in Metal Nanocomposites [Emmeline Sheu](#); Texas A&M University, United States.

10:45 AM SF08.05.02

Unraveling Contributions to Thermal Stability in Nanocrystalline Alloys Using Nanometallic Multilayers [William S. Cunningham](#); Stony Brook University, United States.

11:00 AM *SF08.05.03

Hierarchical Morphologies in Vapor and Laser Deposited Immiscible Alloys [Ben Derby](#); Los Alamos National Laboratory, United States.

11:30 AM SF08.05.04

Implications of Ternary Solute Additions to the Granular Stability and Mechanical Behavior of Nanocrystalline Alloys [Thomas Koenig](#); University of Alabama, United States.

SESSION SF08.06: Rapid Deformation II
Session Chairs: Jaafar El-Awady and Janelle Wharry
Tuesday Afternoon, May 10, 2022
Hilton, Kalia Conference Center, 2nd Floor, Lehua Suite

1:30 PM *SF08.06.01

Understanding Evolution of Metal Microstructures during Dynamic Deformation at Atomic Scales [Avinash M. Dongare](#); University of Connecticut, United States.

2:00 PM SF08.06.02

High Strain Rate Nanoindentation Testing of Mg-Zn Alloys Using Piezoelectric Load Cell Measurements [Christopher Walker](#); Texas A&M University, United States.

2:15 PM SF08.06.03

The Effect of Internal Damage Accumulation on the Stress-Strain Response of a Metallic Glass [Robert Maass](#)^{1,2}; ¹Federal Institute of Materials Research and Testing (BAM), Germany; ²University of Illinois at Urbana-Champaign, United States.

SESSION SF08.07: Rapid Solidification II
Session Chairs: Amy Clarke and Christian Leinenbach
Tuesday Afternoon, May 10, 2022
Hilton, Kalia Conference Center, 2nd Floor, Lehua Suite

3:30 PM *SF08.07.01

On the Impact of Rapid Solidification and Intrinsic Heat Treatment in Additive Manufacturing—From Microstructure to Properties [Thomas Niendorf](#); University of Kassel, Germany.

4:00 PM SF08.07.02

Microstructural and Texture Evolution of Titanium Alloys During Additive Manufacturing [Alec Saville](#); Colorado School of Mines, United States.

4:15 PM SF08.07.03

Laser Powder Bed Fusion of Novel 2xxx Series Al-Cu Alloys—Manufacturability, Microstructure and Mechanical Properties [Marvin Schuster](#)^{1,2}; ¹Empa, Switzerland; ²École Polytechnique Fédérale de Lausanne, Switzerland.

SESSION SF08.08: Poster Session: Far from Equilibrium Microstructure Evolution

Session Chair: Manyalibo Matthews

Tuesday Afternoon, May 10, 2022

5:00 PM - 7:00 PM

Hawai'i Convention Center, Level 1, Kamehameha Exhibit Hall 2 & 3

SF08.08.01

Strategizing with Unique Hot Isostatic Pressing Treatments to Increase Productivity During Post-Processing and Take Advantage of Microstructural Heterogeneities in Laser-Melted Inconel 718 Parts [Jake Benzing](#); National Institute of Standards and Technology, United States.

SF08.08.02

Solute Composition and Cryogenic Temperature Effects on the Stability of Nano-Twins Under Load [Jarod Robinson](#); The University of Alabama, United States.

SF08.08.03

Effect of Strain Rate on Texture Formation Behavior in High Temperature Deformation of AZ80 Magnesium [Yebeen Ji](#); Pukyong National University, Korea (the Republic of).

SF08.08.04

Effect of Temperature and Strain Rate on High Temperature Deformation Behaviors of Ti-6Al-4V Alloy [Pyeong-Seok Jo](#); Suncheon National University, Korea (the Republic of).

SF08.08.05

Microstructural Variation and Evaluation of Formability According to High Temperature Compression Conditions of AMS4928 Alloy [Jae Gwan Lee](#); Suncheon National University, Korea (the Republic of).

SF08.08.06

Effect of Al₂Ca Precipitation on Plane Strain Deformation Behaviors of AZ61 Magnesium Alloy [Kibeom Kim](#); Pukyong National University, Korea (the Republic of).

SESSION SF08.09: Radiation II

Session Chairs: Pascal Bellon and Ben Derby

Wednesday Morning, May 11, 2022

Hilton, Kalia Conference Center, 2nd Floor, Lehua Suite

8:30 AM *SF08.09.01

Insight on High-Dose Radiation Damage Buildup by Multistage Molecular Dynamics Simulations [Kai H. Nordlund](#); University of Helsinki, Finland.

9:00 AM SF08.09.02

Effect of Radiation-Induced Point Defects on Phase Transformations in FeNi Alloys [Estelle Meslin](#); CEA Saclay, France.

9:15 AM SF08.09.03

He Implantation Responses in Cu-W Nanocomposites [Kelvin Y. Xie](#); Texas A&M University, United States.

9:30 AM *SF08.09.04

Deformation Twinning and Transformations in Concentrated Solid-Solution fcc Fe- and Ni-Based Alloys Under Irradiation [Janelle P. Wharry](#); Purdue University, United States.

10:00 AM BREAK

SESSION SF08.10: Severe Plasticity II

Session Chairs: Avinash Dongare and Arindam Raj

Wednesday Morning, May 11, 2022

Hilton, Kalia Conference Center, 2nd Floor, Lehua Suite

10:45 AM *SF08.10.01

Oxidizer Compatible Materials for Reusable Staged Combustion Rocket Engines [Zachary C. Cordero](#); MIT, United States.

11:15 AM SF08.10.02

High Load Sliding, Deformation Microstructures, Strength and Hardening for Gradient Bulk Nanostructures [Darcy Hughes](#); Sandia National Laboratories (ret), United States.

11:30 AM SF08.10.03

Investigating the Strain Rate Dependence of Hardness of Cu/Mo Nanolaminate Films Using Conventional and High Strain Rate Nanoindentation Methods [Wesley Higgins](#); Texas A&M University, United States.

11:45 AM SF08.15.02

Rocks and Metal—Parallel Solid Phase Plasticity Mechanisms and Non-Equilibrium Microstructures During Intense Shear Deformation [Suveen N. Mathaudhu](#)^{1,2}; ¹Colorado School of Mines, United States; ²Pacific Northwest National Laboratory, United States.

SESSION SF08.11: Surface and Interface Behaviors
Session Chairs: Matteo Seita and Kelvin Xie
Wednesday Afternoon, May 11, 2022
Hilton, Kalia Conference Center, 2nd Floor, Lehua Suite

3:30 PM SF08.11.01

Non-Arrhenius Grain Boundary Migration Explained by Classical Thermally Activated Mechanisms [Eric R. Homer](#); Brigham Young Univ, United States.

3:45 PM SF08.11.02

Molecular Phase Field—A Physics-Based Model of Interfaces [David W. Jacobson](#); University of Alabama, United States.

4:00 PM SF08.11.04

Structural Instability in High Surface-to-Volume Ratio Nanoporous Metals Studied Using Small- and Wide-Angle X-Ray Scattering Techniques [Alexander Ng](#); University of Pennsylvania, United States.

4:15 PM *SF08.11.05

The role of Grain-Boundary Migration on Irradiation-Fatigue [Brad L. Boyce](#); Sandia National Laboratories, United States.

SESSION SF08.12: Phase Transformations
Session Chair: Suveen Mathaudhu
Thursday Morning, May 12, 2022
Hilton, Kalia Conference Center, 2nd Floor, Lehua Suite

8:30 AM *SF08.12.01

Using Solid-Liquid Phase Transformation in Fusible Metals as a Self-Healing Mechanism for Next Generation Metal-Ion Battery Anodes [Eric Detsi](#); Univ of Pennsylvania, United States.

9:00 AM SF08.12.02

Understanding the Development and Characteristics of Non-Equilibrium Microstructures in Hydrogel Enabled Additively Manufactured Metals and Alloys [Rebecca A. Gallivan](#); California Institute of Technology, United States.

9:15 AM SF08.12.03

Thermodynamic Evaluation of Irreversible Amorphization in W-Containing Metallic Glass Composite [YoungJun Kwon](#); Kookmin University, Korea (the Republic of).

9:30 AM *SF08.12.04

Understanding Phase Transformations During Additive Manufacturing Toward the Design of Functionally Graded Materials [Allison M. Beese](#); The Pennsylvania State University, United States.

10:00 AM BREAK

SESSION SF08.13: Radiation III
Session Chairs: Eric Homer and Kai Nordlund
Thursday Morning, May 12, 2022
Hilton, Kalia Conference Center, 2nd Floor, Lehua Suite

11:00 AM *SF08.13.01

Impact of Non-Equilibrium Lattice Point Defects on Semi-Coherent Precipitation and Segregation at Structural Defects [Maylise Nastar](#)^{1,2}; ¹CEA Saclay, France; ²Université Paris-Saclay, France.

11:30 AM SF08.13.02

Full Energy Range Primary Radiation Damage Model [Par Olsson](#); KTH Royal Inst of Technology, Sweden.

11:45 AM SF08.13.03

Effect of Simulation Technique on the High-Dose Irradiation Response of Nuclear Materials [Fredric Granberg](#); University of Helsinki, Finland.

SESSION SF08.14: Rapid Solidification III
Session Chairs: Wesley Higgins and Christian Leinenbach
Thursday Afternoon, May 12, 2022
Hilton, Kalia Conference Center, 2nd Floor, Lehua Suite

1:30 PM *SF08.14.01

The Interplay of Local Chemistry and Plasticity in Controlling Microstructure Formation During Laser Powder Bed Fusion of Metals [Jaafar A. El-Awady](#); Johns Hopkins University, United States.

2:00 PM SF08.14.02

Effect of Rapid-Solidification Structures on the Deformation Behavior and Thermal Stability of an AM 316L Stainless Steel [Thomas Voisin](#); Lawrence Livermore National Laboratory, United States.

2:15 PM SF08.14.03

Direct Observation of 3D Atomic Packing in Amorphous Materials [Dennis Kim](#); University of California, Los Angeles, United States.

SESSION SF08.16: Far from Equilibrium Microstructure Evolution I
Session Chair: Michael Demkowicz
Tuesday Morning, May 24, 2022
SF08-Virtual

8:00 AM SF08.16.01

Mechano-Chemical Segregation in a Fe-Based Bulk Metallic Glass at Room Temperature [Dmitri V. Louzguine](#)^{1,2}; ¹Advanced Institute for Materials Research (WPI-AIMR), Tohoku University, Japan; ²AIST, Japan.

8:15 AM SF08.16.02

The Effect of Ultrasonic Treatment Conditions on the Melt Quality and Microstructure of AlSiMgCu Alloy [Ho Sung Jang](#)^{1,3}; ¹Korea Institute of Industrial Technology, Korea (the Republic of); ³Pusan National University, Korea (the Republic of).

8:20 AM SF08.16.03

Thermomechanical Processing of Magnesium Alloys to Promote Strengthening via Deformation-Induced Clustering and Precipitation [Suhaz Eswarappa Prameela](#); Johns Hopkins University, United States.

8:35 AM SF08.16.04

Understanding Damage Nucleation and Evolution in Tantalum Microstructures during Spall Failure at the Atomic Scales [Marco J. Echeverria](#); University of Connecticut, United States.

8:50 AM SF08.16.05

Structure-Dynamics Relationships in Cryogenically Deformed Metallic Glass [Jurgen H. Eckert](#)^{1,2}; ¹Erich Schmid Institute of Materials Science, Austrian Academy of Sciences, Austria; ²Montanuniversität Leoben, Austria.

9:05 AM *SF08.16.06

Additive Manufacturing of Permanent Magnetic NdFeB Using Laser Powder Bed Fusion—Process-Structure-Property Relationships [Nesma Aboulkhair](#)^{2,1}; ¹Technology Innovation Institute, United Arab Emirates; ²The University of Nottingham, United Kingdom.

SESSION SF08.17: Far from Equilibrium Microstructure Evolution II
Tuesday Morning, May 24, 2022
SF08-Virtual

10:30 AM *SF08.16.07

Precision Nanocrystallization by CNC-Controlled Surface Mechanical Attrition Treatment [Mark Atwater](#); Liberty University, United States.

11:00 AM *SF08.06.04

Design of Damage Resistant Materials Using Additive Manufacturing [Saryu Fensin](#); Los Alamos National Laboratory, United States.

SYMPOSIUM SF09

High Entropy Materials II—From Fundamentals to Potential Applications
May 9 - May 25, 2022

Symposium Organizers

* Invited Paper

SESSION SF09.01 Structural/Mechanical Properties I
Session Chairs: Andrew Minor and Eun Soo Park
Monday Afternoon, May 9, 2022
Hawai'i Convention Center, Level 3, 325B

2:00 PM *SF09.01.04

Short Range Order and the Evolution of Deformation Mechanisms in the CrCoNi Medium Entropy Alloy [Andrew M. Minor](#)^{1,2}; ¹University of California, Berkeley, United States; ²Lawrence Berkeley National Laboratory, United States.

2:30 PM *SF09.01.05

Suppressed Radiation-Induced Dynamic Recrystallization in CrFeCoNiCu High-Entropy Alloy [Hyejung Chang](#)^{1,2}; ¹Korea Institute of Science and Technology, Korea (the Republic of); ²Missouri University of Science and Technology, Korea (the Republic of).

3:00 PM SF09.01.06

***In Situ* TEM and Computer-Aided Analysis of Individual Dislocation Motion Through a Cantor Alloy at Room and Liquid Nitrogen Temperature** [Marc Legros](#); CEMES CNRS, France.

3:15 PM SF09.01.07

Local Characterization of High Entropy Materials Using X-Ray Absorption Fine Structure Spectroscopy [Christina Rost](#); James Madison University, United States.

3:30 PM SF09.01.08

Ordering and Magnetism of Cr in FCC Solid Solutions [Flynn Walsh](#)^{1,2}; ¹Lawrence Berkeley National Laboratory, United States; ²University of California, Berkeley, United States.

SESSION SF09.02 Refractory High Entropy Alloy
Session Chairs: Daniel Gianola and Matthew Kramer
Tuesday Morning, May 10, 2022
Hawai'i Convention Center, Level 3, 325B

9:00 AM *SF09.02.02

Pathways for Plastic Deformation in Refractory Multi-Principal Element Alloys [Daniel S. Gianola](#); University of California, Santa Barbara, United States.

9:30 AM SF09.02.03

Superior High-Temperature Strength in a Supersaturated Refractory High-Entropy Alloy [Rui Feng](#); Oak Ridge National Laboratory, United States.

9:45 AM SF09.02.04

Investigation of Microstructure and Mechanical Properties of Selected Phase by Nature on Multi-Component Refractory High Entropy Alloys [Jaekwon Kim](#); Seoul National University, Korea (the Republic of).

10:00 AM BREAK

10:30 AM *SF09.02.05

Theory-Guided Combinatorial Synthesis and Characterization of Refractory Multi-Principal Element Alloys [Matthew J. Kramer](#)^{2,1}; ¹Iowa State University, United States; ²Ames Laboratory, United States.

11:00 AM SF09.02.06

Exploring Strength-Ductility Synergy for bcc Refractory HEAs Through Integration of First-Principles Calculations, Statistical Learning and CALPHAD [Yong-Jie Hu](#); Drexel University, United States.

11:15 AM SF09.02.07

A Fast and Robust Method for Predicting the Phase Stability of Refractory Complex Concentrated Alloys Using Pairwise Mixing Enthalpy [Rohan Mishra](#); Washington University in St. Louis, United States.

11:30 AM SF09.02.08

ULtrahigh TEmpérature Refractory Alloys (ULTERA) Database [Adam M. Krajewski](#); The Pennsylvania State University, United States.

11:45 AM SF09.02.09

Hydrogen Accommodation in the TiZrNbHfTa High Entropy Alloy. [Christopher Moore](#)^{1,2,5}; ¹Bangor University, United Kingdom; ²Royal Society of Chemistry, United Kingdom; ⁵Tokamak Energy, United Kingdom.

SESSION SF09.03 Theoretical Modeling and Computational Simulations

Session Chairs: Robert Maass and Ji-Cheng Zhao

Tuesday Afternoon, May 10, 2022

Hawai'i Convention Center, Level 3, 325B

1:30 PM *SF09.03.01

Insights on Phase Formation from Thermodynamic Calculations and Machine Learning of 2436 Experimentally Measured High Entropy Alloys [Ji-Cheng Zhao](#); University of Maryland, United States.

2:00 PM *SF09.03.02

Composition Design of High-Entropy Alloys with Deep Sets Learning [Wei Chen](#); Illinois Institute of Technology, United States.

2:30 PM SF09.03.03

Defect-Informed Figure of Merit for the High-Throughput Screening of New High-Entropy Materials [Dibyendu Dey](#); University of Maine, United States.

2:45 PM SF09.03.04

Investigation of Short-Range Order in CrCoNi from First-Principles Energy Density Method [Yang Dan](#); University of Illinois at Urbana-Champaign, United States.

3:00 PM BREAK

3:30 PM SF09.03.05

Stacking Fault Energies in Ni-Based Concentrated Alloys Using Density Functional Theory and Machine Learning [Dilpuneet S. Aidhy](#); University of Wyoming, United States.

3:45 PM SF09.03.06

Design of Multi-Principal Element Alloys with Generalized Polynomial Solution Model [John D. Cavin](#)^{1,2}; ¹WUSTL, United States; ²Northwestern University, United States.

4:00 PM SF09.03.07

Optimizing Strength and Corrosion Resistance of CoCrFeNi Alloys via DFT Calculations [Wenjun Cai](#); Virginia Polytechnic Institute and State University, United States.

4:15 PM SF09.03.08

Conditional Generative Modeling for Inverse Design of High-Entropy Alloys with Tailored Hardness [Arindam Debnath](#); The Pennsylvania State University, United States.

SESSION SF09.04: Poster Session: High Entropy Materials II—From Fundamentals to Potential Applications

Session Chairs: Hyejung Chang and Eun Soo Park

Tuesday Afternoon, May 10, 2022

5:00 PM - 7:00 PM

Hawai'i Convention Center, Level 1, Kamehameha Exhibit Hall 2 & 3

SF09.04.01

Asymmetry of Element-Specific Lattice Distortion in 3D Transition Metal-Based Complex Concentrated Alloys [Hyunseok Oh](#)^{1,3}; ¹Seoul National University, Korea (the Republic of); ³Massachusetts Institute of Technology, United States.

SF09.04.02

Atomic-Scale Measurement of Chemical Short-Range Order (C-SRO) in CrMnFeCoNi High Entropy Alloys and Its Effect on the Deformation Behaviors [Kooknoh Yoon](#); Seoul National University, Korea (the Republic of).

SF09.04.03

Short Range Order Correlated with Hardening and Softening Behavior of High Entropy Brasses and Bronzes [Anna M. Soper](#); Harvey Mudd College, United States.

SF09.04.04

Multiscale Microstructural Modeling and Simulation of Deformation in AlCoCrCuFeNi High Entropy Alloys via X-Ray Computed Tomography and Homogenization Analysis [Ryo Inoue](#); Tokyo University of Science, Japan.

SF09.04.07

Clarification of Phase Stability and Oxidation Mechanism for TiZrHfTaX (X= Ta, Cr) by Using Thermodynamic Calculation [Yuki Komiya](#); Tokyo University of Science, Japan.

SF09.04.08

Material Design for TiZrHfNbTaB_x—A Boundary Material of Refractory High Entropy Alloys and Ceramics [Yutato Arai](#); Tokyo University of Science, Japan.

SF09.04.09

A Study of Ideal Glass State via High Entropy Metallic Glasses [Ji Young Kim](#); Seoul National University, Korea (the Republic of).

SF09.04.10

Nanotribology of High Entropy Alloy Thin Films [Gokay Adabasi](#); University of California, Merced, United States.

SF09.04.11

Exploring M₃O₄ Spinel High-Entropy Oxide Nanoparticles for Emissions Catalysis [Sreya Paladugu](#); University of Tennessee, Knoxville, United States.

SF09.04.12

Sol-gel Synthesis of Ceria-Zirconia-Based High-Entropy Oxides as High-Promotion Catalysts for the Synthesis of 1,2-Diketones from Aldehyde Igor Djerdj; Department of Chemistry, Josip Juraj Strossmayer University of Osijek, Croatia.

SF09.04.13

Synthesis of Nanoporous Structure by Selective Phase Dissolution of AlCoCrFeNi High Entropy Alloy and Its Electrochemical Properties as Supercapacitor Electrode Kim Chamil; yonsei university, Korea (the Republic of).

SF09.04.14

First Principles Study of Phase Stability, Mechanical Properties, Martensitic Transformation and Phonon Dispersion of Ni₄₄Ti₃₅Zr₁₅Co₆ Alloy System Tapasendra Adhikary; Indian Institute of Technology Kharagpur, India.

SESSION SF09.05 Phase Stability of High Entropy Alloy

Session Chairs: Easo George and Eun Soo Park

Wednesday Morning, May 11, 2022

Hawai'i Convention Center, Level 3, 325B

10:00 AM *SF09.05.01

Excitements and Challenges in High Entropy Alloy Research B.S. Murty^{1,2}; ¹Indian Institute of Technology Hyderabad, India; ²Indian Institute of Technology Madras, India.

10:30 AM *SF09.01.03

Collective Dislocation Motion and Localization of Slip in an HEA Robert Maass^{1,2}; ¹Federal Institute of Materials Research and Testing (BAM), Germany; ²University of Illinois at Urbana-Champaign, United States.

11:00 AM SF09.05.02

Tuning Phase Transformations in Epsilon-Martensite—Pathways to Extend the Limit of Metastability Engineering Shaolou Wei; Massachusetts Institute of Technology, United States.

11:15 AM SF09.05.03

Influence of Co/Ni Ratio on the Shape Memory Effect in the CrMnFeCoNi Alloy System Je In Lee; Pusan National University, Korea (the Republic of).

11:30 AM SF09.05.04

Martensitic Phase Transformation in CrCoNi Medium- and CrMnFeCoNi High-Entropy Alloy Robert Chulist; Polish Academy of Sciences, Poland.

SESSION SF09.06 Structural/Mechanical Properties II

Session Chairs: Je In Lee and B.S. Murty

Wednesday Afternoon, May 11, 2022

Hawai'i Convention Center, Level 3, 325B

1:45 PM *SF09.06.01

Novel Precipitate Strengthening Mechanism in a Medium-Entropy Alloy Easo P. George^{1,2}; ¹Oak Ridge National Laboratory, United States; ²The University of Tennessee, Knoxville, United States.

2:15 PM SF09.06.03

Strain Distribution Analysis Using PED Technique at the Interface of L2₁ Precipitates in Al-Cr-Fe-Ni-Ti Complex Concentrated Alloy System Hyejung Chang; Korea Institute of Science and Technology, Korea (the Republic of).

2:30 PM SF09.06.02

Investigation of Deformation Mechanism and Microstructural Evolution in B2 Nano-Precipitate Strengthened Medium Entropy Alloy Maya P. Agustianingrum; Yeungnam University, Korea (the Republic of).

2:45 PM SF09.06.05

Tailored Complex Concentrated Alloys 3D Printed from Oxide Precursors Katie D. Koube; Georgia Institute of Technology, United States.

3:00 PM BREAK**3:30 PM SF09.06.07**

Analysis of the Influence of the Composition of Fe-Cr-Ni-X (X=Mn, Co) Alloys on the Corrosion Properties using Diffusion Multiples for Rapid Realization of Potential Material Combinations Yasemin Yesilcicek; Federal Institute for Materials Research and Testing, Germany.

3:45 PM SF09.06.08

Creep-Resistant Cr-Mn-Fe-Co-Ni High-Entropy Alloys Having a Single FCC Phase Min-Gu Jo^{1,2}; ¹Korea Institute of Science and Technology, Korea (the Republic of); ²Seoul National University, Korea (the Republic of).

SESSION SF09.07 Functional Properties and Innovative Applications

Session Chairs: Tianshu Li and Peter Liaw

Thursday Morning, May 12, 2022

Hawai'i Convention Center, Level 3, 325B

10:00 AM *SF09.07.01

Entropy-Maximized Materials for Electrocatalysis Applications Sheng Dai^{2,1}; ¹Oak Ridge National Laboratory, United States; ²The University of Tennessee, Knoxville, United States.

10:30 AM SF09.07.02

Transition-Metal-Based High Entropy Oxide Materials for Non-Enzymatic Electrochemical Sensing of Sweat Biomarkers [Ziyu Yin](#); University of Hawaii, United States.

10:45 AM SF09.07.03

Understanding the Structure-Property Relationship in Bio-Enabled High Entropy Nanocatalysts [Bijil Subhash](#); University of New South Wales, Australia.

11:00 AM SF09.07.04

Gradient Structure Design of High- and Medium- Entropy Alloy via Novel Surface Modification Techniques [Timothy A. Listyawan](#); Yeungnam University, Korea (the Republic of).

11:15 AM SF09.07.05

Physical Property in Innovative States of High Entropy Alloy Films—Atomic Site and Structural Disordered [Jia-Wei Chen](#); National Yang Ming Chiao Tung University, Taiwan.

SESSION SF09.08 High Entropy Oxides
Session Chairs: Sheng Dai and Hyunseok Oh
Thursday Afternoon, May 12, 2022
Hawai'i Convention Center, Level 3, 325B

1:45 PM *SF09.08.01

Computational Discovery of Co-Existence of Multiple Short-Range Orders in Si-Ge-Sn Medium-Entropy Alloys [Tianshu Li](#); George Washington Univ, United States.

2:15 PM SF09.08.02

Entropic Effects Explain Colossal Softening and Negative Thermal Expansion in Empty Perovskites [Igor Zaliznyak](#); Brookhaven National Laboratory, United States.

2:30 PM SF09.08.03

Microstructural Reconfiguration in High-Entropy Oxides [George N. Kotsonis](#); The Pennsylvania State University, United States.

2:45 PM SF09.08.04

Corrosion Properties and Protective Oxide Film Characteristics of CrMnFeCoNi High Entropy Alloy and CrCoNi Medium Entropy Alloy [Annica Wetzel](#); Bundesanstalt für Materialforschung und -prüfung, Germany.

3:00 PM BREAK

3:30 PM SF09.08.05

Thermal and Ablation Properties of a High-Entropy Metal Diboride—(Hf_{0.2}Zr_{0.2}Ti_{0.2}Ta_{0.2}Nb_{0.2})B₂ [Md Shafkat Bin Hoque](#); University of Virginia, United States.

3:45 PM SF09.08.06

Unsupervised Machine Learning Assisted TEM Study of Phase Formation and Microstructure Tuning in Entropy-Stabilized Oxide Thin Films [Leixin Miao](#); Department of Materials Science and Engineering, The Pennsylvania State University, United States.

4:00 PM SF09.08.07

Crystal Growth and Phase Composition of High-Entropy Rare-Earth Sesquioxides [Matheus Pianassola](#)^{1,3}; ¹University of Tennessee, Knoxville, United States; ³Scintillation Materials Research Center, United States.

4:15 PM SF09.08.08

Entropy Stabilization, Local Structure and Short-Range Ordering in Oxides with α -PbO₂ Structure [Solveig S. Aamlid](#)^{1,2}; ¹The University of British Columbia, Canada; ²The University of British Columbia, Canada.

SESSION SF09.09 General Session I
Session Chairs: Cecilia Cao and Koichi Tsuchiya
Tuesday Afternoon, May 24, 2022
SF09-Virtual

9:00 PM *SF09.09.01

FCC-HCP Phase Stability and Grain Refinement Behavior in Cr₂₀Mn₂₀Fe₂₀Co_{40-x}Ni_x High-Entropy Alloys [Koichi Tsuchiya](#); National Institute for Materials Science, Japan.

9:30 PM *SF09.01.02

Plastic Deformation of Single Crystals of Equiatomic and Non-Equiatomic High- and Medium Entropy Alloys of the Cr-Mn-Fe-Co-Ni and Its Sub-Systems [Haruyuki Inui](#); Kyoto University, Japan.

10:00 PM SF09.09.05

High Entropy Approach Starting from a Corner of the Phase Diagram in Designing High Strength Fe-Based Alloys [Dmitri V. Louzguine](#)^{2,1}; ¹AIST, Japan; ²AIMR, Tohoku University, Japan.

10:15 PM SF09.09.02

Effects of Annealing on the Atomic-Scale Structures and Mechanical Properties in Single Crystals of the Equiatomic Cr-Co-Ni Medium-Entropy Alloy [Le Li](#); Kyoto University, Japan.

10:30 PM SF09.09.03

Alloy Design of Cr-Co-Ni-Based Medium-Entropy Alloys for High Strength and High Ductility [Zhi Wang](#); Kyoto University, Japan.

10:35 PM SF09.04.05

Elevated Temperature Deformation Behavior of AlCoCrFeNi High Entropy Alloy [Ji-Woon Lee](#); Kongju National University, Korea (the Republic of).

10:40 PM SF09.06.06

Effect of Fe Contents on the Plane Stress Crack Growth Resistance of $\text{Fe}_x(\text{CoCrMnNi})_{100-x}$ High Entropy Alloys at Cryogenic Temperature [Hyokyung Sung](#); Gyeongsang National University, Korea (the Republic of).

SESSION SF09.10: General Session II
Session Chairs: Cecilia Cao and Jurgen Eckert
Wednesday Morning, May 25, 2022
SF09-Virtual

8:00 AM *SF09.02.01

Order Phenomena and Mechanical Properties in Refractory High Entropy Alloys of the System Ta-Mo-Cr-Ti-Al [Martin Heilmair](#); Karlsruhe Institute of Technology, Germany.

8:30 AM *SF09.09.04

Transition Metal-Based High Entropy Alloy Microfiber Electrodes with Improved Corrosion Behavior and Hydrogen Activity [Jurgen H. Eckert](#)^{1,2}; ¹Erich Schmid Institute of Materials Science, Austrian Academy of Sciences, Austria; ²Montanuniversität Leoben, Austria.

9:00 AM SF09.09.08

Order and Disorder in the Ga-Substituted High Entropy Oxide Spinel $(\text{MnFeCrCoNi})_{3-x}\text{Ga}_x\text{O}_4$ [Alannah Hallas](#); The University of British Columbia, United States.

9:15 AM SF09.09.06

High Entropy Based Relaxor Ferroelectrics for Energy Storage and Energy Conversion [Pao-Wen Shao](#); National Yang Ming Chiao Tung University, Taiwan.

9:30 AM SF09.09.07

Machine-Learning Potentials Enable Predictive and Tractable High-Throughput Screening of Random Alloys [Max Hodapp](#); Skolkovo Institute of Science and Technology, Russian Federation.

SYMPOSIUM SF10

Emerging Functional Oxides and Interfaces
May 9 - May 24, 2022

Symposium Organizers

* Invited Paper

SESSION SF10.01: Spin, Charge and Topology I
Session Chairs: Alex Demkov and Jaekwang Lee
Monday Morning, May 9, 2022
Hawai'i Convention Center, Level 3, 312

10:45 AM *SF10.01.01

A New Era in Ferroelectrics [Ramamoorthy Ramesh](#); University of California, Berkeley, United States.

11:15 AM *SF10.01.03

Charged Higher Order Topologies in Room Temperature Magnetoelectric Multiferroic Thin Films [Michele S. Conroy](#)^{2,1}; ¹University of Limerick, Ireland; ²Imperial College London, United Kingdom.

SESSION SF10.02: Spin, Charge and Topology II
Session Chairs: Jaekwang Lee and Rohan Mishra
Monday Afternoon, May 9, 2022
Hawai'i Convention Center, Level 3, 312

2:00 PM SF10.02.02

Strain-Induced Interfacial Ferromagnetism in (111)-Oriented LaNiO₃ Films [Margaret Kane](#); Stanford University, United States.

2:15 PM SF10.02.03

Emergent Topological Phase Transition Dynamics of Polar Skyrmions [Elizabeth Donoway](#)^{1,2}; ¹University of California, Berkeley, United States; ²Lawrence Berkeley National Laboratory, United States.

2:30 PM *SF10.02.04

Topological Spin Textures in Multiferroic and 2D vdW Materials [Xiuzhen Yu](#); RIKEN, Japan.

3:00 PM BREAK

3:30 PM SF10.02.05

Tunable Spin Exchange Splitting in Graphene-Perovskite Oxide Heterostructure [Dongwon Shin](#); Sungkyunkwan University, Korea (the Republic of).

3:45 PM SF10.02.06

Interfacial Exchange Coupling in Epitaxial La_{0.7}Sr_{0.3}CoO₃/La_{0.7}Sr_{0.3}MnO₃ Heterostructures [Mingzhen Feng](#); University of California, Davis, United States.

4:00 PM SF10.02.07

Flexoelectricity in Magnetic Materials [John D. Cavin](#)^{1,2}; ¹WUSTL, United States; ²Northwestern University, United States.

4:15 PM SF10.02.08

Relation Between Residual Strain and Magnetic Properties of Hybrid Semiconductor Nanowires with Intermetallic Phases [Slawomir Kret](#); Polish Academy of Sciences, Poland.

SESSION SF10.03: Poster Session I: Emerging Functional Oxides and Interfaces I
Session Chairs: Jaekwang Lee and Rohan Mishra
Monday Afternoon, May 9, 2022
5:00 PM - 7:00 PM
Hawai'i Convention Center, Level 1, Kamehameha Exhibit Hall 2 & 3

SF10.03.01

Rational Design for Hybridization of MoS₂ and Perovskite Oxide to Realize a Bifunctional Catalyst Suitable for Effective Water Splitting [Amit K. Rana](#); Ulsan National Institute of Science and Technology (UNIST), Korea (the Republic of).

SF10.03.02

Ternary Sulfides as Electrocatalysts for Water Splitting [Shantanu Singh](#); University of Southern California, United States.

SF10.03.03

Spin Hall Effect Driven Spin Transport at Two-Dimensional Conducting SrTiO₃ Surface [Mi-Jin Jin](#)^{2, 1}; ¹Institute for Basic Science, United States; ²University of Cambridge, United Kingdom.

SF10.03.04

Frustrated Magnetism in Rare-Earth Titanate Pyrochlore Thin Films Grown by Molecular Beam Epitaxy [Margaret A. Anderson](#); Harvard University, United States.

SF10.03.05

Correlating Surface Structures and Nanoscale Friction of CVD Multi-Layered Graphene [Min Gi Choi](#); Mechanical Engineering, Pusan National University, Korea (the Republic of).

SF10.03.07

Highly Durable Shell Formation on Rh for Increased Amount of Metal-Support Interfaces from Enhanced Surface Defect Sites by Fe Doping on CeO₂ [Gunjoo Kim](#); KAIST, Korea (the Republic of).

SF10.03.09

Novel Solid-State Synthesis of Platinum-Alloy Nanoparticles via Uniform Decomposition of Bimetallic Compounds on Carbon [Tae Yong Yoo](#)^{1, 2}; ¹Seoul National University, Korea (the Republic of); ²Center for Nanoparticle Research, Institute for Basic Science, Korea (the Republic of).

SF10.03.10

Effect of Doping Concentration on Ferroelectricity in Hafnia [Jun-Cheol Park](#); Gwangju Institute of Science and Technology, Korea (the Republic of).

SF10.03.11

Temperature Dependence of Spin-Orbit Torques Exerted by a 2DEG in CoFeB/LaTiO₃/SrTiO₃ Thin-Film Heterostructures [Lauren Riddiford](#)^{1, 2}; ¹Stanford University, United States; ²Stanford University, United States.

SF10.03.12

Co-substituted BiFeO₃—Thermodynamic, Electronic and Ferroelectric Properties from First Principles [Shivani Grover](#); University of Reading, United Kingdom.

SF10.03.13

Defective Domain Control of TiO₂ Support in Pt/TiO₂ Catalyst for Room Temperature Formaldehyde (HCHO) Remediation [Youngtak Oh](#); KIST, Korea (the Republic of).

SF10.03.14

Diffusion in Doped and Undoped Amorphous Zirconia [Megan W. Owen](#); Bangor University, United Kingdom.

SF10.03.15

Poling-Driven Modulation of Structural and Luminescent Properties in Eu³⁺-doped (1-x)(Bi_{1/2}Na_{1/2})TiO₃-xBaTiO₃ Relaxor [Yunsang Lee](#); Soongsil Univ, Korea (the Republic of).

SF10.03.16

Magnetism Induced by Nitrogen Doping in Ferroelectric HfO₂ [ChangHoon Kim](#); UNIST, Korea (the Republic of).

SF10.03.17

A Pioneering Tactic to Design and Develop Highly Sensitive and Selective Gas Sensors—Exsolution Catalyst [Bharat Sharma](#); KIT - Karlsruher Institut für Technologie, Germany.

SF10.03.18

Fast Responding and Highly Reversible Gasochromic H₂ Sensor Using Pd-Decorated Amorphous WO₃ Thin Films [Sung Hwan Cho](#); Seoul National University, Korea (the Republic of).

SF10.03.19

Atomic-Scale Observation of Monoclinic Nanodomain in VO₂ with Ultra-Fast and Energy Efficient Metal-Insulator Transition [Hyeji Sim](#); Pohang University of Science and Technology (POSTECH), Korea (the Republic of).

SF10.03.20

Synthesis and Characterization of Novel Magnetic Nanodiscs for Magnetothermal and Magnetomechanical Transduction [Ye Ji Kim](#); Massachusetts Institute of Technology, United States.

SF10.03.21

Synthesis and Characterization of Strontium Cobaltite Membranes Under Topotactic Transformations [Hudson Shih](#); University of California, Davis, United States.

SF10.03.22

Atomic-Scale Understanding of the Role of Dopant (Al, Zr) on the Structural Properties of Nickel-Rich Cathode for Lithium-Ion Batteries [So-Yeon Kim](#); POHANG UNIVERSITY OF SCIENCE AND TECHNOLOGY, Korea (the Republic of).

SF10.03.23

High Mobility Two-Dimensional Electron Gas in PbZr_{0.5}Ti_{0.5}O₃/BaSnO₃ Heterostructure [Jaejin Hwang](#); Pusan National University, Korea (the Republic of).

SF10.03.24

Fabrication of Carbon-Coated Fe₃O₄-SnO₂ Core-Shell Nanocomposites via Surface Carboxylation and Amination [Gye Sek An](#); Kyonggi University, Korea (the Republic of).

SF10.03.25

Spin Arrangements in the Double Perovskite LaSr_{1-x}Ca_xNiReO₆ [Konstantinos Papadopoulos](#); Chalmers University of Technology, Sweden.

SF10.03.26

Influence of amorphous Si-Zn-Sn-O on Tunneling Magnetoresistance of CoFeB/SZTO/CoFeB Magnetic Tunnel Junctions [Jin Young Hwang](#)^{1, 2}; ¹Korea University, Korea

(the Republic of); ²Gachon university, Korea (the Republic of).

SF10.03.27

Compositional Patterning in Carbon Implanted Titania Nanotubes [Astrid Kupferer](#)^{1,2}; ¹Leibniz Institute of Surface Engineering, Germany; ²Universität Leipzig, Germany.

SESSION SF10.04: Novel Functionalities I
Session Chairs: Woo Seok Choi and Ramamoorthy Ramesh
Tuesday Morning, May 10, 2022
Hawai'i Convention Center, Level 3, 312

8:30 AM *SF10.04.01

Epitaxial BaTiO₃ for Emergent Silicon-Integrated Optical Computing [Alex Demkov](#); The University of Texas, United States.

9:00 AM SF10.04.02

Solid-State Electrochemical Control of Oxygen Contents in Transition Metal Oxide Thin Films with Perovskite-Related Crystal Structure [Hiromichi Ohta](#); Hokkaido Univ, Japan.

9:15 AM SF10.04.03

Electrically Controllable Kirigami Structures in Free-Standing Ferroelectric Thin Films [Donghoon Kim](#); ETH Zurich, Switzerland.

9:30 AM BREAK**10:00 AM *SF10.04.04**

Deterministic Control of Ferroelectric Polarization by Ultrafast Laser Pulses [Laurent Bellaiche](#); University of Arkansas, United States.

10:30 AM SF10.04.05

Topotactic Transformations in Perovskite Oxide Thin Films [Yayoi Takamura](#); University of California, Davis, United States.

10:45 AM SF10.04.06

Lone-Pair Electrons Enhanced Giant Nonlinear Optical Susceptibility in γ -NaAsSe₂ [Jingyang He](#); Penn State, United States.

11:00 AM SF10.04.07

Flat-Band Ferroelectricity for Densest Memory First Discovered in HfO₂ [Jun Hee Lee](#); Ulsan National Institute of Science and Technology, Korea (the Republic of).

SESSION SF10.05: Novel Functionalities II
Session Chairs: Sinead Griffin and Jackwang Lee
Tuesday Afternoon, May 10, 2022
Hawai'i Convention Center, Level 3, 312

1:30 PM *SF10.05.01

Navigating and Predicting Oxide Synthesis Recipes in High-Dimensional Thermodynamic Space [Wenhao Sun](#); University of Michigan, United States.

2:00 PM SF10.05.02

Structural Ripples and Nanoscale Bubble Domains in a Freestanding Ultrathin Ferroelectric - Dielectric - Ferroelectric Heterostructure [Saidur R. Bakaul](#); Argonne National Laboratory, United States.

2:15 PM SF10.05.03

Modulating the Ferroelectricity of Hafnium Zirconium Oxide Ultrathin Films via Interface Engineering to Control the Oxygen Vacancy Distribution [Joonbong Lee](#); Sejong University, Korea (the Republic of).

2:30 PM SF10.05.05

Emergent Ferroelectric Functionality in Square Tensile Strained BaTiO₃ Film [Yoon Seok Oh](#); Ulsan National Institute of Science and Technology, Korea (the Republic of).

2:45 PM SF10.05.06

Observation of Negative Piezoelectricity in HfO₂-Based Thin-Film Capacitors [Pratyush P. Buragohain](#); University of Nebraska-Lincoln, United States.

SESSION SF10.06: Microscopy and Spectroscopy I
Session Chairs: Albina Borisevich and Young-Min Kim
Wednesday Morning, May 11, 2022
Hawai'i Convention Center, Level 3, 312

8:30 AM *SF10.06.01

Correlation of Local Crystal/Electronic Structures with Activity and Durability of Oxygen Electrocatalysis in Complex Oxides [Sung-Yoon Chung](#); Korea Advanced Institute of Science and Technology, Korea (the Republic of).

9:00 AM SF10.06.02

Atomic-Scale Characterization of Phosphate Cathodes for Calcium-Ion Batteries [Arashdeep S. Thind](#)^{1,2}; ¹University of Illinois at Chicago, United States; ²Argonne National Laboratory, United States.

9:15 AM SF10.06.03

Real-Time Quantum Dynamics for Controlling Polarization Switching in Ferroelectric Materials [Bryan M. Wong](#); University of California, Riverside, United States.

9:30 AM BREAK

10:00 AM *SF10.06.04

Tailoring Topology in Real and Reciprocal Space in Oxides [Sinead M. Griffin](#); Lawrence Berkeley National Laboratory, United States.

10:30 AM SF10.06.05

Opto-Mechanical Mapping of Ferroelectric Domains and the Piezo-Photovoltaic Effect [Gaurav Vats](#); KU Leuven, Belgium.

10:45 AM SF10.06.06

Electron Microscopic Understanding of Domain-Wall-Free Ferroelectricity in Y Doped HfO₂ [Min-Su Kim](#); Pohang University of Science and Technology (POSTECH), Korea (the Republic of).

SESSION SF10.07: Microscopy and Spectroscopy II

Session Chairs: Robert Klie and Xiuzhen Yu

Wednesday Afternoon, May 11, 2022

Hawai'i Convention Center, Level 3, 312

1:30 PM *SF10.07.01

Advanced Electron Energy Loss Spectroscopy Investigations of Heterointerfaces for Spintronics Applications [Quentin Ramasse](#); SuperSTEM Laboratory, United Kingdom.

2:00 PM SF10.07.02

Atomic-Level Imaging and Quantification of Dopants in a Semiconducting Complex Oxide [Kasper Hunnestad](#); Norwegian University of Science and Technology, Norway.

2:15 PM SF10.07.03

Identification of Atomic-Scale Electrocatalytically-Relevant Depth in Manganese Oxide Heterostructures [Jegon Lee](#); Sungkyunkwan University, Korea (the Republic of).

2:30 PM BREAK

3:00 PM *SF10.07.04

Atomic-Resolution Study of Complex Oxides for Multi-Valent Ion Battery Cathodes [Robert F. Klie](#); University of Illinois-Chicago, United States.

3:30 PM SF10.07.05

Deep Learning Crystallographic Mapping of Polycrystalline Hf_{0.5}Zr_{0.5}O₂ Thin Films [Young-Hoon Kim](#); Sungkyunkwan University, Korea (the Republic of).

3:45 PM SF10.07.06

Giant Optical Anisotropy in Quasi-One-Dimensional Transition Metal Chalcogenides Having Periodic Structural Modulations [Guodong Ren](#); Washington University in St. Louis, United States.

SESSION SF10.08: Poster Session II: Emerging Functional Oxides and Interfaces II

Session Chairs: Miaofang Chi and Young-Min Kim

Wednesday Afternoon, May 11, 2022

5:00 PM - 7:00 PM

Hawai'i Convention Center, Level 1, Kamehameha Exhibit Hall 2 & 3

SF10.08.01

Magnetic and Transport Anomalies in Dy₄RhAl [Karthik K. Iyer](#)^{1,2,3}; ¹Tata Institute of Fundamental Research, India; ²KLE Society's Dr. Prabhakar Kore Basic Science Research Centre, KAHER, India; ³KLE Society's, Basavaprabhu Kore Arts, Science & Commerce College, India.

SF10.08.02

Thermodynamic and Kinetic Properties of Ceramic Oxide Grain Boundaries with High Dopant Concentrations [Tara M. Boland](#); Arizona State University, United States.

SF10.08.03

Simultaneous Mapping of Elemental Distribution and Ionic Displacement in Multiferroic BiFeO₃ Thin Film via a Picoscale-Precision STEM-EDX [Sang-Hyeok Yang](#); Sungkyunkwan University, Korea (the Republic of).

SF10.08.04

Enhanced Second Harmonic Generation in Ferroelectric (Zn, Mg)O Wurtzite System [Rui Zu](#); The Pennsylvania State University, United States.

SF10.08.05

Atomistic Study of Site-Selective Doping Behavior in SnO₂ [Yeongrok Jin](#); Pusan National University, Korea (the Republic of).

SF10.08.06

Surface Modification of LSCF/GDC Cathodes by Epitaxial Deposition of Sm_{0.5}Sr_{0.5}CoO₃ via Ultrasonic Spray Infiltration [Seungbok Lee](#); KIER / UST, Korea (the Republic of).

SF10.08.07

Highly Sensitive Ion-Sensors with Symmetrically Gated Coplanar Metal-Oxide Electrochemical Transistors [YoungWoo Jang](#); Chung-Ang University, Korea (the Republic of).

SF10.08.08

Unveiling Invisible Surface Corrugation on CVD Graphene [Seonha Park](#); Pusan National University, Korea (the Republic of).

SF10.08.09

High-Performance Electrochemical Carbon Dioxide Reduction Reaction with Designing Sub-Nanometer Space in Tin Oxide Nanoparticles [Mun Kyoung Kim](#); Sungkyunkwan University, Korea (the Republic of).

SF10.08.10

The Design and Characterization of Self-Forming Barrier with Co Alloy for Highly Reliable Advanced Interconnects [Yoongu Lee](#); Seoul National University, Korea (the Republic of).

SF10.08.11

High-Performance Dielectric Ceramics/Polymer Composite Films for Energy-Harvesting Applications [Fazli Akram](#)^{2,1}; ¹University of Ulsan, Korea (the Republic of); ²North Carolina Central University, United States.

SF10.08.12

An Effective PEC Tandem Cell, Based on Sputtered Surfaces with Samarium Doped SrTiO₃ Photoanode [Michael Arnold](#); Fraunhofer IKTS, Germany.

SF10.08.13

Anisotropic Light Absorption and Charge Transport Properties of Epitaxial BiVO₄ Films [Viktoria F. Kunzelmann](#); Technical University of Munich, Walter Schottky Institute, Germany.

SF10.08.14

Ultra-High Temperature Stable Hydrophobic Coatings Fabricated by Phased-Controlled Synthesis of Lanthanum-Based Materials [Anna K. Schmidt-Verma](#); Universität zu Köln, Germany.

SF10.08.15

First Epitaxial Thin Film of Low-Bandgap Manganese Vanadium Oxide (MnV₂O₄) [Kamal Rudra](#)^{1,2}; ¹University of Michigan, United States; ²Indian Institute of Science, India.

SF10.08.17

Laser-Induced Trapping of Metastable Amorphous-MO_x/C Nanocomposites [Elijah M. Davis](#)^{2,1}; ¹Nano-BioMaterials Laboratory for Energy, Energetics & Environment (nbml-E3), United States; ²The University of Tennessee, Knoxville, United States.

SF10.08.18

Magnetolectric Coupling in LuFeO₃/CoFe₂O₄ Superlattices [Rustem Ozgur](#); UC Berkeley, Materials Science and Engineering, United States.

SF10.08.19

Oxide Semiconductor-Based Ferroelectric NAND Flash Memory for 3D Memory Applications [Ik-Jyae Kim](#); Pohang University of Science and Technology, Korea (the Republic of).

SF10.08.20

Mechanisms of Magnetolectric Coupling at the Composite Interfaces of Epitaxial Asymmetric Multilayer Heterostructures [Dhiren K. Pradhan](#)^{1,2}; ¹The University of Tennessee, Knoxville, United States; ²Oak Ridge National Laboratory, United States.

SF10.08.21

Electronic Transport and Interface Properties of (MgZnCd)O Based Ternary and Quaternary Alloys [Gary Pennington](#); Towson University, United States.

SF10.08.22

Atomic level Variations of Strain-Fields at Surfaces and Steps on CeO₂ Nanoparticles Under Different Reducing Conditions [Piyush Haluai](#); Arizona State University, United States.

SF10.08.23

Dynamic Symmetry Breaking in BaTiS₃ Towards Tunable Linear IR Birefringence [Boyang Zhao](#)^{1,4}; ¹University of Southern California, United States; ⁴University of Southern California, United States.

SF10.08.24

Intrinsic Switching in Ferroelectric Y:HfO₂ Thin Film Capacitors [Pratyush P. Buragohain](#); University of Nebraska–Lincoln, United States.

SF10.08.25

Adsorption and Diffusion of Oxygen on Pure and Partially Oxidized Metal Surfaces [Hendrik Heinz](#); University of Colorado at Boulder, United States.

SF10.08.26

Revealing the Structure and Oxygen Transport at Interfaces in Complex Oxide Heterostructures via ¹⁷O NMR Spectroscopy [Michael A. Hope](#)^{1,2}; ¹EPFL, Switzerland; ²University of Cambridge, United Kingdom.

SESSION SF10.09: Interface, Strain and Defect Engineering

Session Chairs: Miaofang Chi and Young-Min Kim

Thursday Morning, May 12, 2022

Hawai'i Convention Center, Level 3, 312

8:45 AM *SF10.09.01

Local Observations of Defects and Disorder in Ferroelectrics and Their Impact on Phase Transition Behavior [Albina Borisevich](#); Oak Ridge National Laboratory, United States.

9:15 AM SF10.09.02

Multilevel Strain Accomodation in an Single-Crystalline BiFeO₃ Thin Film at Multiple Length Scales [Wooseon Choi](#); Sungkyunkwan University, Korea (the Republic of).

9:30 AM SF10.09.03

Emergent Interface Vibrational Structure of Oxide Superlattices [Eric R. Hoglund](#); University of Virginia, United States.

9:45 AM BREAK

SESSION SF10.10: Materials Design and Characterization
Session Chairs: Young-Min Kim and Quentin Ramasse
Thursday Morning, May 12, 2022
Hawai'i Convention Center, Level 3, 312

10:15 AM *SF10.10.01

Tracking the Surface Chemistry and Composition of Complex Oxides *In Situ* During Growth [Jayakanth Ravichandran](#); University of Southern California, United States.

10:45 AM SF10.10.02

Deformed Crystalline Structures of Vanadium Oxide Films with Modified Metal-Insulator Transition and Asymmetric Magnetoresistance [Jae-Hyun Ha](#); Daegu Gyeongbuk Institute of Science & Technology (DGIST), Korea (the Republic of).

11:00 AM SF10.10.03

Heterogeneous Integration of Single-Crystalline Rutile Nanomembranes with Steep Phase Transition on Silicon Substrates [Dong Kyu Lee](#); Pohang University of Science and Technology, Korea (the Republic of).

11:15 AM SF10.10.04

Structural and Electronic Properties of Iridate Epitaxial Thin Films [Emily Lindgren](#); Stanford University, United States.

SESSION SF10.11: Emerging Functional Oxides and Interfaces I
Session Chairs: Miaofang Chi and Rohan Mishra
Monday Afternoon, May 23, 2022
SF10-Virtual

1:00 PM *SF10.11.01

Piezoelectric and Ferroelectric Properties of Novel Layered van der Waals Crystals [Nina Balke](#); North Carolina State University, United States.

1:30 PM SF10.11.02

Time-Voltage Dependent Evolution of Anti-Frenkel Defects in ErMnO₃ [Jiali He](#); Norwegian University of Science and Technology (NTNU), Norway.

1:45 PM SF10.11.03

In Situ Analysis of Ferroelastic Domains in LaAlO₃ [John J. Scott](#); Queen's University Belfast, United Kingdom.

2:00 PM SF10.11.04

The Rational Design of New Antiferroelectrics and Ferroelectrics [Joseph W. Bennett](#); University of Maryland Baltimore County, United States.

2:15 PM SF10.11.05

Observation and Control of Nano-Domains in Improper Ferroelectric Gd₂(MoO₄)₃ [Ivan Ushakov](#); Norwegian University of Science and Technology, Norway.

2:20 PM SF10.11.06

Gold Nanorods for Improving Near-Infrared Attenuation in SnO₂:F Thin Films [Alfredo Campos](#); Universidad Tecnologica de Panama, Panama.

2:25 PM SF10.11.07

Quantitative Analysis of Organic-Metal Interactions—New IFF MD Models, Get it Right [Cheng Zhu](#); university of colorado boulder, United States.

2:30 PM SF10.11.08

The Effect of Intrinsic Layer on the Performance of Oxide-Based p-i-n Hetero Junctions Integrating p-SnOx and n-InGaZnO [Donghun Lee](#); Purdue University, United States.

2:35 PM SF10.11.09

Defect Formation and Interface Charge Transfer at Misfit Dislocations in CeO₂/MgO Heterostructure [Pratik P. Dholabhai](#); Rochester Institute of Technology, United States.

2:40 PM SF10.11.10

Simultaneous Atomic-Resolution Imaging of Light and Heavy Elements in Functional Materials by CoM-STEM [Michael Zachman](#); Oak Ridge National Laboratory, United States.

SESSION SF10.12: Emerging Functional Oxides and Interfaces II
Session Chairs: Young-Min Kim and Jaekwang Lee
Monday Afternoon, May 23, 2022
SF10-Virtual

9:00 PM *SF10.12.01

Three-Dimensional Imaging by Large-Angle Illumination STEM [Ryo Ishikawa](#)^{1,2}; ¹The University of Tokyo, Japan; ²Japan Science and Technology Agency, Japan.

9:30 PM SF10.12.02

Interfacial Mg²⁺ Diffusion in Epitaxial Fe₃O₄ Thin Films [Krishna Prasad Koirala](#); Pacific Northwest National Laboratory, United States.

9:45 PM SF10.12.05

WITHDRAWN 5/12/22 SF10.12.05 Ligand Field-Induced Unconventional Transition Metal Dopant for a High-Mobility and Near-Infrared Transparent Conductive Oxide—W-Doped Rutile SnO₂ [Yasushi Hirose](#); Univ of Tokyo, Japan.

9:50 PM SF10.12.06

One-pot Fabrication and Characterization of Bioactive CeO_{2-x} Nanocrystals with Enhanced Radical Scavenging Potential [Sayoni Sarkar](#)^{1,3}; ¹IIT Bombay, India; ³IIT Bombay, India.

9:55 PM SF10.12.10

Construction of Hollow Nanocoils via Controlled Interfacial Reaction in Colloidal Solution [Jun Hwan Moon](#); Korea University, Korea (the Republic of).

10:00 PM *SF10.02.01

Spiral Spin State Mediated by Chiral Phonon in Artificial Superlattices [Woo Seok Choi](#); Sungkyunkwan University, Korea (the Republic of).

10:30 PM SF10.08.16

Multicolor, Dual-Image, Printed Electrochromic Displays Based on Tandem Configuration [Keon-Woo Kim](#); Pohang University of Science and Technology, Korea (the Republic of).

SESSION SF10.13: Emerging Functional Oxides and Interfaces III

Session Chairs: Young-Min Kim and Jaekwang Lee

Tuesday Morning, May 24, 2022

SF10-Virtual

8:00 AM SF10.12.03

Simultaneous Enhancement of Piezoelectric and Elastic Properties in Codoped AlN System with B and Sc [Huirong Jing](#); Shanghai Jiao Tong University, China.

8:05 AM SF10.12.04

Establishment of Control Method for Ferroelectric Properties in (Al_{1-x}Sc_x)N Films [Shinnosuke Yasuoka](#); Tokyo Institute of Technology, Japan.

8:10 AM SF10.12.08

Powder ALD(Atomic Layer Deposition)-Processed LSCF(Lanthanum Strontium Cobalt Ferrite) Cathodes for Solid Oxide Fuel Cell to Suppressing Sr-Exsolution [Sung Eun Jo](#); Seoul National University of Science & Technology, Korea (the Republic of).

8:15 AM SF10.12.09

Epitaxial SrRuO₃ Freestanding Membranes Through Selective Etching of Sacrificial Buffer Layers [Muhammad Sheeraz](#); University of Ulsan, Korea (the Republic of).

8:20 AM *SF10.12.07

Defect Engineering of the Magnetic and Topological Properties of Natural van der Waals Heterostructural Compounds *n*MnTe.*m*Bi₂Te₃ [Jiaqiang Yan](#); Oak Ridge National Laboratory, United States.

8:50 AM SF10.01.02

Large Rashba Spin-Orbit Effect by Orbital Engineering at SrTiO₃-Based Correlated Interfaces [Ganesh Ji Omar](#); National University of Singapore, Singapore.

SYMPOSIUM SF11

Advances in Design, Synthesis and Characterization of Functional Heteroanionic Materials
May 11 - May 24, 2022

Symposium Organizers

* Invited Paper

SESSION SF11.01: Synthesis and Characterization of Heteroanionic Materials I

Session Chairs: Stephan Lany and James Rondinelli

Wednesday Morning, May 11, 2022

Hawai'i Convention Center, Level 3, 325A

8:30 AM SF11.01.01

Tuning the Structural and Magnetic Properties of Layered Manganese Oxysulfides—Synthesis and Topochemical Manipulations of $\text{CaSrMnO}_2\text{Cu}_{4-x}\text{S}_3$ [Viktoria Falkowski](#)^{1,3}; ¹University of Oxford, United Kingdom; ³The Faraday Institution, United Kingdom.

8:45 AM *SF11.01.02

Anionic Ordering in Novel Aurivilius Oxyfluorides, Magnetism and Multiferroicity [Olivier Mentré](#); UCCS, France.

9:15 AM SF11.01.03

Anionic (Dis)order and Fluoride Dynamics in Complex Transition Metal Oxyfluorides from High-Resolution Solid-State NMR Spectroscopy [Kent J. Griffith](#); Northwestern University, United States.

9:30 AM BREAK

SESSION SF11.02: Design of Heteroanionic Materials

Session Chairs: Jill Wenderott and Patrick Woodward

Wednesday Morning, May 11, 2022

Hawai'i Convention Center, Level 3, 325A

10:00 AM *SF11.02.01

Effect of Disorder on the Properties of Anion-Doped Wide-Bandgap Semiconductors [Julia E. Medvedeva](#); Missouri Univ of S&T, United States.

10:30 AM SF11.02.02

Heteroanionic Materials Discovery via *Ab Initio* Hydrothermal Synthesis-by-Design [Lauren N. Walters](#); Northwestern University, United States.

10:45 AM SF11.02.03

Crystal and Electronic Structure Predictions in Oxide-Nitrides and Interfaces with Hetero-Anionic Interlayers [Stephan Lany](#); National Renewable Energy Laboratory, United States.

11:00 AM SF11.02.04

Discovery of the Novel Sustainable *n*-Type Thermoelectrics Zn_2NX ($X = \text{Cl, Br, I}$) by Anion Mutation of ZnO [Kieran B. Spooner](#); University College London, United Kingdom.

SESSION SF11.03: Synthesis and Characterization of Heteroanionic Materials II

Session Chairs: Kent Griffith and Anke Weidenkaff

Wednesday Afternoon, May 11, 2022

Hawai'i Convention Center, Level 3, 325A

1:30 PM *SF11.03.01

Low-Temperature Topochemical Reactions as a Route to Novel Mixed-Anion Materials [Michael Hayward](#); University of Oxford, United Kingdom.

2:00 PM SF11.03.02

***In Situ* Ammonolysis Reveals Pathway to Low Temperature Synthesis of High Surface Area Cubic Molybdenum Oxynitrides** [Elise Goldfine](#); Northwestern University, United States.

2:15 PM *SF11.03.03

Exploring the Relationship Between Local Bonding Preferences and Long Range Crystallographic Order [Patrick Woodward](#); Ohio State University, United States.

SESSION SF11.04: Poster Session: Heteroanionic Materials
Session Chairs: Steven May and James Rondinelli
Wednesday Afternoon, May 11, 2022
5:00 PM - 7:00 PM
Hawai'i Convention Center, Level 1, Kamehameha Exhibit Hall 2 & 3

SF11.04.01

High Performance and Surface Stability of Fe-Bi Heteroanionic Compounds for Electrocatalytic Oxygen Evolution Reaction [John Hong](#); Kookmin University, Korea (the Republic of).

SF11.04.02

Effect of Post-Deposition Fluorination Treatment on the Structure and Electrical Transport Properties of Epitaxial $\text{La}_{0.67}\text{Ca}_{0.33}\text{MnO}_{3-y}$ Thin Films [Benjamin Moore](#); Towson University, United States.

SESSION SF11.05: Heteroanionic Thin Films
Session Chair: Steven May
Thursday Morning, May 12, 2022
Hawai'i Convention Center, Level 3, 325A

10:30 AM *SF11.05.01

Designer Mixed-Anion Materials for Solar-Energy Harvesting and Fluoride-Ion Batteries [Rohan Mishra](#); Washington University in St. Louis, United States.

11:00 AM *SF11.05.02

Exploring Electronic Functionalities of Transition Metal Oxynitrides in Thin-Film Form [Tetsuya Hasegawa](#); Univ of Tokyo, Japan.

SESSION SF11.06: Energy Applications for Heteroanionic Materials
Session Chairs: Viktoria Falkowski and Julia Medvedeva
Thursday Afternoon, May 12, 2022
Hawai'i Convention Center, Level 3, 325A

3:30 PM SF11.06.01

Late-Transition Metal Oxynitrides: Overcoming Challenges by Leveraging Their Earlier Counterparts [Matthew Sweers](#); Northwestern University, United States.

3:45 PM SF11.06.02

$\text{Y}_2\text{Ti}_2\text{O}_5\text{S}_2$ —A Quasi-Layered Oxysulphide for Thermoelectric Energy Generation [Katarina Brlec](#); University College London, United Kingdom.

4:00 PM *SF11.06.03

Perovskite-Type Oxynitride Substitution Material [Anke Weidenkaff](#); Technical University of Darmstadt, Germany.

SESSION SF11.07: Synthesis and Characterization of Heteroanionic Materials III
Session Chairs: Oliver Clemens and Hiroshi Kageyama
Monday Morning, May 23, 2022
SF11-Virtual

10:30 AM *SF11.07.01

3D ED for Determining Anion Order, *Ex Situ* and *In Situ* [Joke Hadermann](#); Univ of Antwerp, Belgium.

11:00 AM *SF11.07.02

Tuning the Chemical and Physical Properties of Mixed-Anion Compounds [Simon Clarke](#); Univ of Oxford, United Kingdom.

11:30 AM *SF11.07.03

Designing Polar Mixed-Anion Materials [Emma E. McCabe](#); Durham University, United Kingdom.

SESSION SF11.08: Optical Properties of Heteroanionic Materials
Session Chair: Steven May
Monday Afternoon, May 23, 2022
SF11-Virtual

6:30 PM *SF11.08.01

Topochemical Synthesis of Mixed-Anion Oxide Epitaxial Thin Films [Akira Chikamatsu](#); Ochanomizu University, Japan.

7:00 PM *SF11.08.02

Metastable Layered Oxynitrides for Visible-Light Photocatalysis [Kazuhiko Maeda](#); Tokyo Inst of Technology, Japan.

7:30 PM *SF11.08.03

Pleochroism of the 5d oxychloride $\text{Ca}_3\text{ReO}_5\text{Cl}_2$ —A Unique Optical Property of the Mixed-Anion Compound [Daigorou Hirai](#); Institute for Solid State Physics, University of Tokyo, Japan.

8:00 PM SF11.08.04

Voltage Control of Patterned Properties in Lateral Oxide/Oxyfluoride Strontium Ferrate Heterostructures [Benjamin Lefler](#); Drexel University, United States.

8:15 PM SF11.08.05

Synthesis and Characterization of the New Phase of Ferric Hydroxide Intercalated with Heteroanionic Material [DaeBeom Lee](#); Korea university, Korea (the Republic of).

SESSION SF11.09: Oxynitrides and Catalysis
Session Chairs: Joke Hadermann and Houria Kabbour
Tuesday Morning, May 24, 2022
SF11-Virtual

10:30 AM *SF11.09.01

Nitride Tuning of Transition Metal Oxides [Amparo Fuertes](#); Institut de Ciència de Materials de Barcelona (CSIC), Spain.

11:00 AM *SF11.09.02

New High Oxidation State Transition Metal Nitrides [John P. Attfield](#); University of Edinburgh, United Kingdom.

11:30 AM *SF11.09.03

Structure and Composition Change in New Materials for Catalysis [Yoji Kobayashi](#); King Abdullah University of Science and Technology, Saudi Arabia.

SESSION SF11.10: Advanced Heteroanionic Materials
Session Chairs: Emma McCabe and James Rondinelli
Tuesday Afternoon, May 24, 2022
SF11-Virtual

1:00 PM *SF11.10.01

Design and Discovery of Multiple Anion Functional Materials—Synthesis, Structure, Computation and Machine Learning [Matthew Rosseinsky](#); University of Liverpool, United Kingdom.

1:30 PM *SF11.10.02

Electrochemistry Meets Oxyfluorides—The Alteration of Magnetic Properties via Battery Chemistry [Oliver Clemens](#); Uni Stuttgart, Germany.

2:00 PM *SF11.10.03

Designing New Superconductors with Mixed Anions [Alain Demourgues](#); ICMCB-CNRS-University of Bordeaux, France.

SYMPOSIUM SF12

Bioinspired Structural Composites—Advances in Experiments, Simulations and AI-Based Design
May 9 - May 25, 2022

Symposium Organizers

* Invited Paper

SESSION SF12.01: Biopolymers Driven Architected Materials—Design, Synthesis and Characterization I
Session Chairs: Hendrik Heinz and Dhriti Nepal
Monday Morning, May 9, 2022
Hilton, Mid-Pacific Conference Center, 6th Floor, South Pacific 4

10:30 AM *SF12.01.01

Bio-Enabled Functional Materials—From Ultrastrong Actuation to Photonic and Emissive Structures [Vladimir Tsukruk](#); Georgia Institute of Technology, United States.

11:00 AM *SF12.01.02

DNA-Programmed Assembly of Nanoparticle Superlattices with Dynamic and Tailorable Mechanical and Optical Phenomena [Robert J. Macfarlane](#); Massachusetts Institute of Technology, United States.

11:30 AM *SF12.01.03

Design, Interfacial Mechanics and Applications of Mussel-Inspired Polymers [Phillip B. Messersmith](#); University of California, Berkeley, United States.

12:00 PM SF12.01.04

Bioinspired Designed Interfaces Between Proteins and Inorganic Crystals for Templated Assembly and Co-Assembly [Sakshi Yadav](#); Pacific Northwest National Laboratory, United States.

SESSION SF12.02: Biopolymers Driven Architected Materials—Design, Synthesis and Characterization II
Session Chairs: Hendrik Heinz, Dhriti Nepal and Joshua Uzarski
Monday Afternoon, May 9, 2022
Hilton, Mid-Pacific Conference Center, 6th Floor, South Pacific 4

2:00 PM *SF12.02.02

Silk Based Nanocomposites with Tunable Mechanical Properties [David L. Kaplan](#); Tufts University, United States.

2:30 PM BREAK

3:00 PM SF12.02.03

In Situ Visualization of the Hierarchical Anisotropy of 3D Printed Lyotropic Liquid Crystals [Adrian Rodriguez-Palomo](#); Chalmers University of Technology, Sweden.

3:15 PM SF12.02.04

In Situ Characterizing the Conformational Modulation of R-Bodies, a pH-Dependent Force Generator in Bacteria [Shuai Zhang](#)^{1,2}; ¹University of Washington, United States; ²Pacific Northwest National Laboratory, United States.

3:30 PM SF12.02.05

Toward Ordered Materials Based on Self-Assembled Iridescent *Cellulophaga lytica* (*C. lytica*) Biofilms [Kennedy Brown](#); AFRL, United States.

3:45 PM SF12.02.06

Evolutionary Origin of Silk Material Hierarchy [Ori Brookstein](#); Weizmann Institute of Science, Israel.

SESSION SF12.03: Poster Session: Bioinspired Structural Composites—Advances in Experiments, Simulations and AI-Based Design
Session Chairs: Hendrik Heinz, Dhriti Nepal, Bret Rogers and Vikas Varshney
Monday Afternoon, May 9, 2022
5:00 PM - 7:00 PM
Hawai'i Convention Center, Level 1, Kamehameha Exhibit Hall 2 & 3

SF12.03.01

Additive Manufacturing of Drag Reducing Synthetic Surfaces Inspired by Shark Denticles [Daniel D. Lim](#); University of California, Berkeley, United States.

SF12.03.02

Metallic Open Channel Colloidal Superlattices [Yuanwei Li](#); Northwestern University, United States.

SF12.03.03

Oriented Self-Assembly of Natural Photosystems with Surface Modified Carbon Nitride Nanosheets for Efficient Photoconversion [Nyeongbeen Jo](#); Korea Advanced Institute of Science and Technology, Korea (the Republic of).

SF12.03.04

The Intrinsically Disordered Worm Jaw Protein, Nvjp-1—A Liquid-liquid Phase Separated Material for Advanced Applications [Sanaz Farajollahi](#)^{1,2}; ¹UES, United States; ²Air Force Research Laboratory, United States.

SF12.03.05

Bioinspired Structured Chitosan/Silica Composites for Passive Radiative Daytime Cooling [Tobias Lauster](#); University of Bayreuth, Germany.

SF12.03.06

Bioinspired Nanocomposites for Next-Generation Batteries [Ahmet Emre](#); University of Michigan, United States.

SF12.03.07

Design of Functionally Graded Bioinspired Pillar Adhesives Using Bayesian Optimization [Maya Horii](#); University of California, Berkeley, United States.

SF12.03.08

Facile, Energy Efficient Microscale Fibrillation of Polyacrylamides under Ambient Conditions [Menandro Cruz](#); University of Cambridge, United Kingdom.

SF12.03.09

Active Anti-Icing and De-Icing Surface Based on Magneto-Responsive Photothermal Composite Cilia [Jaeil Kim](#); Ulsan National Institute of Science and Technology, Korea (the Republic of).

SF12.03.10

From Spectroscopy Image to Mechanical Properties—Customizable Characterization Platform for Multiscale Structural Materials Using the Image-Particle Converter and GPU-Accelerated Lattice Spring Model [Yuan Chiang](#); National Taiwan University, Taiwan.

SF12.03.11

3D Nano-Writing of Biopolymers [Un Yang](#); Pohang University of Science and Technology, Korea (the Republic of).

SF12.03.12

Hydrogel-Shelled Photonic Microbeads for Structural-Color Inks [Seong Kyeong Nam](#); Korea Advanced Institute of Science and Technology, Korea (the Republic of).

SF12.03.14

Protein-Based Adhesives for Biocomposites [Joseph Slocik](#)^{2,1}; ¹Air Force Research Laboratory, United States; ²UES, Inc., United States.

SF12.03.15

Flow-Assisted Chiral Self-Assembly in 3D Printed Constructs [Mohsen Esmaili](#); University of South Carolina, United States.

SF12.03.17

Substrate-Mediated Colloidal Assembly for Templating Bio-Inspired Structural Color [Bianca C. Datta](#); Massachusetts Institute of Technology, United States.

SESSION SF12.04: Self Assembly of Interphase Tailored Nanostructures—Advanced Characterization I

Session Chairs: Ken Caster, Hendrik Heinz and Dhriti Nepal

Tuesday Morning, May 10, 2022

Hilton, Mid-Pacific Conference Center, 6th Floor, South Pacific 4

8:00 AM *SF12.04.01

Polymer-Grafted, Layered Transition Metal Dichalcogenide for Nano-Laminates and Nano-Composites [Richard A. Vaia](#); Air Force Research Laboratory, United States.

8:30 AM *SF12.04.02

Ideas for Creating Impact Resistant Polymeric Materials by Tuning Molecular Topology [Sinan Keten](#); Northwestern University, United States.

9:00 AM *SF12.04.03

A New Computational Method (CREASE) for Analyzing Small Angle Scattering Profiles from Macromolecular Materials [Arthi Jayaraman](#); University of Delaware, United States.

9:30 AM *SF12.04.04

Using AI to Unlock Nature's Secrets to Design Mechanical Metamaterials [Catherine Brinson](#); Duke University, United States.

10:00 AM SF12.05.03

Establishing the Rules for the Organization and Crystallization of Colloidal Anisotropic Nanoparticles [Wenjie Zhou](#); Northwestern University, United States.

SESSION SF12.05: Self Assembly of Interphase Tailored Nanostructures—Advanced Characterization II

Session Chairs: Hendrik Heinz, Dhriti Nepal and Joshua Uzarski

Tuesday Afternoon, May 10, 2022

Hilton, Mid-Pacific Conference Center, 6th Floor, South Pacific 4

1:45 PM *SF12.05.01

Smart Polymer Interfaces—From Biologically Inspired to Biologically Applied Designs [Rana Ashkar](#)^{1,2}; ¹Virginia Tech, United States; ²Virginia Tech, United States.

2:15 PM SF12.05.04

Rapid Synchronized Fabrication of Vascularized Thermosets and Composites [Mayank Garg](#)^{1,2}; ¹University of Illinois at Urbana-Champaign, United States; ²University of Illinois at Urbana-Champaign, United States.

2:30 PM SF12.05.05

SAXS/WAXS and SANS Studies in Crystalline Polymers and Numerical Simulation [Yingrui Shang](#); Oak Ridge National Laboratory, United States.

SESSION SF12.13: Poster Session II

Tuesday Afternoon, May 10, 2022

5:00 PM - 7:00 PM

Hawai'i Convention Center, Level 1, Kamehameha Exhibit Hall 2 & 3

SF12.03.13

Tailoring Structure and Biofunctionality of Low-Density Nanocellulose Aerogels [Jowan Rostami](#); KTH Royal Institute of Technology, Sweden.

SESSION SF12.06: Mechanics of Biomaterials and Composites—Coupling Modeling to Experiments I

Session Chairs: Hendrik Heinz, Dhriti Nepal and Vikas Varshney

Wednesday Morning, May 11, 2022

Hilton, Mid-Pacific Conference Center, 6th Floor, South Pacific 4

8:30 AM *SF12.06.01

Correlative Nanoscale Spectroscopy of Nanocomposites at the Extreme Limits of Molecular-scale Confinement [Reinhold H. Dauskardt](#); Stanford University, United States.

9:00 AM *SF12.06.02

Strength and Fatigue versus Morphology of Nanotubes Assemblies—Computer-Simulated [Boris I. Yakobson](#); Rice University, United States.

9:30 AM *SF12.06.03

Multiscale, Multiphysics Simulation Meets AI-Based Science for Advanced Materials Design [Peter Coveney](#); University College London, United Kingdom.

10:00 AM BREAK

10:30 AM *SF12.06.04

Atomic-Scale Hybrid Materials Design for Structural and Other Functionalities [Ajit K. Roy](#); Air Force Research Laboratory, United States.

11:00 AM SF12.06.05

The Interplay Between Thermal Transport and Bio-Inspired Structural Materials [Zhiting Tian](#); Cornell University, United States.

SESSION SF12.07: Mechanics of Biomaterials and Composites—Coupling Modeling to Experiments II

Session Chairs: Hendrik Heinz, Dhriti Nepal and Ming-Jen Pan

Wednesday Afternoon, May 11, 2022

Hilton, Mid-Pacific Conference Center, 6th Floor, South Pacific 4

2:00 PM *SF12.07.01

Biological Blueprints For Architected Impact Resistant Materials [David Kisailus](#); University of California, Irvine, United States.

2:30 PM BREAK

3:00 PM *SF12.07.04

Characterization of fl-CNT/Polymer Composite Material Interfaces—Molecular Dynamics Studies [Gregory Odegard](#); Michigan Technological University, United States.

3:30 PM SF12.07.05

Towards Electric Wings: Bio-inspired Tree-Root-Like interface for Structural Batteries [Yuan Yang](#); Columbia University, United States.

3:45 PM SF12.07.06

Machine Learning for Carbon Nanotube Yarn Mechanical Properties [Jordan Winetroun](#); University of Colorado, Boulder, United States.

4:00 PM SF12.07.07

Bio-Inspired Mode-I Fracture and Fatigue Crack Healing in CFRP Composites Using Thermoplastic Healants [Samit Roy](#); University of Alabama, United States.

SESSION SF12.08: Nature Inspired Dynamic Composites

Session Chairs: Chris Crouse, Ming-Jen Pan and Bret Rogers

Thursday Morning, May 12, 2022

Hilton, Mid-Pacific Conference Center, 6th Floor, South Pacific 4

8:30 AM SF12.08.01

3D Printing High-Performance Nanocellulose and Chitosan Composites—The Importance of Nanostructuring and Complexation [Rigoberto C. Advincula](#)^{1,2,3}; ¹Case Western Reserve University, United States; ²The University of Tennessee, Knoxville, United States; ³Oak Ridge National Laboratory, United States.

8:45 AM SF12.08.02

Musculoskeletal System-Mimetic Nanocomposite Robots for Agile and Multimodal Magnetic Swimming [Jeong Jae Wie](#); Inha University, Korea (the Republic of).

9:00 AM SF12.08.03

Creation of Bio-Functional Plastics with Renewable Surfaces [Joseph Slocik](#); Air Force Research Laboratory, United States.

9:15 AM SF12.08.04

WITHDRAWN 5/8/22 SF12.08.04 Cellulose-hemicellulose-lignin Interaction in Coconut Endocarp [Ning Zhang](#); University of Alabama, United States.

9:30 AM SF12.08.05

From Diatom Frustule to the Design of Novel Bioinspired Lightweight Materials [Flavia Libonati](#); University of Genoa, Italy.

9:45 AM SF12.08.06

Development of Anisotropic Triple Network Hydrogels with Superior Mechanical and Adhesive Properties for Artificial Tendon [Suji Choi](#); Sungkyunkwan University, Korea (the Republic of).

10:00 AM SF12.08.07

Morphing Capabilities and Processing Susceptibility of Vitrimers and Vitriemer Nanocomposites [Amber M. Hubbard](#); Air Force Research Laboratory, United States.

SESSION SF12.09: Panel Discussion: Bioinspired Structural Composites—Advances in Experiments, Simulations and AI Based Design

Session Chairs: Hendrik Heinz and Dhriti Nepal

Thursday Afternoon, May 12, 2022

Hilton, Mid-Pacific Conference Center, 6th Floor, South Pacific 4

1:30 PM OPENING INTRODUCTION OF TOPICS, POINTS OF DISCUSSION AND PANEL EXPECTATIONS

1:35 PM PANEL INTRODUCTIONS

1:40 PM PANELIST'S OVERVIEW

2:05 PM *SF12.09.01

PANEL DISCUSSION: Bioinspired Structural Composites—Advances in Experiments, Simulations and AI Based Design [Carole C. Perry](#); Nottingham Trent University, United Kingdom.

2:55 PM CLOSING REMARKS

3:00 PM BREAK

SESSION SF12.10: Open Forum: Collaboration and Partnership Opportunities

Session Chairs: Hendrik Heinz and Dhriti Nepal

Thursday Afternoon, May 12, 2022

Hilton, Mid-Pacific Conference Center, 6th Floor, South Pacific 4

3:30 PM INTRODUCTIONS OF THE PANELISTS

3:35 PM *SF12.10.01

Program Overviews by each Panelist [Birgit Schwenzer](#); National Science Foundation, United States.

4:05 PM Q&A WITH AUDIENCE

SESSION SF12.11: General Session I

Session Chairs: Hendrik Heinz, Dhriti Nepal, Carole Perry and Emilie Siochi

Wednesday Afternoon, May 25, 2022

SF12-Virtual

1:00 PM *SF12.11.01

Bioinspired Assembly of Peptide and DNA-Based Nanostructures [George C. Schatz](#); Northwestern University, United States.

1:30 PM *SF12.11.02

Biomimetic Colour Engineering from Nature to Applications [Silvia Vignolini](#); University of Cambridge, United Kingdom.

2:00 PM SF12.11.03

Statistical Field Theory for the Free Energy of an Electro-Mechanical Polymer Chain—Non-Local Dipole-Dipole Interactions in the Fixed Applied Field Ensemble [Pratik Khandagale](#); Carnegie Mellon University, United States.

2:15 PM SF12.11.04

WITHDRAWN 5/17/22 SF12.11.04 Mean-Field Approximation of Orientational Potentials in Lipid Membranes [Abhinav Ramkumar](#); Purdue University, United States.

2:20 PM SF12.11.05

Modifying Composite Interfaces to Maximise Physical Performance and Functionality [Luke Henderson](#); Deakin University, Australia.

2:35 PM SF12.11.06

Non-destructive Hardness Prediction via Deep Learning Image Regression Models [Andrew Lew](#); Massachusetts Institute of Technology, United States.

2:40 PM SF12.11.07

Self-assembled Crystalline Diblock Copolypeptoid Nanostructures Revealed by 3D Cryogenic Electron Microscopy [Tianyi Yu](#); Lawrence Berkeley National Lab, United States.

States.

SESSION SF12.12: General Session II
Session Chairs: Hendrik Heinz, Dhriti Nepal, Carole Perry and Emilie Siochi
Wednesday Afternoon, May 25, 2022
SF12-Virtual

6:30 PM *SF12.12.01

Graph Theoretical Descriptors for Biomimetic Nanoparticles and Fibrous Nanocomposites [Nicholas A. Kotov](#); University of Michigan, United States.

7:00 PM *SF12.12.02

WITHDRAWN 5/17/22 SF12.12.02 Hierarchical Architectures Based on 2D Materials and 3D Printing [Pulickel Ajayan](#); Rice University, United States.

7:30 PM SF12.12.03

Direct Writing of Structurally Colored 2D Graphics and 3D Objects Using Colloidal Inks [Jong Bin Kim](#); Korea Advanced Institute of Science and Technology, Korea (the Republic of).

7:45 PM SF12.12.04

Hierarchically Porous Stimuli-Responsive Chitosan/MXene (Ti₃C₂T_x) Foams by Two-Step Crosslinking Mechanism [Stephanie K. Lee](#); Sungkyunkwan University, Korea (the Republic of).

7:50 PM SF12.07.03

Investigating Interfaces in the Cell Wall of Fast-Growing Plant for Next-Generation Composites [Anamika Prasad](#); South Dakota State University, United States.

SYMPOSIUM SF13

From Actuators and Energy Harvesting Storage Systems to Living Machines
May 9 - May 24, 2022

Symposium Organizers

* Invited Paper

SESSION Tutorial SF13.00: Soft Actuators and Robotic Systems for Living Machines
Session Chairs: Muhammad Farhan, Andreas Lendlein, Yue Liu and Fabian Meder
Monday Morning, May 23, 2022
SF13-Virtual

8:30 AM

Soft Actuators Muhammad Farhan; Helmholtz Zentrum Hereon, Germany.

9:30 AM Q&A

9:45 AM

In-Situ Characterization by Atomic Force Microscopy Yue Liu; Helmholtz-Zentrum Geesthacht, Germany.

10:45 AM Q&A

11:00 AM

Energy Conversion in Living Plants Fabian Meder; Italian Institute of Technology, Italy.

SESSION SF13.01: Soft Actuators I
Session Chairs: Kris L. Dorsey and Ruike Renee Zhao
Monday Morning, May 9, 2022
Hilton, Kalia Conference Center, 2nd Floor, Hibiscus 1

10:30 AM *SF13.01.01

Soft Energy Harvesters and Actuators Using Liquid Metal Michael Dickey; North Carolina State University, United States.

11:00 AM SF13.01.02

Multifunctional Magnetic Origami Robots Ruike Renee Zhao; Stanford University, United States.

11:15 AM *SF13.01.03

Programming Intelligence in Liquid Crystal Elastomer Composites: From Actuation to Energy Harvesting Shu Yang; University of Pennsylvania, United States.

SESSION SF13.02: Soft Actuators II
Session Chairs: Andreas Lendlein and Pablo Valdivia y Alvarado
Monday Afternoon, May 9, 2022
Hilton, Kalia Conference Center, 2nd Floor, Hibiscus 1

3:00 PM *SF13.02.01

Applications of Large Strain Near Phase Instabilities in Relaxor Ferroelectric Single Crystals Christopher Lynch; University of California, Riverside, United States.

3:30 PM SF13.02.02

Light-Triggered Temperature-Responsive Hydrogel Actuator Reinforced with Bacterial Cellulose for Soft Robotics Dachwan Park^{3, 1}; ¹Sungkyunkwan University, Korea (the Republic of); ³University of Pennsylvania, United States.

3:45 PM SF13.02.03

Printable and Self-Healing Gelatin Conductive Ink for Dielectric Elastomer Actuators and Strain Sensors Geonoh Choe; Korea National University of Transportation, Korea (the Republic of).

4:00 PM SF13.02.04

Sequential Coupling of Functions in Hydrogels Enables Shape-Memory Hydrogels with pH, Enzyme- or an Inverse Temperature Sensitivity Marc Behl; Helmholtz-Zentrum hereon, Germany.

4:15 PM SF13.02.05

Nanowire-Forest Grown Shape Memory Alloy for Fast Actuation and Its Application to Bio-Inspired Robotics [Saewoong Oh](#); KAIST, Korea (the Republic of).

4:30 PM SF13.02.06

Sensitive Multi-Stimuli Responsive Actuating Films Driven by Submolecular Switching [Michael Leveille](#); University of California, Merced, United States.

SESSION SF13.03: Biomaterials/Devices
Session Chairs: Andreas Lendlein and Ruike Renee Zhao
Tuesday Morning, May 10, 2022
Hilton, Kalia Conference Center, 2nd Floor, Hibiscus 1

9:00 AM *SF13.03.01

Smart 3D Microtechnologies for Biology and Human Health [David H. Gracias](#); Johns Hopkins University, United States.

9:30 AM SF13.03.02

Motion-Activated Zn-Air Battery as a Power Supply to Smart Contact Lenses [Erfan Pourshaban](#); University of Utah, United States.

9:45 AM SF13.03.03

Soft Matter Actuators for Muscle-Replacement Applications [Ben Baker](#); University of Bristol, United Kingdom.

10:00 AM BREAK

10:30 AM SF13.03.04

Manipulation and Assembly of Anisotropic Nanoparticles with Ultrahigh Precision and Versatility in Both Position and Angle Control [Huaizhi Li](#); The University of Texas at Austin, United States.

10:45 AM *SF13.03.05

Biodegradable and Biocompatible Actuators for Soft and Biohybrid Robotics [Victoria Webster-Wood](#); Carnegie Mellon University, United States.

SESSION SF13.04: Biomaterials/Devices and Energy Harvesting
Session Chairs: Kris L. Dorsey and Pablo Valdivia y Alvarado
Tuesday Afternoon, May 10, 2022
Hilton, Kalia Conference Center, 2nd Floor, Hibiscus 1

1:30 PM *SF13.04.01

Bone-Inspired Autonomously Reinforcing and Damage-Mitigating Materials [Sung Hoon Kang](#); Johns Hopkins University, United States.

2:00 PM SF13.04.02

Polarization-Induced Polymer Dielectric Layers for Multifunctional Triboelectric Applications with Self-Healing and High-Performance [Minsoo Kim](#); Ulsan National Institute of Science and Technology, Korea (the Republic of).

2:15 PM SF13.04.03

Advanced Traffic and Security Systems with Facile Spray-Coating Based Triboelectric Nanogenerator [Jonghyeon Yun](#); Kyung Hee University, Korea (the Republic of).

2:30 PM BREAK

3:00 PM *SF13.04.04

Piezoelectric Fibers [Philippe Poulin](#); University of Bordeaux, France.

3:30 PM SF13.04.05

Hybrid Energy Harvester Utilizing Dual Stimulus of Temperature and Humidity Enabled by Thermoelectric and Hydrons [Hyesu Han](#); Korea University, Korea (the Republic of).

SESSION SF13.05: 3D/4D-Printing
Session Chairs: Kris L. Dorsey and Ruike Renee Zhao
Wednesday Morning, May 11, 2022
Hilton, Kalia Conference Center, 2nd Floor, Hibiscus 1

8:30 AM *SF13.05.01

Multimaterial 3D/4D Printing for Functional Composites [Hang \(Jerry\) Qi](#); Georgia Inst of Technology, United States.

9:00 AM SF13.05.02

Freeform Liquid 3D-Printing of Silicone/Epoxy Hybrid Resins for the Fabrication of Functionally Graded Materials Applied to Soft Robotics [Theo Calais](#); Singapore University of Technology and Design, Singapore.

9:15 AM SF13.05.03

Spinodal Metamaterials as Pneumatic Actuators for Complex Shape Morphing [Andreas Walker](#); ETH Zurich, Switzerland.

9:30 AM *SF13.05.04

New Materials and Approaches for 2D and 3D Printing of Responsive Objects [Shlomo Magdassi](#); Hebrew Univ of Jerusalem, Israel.

10:00 AM BREAK

10:30 AM SF13.05.05

Nanostructured Layers and 4D Printed Materials—Scalable Stimuli-Responsive Functionality [Rigoberto C. Advincula](#)^{1,2,3}; ¹Case Western Reserve University, United States; ²The University of Tennessee, Knoxville, United States; ³Oak Ridge National Laboratory, United States.

10:45 AM DISCUSSION TIME**11:00 AM SF13.05.07**

Computational Design of 4D Printed Tunable Pneumatic Valves [Joël N. Chapuis](#); ETH Zürich, Switzerland.

11:15 AM SF13.05.08

Tunable Silicone/Epoxy Hybrid Resins for the Fabrication of Functionally Graded Materials Applied to Flying Devices [Theo Calais](#); Singapore University of Technology and Design, Singapore.

SESSION SF13.06: Plants

Session Chairs: Andreas Lendlein and Ruike Renee Zhao

Wednesday Afternoon, May 11, 2022

Hilton, Kalia Conference Center, 2nd Floor, Hibiscus 1

1:30 PM *SF13.06.01

Developmental Themes of a Climbing Cactus—A Bio-Inspired Approach for New Actuator Technologies [Patricia Soffiatti](#)^{1,2}; ¹FEDERAL UNIVERSITY OF PARANÁ STATE, Brazil; ²Botany & Plant Modelling - AMAP, France.

2:00 PM *SF13.06.02

Nature-Derived Multifunctional Materials and Nature-Inspired Designs [Hongli Zhu](#); Northeastern University, United States.

2:30 PM *SF13.06.03

From Plants and Soft Animals—Lessons for a New Generation of Living Machines [Barbara Mazzolai](#); Istituto Italiano di Tecnologia, Italy.

3:00 PM SF13.05.06

Micropatterned 2D Pyrolytic Carbon Microlattices Fabricated via Stereolithography [Akira Kudo](#); Tohoku University, Japan.

SESSION SF13.07: Poster Session: From Actuators and Energy Harvesting Storage Systems to Living Machines

Session Chairs: Andreas Lendlein and Pablo Valdivia y Alvarado

Wednesday Afternoon, May 11, 2022

5:00 PM - 7:00 PM

Hawai'i Convention Center, Level 1, Kamehameha Exhibit Hall 2 & 3

SF13.07.01

Programmable Mechanical Properties in Dynamic Reaction-Induced Phase Separated Thia-Michael Networks [Nicholas Boynton](#); University of Chicago, United States.

SF13.07.03

Shear Thickening Fluid-Based Robust and Flexible Triboelectricity-Based Harvesting System for Impact Force Sensor [Youngsu Kim](#); Kyung Hee University, Korea (the Republic of).

SF13.07.04

Self-Powered Finger Motion-Sensing Structural Color Display [Kim T. Bin](#); Yonsei University, Korea (the Republic of).

SF13.07.05

Light-Actuated Anisotropic Microactuators from CNT/Hydrogel Nanocomposites [Aoife Gregg](#); University of Cambridge, United Kingdom.

SF13.07.06

Working Fluid Enhancement for a Solar Water Heater System towards Hawaii with Nanofluids [Takuya P. Wise](#); University of Hawaii at Manoa, United States.

SF13.07.07

Retention and Deformation of the Blue Phases in Liquid Crystalline Elastomers [Kyle Schlafmann](#); University of Colorado - Boulder, United States.

SF13.07.08

Solid-State Tunable Thermal Energy Storage for Building Envelopes [Shuang Cui](#)^{1,2}; ¹The University of Texas at Dallas, United States; ²National Renewable Energy Laboratory, United States.

SESSION SF13.08: General Session I

Session Chairs: Kris L. Dorsey and Ruike Renee Zhao

Tuesday Morning, May 24, 2022

SF13-Virtual

8:00 AM *SF13.08.01

Material-Form-Scale Effects of Shape Memory Alloy (SMA) Actuators [Sung-Hoon Ahn](#); Seoul National University, Korea (the Republic of).

8:30 AM *SF13.08.02

Long-Life-Cycle and Damage-Recovery Artificial Muscles via Controllable and Observable Self-Clearing Process [Huichan Zhao](#); Tsinghua University, China.

9:00 AM SF13.08.03

Synthesis and Characterisation of Multifunctional Ba_{0.95}Ca_{0.05}Sn_{0.09}Ti_{0.91}O₃ Ceramic [Pravin F. Varade](#); Indian Institute of Technology Bombay, India.

9:15 AM SF13.08.04

Improving the Durability of Soft EPIC Actuators by Modifying Their Viscoelastic Properties by Using a Skin-Inspired Hybrid Polymer Film [Hyunwoo Kim](#); Korea Advanced Institute of Science and Technology, Korea (the Republic of).

9:30 AM *SF13.08.05

Fabrication of 4D Multifunctional Living Systems [Peer Fischer](#)^{1,2}; ¹Max Planck Institute, Germany; ²Universität Stuttgart, Germany.

10:00 AM SF13.07.02

High Piezoelectric Characteristic of SnS₂/SnS Heterostructure for Piezoelectric Nanogenerator [Minje Kim](#); Chungnam National University, Korea (the Republic of).

SESSION SF13.09: General Session II

Session Chair: Kris L. Dorsey

Tuesday Afternoon, May 24, 2022

SF13-Virtual

1:00 PM *SF13.09.01

Soft Matter Transducers for Wearable Energy Harvesting & Power [Carmel Majidi](#); Carnegie Mellon University, United States.

1:30 PM SF13.09.02

Actuating Micro-Bowls with a Temperature-Memory [Yue Liu](#)^{1,2}; ¹Helmholtz-Zentrum Hereon, Germany; ²University of Potsdam, Germany.

1:45 PM SF13.09.03

Magnetoelectric Coupling in Inorganic/Organic Hybrid Composite Thin Films [Muiréann A. de hOra](#); University of Cambridge, United Kingdom.

1:50 PM SF13.09.04

Origami Hand for Soft Robotics Driven by Thermally Controlled Polymeric Fiber Actuators [Muhammad Farhan](#); Helmholtz-Zentrum Hereon, Germany.

2:05 PM *SF13.09.05

Computational Design of Thermo-Responsive Hydrogel Crawlers [Thao Nguyen](#); Johns Hopkins Univ, United States.

SYMPOSIUM SF14

Novel Frontiers in 3D and 4D Multi-Photon Micro-Fabrication—Materials, Methods and Applications
May 9 - May 24, 2022

Symposium Organizers

* Invited Paper

SESSION SF14.01: New Materials and Technologies I
Session Chairs: Larisa Florea and Virgilio Mattoli
Monday Afternoon, May 9, 2022
Hilton, Kalia Conference Center, 2nd Floor, Hibiscus 2

1:30 PM *SF14.01.01

3D/4D Two-Photon and Two-Step Laser Nanoprinting—Recent Progress Martin Wegener; Karlsruhe Institute of Technology, Germany.

2:00 PM SF14.01.02

3D Fabrication of PEDOT:PSS Containing Microstructures via Two-Photon Polymerization Jason Delente; School of Chemistry & AMBER, The SFI Research Centre for Advanced Materials and BioEngineering Research, Trinity College Dublin, Ireland.

2:15 PM SF14.01.03

Additive Manufacturing of 3D ZrO₂:Eu³⁺ Luminescent Microstructures Jedrzej P. Winczewski; University of Twente, Netherlands.

2:30 PM SF14.01.04

Analyzing the Interior of 3D Polymer Nanostructures by SEM Imaging of Ultrathin Sections Irene U. Wacker; University of Heidelberg, Germany.

2:45 PM BREAK

3:15 PM *SF14.01.05

3D Printing of Highly Stretchable Hydrogel with Diverse UV Curable Polymers Qi Ge; Southern University of Science and Technology, China.

3:45 PM SF14.01.06

Characterization of Radical-Mediated and [2+2] Cycloaddition Photocrosslinking of Maleimide Monomers and Macromers Bruce E. Kirkpatrick; University of Colorado Boulder, United States.

4:00 PM SF14.01.07

3D Printing of Ultra-Strong and Hierarchically Porous Nanoarchitectures Using Nanocluster-Based Photoresists Qi Li; Stanford University, United States.

4:15 PM *SF14.01.08

4D Elastic Microstructures for Robotics and Integrated Photonics Sara Nocentini^{1,2}; ¹National Institute for Metrological Research, Italy; ²European Laboratory for Nonlinear Spectroscopy, Italy.

SESSION SF14.02: Applications I
Session Chairs: Shlomo Magdassi and Martin Wegener
Tuesday Morning, May 10, 2022
Hilton, Kalia Conference Center, 2nd Floor, Hibiscus 2

9:00 AM SF14.02.02

Multiphoton Applications in Laser-Fusion Research—From Printing Fusion-Fuel Targets with Sub-150-nm Features to Acquiring Three-Dimensional Structural and Elemental Information of the Target David Harding^{1,2}; ¹University of Rochester, United States; ²University of Rochester, United States.

9:15 AM SF14.02.03

Two-Photon 3D Printing of Hydrophobic Membranes to Control Gas-Liquid-Solid Interfaces Xiaoxing Xia; Lawrence Livermore National Laboratory, United States.

9:30 AM SF14.02.04

Fabrication of Shells and Foams via Two-Photon Polymerization for Laser-Fusion Experiments Sarah M. Fess; University of Rochester, United States.

9:45 AM SF14.02.05

Coupling Quantum Emitters into Single Mode Fibers Using Femtosecond 3D Printing Harald Giessen; University of Stuttgart, Germany.

10:00 AM BREAK**10:30 AM SF14.02.06**

Direct Laser Writing and Wet Metallization of Bioinspired Artificial Bacterial Flagella [Roberto Bernasconi](#); Politecnico di Milano, Italy.

10:45 AM SF14.02.07

Biomimetic Super-Hydrophobic Surfaces Patterned via 3D Laser Lithography [Omar Tricinci](#); Center for Materials Interfaces, Istituto Italiano di Tecnologia, Italy.

11:00 AM SF14.02.08

Direct Laser Writing of Bioinspired Architectures with Novel Polysaccharide-Based Photoresists [Maximilian Rothhammer](#); Technische Universität München, Germany.

SESSION SF14.03: New Materials and Technologies II/Panel Discussion: Future Directions/Opportunities of Multi-Photon Microfabrication

Session Chairs: Harald Giessen and Sara Nocentini

Tuesday Afternoon, May 10, 2022

Hilton, Kalia Conference Center, 2nd Floor, Hibiscus 2

1:30 PM *SF14.03.01

Determining the Order of Absorption in Multiphoton Photoresists [John T. Fourkas](#); University of Maryland, United States.

2:00 PM SF14.03.02

Living Microstructures by Combining Laser Printing and Dynamic Covalent Exchange of Alkoxyamines [Manuel Tsotsalas](#); KIT, Germany.

2:15 PM SF14.03.03

Photonic Micro-Actuators [Larisa Florea](#); Trinity College Dublin, Ireland.

2:30 PM SF14.03.04

Dual Networks Polymer Structures with Functional and Mechanical Gradients for Direct Laser Writing (DLW) [Giovanni Fortunato](#); Rijksuniversiteit Groningen, Netherlands.

2:45 PM SF14.03.05

Transfer Technique of Direct Laser Written Micro-Structures on Complex Surfaces via Ultrathin Films Handling [Andrea Ottomaniello](#); Istituto Italiano di Tecnologia, Italy.

3:00 PM BREAK**3:30 PM SF14.03.06**

Direct Laser Writing of Bioinspired Functional Materials [Colm B. Delaney](#); Trinity College Dublin, Ireland.

3:45 PM SF14.03.07

Fabrication and Design of 4D Hydrogel Microstructures Displaying Reversible Sugar Induced Actuation [Alexa Ennis](#); Trinity College Dublin, the University of Dublin, Ireland.

4:00 PM PANEL DISCUSSION: FUTURE DIRECTIONS/OPPORTUNITIES OF MULTI-PHOTON MICROFABRICATION

SESSION SF14.04: Applications II

Session Chairs: Eva Blasco and Larisa Florea

Wednesday Afternoon, May 11, 2022

Hilton, Kalia Conference Center, 2nd Floor, Hibiscus 2

2:00 PM SF14.04.02

Two-Photon Printing of Glassy Metasurfaces with Circular Dichroic Memory [Madelyn P. Jeske](#); University of Rochester, United States.

2:15 PM SF14.04.03

Novel Active Three-Dimensional (3D) Tunable Spiral Zone Plate Fabricated Using Femtosecond Pulse Direct Laser Writing (fs-DLW) [Saurabh Awasthi](#); University of Connecticut, United States.

2:30 PM SF14.04.04

Scalable Fabrication of Nanolattices Enabled by Metasurface Based 3D Interference Lithography [Matias Kagias](#); California Institute of Technology, United States.

SESSION SF14.05: Poster Session: Novel Frontiers in 3D and 4D Multi-Photon Micro-Fabrication—Materials, Methods and Applications

Session Chairs: Eva Blasco and Virgilio Mattoli

Wednesday Afternoon, May 11, 2022

5:00 PM - 7:00 PM

Hawai'i Convention Center, Level 1, Kamehameha Exhibit Hall 2 & 3

SF14.05.02

Post-Functionalization of Photocured Microstructures by Living Polymerization [Frank M. Den Hoed](#)^{1,2}; ¹University of Groningen, Netherlands; ²Istituto Italiano di Tecnologia, Italy.

SF14.05.03

Direct Laser Writing of Silica Nanoparticle Composites for Mechanical Reinforcement of Hydrogel Networks [Amrutha Augustine](#); Trinity College Dublin, The University of Dublin, Ireland.

SF14.05.04

3D Coherent Anti-Stokes Raman Scattering (CARS) Imaging of Fuel Capsules Used for Laser-Direct-Drive Inertial Confinement Fusion [Xi Huang](#); Univ of Nebraska, United States.

SF14.05.05

3D Printing of Millimeter-Scale Nanostructured Foam Targets for Laser-Direct-Drive Inertial Confinement Fusion [Peixun Fan](#); Univ of Nebraska, United States.

SESSION SF14.06: New Materials and Technologies III

Session Chairs: Eva Blasco and Virgilio Mattoli

Tuesday Morning, May 24, 2022

SF14-Virtual

10:30 AM *SF14.06.01

The Importance of Dedicated Resins in 3D Microfabrication and Their Applications [Benjamin Richter](#); Nanoscribe GmbH & Co. KG, Germany.

11:00 AM SF14.06.03

4D Printed Programmable Structures [Christoph A. Spiegel](#)^{1, 2, 3}; ¹Heidelberg University, Germany; ²Heidelberg University, Germany; ³Karlsruhe Institute of Technology, Germany.

11:15 AM *SF14.06.04

Light-Based Additive Manufacturing for Applications in Photonics, Biomedicine and Photocatalysis [Maria Farsari](#); FORTH/IESL, Greece.

11:45 AM *SF14.04.01

3D Printed Microoptics—State of the Art and Future Challenges [Harald Giessen](#); University of Stuttgart, Germany.

SESSION SF14.07: New Materials and Technologies IV

Session Chairs: Eva Blasco and Virgilio Mattoli

Tuesday Afternoon, May 24, 2022

SF14-Virtual

1:00 PM *SF14.07.01

Dynamic Photoresists for Precision 3D Laserlithography Based on Wavelength Resolved Photochemistry [Christopher Barner-Kowollik](#); Queensland University of Technology, Australia.

1:30 PM SF14.07.02

Direct Laser Writing of Complex 3D Ag Nanoparticle Patterns Inside Prefabricated Polymer Microstructures [Luisa Lavelle](#); Trinity College Dublin, Ireland.

SYMPOSIUM SF15

Thermal Processes and Management Under Unconventional Conditions
May 9 - May 24, 2022

Symposium Organizers

* Invited Paper

SESSION SF15.01: Thermal Properties in 2D Materials I
Session Chairs: Roman Anufriev and Michael Pettes
Monday Morning, May 9, 2022
Hawai'i Convention Center, Level 3, 309

10:30 AM *SF15.01.01
Thermal Transport in Layered Materials and Devices [Eric Pop](#); Stanford University, United States.

11:00 AM SF15.01.02
Design of Temperature Coefficient of Resistance of Graphene Composite for Rapid Heating Elements [Sunghoon Park](#); Soongsil University, Korea (the Republic of).

11:15 AM SF15.01.03
Ordered Opals Monolayers on Quasi-Arbitrary Substrates for Extreme Heat Flux Applications [Carlos D. Diaz](#); Massachusetts Institute of Technology, United States.

SESSION SF15.02: Thermoelectrics
Session Chairs: Michael Pettes and Meenakshi Singh
Monday Afternoon, May 9, 2022
Hawai'i Convention Center, Level 3, 309

1:30 PM *SF15.02.01
Goniopolar Thermoelectrics [Joseph P. Heremans](#); The Ohio State University, United States.

2:00 PM SF15.02.02
Interfacial Patterning to Create High ZT Thermoelectric Materials [Shane G. Davies](#); University of Exeter, United Kingdom.

2:15 PM SF15.02.03
Thermoelectric Measurements in Superconductor-Ferromagnet Hybrids [Meenakshi Singh](#); Colorado School of Mines, United States.

2:30 PM BREAK

SESSION SF15.03: Thermal Properties in 2D Materials II
Session Chairs: Michael Pettes and Meenakshi Singh
Monday Afternoon, May 9, 2022
Hawai'i Convention Center, Level 3, 309

3:00 PM *SF15.03.01
Interface and Defect Modification of 2D Materials [Michael T. Pettes](#); Los Alamos National Laboratory, United States.

3:30 PM SF15.03.02
Desolvation-Induced Versatile Transfer Printing of Binder-Free Boron Nitride Film with Thermal, Optical Dual Functionality [Yujin Han](#); KAIST, Korea (the Republic of).

3:45 PM *SF15.03.03
Transition of Thermal Behavior in Graphite Under High Pressure [Yaguo Wang](#); Mechanical Engineering, Texas Materials Institute, The University of Texas at Austin, United States.

4:15 PM SF15.03.04
Investigation of the Optical Properties of hBN Nanoparticles for High Solar Reflection [Ioanna Katsamba](#); Purdue University, United States.

SESSION SF15.04: Thermal Properties in 2D Materials III
Session Chairs: Roman Anufriev and Michael Pettes

Tuesday Morning, May 10, 2022
Hawai'i Convention Center, Level 3, 309

10:15 AM *SF15.04.01

Electron-Phonon Interaction and the Wiedemann-Franz Law in Graphene [Li Shi](#); The University of Texas at Austin, United States.

10:45 AM SF15.04.02

Effect of Twist Angle on Thermal Transport Crossing 2D Bilayers [Lenan Zhang](#); Massachusetts Institute of Technology, United States.

11:00 AM SF15.04.04

Electrically Controlled Heat Transport in Multilayer Graphene [Pietro Steiner](#); University of Manchester, United Kingdom.

SESSION SF15.05: Thermal Materials and Devices I
Session Chairs: Woochul Lee and Yunhui Wu
Tuesday Afternoon, May 10, 2022
Hawai'i Convention Center, Level 3, 309

2:00 PM SF15.05.01

Quantum of Thermal Conductance of Nanofilms Due to Surface-Phonon Polaritons [Jose Ordonez-Miranda](#)^{1,2}; ¹LIMMS-IIS, Japan; ²IIS, The University of Tokyo, Japan.

2:15 PM SF15.05.02

Macroscale Ballistic Heat Conduction by Surface Phonon-Polaritons [Yunhui Wu](#); University of Tokyo, Japan.

2:30 PM SF15.05.03

Thermal Conductivity and Diffusivity of Piezoelectric PZT Stack [Brandi Wooten](#); The Ohio State University, United States.

2:45 PM SF15.05.04

Measurement of Thermal Conductivity in a Supercooled Hydrogel-Salt Complex Near Its Phase Transition [Daniel Hsieh](#); University of Illinois at Urbana Champaign, United States.

SESSION SF15.07: Machine Learning in Thermal Properties
Session Chairs: James Carpenter and Patrick Schelling
Wednesday Morning, May 11, 2022
Hawai'i Convention Center, Level 3, 309

9:00 AM SF15.07.01

Machine Learning-Based Solutions for Thermo-Mechanical Reliability of GaN MMIC Power Amplifiers [Sumin Kang](#); Korea Institute of Machinery & Materials, Korea (the Republic of).

9:15 AM SF15.07.02

The Voxelized Atomic Structure Machine Learning Framework for Modeling Structure-Property Relationships in High Entropy Alloys [Matthew C. Barry](#); Georgia Institute of Technology, United States.

9:30 AM BREAK

SESSION SF15.06: Poster Session I: Thermal Properties and Management I
Session Chairs: James Carpenter, Jose Ordonez-Miranda and Yunhui Wu
Tuesday Afternoon, May 10, 2022
5:00 PM - 7:00 PM
Hawai'i Convention Center, Level 1, Kamehameha Exhibit Hall 2 & 3

SF15.06.01

Spontaneous Laser-Induced Micropatterning on Pre-Strained Elastomeric Surfaces [Eunseung Hwang](#)^{1,2}; ¹Hanyang University, Korea (the Republic of); ²Hanyang University, Korea (the Republic of).

SF15.06.02

Modeling the Frequency-Dependent Response of Heterojunction Thermal Diodes for AC-to-DC Thermal Rectification [Trevor J. Shimokusu](#); William Marsh Rice University, United States.

SF15.06.03

Thermal Conductivity of a Paraffin Composite as a Thermal Conductive Phase Change Material for Novel Heat Management [Jocheon Kim](#)^{1,2,3}; ¹Chung-Ang University, Korea (the Republic of); ²Chung-Ang University, Korea (the Republic of); ³Chung-Ang University, Korea (the Republic of).

SF15.06.04

Ultrawhite and Lightweight Boron Nitride Nanoplatelet Paints for Daytime Radiative Cooling [Andrea L. Felicelli](#); Purdue University, United States.

SF15.06.05

Solenoid Actuating Electrocaloric Cooling Device with Relaxor Ferroelectric Polymer [Dong Hyun Seo](#); Gwangju Institute of Science and Technology, Korea (the Republic of).

SESSION SF15.08: Thermal Modeling
Session Chairs: Jose Ordonez-Miranda and Patrick Schelling
Wednesday Morning, May 11, 2022
Hawai'i Convention Center, Level 3, 309

10:30 AM *SF15.08.01

Impact of Four-Phonon Scattering on Thermal Conductivity and Radiative Cooling Properties [Xiulin Ruan](#); Purdue Univ, United States.

11:00 AM SF15.08.02

First-principles Predictions of Temperature-dependent Raman and Optical Responses [Zherui Han](#); Purdue University, United States.

11:15 AM SF15.08.03

Linear-Response Functions for Phonon-Mediated Heat Transport [Patrick K. Schelling](#); Univ of Central Florida, United States.

11:30 AM SF15.08.04

Thermal Conductivity Prediction of Ceramic Materials at High Temperature [Zherui Han](#); Purdue University, United States.

SESSION SF15.09: Thermal Measurement Techniques
Session Chairs: Jose Ordonez-Miranda and Patrick Schelling
Wednesday Afternoon, May 11, 2022
Hawai'i Convention Center, Level 3, 309

1:30 PM *SF15.09.01

Direct Measurement of Electron Thermal Conductivity Using Ultra-High Resolution Spatiotemporal Mapping [Xianfan Xu](#); Purdue Univ, United States.

2:00 PM SF15.09.02

Broad-Bandwidth Photothermal Microscopy for Real-Time Studies of Nanoparticle-Assisted Melting and Resolidification [Suhun Jo](#); Indiana University Bloomington, United States.

2:15 PM *SF15.09.03

Nanoscale Materials Defect States Imaging and Quantitative Interpretation [Ajit K. Roy](#); Air Force Research Laboratory, United States.

2:45 PM SF15.09.04

Phonon Mean Free Path Spectroscopy in Silicon and Silicon Carbide Nanomembranes in the 4 - 400 K Range [Roman Anufriev](#); The University of Tokyo, Japan.

SESSION SF15.10: Poster Session II: Thermal Properties and Management II
Session Chairs: Bachir El Fil and Jose Ordonez-Miranda
Wednesday Afternoon, May 11, 2022
5:00 PM - 7:00 PM
Hawai'i Convention Center, Level 1, Kamehameha Exhibit Hall 2 & 3

SF15.10.01

Enhancement of Thermoelectric Generator by Non-Contact Mode of Ion Injection for Inducing Triboelectric Charges [Sun-Woo Kim](#); Sungkyunkwan University, Korea (the Republic of).

SF15.10.02

Phase Change Materials Encapsulated by Silica/Polydopamine/Cellulose Nano Fiber for Thermal Energy Storage [Taeksu P. Kim](#); Inha University, Korea (the Republic of).

SF15.10.03

Characterization and Prediction of Thermal Expansion Coefficients for 2D Transition Metal Dichalcogenide Monolayers [Yang Zhong](#); Massachusetts Institute of Technology, United States.

SESSION SF15.11: Thermal Materials and Devices II
Session Chairs: James Carpenter and Marat Khafizov
Thursday Morning, May 12, 2022
Hawai'i Convention Center, Level 3, 309

8:45 AM *SF15.11.01

The Importance of Accurate Material Properties in Thermofluid Modeling for Extreme Temperatures and Pressures [Timothy Fisher](#); University of California, Los Angeles, United States.

9:15 AM SF15.11.03

Impact of Dislocation Loops on Thermal Conductivity of Fluorite Oxides [Marat Khafizov](#); The Ohio State University, United States.

9:30 AM SF15.11.04

Determining Deformation Behavior of AISI 9310 Steel Varying Temperature and Strain Rate for Aerospace Applications [Adanma Akoma](#); University of Connecticut, United States.

9:45 AM BREAK

SESSION SF15.12: Energy Management and Harvesting I
Session Chairs: Peter Bermel and Satish Kumar
Thursday Morning, May 12, 2022
Hawai'i Convention Center, Level 3, 309

10:30 AM *SF15.12.01

Robust Ceramic/Metal Composites for High-Temperature Heat Exchangers for Concentrated Solar Power [Ken Sandhage](#); Purdue University, United States.

11:00 AM SF15.12.02

Determining the Effectiveness of Radiative Cooler-Integrated Solar Cells [Seyeon Heo](#); Gwangju Institute of Science and Technology, Korea (the Republic of).

11:15 AM SF15.12.03

Investigating Micropatterned Thermochromic Coatings for Space Vehicle Thermal Management [Joseph A. Peoples](#); Purdue University, United States.

SESSION SF15.13: Energy Management and Harvesting II
Session Chairs: Bachir El Fil and Satish Kumar
Thursday Afternoon, May 12, 2022
Hawai'i Convention Center, Level 3, 309

1:45 PM SF15.13.01

Rugate Filter Design and Characterization for Ultra-High Temperatures (up to 1700 °C) [Peter Bermel](#); Purdue University, United States.

2:00 PM SF15.13.03

Tailored Indoor Setup for Characterization of Passive Daytime Cooler [Qimeng Song](#); Bayreuth University, Germany.

2:15 PM SF15.13.04

Thickness Optimization for Passive Radiative Daytime Cooling with Polymeric Materials [Tobias Lauster](#); University of Bayreuth, Germany.

2:30 PM BREAK

3:00 PM SF15.13.05

Highly Efficient and Salt Rejecting Solar Evaporation via a Wick-Free Confined Water Layer [Xiangyu Li](#); Massachusetts Institute of Technology, United States.

3:15 PM SF15.13.06

A Novel Coating Method for Superior Kinetics in Adsorption Energy Systems [Bachir El Fil](#); MIT, United States.

3:30 PM SF15.13.07

Use of Pressure as an Unconventional Dynamic Control Variable on Desorption-Based Thermal Energy Storage [Patrick Shamberger](#); Texas A&M University, United States.

3:45 PM SF15.13.08

Design of a High Performance Compact Atmospheric Water Harvester Under Extremely Conditions [Xiangyu Li](#); Massachusetts Institute of Technology, United States.

4:00 PM *SF15.13.09

Thermal Transport in Ultrawide Bandgap Materials and Devices [Samuel Graham](#)^{2, 1}; ¹Georgia Institute of Technology, United States; ²University of Maryland, United States.

4:30 PM SF15.13.10

Towards Precise Tunability of Coefficient of Thermal Expansion in Epoxies [Erica Redline](#); Sandia National Laboratories, United States.

4:45 PM SF15.13.11

Thermal Conductivity of Electrospun PEO/PEDOT:PSS Nanofiber Produced by Near-Field Electrospinning Method [Anh Tuan Nguyen](#); University of Hawaii at Manoa, United States.

5:00 PM SF15.13.12

Multiphase Liquid Metal Soft Composites for Thermal Management of Microelectronics [Wilson Kong](#)^{2, 1}; ¹Air Force Research Laboratory, United States; ²Arizona State University, United States.

5:15 PM SF15.13.13

Control of Thermal Transport at Ultrahigh Temperatures by Immiscible Oxide Heterostructures [Sean McSherry](#); University of Michigan–Ann Arbor, United States.

SESSION SF15.14: Thermal Transport I
Session Chairs: Yi Li and Annie Zhang
Monday Afternoon, May 23, 2022
SF15-Virtual

6:30 PM *SF15.14.01

Cryogenic Heat Transfer in High Electron Mobility Transistors—Phonon Radiation and Superfluid Helium Boiling [Austin J. Minnich](#); California Institute of Technology, United States.

7:00 PM SF15.14.03

Thermal Transport Properties of Hybrid Semiconductors Investigated by Vibrational-Pump Visible-Probe Spectroscopy [Peijun Guo](#); Yale University, United States.

7:15 PM SF15.14.04

Inelastic Phonon Transport Across Atomically Sharp Metal/Semiconductor Interfaces [Bo Sun](#); Tsinghua University, China.

7:30 PM SF15.14.06

Synthesis and Testing of Graphene Composites for Thermal and Electromagnetic Interference Shielding at Elevated Temperatures [Fariborz Kargar](#); University of California, Riverside, United States.

7:45 PM SF15.14.07

A Prototype of High-Temperature Vacuum Prober from 300 K to 1200 K for Continuous 3-Omega Thermal Measurements [Laurent Jalabert](#); LIMMS-CNRS/IIS Univ of Tokyo, Japan.

SESSION SF15.15: Thermal Transport II
Session Chairs: Yi Li and Annie Zhang
Monday Morning, May 23, 2022
SF15-Virtual

10:30 AM *SF15.15.01

Thermal Conduction Across a Weakly Interacting Interface in 2D Materials Constructs [Yong-Wei Zhang](#); Institute of High Performance Computing, Singapore.

11:00 AM SF15.15.02

Spatial Thermal Conductivity Variation of Particulate-Filled Thermal Interface Materials [Zeichen Zhang](#); Binghamton University, United States.

11:15 AM SF15.15.03

Novel Method for *In Situ* Thermal Property Evaluation of Thermal Interface Materials [Piyush Kulkarni](#); Binghamton University, United States.

11:30 AM SF15.15.04

Thermal Transport in Self-Assembled Materials—From High Anisotropy to High Temperatures [Markus Retsch](#); University of Bayreuth, Germany.

11:45 AM SF15.15.05

Electrical vs Spatial Symmetry in Geometrically Defined Single-Material Graphene Thermoelectric Devices [Oleg V. Kolosov](#); Lancaster University, United Kingdom.

12:00 PM SF15.15.06

Study of Thermal Conductivity of Liquid Metal with a Series of Fillers Through Homebuilt Experimental Setup [Michael Zhang](#); Lake Oswego High School, United States.

12:05 PM *SF15.15.07

Thermal Effects in Quasi-2D Quantum Charge-Density-Wave Devices Operational in Extreme Radiation Environments [Alexander A. Balandin](#); University of California, Riverside, United States.

SESSION SF15.16: Energy Management and Harvesting III
Session Chairs: Yi Li and Annie Zhang
Tuesday Morning, May 24, 2022
SF15-Virtual

8:00 AM SF15.16.01

Printing onto Dissimilar Materials by Selective Laser Melting for Electronics Cooling Applications [Arad Azizi](#); Binghamton University, United States.

8:15 AM SF15.16.02

Materials and Melt Pool Characterization During Selective Laser Melting Through a Scanning Modulated Laser [Nicholas S. Tomasello](#); Binghamton University, United States.

8:30 AM SF15.16.03

Crumpled Particles of Ethanol-Wetted Graphene Oxide for High-Temperature Nanofluidic Solar-Thermal Energy Harvesting [Jingyi Zhang](#); Shanghai Jiao Tong University, China.

8:45 AM SF15.16.04

Thermoelectric Properties of Nanocrystalline Silicon Film Grown by PECVD [Battogtokh Jugdersuren](#); Jacobs Engineering Group, United States.

SYMPOSIUM SF16

Advanced Materials for Antibacterial, Antiviral and Antifungal Applications—From Micro to Nano
May 9 - May 25, 2022

Symposium Organizers

* Invited Paper

SESSION SF16.01: Nano-, Micro-Structured Surfaces and Coatings—Structure-Function Relationships I
Session Chairs: Rafik Naccache and Ketul Popat
Monday Morning, May 9, 2022
Hawai'i Convention Center, Level 3, 306B

10:30 AM SF16.01.01

Mechano-Bactericidal Activity of Bioinspired Glass Nanopatterns [Martyna Michalska](#); University College London, United Kingdom.

10:45 AM SF16.01.02

Poly(d-glucose carbonate)-Based Crosslinked Networks for Renewable and Degradable Coatings [Yidan Shen](#); Texas A&M University, United States.

11:00 AM SF16.01.03

Antimicrobial Effects of Piezoelectric Charges [Santiago Orrego](#); Temple University, United States.

11:15 AM SF16.01.04

Nanoscale Surface Properties of SU-8 Polymer Modulate *Xylella fastidiosa* Motility, Adhesion and Colonization [Silambarasan Anbumani](#); University of Campinas, Brazil.

11:30 AM *SF16.01.05

Antimicrobial Strategies Based on Natural Sources and Biomimetic Materials [Rui L. Reis](#)^{1,2}; ¹University of Minho, Portugal; ²ICVS/3B's – PT Government Associate Laboratory, Portugal.

SESSION SF16.02: Nanocomposite Textiles and Wound Dressings

Session Chairs: Rafik Naccache and Ketul Popat

Monday Afternoon, May 9, 2022

Hawai'i Convention Center, Level 3, 306B

1:30 PM SF16.02.01

Silicate-Based Films with Antimicrobial Efficacy for Burn Wound Treatments [Kausik Mukhopadhyay](#); University of Central Florida, United States.

1:45 PM SF16.02.02

Anti-Pathogenic Hydrogel Nanospine Patch for Controlling Stem Cell Behavior [Donghyuk Lee](#); Ulsan National Institute of Science and Technology, Korea (the Republic of).

2:00 PM SF16.02.03

Highly Cross-Linked, Phosphorus-Based Hydrogels as Drug-Loaded Wound-Dressing [Jeroen Royakkers](#); Maastricht University, Netherlands.

2:15 PM SF16.02.04

Bioactive and Antimicrobial Patterned Nanofibers Scaffold for Skin Regeneration and Wound Healing [Shrouk M. Abdo](#); American University in Cairo, Egypt.

2:30 PM BREAK

SESSION SF16.03: Nano-, Micro-Structured Surfaces and Coatings—Structure-Function Relationships II

Session Chairs: Diego Mantovani and Fabio Variola

Monday Afternoon, May 9, 2022

Hawai'i Convention Center, Level 3, 306B

3:00 PM SF16.03.01

Polymer Thin Films Designed to Decrease Microbial Pathogenicity by Altering Metabolic Activity [Trevor Franklin](#); Cornell University, United States.

3:15 PM SF16.03.02

Antifouling Performance of Nanoscale Polydimethylsiloxane Brushes [Kevin Golovin](#); University of Toronto, Canada.

3:30 PM SF16.03.03

Polydopamine-Based Coatings that Kill Bacteria and Inactivate SARS-CoV-2 Virus [William A. Ducker](#); Virginia Tech, United States.

3:45 PM *SF16.03.04

Nanoengineered Antibacterial Surfaces [Krasimir Vasilev](#); University of South Australia, Australia.

4:15 PM SF16.03.05

Antibacterial Surfaces Made Up of Cicada Wings Replicated Through Secondary Mode Electrohydrodynamic Instability [Dae Joon Kang](#); Sungkyunkwan University, Korea (the Republic of).

4:30 PM SF16.03.06

Replica Molding of Naturally Inspired Surfaces to Produce Antibacterial Nanostructured Biomaterials [Susan Kelleher](#)^{1,2}; ¹Dublin City University, Ireland; ²University College Dublin, Ireland.

SESSION SF16.04: Drug- and Ion-Releasing Surfaces and Coatings I
Session Chairs: Diego Mantovani, Rafik Naccache, Ketul Popat and Fabio Variola
Tuesday Morning, May 10, 2022
Hawai'i Convention Center, Level 3, 306B

9:00 AM SF16.04.02

Responsive Hybrid Nanomaterials for Eradicating Bacterial Infections [Miryana Hémadi](#); Université de Paris, France.

9:15 AM *SF16.04.03

Graphene-Based Anti-Microbials: Nanostructured Coatings and 3D Printed Nanocomposites [Rigoberto C. Advincula](#)^{1,2,3}; ¹Case Western Reserve University, United States; ²The University of Tennessee, Knoxville, United States; ³Oak Ridge National Laboratory, United States.

9:45 AM BREAK

10:15 AM SF16.04.04

Glycoconjugate-Functionalized Magnetic Nanoparticles—A Tool for Selective Killing of Targeted Bacteria via Magnetically Mediated Energy Delivery. [Olin T. Mefford](#); Clemson University, United States.

10:30 AM SF16.04.05

Small Nanoclay—Big Antibacterial Opportunities [Ofer - Prinz Setter](#); Technion - Israel Institute of Technology, Israel.

10:45 AM SF16.04.06

Novel Hybrid Nanostructured Materials for Controlling Viruses and Bacteria [Jun-Won Kook](#)^{1,2}; ¹Ajou University, Korea (the Republic of); ²Ajou University, Korea (the Republic of).

11:00 AM SF16.04.07

Reshaping *De Novo* Protein Switches into Bioresponsive Material Formats for Sensing Applications [Luciana d'Amone](#); Tufts University, United States.

SESSION SF16.05: Drug- and Ion-Releasing Surfaces and Coatings II
Session Chairs: Rafik Naccache and Fabio Variola
Tuesday Afternoon, May 10, 2022
Hawai'i Convention Center, Level 3, 306B

2:00 PM SF16.05.01

Antiviral Nanostructures [Oliver A. Williams](#); Cardiff University School of Physics and Astronomy, United Kingdom.

2:15 PM SF16.05.03

Engineered Biomimetic Nanoparticles for Antibacterial Activity [Emine S. Turali-Emre](#); University of Michigan, United States.

2:30 PM SF16.05.04

Nanotechnology Strategies Towards a Sustainable Agriculture [Nubia Zuverza](#); The Connecticut Agricultural Experiment Station, United States.

2:45 PM SF16.05.05

Iron Quantum Dots and Nanocarbons Electro-Assembling as Electrocatalyst for Sanitizing Solution in Terrestrial and Space Applications [Armando Pena-Duarte](#)^{1,2}; ¹University of Puerto Rico at Rio Piedras, United States; ²The University of Texas at El Paso, United States.

3:00 PM BREAK

SESSION SF16.06: Advanced Materials for Antimicrobials
Session Chairs: Diego Mantovani and Ketul Popat
Tuesday Afternoon, May 10, 2022
Hawai'i Convention Center, Level 3, 306B

3:15 PM SF16.06.01

Immobilization of Lysozyme on Zwitterionic Poly(4-vinylpyridine) Thin Films Enables Antifouling and Antibacterial Surfaces [Alexandra Khlyustova](#); Cornell University, United States.

3:30 PM SF16.06.02

Fabrication of Superhydrophobic Surface via a Novel Air-Assisted Electrospray Method [Thu H. Nguyen](#); University of Louisiana at Lafayette, United States.

3:45 PM SF16.06.03

Nanospace-Confined Synthesis of *Catalytic-Motile* Nanocrystals for Biofilm Eradication, Drug-Delivery and Water Purification [Nitee Kumari](#); POSTECH, Korea (the Republic of).

4:00 PM *SF16.06.04

Fortified Antibacterial Efficacy Through Sustained Biocidal Effect and High-Temperature Superhydrophobicity [Sanjay Mathur](#)^{1,2}; ¹University of Cologne, Germany; ²Indian Institute of Technology, Madras, India.

4:30 PM SF16.06.05

A Multilayered Edible Coating to Extend Produce Shelf Life [Elisabetta Ruggeri](#); Tufts University, United States.

4:45 PM SF16.06.06

Biomimetic Phage Mimicking Antimicrobial Nanoparticles for Antibiotic Free, Bactericidal Action Against the Multi-Drug Resistant ESKAPE Class of Pathogens [Prakash Nallathamby](#); University of Notre Dame, United States.

SESSION SF16.07: Poster Session: Advanced Materials for Antibacterial, Antiviral and Antifungal Applications—From Micro to Nano

Session Chairs: Diego Mantovani and Ketul Popat

Tuesday Afternoon, May 10, 2022

5:00 PM - 7:00 PM

Hawai'i Convention Center, Level 1, Kamehameha Exhibit Hall 2 & 3

SF16.07.01

TMD Antibody Mimics Bearing Tripeptide Recognition Phases for Selective Bacterial Detection and Inactivation [Hyun ji Lee](#); Hanyang University, Korea (the Republic of).

SF16.07.02

ZnO Nanostructures by Hot Water Treatment for Photocatalytic Bacterial Disinfection [Ranjitha Hariharalakshmanan](#); University of Arkansas at Little Rock, United States.

SF16.07.03

Versatile, Fast and Reliable Photocatalytic Activity Assay for Nanomaterials in Aqueous Suspension [Min Jeong Kwak](#); Korea Research Institute of Standards and Science, Korea (the Republic of).

SF16.07.04

Nanostructure Based Wettability Modification of TiAl6V4 Alloy Surface for Anti-Biofilm—Superhydrophilic, Superhydrophobic and Slippery Surface [Jeong-Won Lee](#); Chosun University, Korea (the Republic of).

SF16.07.05

A Sustainable Method for Food Preservation Based on PVA and N-Acetylcysteine Films [Benedetta Niccolini](#); Università Cattolica del Sacro Cuore, Italy.

SF16.07.06

Anti-Biofilm Activity of Chiral Graphene Nanoparticles [Misché Hubbard](#); University of Michigan, United States.

SF16.07.07

Biodegradable Nanocomposites with Antibacterial Silica Nanoparticles and Their Food Packaging Applications [Sangwook Woo](#); Yonsei University, Korea (the Republic of).

SF16.07.08

Biofouling-Resistant Composite Tubular Devices with Magneto-Responsive Dynamic Undulatory Inner Walls [Geonjun Choi](#); Ulsan National Institute of Science and Technology, Korea (the Republic of).

SF16.07.09

Long-term Repellency of Various Liquids by Interconnected Reentrant Structures [Seung Min Oh](#); Changwon National University, Korea (the Republic of).

SF16.07.10

Enhancing Antibacterial Property of Nanostructured Aluminum Foil by Essential Oil [Quinshell Smith](#); University of Arkansas in Little Rock, United States.

SF16.07.11

Slippery Microstructured Surfaces for Reducing Touch Contamination of Pathogen-Laden Respiratory Droplets [Woo Young Kim](#); Changwon National University, Korea (the Republic of).

SF16.07.12

Experimental Study on Long-Term Characteristics of Water Repellency in Microcavity Structures [Seo Rim Park](#); Changwon National University, Korea (the Republic of).

SF16.07.13

Creating Efficient Anti-Bacterial Surfaces on Catheters with Antibiotic-Free Liquid Coatings [Chun Ki Fong](#); University of Maine, United States.

SESSION SF16.08: Advanced Materials for Antimicrobials I
Session Chairs: Diego Mantovani, Rafik Naccache and Fabio Variola
Wednesday Morning, May 11, 2022
Hawai'i Convention Center, Level 3, 306B

9:15 AM SF16.08.01

Reusable Janus Self-Cleaning Nanofibrous Air Filters [Haran Lee](#); Chungnam National University, Korea (the Republic of).

9:30 AM SF16.08.02

Design of Antifouling Amphiphilic Interfaces with Molecular Heterogeneities to Control Biofilm Formation and Bacterial Behavior [Alexandra Khlyustova](#); Cornell University, United States.

9:45 AM SF16.08.03

Graphene Based Framework Materials as Self-Sterilizing Multi-Pollutant Air Filtration Media [Armin Reimers](#); Christian-Albrecht-Universität zu Kiel, Germany.

10:00 AM BREAK

10:30 AM SF16.08.04

Transparent Silver Oxide Coating That Inactivates SARS-CoV-2 and Kills Bacteria [Mohsen Hosseini](#); Virginia Polytechnic Institute and State University, United States.

10:45 AM SF16.08.05

A New Fouling-Resistant Strategy with Dynamic Undulatory Topographical Motion for Efficient Suppression of Biofilm Formation [Hyejin Jang](#); Ulsan National Institute of Science and Technology, Korea (the Republic of).

11:00 AM SF16.08.06

Catechol-Containing Polymer as Self-Activating Antipathogenic Coating [Bruce Lee](#); Michigan Technological Univ, United States.

11:15 AM *SF16.08.07

WITHDRAWN 5/10/22 SF16.08.07 Electrophoretic Deposition as a Fast Tool for the Immobilization of Antimicrobial Agents [Annabel Braem](#); KU LEUVEN DEPARTMENT OF MATERIALS ENGINEERING, Belgium.

SESSION SF16.09: Advanced Materials for Antimicrobials II

Session Chairs: Diego Mantovani and Rafik Naccache

Wednesday Afternoon, May 11, 2022

Hawai'i Convention Center, Level 3, 306B

3:30 PM SF16.09.01

Liquid-Coated Air and Water Filters Resist Bacterial Biofouling [Justin Hardcastle](#); University of Maine, United States.

3:45 PM SF16.09.02

In Situ One-Step Direct Loading of Agents in Acrylic-Based Coatings Deposited by Aerosol-Assisted Open-Air Plasma for Controlled Release Application [Gabriel Morand](#)^{1,2}; ¹Université Laval, Canada; ²Institut de Recherche de Chimie Paris (Chimie ParisTech-PSL), France.

4:00 PM SF16.09.03

Fluorographene-Based Biocompatible Anti-Biofouling Coating with Superior Properties [Ishita Agrawal](#)^{1,2}; ¹National University of Singapore, Singapore; ²National University of Singapore, Singapore.

4:15 PM SF16.09.05

Surfaces with Instant and Persistent Antimicrobial Efficacy Against Bacteria and SARS CoV 2 [Anish Tuteja](#); Univ of Michigan, United States.

SESSION SF16.10: Antifouling, Photocatalytic, Self-Cleaning and Superhydrophobic Surfaces and Coatings

Session Chairs: Rafik Naccache and Fabio Variola

Thursday Morning, May 12, 2022

Hawai'i Convention Center, Level 3, 306B

8:45 AM SF16.10.01

Plasma-Based Strategies to Control the Release of Ag⁺ on Short- and Long-Term Periods from Ag-Based Antibacterial Coatings [Linda V. Bonilla-Gameros](#); Université Laval, Canada.

9:00 AM SF16.10.02

On-Demand Synthesis of Antiseptics at the Site of Infection for Treatment of Viral and Drug-Resistant Bacterial Infections [Rong Yang](#); Cornell University, United States.

9:15 AM SF16.10.03

Polysaccharides-Catechols Films Loaded with Antibiotic as Antibacterial Drug Release System [Pascale Chevallier](#); Laboratory for Biomaterials and Bioengineering, Canada Research Chair I in Biomaterials and Bioengineering for the Innovation in Surgery, Canada.

SESSION SF16.11: General Session I

Wednesday Morning, May 25, 2022

SF16-Virtual

8:00 AM *SF16.11.01

Developmental Strategies to Address Prosthetic Infection of Biomaterials [Bikramjit Basu](#); Indian Institute of Science, India.

8:30 AM SF16.04.01

Using Aerosolized Silicon Nanoparticles Towards Development of Masks Designed to Filter Specific Viruses [Ammar Nayfeh](#); Khalifa University of Science and Technology, United Arab Emirates.

8:45 AM SF16.11.02

Development of Bioactive Titanium Surfaces with Antimicrobial Properties via Laser Surface Processing [Vidhya Selvamani](#); Purdue university, United States.

9:00 AM SF16.11.03

Synthesis and Coating of Copper Nanoparticle Embedded Carbon Matrix for Antimicrobial Applications [Amirali S. Akhavi](#); University of California, Riverside, United

States.

9:15 AM SF16.11.04

Functional Coatings Optimization Through Colloidal Assembly [Ignacio Martin-Fabiani](#); Loughborough University, United Kingdom.

9:30 AM SF16.11.05

Fluorine-Free Superhydrophobic Coating with Antibiofilm Properties Based on Pickering Emulsion Templating [Guy Mechrez](#); Volcani Center, ARO, Israel.

9:45 AM SF16.11.06

Multifunctional Nanoparticles for Magnetic Dyeing and Antimicrobial Finishing [Jianchuan Wen](#); University of Massachusetts Lowell, United States.

SESSION SF16.12: General Session II
Tuesday Afternoon, May 24, 2022
SF16-Virtual

9:00 PM *SF16.12.01

Antimicrobial Nanotextured Surfaces [Nathalie Tufenkji](#); McGill University, Canada.

9:30 PM SF16.12.02

Coal-Derived Graphene Oxide/Copper Ferrite Nanocomposites with Antibacterial and Sonophotocatalytic Properties for Wastewater Remediation [Nomin Tserendulam](#); National University of Mongolia, Mongolia.

9:45 PM SF16.12.03

Potentials of Graphene-cuprous Oxide Nanocomposites for the Removal of Antibiotic Resistant Bacteria [Lkhagvasuren Munkhchuluun](#); National University of Mongolia, Mongolia.

10:00 PM SF16.12.04

Machining Medium Effect on Biocompatibility of Titanium-Based Dental Implants [G. Bahar Basim](#); NSF center for Particle and Surfactant Systems, United States.

10:15 PM SF16.12.05

Transparent Surface Coatings that Kill Antimicrobial-Resistant Bacteria within Minutes and Inactivate the COVID-19 Virus [Saeed Behzadinasab](#); Virginia Tech, United States.

10:30 PM SF16.12.06

Novel Antibacterial Hydrophilic Hard Coating Containing New Designed Antibacterial Agent [Won-Suk Chang](#); Samsung Advanced Institute of Technology, Korea (the Republic of).

10:45 PM SF16.12.07

ZnO Nanowires-PLA Fiber Hierarchical Structure for Antibacterial Surface [Sang Won Byun](#); Korea University, Korea (the Republic of).