

All times are EDT

▲ Plenary Speaker

EMC Awards Ceremony and Plenary Session

9:00 am			EMC Awards Ceremony
9:15 am	David D. Awschalom	▲ PL01	Abandoning Perfection for Quantum Technologies
10:15 am			Break

A: Epitaxial Devices

10:45 am	Rasha El-Jaroudi	A01	(Student) Growth of B-III-V Alloys for GaAs-Based Optoelectronic Devices
11:00 am	Andrew Frederick Briggs	A02	(Student) Enhanced Double Heterostructure Infrared LEDs Using Monolithically Integrated Plasmonic Materials
11:15 am	Nayana Remesh	A03	(Student) Impact of Buffer Traps on Temperature-Dependent Dynamic Ron in AlGaIn/GaN HEMT
11:30 am	Michael Pedowitz	A05	(Student) Mn+3 Rich Nanofibrous Layered δ -phase MnO_2 on Epitaxial Graphene-Silicon Carbide for Selective Gas Sensing
11:45 am	Li-Chung Shih	A06	(LATE NEWS, Student) Dual-Function ZTO Phototransistor Memory with Au Nanoparticles Mediated for Photo-Sensing and Multilevel Photo-Memory

B: Low-Dimensional Structures I

10:45 am	Nicholas Paul Morgan	B01	(Student) Scalable III-V Nanowire Networks for IR Photodetection
11:00 am	Rabin Pokharel	B02	Epitaxial GaAsSbN (Te) NWs for Near-Infrared Region Photodetection Application
11:15 am	Shisir Devakota	B03	(Student) A Te Doped GaAsSb Ensemble Nanowire Photodetector for Near-Infrared Application
11:30 am	Gilbert Daniel Nessim	B04	Towards the Growth of 3D Forests of Carbon Nanotubes—Selective Height Control Using Thin-Film Reservoirs and Overlayers
11:45 am	Dylan J. McIntyre	B06	(LATE NEWS, Student) Enhancement of Integrated Cu-Ti-CNT Conductors via Joule-Heating Driven CVD

C: Plasmonics, Strong-Coupling and Resonant Optical Structures

10:45 am	John Tomko	C01	Long-Lived Modulation of Plasmonic Absorption by Ballistic Thermal Injection
11:00 am	Patrick Rufangura	C02	(Student) Enhanced Absorption with Core/Shell Silicon Carbide/Graphene Nanowires for Tunable Mid-Infrared Nanophotonics
11:15 am	Guanyu Lu	C03	(Student) Engineering the Spectral and Spatial Dispersion of Thermal Emission via Strong Coupling
11:30 am	Chan Kyaw	C04	(Student) Polarization-Selective Modulation of Supercavity Resonances Originating from Bound States in the Continuum
11:45 am	Vanessa Breslin	C05	Hyperbolic Phonon Polaritons in Calcite Nanopillar and Nanohole Arrays for Nanoscale Infrared Confinement
12:00 pm	Abhilasha Kamboj	C06	(Student) Long-Wave Infrared Topological Phonon Chain

D: Scandium Nitride

10:45 am	Matthew Hardy	D01	Stress and Crystal Quality Control in Heteroepitaxial ScAlN Grown on SiC by Molecular Beam Epitaxy
11:00 am	Joseph Casamento	D02	(Student) Physical Properties of $\text{Sc}_x\text{Al}_{1-x}\text{N}/\text{GaN}$ Heterostructures by Molecular Beam Epitaxy
11:15 am	Micah Haseman	D03	(Student) Cathodoluminescence and X-Ray Photoelectron Spectroscopy of ScN: Dopant, Defects and Band Structure
11:30 am	Morton Greenslit	D04	(Student) Plasma-Assisted Epitaxy of Piezoelectric $\text{Sc}_x\text{Al}_{1-x}\text{N}$ Films for Use in Harsh Environment Microwave Acoustic Sensors
11:45 am	Clarissa Vazquez-Colon	D05	Composition and Electrical Characterization of $\text{Sc}_x\text{Al}_{1-x}\text{N}$ Grown on Si Substrate by DC Sputtering
12:00 pm	Ping Wang	D06	Molecular Beam Epitaxy of N-Polar ScAlN and HEMT Structures

E: Nanostructured Materials

10:45 am	Matt Brubaker	E01	Gallium Desorption from Selective Epitaxy Growth Mask Surfaces Determined by <i>In Situ</i> Reflectance Measurements
11:00 am	Alireza Abrand	E02	(Student) Growth and Characterization of Mixed-Dimensional InAs/MoS ₂ Heterostructures
11:15 am	Andrew Nelson	E03	Structural Symmetry Breaking and Fast Chemical Diffusion in the Lead-Cadmium Sulfide Cation Exchange System
11:30 am	Divya Jyoti Prakash	E04	(Student) Self-Assembly of Hybrid Nanomembranes via Reconfiguration of Amorphous Complex Oxides
11:45 am	Bryan Melanson	E06	(LATE NEWS, Student) Realization of High-Efficiency Green InGaN Nanowire Light-Emitting Diodes Using a Novel Dry-Etch Hardmask Removal Process

PROGRAM AT-A-GLANCE

WEDNESDAY

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F: Gallium Oxide Devices

10:45 am	Andreas Fiedler	F01	Growth and Characterization of Deep Acceptor Mg-Doped/N-Type β -Ga ₂ O ₃ Junctions
11:00 am	Arkka Bhattacharyya	F02	(Student) MOVPE-Grown β -Ga ₂ O ₃ High Current Density (130 mA/mm) MESFET with a Record Metal/Ga ₂ O ₃ Specific Contact Resistance of $8.3 \times 10^{-7} \Omega \cdot \text{cm}^2$
11:15 am	Dawei Wang	F03	(Student) Modulation-Doped β -(Al _x Ga _{1-x}) ₂ O ₃ /Ga ₂ O ₃ HEMTs: Design Principles and Performance Optimization via TCAD
11:30 am	Dinusha Herath Mudiyanse	F04	(Student) Vertical Wide Bandgap β -Ga ₂ O ₃ /GaN p-n Heterojunction with Mesa Based Edge Termination
11:45 am	Rujun Sun	F05	Temperature Dependent Current Stress of β -Ga ₂ O ₃ Schottky Devices
12:00 pm	Zhe Ashley Jian	F06	(LATE NEWS, Student) Electrical Properties of MOCVD-Grown AlSiO Gate Dielectric on (001) β -Ga ₂ O ₃

DRC Session 8: Thin Film Devices

10:30 am	Mengwei Si	8A	High-Performance Atomic-Layer-Deposited In ₂ O ₃ Transistors with EOT Scaling Down to 0.86 nm: Achieving I_{ON} of 1.2 A/mm at $V_{\text{GS}}-V_{\text{T}}=1\text{V}$ and $V_{\text{DS}}=1\text{V}$ and g_{m} of 1.5 S/mm at $V_{\text{DS}}=1\text{V}$
10:50 am	Christopher R. Allemang	8B	Steep Subthreshold Swing ALD ZTO TFTs with <i>in situ</i> Gate Insulator
11:10 am	Thomas Anthopolous	8C	(Invited) Large-Area Nanoelectronics Manufactured at a Flash
11:50 am	Kelly Liang	8D	Field-Emission Enhanced Contacts for Disordered Semiconductor Based Thin-Film Transistors

DRC Session 9: Wide Bandgap Devices II

12:50 pm	Martin Kuball	9A	(Invited) Thermal Modeling for Wide Bandgap Devices
1:30 pm	Aditya Raj	9B	GaN/AlGaN Superlattice Based E-Mode P-Channel MES FinFET
1:50 pm	Reet Chaudhuri	9C	GHz-Speed GaN/AlN P-Channel MIS-HFETs with I_{max} of 0.5 A/mm
2:10 pm	Mina Rais-Zadeh	9D	(Invited) III-Nitride Acousto-Electric Microsystems for Extreme Space Environments

G: Defects and Doping

1:15 pm	Annalisa Calò	G01	Spatial Defects Nanoengineering for Bipolar Conductivity in MoS ₂
1:30 pm	Burcu Ozden	G02	An Alternative Way to Tune the Defects in a Single Layer MoS ₂
1:45 pm	Claire Grace Andreasen	G03	(Student) Electron Redistribution at Monovacancy in Graphene
2:00 pm	Julia Tala Hatoum	G04	(Student) Chemical Consequence of Electron Redistribution in Graphene with Grain-Boundary
2:15 pm	James Bork	G05	(LATE NEWS, Student) Improvements in InAlBiAs Morphology and Prospects of InAlBiAs-Based Photon Upconverter
2:30 pm			Break
3:00 pm	Hsien-Lien Huang	G06	(Student) Atomic Scale Investigation of Aluminum Incorporation, Defects and Phase Stability in β -(Al _x Ga _{1-x}) ₂ O ₃ Films
3:15 pm	Pegah Bagheri	G07	(Student) Direct Evidence of Ge Becoming a Deep Donor Instead of a DX- in Al Rich
3:30 pm	Chunyi Huang	G08	(Student) Si Dopants Enable Catalyst-Free n-Type GaAs Nanowire Growth by Modifying Facet Energies
3:45 pm	Qianyu Cheng	G09	(Student) Crystallographic and Defect Characterization of PVT-Grown ZnSe Under Different Growth Configurations

H: Low-Dimensional Structures II

1:15 pm	Benjamin Diroll	H01	Surface Chemistry Modifies Band Edge Structure of Colloidal Quantum Wells
1:30 pm	Olivia Pavlic	H02	(Student) <i>Ab Initio</i> Studies of the Optical Properties of Lead Chalcogenide Nanocrystals
1:45 pm	Maia Mombru Frutos	H03	(Student) A Study of the Optimal Synthesis Conditions in Solution Method for Bismuth Sulpho Iodide Nanorods
2:00 pm	Chappel S Thornton	H04	(Student) Rapid Ge Diffusion Along Si/SiO ₂ Interfaces During High Temperature Oxidation for Quantum-Scale Structures
2:15 pm	Pradeep Namboodiri	H05	Fabrication of Single and Few Atom Donor-Based Devices in Silicon
2:30 pm			Break
3:00 pm	Yi Liu	H06	(Student) Self-Selective Formation of Ordered 1D and 2D GaBi Structures on Wurtzite GaAs Nanowire Surfaces
3:15 pm	Sivakumar Vishnuvardhan Mambakkam	H07	(Student) Growth of Topological Insulator Bi ₂ Se ₃ Particles on GaAs via Droplet Epitaxy
3:30 pm	Nicholas Ulizio	H08	(Student) Shape-Effect on Quantum Confinement in Alloy Quantum Dots and Their Applications for Photovoltaic Green Energy
3:45 pm	Pankul Dhingra	H09	(Student) InP Quantum Dot and InGaP Quantum Well Visible Lasers on Si

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I: Silicon Carbide Theory, Characterization and Device Processing

1:15 pm	Tuerxun Ailihumaer	I01	(Student) Investigation of Dislocations Contrast and Determination of Their Burgers Vectors in Synchrotron Grazing-Incidence X-Ray Topographs in PVT-Grown 4H-SiC Crystals
1:30 pm	Hongyu Peng	I02	(Student) Analysis of Local Lattice Distortion of SiC in Weak Beam Topography
1:45 pm	Zeyu Chen	I03	(Student) Assessment of Lattice Damage in High Energy Ion Implanted 4H-SiC Wafers at Room Temperature
2:00 pm	Lu Wang	I04	(Student) Theoretical and Experimental Analysis of Interfaces Between 4H-SiC and High-k Dielectrics
2:15 pm	Timothy Sean Wolfe	I05	(Student) Transition Metal Defects 4H-SiC—Optical and Electronic Levels from First Principles
2:30 pm			Break
3:00 pm	Lydia Kuebler	I06	(Student) Investigation of Implant Temperature on Dopant Activation Efficiency for Single Fluence Al+ Implanted 4H-SiC
3:15 pm	Suman Das	I07	(Student) High Temperature Characteristics of NO Annealed P-Channel 4H-SiC MOSFET
3:30 pm	Mathew Kelley	I08	(Student) Spatially Resolved Fourier Transform Impedance Spectroscopy—A Technique to Rapidly Characterize Composite Interfaces and a Study of Quantum Dot/Epitaxial Graphene/SiC Optoelectronic Devices
3:45 pm	Peter A Schultz	I09	Theory for Intrinsic Point Defects in 3C-SiC Reassessed Using Converged Large-Supercell Calculations
4:00 pm	Henry Fidlow	I10	(Student) Atomistic Basis of Anisotropic Poisson's Ratio in 3C-SiC

J: Group III-Nitride Growth—MBE

1:15 pm	Adam M. Payne	J01	Machine Learning for Evaluation of RHEED Spectra on III-Nitride Films Grown Using Molecular Beam Epitaxy
1:30 pm	Habib Ahmad	J02	(Student) First Experimental Demonstration of P-Type AlN Grown by MBE
1:45 pm	Brandon Dzuba	J03	(Student) Anomalous Super-Linear Growth Rate Reduction with Increasing Aluminum Flux in M-Plane Grown by PAMBE
2:00 pm	Ryan Page	J04	(Student) MBE Growth and Transport Properties of Ultra-Wide Bandgap AlGaIn on AlN Bulk Substrate
2:15 pm	Elaheh Ahmadi	J05	Growth of High Quality 350nm-Thick InGaIn Films on N-Polar GaN Substrates by Plasma-Assisted Molecular Beam Epitaxy
2:30 pm			Break

K: Group III-Nitride MOCVD and Characterization

3:00 pm	Maliha Noshin	K01	(Student) Characterization of Regrown Interface in Ga-Polar c-Plane GaN with Diverse Growth Interruptions
3:15 pm	Henry Collins	K02	(Student) Planar Porosification of N-Polar GaN for Regrowth of Smooth GaN Films
3:30 pm	Sizhen Wang	K03	Scanning Spreading Resistance Microscopy Characterization of Selective Doped GaN Epitaxial Layer Grown by MOCVD
3:45 pm	Michael Evan Liao	K04	(Student) The Origins of Large Surface Step Features of Homoepitaxial GaN Grown on Dot-Core GaN Substrates
4:00 pm	Caroline E Reilly	K05	(Student) Comparison of AlN/GaN Heterostructures Grown at Low Temperatures with Ammonia or Dimethylhydrazine via Metalorganic Chemical Vapor Deposition

L: Properties of 2D Materials

1:15 pm	Akshay Balgarkashi	L01	(Student) The Impact of Localized Hot Spots on the Raman Response of Monolayer MoS ₂
1:30 pm	Lynn Karriem	L02	(Student) Differential Gene Expression in C2C12 Cells Due to Scaffold Structure-Property-Processing-Performance Correlations
1:45 pm	Jun Yan	L03	Improving Exciton Valley Polarization by Scattering
2:00 pm	Jun Xiao	L04	Berry Curvature Memory Enabled by 2D Ferroelectric Semimetals
2:15 pm	Joel F Siegel	L05	(Student) Large-Area Arrays of Short-Wave-Infrared Graphene Plasmonic Resonators Exhibiting Strong Non-Local and Electron Quantization Effects
2:30 pm			Break
3:00 pm	Matthew C Strasbourg	L06	(Student) Enhanced Multiexciton Formation by an Electron-Hole Plasma in 2D Semiconductors
3:15 pm	Joon-Seok Kim	L07	Dielectric Effects on Exciton Emission of MoS ₂ /P(VDF-TrFE) Heterostructure—A Correlated Mapping Study
3:30 pm	Elisabeth Mansfield	L08	Surface Morphology and Composition of Hexagonal Boron Nitride Single Crystals Thermally Oxidized in Dry and Ambient Air
3:45 pm	Yuan Li	L09	(Student) Resistive Switching Properties of Single Layer h-BN Film with Different Electrodes
4:00 pm	Daniel Lewis	L10	(Student) Characteristics and Tunability of Electron Emission Sources from Quasi-Freestanding Epitaxial Graphene Microstructures

PROGRAM AT-A-GLANCE

WEDNESDAY

All times are EDT

M: Thermal Transport

1:15 pm	Joyce H Anderson	M01	Direct Measurement of Thermal Conductivity of Gold from Meso- to Nano-Scale
1:30 pm	Wilarachchige D.C. Bhagya Gunatilleke	M02	(Student) A Fundamental Study of Structural Effects on Thermal Properties of Quaternary Chalcogenides
1:45 pm	Yiwen Song	M04	(Student) Thermal Conductivity of $Al_{1-x}Sc_xN$ for 5G RF MEMS Filters
2:00 pm	Timothy David Brown	M05	(LATE NEWS) Characterization and Exploitation of Non-Linear Dynamics in Vanadium Dioxide Thermal Memristors
2:15 pm			Break

N: Narrow Bandgap Materials and Devices

3:00 pm	Aaron J. Muhowski	N01	Minority-Carrier Lifetimes in Digitally-Grown AlInAsSb Alloys
3:15 pm	Oleg Maksimov	N02	High Detectivity PbS_xSe_{1-x} Films for Mid-Wavelength Infrared Detectors
3:30 pm	Kunal Mukherjee	N03	Mid-Infrared Light Emission from PbSe Epitaxial Films on III-V Substrates
3:45 pm	Mark Wistey	N04	Optical Properties and Band Structures of Strained Ge:C
4:00 pm	Seyedeh Fahimeh Banihashemian	N05	SiSn Electronic Band Structure Modelling Using Density Functional Theory for Optoelectronic Applications

Journal of Electronic Materials

A special issue of the *Journal of Electronic Materials (JEM)** will be published with peer-reviewed papers from the 63rd Electronic Materials Conference.

- Article submission date is **August, 21, 2021**.
- Contact the 2021 Special Issue Editors listed below.

The *Journal of Electronic Materials* reports monthly on the science and technology of electronic materials, while examining new applications for semiconductors, magnetic alloys, dielectrics, nanoscale materials and photonic materials. The *Journal* welcomes articles on methods for preparing and evaluating the chemical, physical, electronic and optical properties of these materials. Specific areas of interest are materials for state-of-the-art transistors, nanotechnology, electronic packaging, detectors, emitters, metallization, superconductivity and energy applications. Review papers on current topics enable individuals in the field of electronics to keep abreast of activities in areas peripheral to their own.

Manuscripts for the EMC 2021 collection will be evaluated according to the same high standards as would be applied to any article submitted to the *Journal*. Authors are encouraged to read carefully and comply with the "Instructions for Authors" on the [springer.com/journal/11664](https://www.springer.com/journal/11664). Submission of a manuscript implies that the work described has not been previously published and is not under consideration for publication elsewhere.

2021 Special Issue Editors

Joshua Caldwell
josh.caldwell@vanderbilt.edu

Jennifer Hite
Jennifer.hite@nrl.navy.mil

Nadeem Mahadik
nadeem.mahadik@nrl.navy.mil

Parsian Mohseni
pkmohseni@rit.edu

Jamie Phillips
jphilli@udel.edu

Shadi Shahedipour-Sandvik
sshahedipour-sandvik@sunypoly.edu

Randy Tompkins
randy.p.tompkins.civ@mail.mil

TMS

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Presenter	Paper #	Title
Zehao Lin	PS2.A	Ferroelectric Field-Effect Transistors by Atomic-Layer-Deposited Hafnium Zirconium Oxide and Indium Oxide as Gate Insulator and Channel Semiconductor
Boce Lin	PS2.B	Experimental RF Characterization of Ferroelectric Hafnium Zirconium Oxide Material at GHz for Microwave Applications
Keerthana Shajil Nair	PS2.C	Process Dependent Ferroelectric Switching in Metal-Ferroelectric-Dielectric-Metal FTJ Stack
Saketh Ram Mamidala	PS2.D	Controlling Filament Stability in Scaled Oxides (3 nm) for High Endurance (>10 ⁶) Low Voltage ITO/HfO ₂ RRAMs for Future 3D Integration
Keren Stern	PS2.E	Sub-Nanosecond Partial Reset for Analog Phase Change Neuromorphic Devices
Daniel S Schneider	PS2.F	MoS ₂ /Graphene Lateral Heterostructure Field Effect Transistors
Shayan Parhizkar	PS2.G	Waveguide-Integrated Photodetectors Based on 2D Platinum Diselenide
Agata Piacentini	PS2.H	Low Hysteresis MoS ₂ -FET Enabled by CVD-Growth h-BN Encapsulation
Sourish Banerjee	PS2.I	Amorphous ALD-Grown GaO _x TFT for BEOL Integration
Jie Zhang	PS2.J	Crystallinity Engineering of Stoichiometric TiO ₂ : Transition from Insulator to Semiconductor
Neel Chatterjee	PS2.K	Mobility Boost in Transparent Oxide Semiconductors with High- κ Gated TFTs
Dong Yang	PS2.L	Enhanced Performance of Ultra-Scaled Vertical SiC Gate-All-Around Nanowire 1.2 kV Power MOSFET
Ankit Shukla	PS2.M	Terahertz Auto Oscillations in Non-Collinear Coplanar Metallic Antiferromagnets
Suyogya Karki	PS2.N	Spin-Dependent Electron Transport in Scandium Nitride Magnetic Tunnel Junction Devices Using First Principles
Karam Cho	PS2.O	Exchange-Coupling-Enabled Electrical-Isolation of Compute and Programming Paths in Valley-Spin Hall Effect Based Spintronic Device for Neuromorphic Applications

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PS1: POSTER SESSION I

WEDNESDAY

4:45 pm - 5:15 pm (EDT)

Presenter	Paper #	Title
Mayank Bulsara	EP01	(Exhibitor Poster) Taiyo Nippon Sanso
Kathy Wheeler	EP02	(Exhibitor Poster) k-Space Associates, Inc.
Brian Doherty	EP03	(Exhibitor Poster) CuttingEdge Ions, LLC
Gary S Tompa	EP04	(Exhibitor Poster) Structured Materials Industries, Inc.
Paul G. Nalam	PS1.01	(Student) Effect of Post-Deposition Annealing on the Structure, Morphology and Optical Properties of GeO ₂ Films
Victor Eliud Cenicerros-Orozco	PS1.02	(Student) Influence of CaO on Reddish Luminescence of Sm ³⁺ -Doped Borosilicate Glasses
Michael Alverson	PS1.03	(Student) Discovery of Novel Crystal Structures via Generative Adversarial Networks
Wafaa Farag Gebril	PS1.04	(Student) CVD Single Layer Graphene-Based Phototransistor with High Responsivity and Detectivity by Photogating Effect
Yongjian Zhou	PS1.05	(Student) Optical Properties of Different Stacking Orders in ReS ₂
Yu-Lin Hsu	PS1.06	(Student) Local Photovoltaic Measurements of CdTe Solar Cells Using Microscale Point Back-Contacts
Joel Hubbard	PS1.07	(Student) Electrical Behavior of CNT Epoxy Composites Under Simulated Space Environments
Jessica Nashelly Salgado-Delgado	PS1.08	(Student) Mechanical and Electrical Properties Study of a Composite Biomaterial of PVA-Chitosan / PPy / PEDOT:PSS / MWCNT / CB
Fomina Lioudmila	PS1.10	Synthesis and Characterization of Novel Pyrrole Ferrocene Derivatives and Their Semiconductor Behaviour
Giovanna Angélica Vázquez Hernández	PS1.11	(Student) Synthesis and Characterization of Novel Organic Compound: 1-(p-Fullerene-Phenyl)-2, 5 Diphenylpyrrole and Its Semiconductor Behavior
Marcos Martinez	PS1.13	Parametric Modeling of Self-Winding Helices for Sub-Millimeter Traveling Wave Tube Amplifiers
Mostafa Abdelhamid	PS1.14	(Student) Device Quality P-Type InGaN Relaxed Films
Ping Wang	PS1.15	On the Photoluminescence Emission of ScAlN Grown by Molecular Beam Epitaxy
Marzieh Savadkoobi	PS1.17	(Student) Effect of Active Molecule Edges on Magnetic Transport Properties of Molecular Spintronics Devices (MSD)
Andrew Christopher Grizzle	PS1.18	Monte Carlo Simulation Study of Single Molecular Spin State Effect on Anit-Ferromagnetically Coupled Magnetic Layers of Magnetic Tunnel Junction Based Spintronics Device
Pius Suh	PS1.20	(Student) Monte Carlo Simulations Investigating the Effect of Intra-Molecular Coupling Within Double Segmented Molecules on Magnetic Properties of Molecular Spintronics Devices
Uzma Amir	PS1.22	Ferromagnetic Electrodes Thickness Impacting the Equilibrium Magnetic Properties of the Magnetic Tunnel Junction Based Molecular Spintronics Devices.
Sarah Sheffield	PS1.23	(Student) Fluoropolymer Ionomers as a Dielectric in Rubrene Single-Crystal Transistors for Improved Charge Carrier Mobility
Lu Yu	PS1.24	(Student) Effects of Lignin Precursors and Processing Conditions on the Structures of Carbon Composites as Electrodes for Batteries
Nuwanjula Samarasingha	PS1.26	(Student) Temperature Dependence of Optical Phonon Bands in GaP
Jesus Marquez	PS1.27	(LATE NEWS, Student) Annealing Time Effects with a Fixed Temperature on Thin-Film Perovskite Solar Cells

PS2: POSTER SESSION II

THURSDAY

9:00 am - 10:30 am (EDT)

Presenter	Paper #	Title
Mayank Bulsara	EP01	(Exhibitor Poster) Taiyo Nippon Sanso
Kathy Wheeler	EP02	(Exhibitor Poster) k-Space Associates, Inc.
Brian Doherty	EP03	(Exhibitor Poster) CuttingEdge Ions, LLC
Gary S Tompa	EP04	(Exhibitor Poster) Structured Materials Industries, Inc.
Jung Suk Cha	PS2.01	(Student) Electrical Characteristics of Differently Surface-Treated N-Type AlInP for Red Light-Emitting Diodes
Nayana Remesh	PS2.02	High-Reliability AlGaIn/GaN HEMTs for High Voltage Applications Using Nitrogen-Rich Silicon Nitride Passivation and Field Plates
Terje Gunnar Finstad	PS2.03	Engineering Electrical Properties of Reactively Sputtered High Entropy Alloy CrFeNiCoCu Films
Ying Wang	PS2.04	Electrical Conductivity and Effects of Bending of Flexible Amorphous Transparent Conducting CdO–Ga ₂ O ₃ Alloy Films Sputter–Deposited at Room Temperature
Alam Saj	PS2.05	Synthesis and Characterization of Germanium Telluride Nanowires for Memory Application
Sreya Suresh	PS2.06	(Student) Correlated Quantum Materials—Exploring Spin Transport in Iridate Thin Films
Nithin Xavier	PS2.08	(Student) Fabrication and Scaling Up of Cs _{0.05} (MA _{0.17} FA _{0.83}) _{0.95} Pb(I _{0.83} Br _{0.17}) ₃ Perovskite Solar Cell at High Moisture and Oxygen Level
Radha Raman	PS2.11	(Student) Conduction-Templated Electrodeposition of Directed Nanostructures on 2D Materials for Axion-Like Evolvable Interconnects
Omid Mohammad Moradi	PS2.12	(Student) Fabrication of Polyvinylidene Fluoride (PVDF) Nanostructures with a Unique Ferroelectric Characteristic Using Initiated Chemical Vapor Deposition (iCVD)
Hiroaki Komatsu	PS2.14	(Student) Photoexcited Carrier Transport Properties of ZnO Nanoparticles-Functionalized Cellulose Nanofiber Films
Malek Mahmoudi	PS2.15	(Student) Developments of Hybrid White Organic Light Emitting Diodes with High Efficiency and Colour Quality Exploiting Exciton Allocation Strategy
Karolis Leitonas	PS2.16	(Student) Investigation of Dibenzo[A,C]Phenazine Derivatives Substituted by Acridan or Carbazole Moieties as Efficient OLED Hosts or Emitters
Jaeho Shin	PS2.18	(Student) Control of Photocurrent Direction by Molecular Dipole Moment in Molecular Heterojunctions with Two-Dimensional Semiconductor
Yang Liu	PS2.19	(Student) Molar Mass Dependence of P3HT on the Molecular Interaction and Performance in a Fullerene-Free Organic Photovoltaic Blend
Indranil Mal	PS2.20	(Student) Effect of Dilute Concentration of Bi on the Optoelectronic Properties of InAs for Long Wavelength Infrared Applications—A First Principle Analysis
Rikuto Nakamura	PS2.21	(Student) Reactive Ion Etching of Mg ₂ Si Substrate Using CF ₄ and SF ₆
Hiroto Tsuchida	PS2.22	(Student) Optical Transmission Measurement of <i>In Situ</i> Annealed Mg ₂ Si Crystals
Makoto Chiba	PS2.23	(Student) I-V and C-V Measurements of Metal/n-Mg ₂ Si Junction
Yudai Ichikawa	PS2.24	(Student) Electrical Property and Photosensitivity of Mesh-Electrode Type Mg ₂ Si Photodiodes Using Au/Pt P-Side Contact
Matas Guzauskas	PS2.27	(Student) Organic Emitters with Photo Induced Conformational Changes for Ratiometric and Colorimetric UV Sensing
Junhee Lee	PS2.28	(Student) Application of p-NiO/n-ZnO Heterojunction PN Diodes as Transparent Temperature Sensors
Yixin Xiao	PS2.29	(Student) Probing the Role of Non-Polar Surfaces of GaN Nanostructures in Efficient and Ultra Stable Photoelectrochemical Water Splitting
Bosun Abbas Roy-Layinde	PS2.30	(Student) Temperature Dependence of Thermophotovoltaic Conversion Using InGaAs Air-Bridge Cells
Ping Wang	PS2.32	Molecular Beam Epitaxy of ScAlN Nanowires—Structural and Optical Properties

Panel on Careers and Post-Graduate Studies in Materials Science

Thursday, June 24 | 7:30 pm – 8:30 pm (EDT)

Zoom Webinar, EMC conference registration NOT required

Moderator: Suzanne Mohney, The Pennsylvania State University

Interested in a career in materials science and want to know more?

- Is graduate school right for you? What paths are there to these careers?
- What does a materials scientist do and where do they work?
- What are the career options in industry, government and academia?

PANELISTS:



Adrienne Stiff-Roberts
Duke University



Wenbing Hu
Applied Materials, Inc.



Samuel Graham
Georgia Institute of Technology



David Estrada
Boise State University



Mona Ebrish
U.S. Naval Research Laboratory



Michael Abraham
Lockheed Martin

This event is organized by the EMC 2021 Officers and was made possible by
National Science Foundation Award DMR-2120668

Program Officer: Debasis Majumdar

PI: Dan Wasserman

Learn more at mrs.org/63rd-emc

PROGRAM AT-A-GLANCE

THURSDAY

All times are EDT

O: Water Splitting, Solar Hydrogen and Batteries

11:15 am	Hyun Uk Chae	O01	(Student) Hot Electron Metal-Free Electrode for Hydrogen Evolution Reaction
11:30 am	Rajashree Konar	O02	(Student) Facile and Scalable Ambient Pressure Chemical Vapor Deposition-Assisted Synthesis of Layered Silver Selenide (β -Ag ₂ Se) on Ag Foil as a Possible Oxygen Reduction Catalyst in Alkaline Medium
11:45 am	Ishtiaque Ahmed Navid	O04	(Student) Molecular Beam Epitaxy, Carrier Dynamics and Photocatalytic Properties of III-Nitride Nanowall Network
12:00 pm	Soonil Lee	O05	(Student) Low-Cost, Scalable Fabrication of Stable, High Performance Si-Based Metal-Insulator-Semiconductor Photoelectrodes for Solar-Driven Water Splitting
12:15 pm			Break
12:45 pm	Chanyeop Yu	O06	(Student) Surface-Modified Zero-Strain Spinel-Type Li ₂ Co _{2-x} Al _x O ₄ (where x = 0, 0.3, and 0.60) Cathodes for Lithium-Ion Batteries
1:00 pm	Lalith Rao	O07	(Student) Multifunctional Composite Binder for High Voltage Lithium-Ion Batteries
1:15 pm	Sami Ullah	O10	Investigation of Lithiated Tin (Sn/Li Alloy) Thin Film as a Low Work Function Termination on Silicon/Diamond Substrates

P: Synthesis and Processing of 2D Materials

11:00 am	Madina Telkhozhayeva	P01	(Student) Higher Ultrasonic Frequency Liquid Phase Exfoliation as a More Efficient Method to Deposit Monolayer to Few-Layer Flakes of 2D Layered Materials
11:15 am	Chuanfang (John) Zhang	P02	(Student) High-Quality MXene Inks for Energy Storage
11:30 am	Annika Grundmann	P03	(Student) MOCVD of 2D-WS ₂ on Conductive TiN/Si Substrates
11:45 am	Rajashree Konar	P04	(Student) Scalable Synthesis of Few-Layered 2D Tungsten Diselenide (2H-WSe ₂) Nanosheets Directly Grown on Tungsten (W) Foil Using Ambient-Pressure Chemical Vapor Deposition for Reversible Li-Ion Storage
12:00 pm	Zehao Zhu	P05	(Student) Towards the Rational Design of Printed 2D Materials
12:15 pm			Break
12:45 pm	Thomas Virgil McKnight	P06	(Student) MOCVD Growth of Tungsten Ditelluride Thin Films
1:00 pm	Gilbert Daniel Nessim	P07	High Yield, Bottom-Up/Top-Down Synthesis of 2D Layered Metal Sulfides, Phosphides and Selenides Using Chemical Vapor Deposition with Applications in Electronics and Electrochemistry
1:15 pm	Ping Wang	P09	Graphene Interface Mediated Lateral Epitaxy of Monolayer Hexagonal Boron Nitride
1:30 pm	Huiran Wang	P10	(Student) Impact of Salt and Solvent Identity on the Deposition of a Cobalt Crown Ether Phthalocyanine Monolayer Electrolyte

Q: Spin Dynamics in Electronic Materials

11:00 am	Stephen Ross McMillan	Q01	Probing the Coherent Spin Dynamics of Divacancies in Silicon Carbide with Low-Field Magnetoresistance
11:15 am	James P. Ashton	Q02	Ultra-Low Field Frequency-Swept Electrically Detected Magnetic Resonance—Multiple Photon Transitions and Bloch-Siegert Shifts
11:30 am	Eva Mutunga	Q03	Electrode Materials Influence on Molecular Spintronics Devices
11:45 am	Denis R Candido	Q04	Suppression of the Optical Linewidth and Spin Decoherence of a Quantum Spin Center in a p-n Diode
12:00 pm	Emma J. Renteria	Q05	Controlled Synthesis of Screw Dislocations in Semiconductor Nanomembranes for Spintronic Applications
12:15 pm			Break
12:45 pm	I-Hsuan Kao	Q06	(Student) Deterministic Switching of a Perpendicularly Polarized Magnet Using Unconventional Spin-Orbit Torques in WTe ₂
1:00 pm	Kwangyul Hu	Q07	(Student) Spin-Wave Edge Modes Excitation in a Tapered Thin Film
1:15 pm	Jonathan Ernesto Valenzuela	Q08	(Student) Neutron Diffraction and Transport Properties of Antiferromagnet CaFe ₂ O ₄
1:30 pm	Yueguang Shi	Q09	First Principles Calculation of the Electronic Structure of V(TCNE) ₂
1:45 pm	Yonatan Calahorra	Q10	Magnetic and Magnetoresistive Properties of Nickel/Nanoporous-GaN Composites

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R: Group III-Nitride Materials and Applications

11:00 am	Amit P Shah	R01	Rhenium-Based Ohmic Contacts to n-GaN
11:15 am	Elia Palmese	R02	(Student) Characterization of $\text{Al}_{1-x}\text{In}_x\text{N}$ Mismatched to GaN for Thin Oxide Applications
11:30 am	Amal Das	R03	(Student) Growth and Characterization of Preferential (100) Oriented AlN Thin Films Grown on Mo Coated Si (100) Substrate by Reactive RF Sputtering
11:45 am	Benjamin McEwen	R04	(Student) AlGaIn/GaN HEMT-Based Detection of Reactive Oxygen Species Molecule H_2O_2
12:00 pm	Sean Johnson	R05	(Student) Analysis of Patterned GaAsSbN Nanowires via Boltzmann Sigmoidal Model
12:15 pm			Break

S: Metasurfaces and Epitaxially-Grown Optical Materials and Devices

12:45 pm	Stefan Maier	S01	Metasurface Orbital Angular Momentum Holography
1:00 pm	Milan Palei	S02	Hybridization of Multi-Plasmon Modes on Coupled Nanoridge Array Metasurfaces for Super-Resolution Imaging
1:15 pm	Leland Joseph Nordin	S03	(Student) All-Epitaxial Spectrally Selective Dual-Color Surface Plasmon-Polariton Infrared Detectors
1:30 pm	Angela Cleri	S04	(Student) Mid-Wave to Near-IR Optoelectronic Properties and Epsilon-Near-Zero Behavior in In-Doped CdO
1:45 pm	Priyanka Petluru	S05	(Student) Long-Range Surface Plasmon Polaritons in All-Epitaxial Structures

T: High Electron Mobility Transistors (HEMT) & Characterization of 2-Dimensional Electron, Hole Gases

11:45 am	Md Didarul Alam	T01	(Student) Influence of Buffer Layer Thickness and Type on Laser Lift-Off of AlGaIn/GaN HEMTs Epilayers on Sapphire Substrates
12:00 pm	Mohi Uddin Jewel	T05	(Student) A Comparative Study of Slow Current Transients in $\text{Al}_{0.4}\text{Ga}_{0.6}\text{N}$ Channel MOSFET's with Back Barriers
12:15 pm			Break
12:45 pm	Jimmy Encomendero	T06	Polarization-Induced 2D Electron and Hole Gases Homoepitaxially Grown on Single-Crystal AlN Substrates
1:00 pm	Carsten Beckmann	T07	Two-Dimensional Hole Gases Induced by Spontaneous and Piezoelectric Polarization in Ga-Face GaN-on-AlGaIn
1:15 pm	Zexuan Zhang	T08	(Student) Polarization-Induced 2D Hole Gases in Undoped InGaIn/AlN Heterostructures Grown on Single-Crystal AlN Substrates
1:30 pm	Athith Krishna	T09	(Student) Effect of Acceptor Traps at Positive Polarization Interfaces on the Charge and Mobility of Holes in N-Polar P-Type GaN/(AlN/AlGaIn) Superlattices
1:45 pm	Phillip Dang	T10	(Student) Concurrent Quantum Hall Effect and Superconductivity in an Epitaxial Nitride Semiconductor/Superconductor Heterostructure

U: Diamond, Gallium Oxide and Related Materials

11:15 am	Nicolas Tappy	U01	(Student) Mapping Boron Concentration in HPHT-Diamond Using Continuous and Time-Resolved Cathodoluminescence Spectroscopy
11:30 am	Dhruba Das	U02	(Student) Making Diamond N-Type with Enhanced Conductivity via Ion Implantation Technique
11:45 am			Break
12:45 pm	Yixiong Zheng	U06	(Student) $\beta\text{-Ga}_2\text{O}_3$ Nanomembrane and Diamond P-N Heterojunction Integrated with Oxide Quantum Tunneling Layer
1:00 pm	Patrick Taylor	U07	MBE Growth and Optical Characterization of Large E_g Rocksalt-Structured Semiconductors
1:15 pm	Daram N Ramdin	U08	(LATE NEWS, Student) Deep Levels and Self-Trapped Excitons at Iridium/Edge-Fed Grown $\beta\text{-Ga}_2\text{O}_3$ Interfaces
1:30 pm	Nathan Paul Yonkee	U09	(LATE NEWS, Student) Time Dependent Simulations of Defect Kinetics and Thermodynamics in Gallium Oxide
1:45 pm	Menka Jain	U10	(LATE NEWS) Rare-Earth Chromites and Manganites—Structural-Property Relations

PROGRAM AT-A-GLANCE

THURSDAY

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V: Nanoscale Characterization

3:15 pm	Peter Moeck	V01	Crystallographic Symmetry and Pseudo-Symmetry Quantifications in Atomic and Molecular Resolution Images
3:30 pm	Andrew Naclerio	V03	Visualizing Oxidation Mechanisms in Few-Layered Black Phosphorus via <i>In Situ</i> Transmission Electron Microscopy
3:45 pm	Elisabeth Mansfield	V04	Transmission Imaging of 2D Materials in a Conventional Scanning Electron Microscope
4:00 pm	Priyanka Ramaswamy	V05	(Student) Doping Assessment of Ga-Assisted MBE Grown Be-Doped GaAs and Te-Doped GaAsSb Nanowires for Infrared Photodetector Application
4:15 pm			Break
4:45 pm	Gabriel Antonio Calderon Ortiz	V06	Identification of Ordered Domains in Organic Semiconducting Polymers Using Variable Probe Size 4-Dimensional Scanning Transmission Electron Microscopy
5:00 pm	Steven Spurgeon	V07	Rapid and Flexible Few Shot Learning-Based Classification of Scanning Transmission Electron Microscopy Data
5:15 pm	Ryan Kowalski	V08	(Student) Identifying Defect Origins of Single-Photon Emitters Using Infrared Nano-Optic Probes
5:30 pm	Mingze Yang	V09	(Student) Measurement of Minority Carrier Diffusion Lengths in Core-Shell GaAs NW p-n Junctions
5:45 pm	Abinash Kumar	V10	(Student) Understanding Relaxor Ferroelectrics at Atomic Scale

W: Organic and Hybrid Materials and Devices I

3:00 pm	Jacob W. Ciszek	W01	Improving Metal-Top-Contact/Organic Interfaces via Monolayers
3:15 pm	Drona Dahal	W02	(Student) Role of the Injection Barrier on the Performance of Vertical Organic Field Effect Transistors
3:30 pm	Paria Naderi	W03	(Student) Effect of Annealing Printed Electrodes on Gate Dielectric Hydrophobicity and Device Performance in Organic Transistors
3:45 pm	Hamna Haneef	W04	(Student) Elucidating the Role of Water-Induced Traps in the Environmental Stability of Polymer Field-Effect Transistors
4:00 pm	Raj Kishen Radha Krishnan	W05	(Student) Organic Doping at Ultra-Low Concentrations
4:15 pm			Break
4:45 pm	Nolan Concannon	W06	Tuning Exciplex Luminescence Using the Stark Effect in Organic Semiconductors
5:00 pm	Hadi Abroshan	W07	Extending Atomic Scale Simulation for OLED Materials—From Discrete Molecules to Disordered Solid State Morphologies
5:15 pm	Evgeny Pakhomenko	W08	(Student) Understanding the Influence of Spontaneous Orientation Polarization on the Efficiency of Organic Light-Emitting Devices (OLEDs)
5:30 pm	Jonathan Andrew Hopkins	W09	(Student) Synthesis and Characterisation of Phosphonated PEDOT—An Organic Material for Energy-Efficient Bioelectronics

X: 2D Material Devices and Applications

3:00 pm	Curt A Richter	X01	Reporting and Benchmarking Emerging Field-Effect Transistors
3:15 pm	Zhixian Zhou	X02	Accumulation-Type Ohmic Contacts Between Degenerately Doped and Nearly Intrinsic 2D Semiconductors
3:30 pm	Yuanyue Liu	X03	Why Two-Dimensional Semiconductors Generally Have Low Electron Mobility
3:45 pm	Lun Jin	X04	(Student) Transition Metal Dichalcogenides (TMDCs) Heterostructures Field Effect Transistors (FETs) Fabricated by Sequential Chemical Vapor Deposition (CVD)
4:00 pm	Xiaohan Wu	X05	(Student) Toward Universal 2D Memory—Conductive-Point Resistive Switching in Non-Metallic Atomic Layers
4:15 pm			Break
4:45 pm	Soaram Kim	X06	Rapid Detection of COVID-19 via Epitaxial Graphene Based Sensor
5:00 pm	Arnab Majee	X07	Quantitative Models of Charge Transport in Chemically Vapor Deposited Graphene on Germanium
5:15 pm	Rohan Sengupta	X08	(Student) Investigating the Impact of Dielectric Passivation and Metal Contacts on the Phase Change of 2D MoTe ₂ via Thermal Annealing
5:30 pm	Riccardo Torsi	X09	(Student) Controlled Rhenium Doping of MoS ₂
5:45 pm	Nailah Oliver	X10	(Student) Computational Modeling of Metal Islands for Hybrid Contacts to MoS ₂

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Y: Devices and Materials for Power Electronics			
3:00 pm	Shahab Mollah	Y01	Study of Temperature Effect on Performance of Ultrawide Bandgap $\text{Al}_{0.4}\text{Ga}_{0.6}\text{N}$ -Channel Depletion and Enhancement Mode MOSFETs with $\text{ZrO}_2/\text{Al}_2\text{O}_3$ Gate Insulator
3:15 pm	Mohammad Wahidur Rahman	Y02	(Student) Hybrid $\text{BaTiO}_3/\text{SiN}_x/\text{AlGaIn}/\text{GaIn}$ Schottky Barrier Diodes with Low Turn-On and High Breakdown Performance
3:30 pm	Nayana Remesh	Y03	(Student) Re-Engineering of Transition Layer to Achieve Record-High Breakdown Field of 2.05 MV/cm for a Buffer Thickness of 1.65 μm of $\text{AlGaIn}/\text{GaIn}$ HEMT on Si
3:45 pm	Andrew Anthony Aragon	Y04	(Student) Carrier Dynamics in Dry-Etched-and-Regrown Nonpolar M-Plane GaN p-n Diodes—A Small-Signal RF Analysis
4:00 pm	Dennis Edward Szymanski	Y05	(Student) Development of III-Nitride Superjunctions
4:15 pm			Break
4:45 pm	Andrew Anthony Aragon	Y06	(Student) Deep-Level Optical Spectroscopy in Wet-Treated Etched-and-Regrown Nonpolar M-Plane GaN Vertical Schottky Diodes
5:00 pm	Yafei Liu	Y07	(Student) X-Ray Topography Characterization of Selective Area Doping of Gallium Nitride Epitaxial Layers for Power Electronic Devices Development
5:15 pm	Mona Ebrish	Y08	Ion Implanted Edge Termination Designs for High Current 1.2kV GaN Vertical PiN Diodes
5:30 pm	Wenbo Li	Y09	(Student) Characterization of Traps in High-Growth-Rate MOCVD-Grown GaN
5:45 pm	Yuxuan Zhang	Y10	(Student) MOCVD GaN Epitaxy with Fast Growth Rates
Z: Solar Cell Materials and Devices			
3:00 pm	Sara Pouladi	Z01	Sulfur Passivation Effect on Low-Angle Grain Boundaries in Single-Crystal-Like GaAs Flexible Thin Film Solar Cells on Metal Tape
3:15 pm	Falk Niefind	Z02	Nanoscale Morphology of Polymer:Fullerene Blends Investigated by Photoemission Electron Microscopy
3:30 pm	Yu-Lin Hsu	Z03	(Student) Impact of Ar Ion Beam Milling on Metal-Halide Perovskite Solar Cells
3:45 pm	Vinod K. Sangwan	Z04	Impedance Spectroscopy for Emerging Non-Fullerene Acceptor Based Organic Solar Cells
4:00 pm	Laura Nielsen	Z05	Development of Polymers for Scalable Organic Photovoltaics
4:15 pm			Break
AA: Heteroepitaxy on Silicon			
4:45 pm	Eamonn Hughes	AA01	(Student) High-Reliability InAs QD Lasers on Silicon Through Misfit Dislocation Trapping Layers
5:00 pm	Pankul Dhingra	AA02	(Student) Dislocation tolerance of n-InGaP Grown on Si
5:15 pm	Tyler Grassman	AA03	$\text{B}_x\text{Ga}_{1-x}\text{P}/\text{Si}$ Grown via Hybrid Gas/Solid-Source Molecular Beam Epitaxy
5:30 pm	Mario James Dumont	AA04	(Student) Growth of Low Dislocation Density GaAs Films on Silicon Using Bonded III-V Template
5:45 pm	Matthew Dennis Chrysler	AA05	(Student) Tuning Band-Alignment at a Semiconductor-Crystalline Oxide Heterojunction via Electrostatic Modulation of the Interfacial Dipole
BB: Gallium Oxide Processing, Characterization and Defects			
3:00 pm	Yaoyao Long	BB01	(Student) Fin-Waist Formation in $\beta\text{-Ga}_2\text{O}_3$ Fin Arrays Defined by ICP-RIE
3:15 pm	Evan Michael Cornuelle	BB02	(Student) Quantitative Defect Characterization of MOCVD-Grown $\beta\text{-(Al,Ga)}_2\text{O}_3$ and Comparison with $\beta\text{-Ga}_2\text{O}_3$
3:30 pm	Md Nazmul Hasan	BB03	(Student) Nanogaps Formation and Recovery Process of Flexible $\beta\text{-Ga}_2\text{O}_3$ Nanomembranes Under Uniaxial Strain
3:45 pm	Michael Evan Liao	BB04	(Student) The Impact of Interfacial Structure on Thermal Transport Characteristics for Wafer Bonded (-201) $\beta\text{-Ga}_2\text{O}_3$ (0001) 4H-SiC
4:00 pm			Break
CC: Gallium Oxide Epitaxy I			
4:45 pm	Saurav Roy	CC01	(Student) Growth and Characterization of <i>In Situ</i> MOCVD-Grown Al_2O_3 Dielectric / (010) $\beta\text{-Ga}_2\text{O}_3$ Interface
5:00 pm	A F M Anhar Uddin Bhuiyan	CC02	(Student) Orientation-Dependent Band Offsets at MOCVD Grown $\beta\text{-(Al}_x\text{Ga}_{1-x})_2\text{O}_3/\beta\text{-Ga}_2\text{O}_3$ Heterointerfaces
5:15 pm	Praneeth Ranga	CC03	(Student) Electrical Characterization of MOVPE-Grown Low Sheet Resistance $\beta\text{-(Al}_x\text{Ga}_{1-x})_2\text{O}_3/\beta\text{-Ga}_2\text{O}_3$ Heterostructure Channels
5:30 pm	Zixuan Feng	CC04	Expanding Growth Window for MOCVD $\beta\text{-Ga}_2\text{O}_3$
5:45 pm	Kenny Huynh	CC05	(Student) Surface Reaction Dependence of Molecular Beam Epitaxy Grown Al on Various Orientations of $\beta\text{-Ga}_2\text{O}_3$
Panel Discussion			
7:30 pm			PD: Panel on Careers and Post-Graduate Studies in Materials Science Panelists: Adrienne Stiff-Roberts Wenbing Hu Samuel Graham, Jr. David Estrada Mona Ebrish Michael Abraham

PROGRAM AT-A-GLANCE

FRIDAY

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DD: Materials for Memory and Logic

9:15 am	Jun Tao	DD01	(Student) Photo Floating-Gate Field-Effect Transistors for Machine Vision
9:30 am	Diana Sungmin Kim	DD02	(Student) Deterministic Analogue Resistive Memory for Neuromorphic Computing Based on Transition Metal Oxides
9:45 am	Sanghyeon Choi	DD03	(Student) SiO _x Nanorod-Structured Artificial Neuron for Probabilistic Computing Applications
10:00 am	Seonghoon Jang	DD04	(Student) Development of a Single Device-Based Organic Tactile Synapse for Artificial Learning Skin Applications
10:15 am			Break
10:45 am	Yuanshen Qi	DD06	Ferroelectricity of As-Deposited HZO Fabricated by Plasma-Enhanced Atomic Layer Deposition at 300°C by Inserting TiO ₂ Interlayers
11:00 am	Oliver Lloyd William McHugh	DD07	(Student) Tackling the Total Spin Hall Conductivity—A Multi-Code Approach for Doped and Alloyed Materials
11:15 am	Marzieh Savadkoobi	DD08	(Student) Effect of Size and Temperature Variation on Magnetic Tunnel Junction-Based Molecular Spintronic Devices (MTJMSDs)
11:30 am	Bishnu R Dahal	DD09	Impact of Anisotropy on the Magnetic Hysteresis of Magnetic Tunnel Junction Based Molecular Spintronics Device (MTJMSD) Properties
11:45 am	Shubham Sukumar Awate	DD10	(Student) High-Speed Two-Dimensional Solid-State Non-Volatile Memory Based on Electric Double Layer Gating Using a Monolayer Electrolyte

EE: Organic and Hybrid Materials and Devices II

9:00 am	Zhongxiang Peng	EE01	(Student) Manipulation of Morphological, Mechanical and Photovoltaic Properties of Ternary Organic Photovoltaic Blends for Optimum Operation
9:15 am	Kyeong-Yoon Baek	EE02	(Student) Structural and Optical Evolution of Mechanochemically Synthesized Zero-Dimensional Cesium Lead Bromide Perovskite
9:30 am	Colin Tyznik	EE03	(Student) Photocurrent Enhancement in Organic Semiconductor/Metal Halide Perovskite Bilayers
9:45 am	Jonghoon Lee	EE05	(Student) Controllable Deposition of Organic-Inorganic Halide Perovskite Films with Wafer-Scale Uniformity by Single-Source Flash Evaporation
10:15 am			Break
10:45 am	Heebeom Ahn	EE06	(Student) Current Noise Analysis on Organo-Metal Halide Perovskite Resistive Switching Memory
11:00 am	Jung Sun Eo	EE07	(Student) Molecular-Scale Selector Implemented by a Combination of Different Molecular Dipole Orientation and Two-Dimensional Semiconductors
11:15 am	Seonggil Ham	EE08	(Student) Fiber-Shaped Multi-Synapses Enabling an Electronic-Textile Neural Network for Wearable Neuromorphic Applications

FF: Doping and Stoichiometric Effects on Epitaxial Material

9:00 am	Joshua Andrew McArthur	FF01	(Student) Background Carrier Polarity Switching in Al _x In _{1-x} As _y Sb _{1-y} Digital Alloys
9:15 am	Binjie Chen	FF02	(Student) Reduction of the T _c and Suppression of the ΔT_c of VO ₂ Epitaxial Films on TiO ₂ Buffered Sapphire Substrate
9:30 am	Xi Zhang	FF03	Electrochemical-Redox-Modulation of the Oxygen Content in Superconducting YBa ₂ Cu ₃ O _{7-δ}
9:45 am	Qian Meng	FF04	(Student) Effect of B Distribution on the Band Structure of BGa(In)As Alloys
10:00 am	Rachel Corey White	FF05	(LATE NEWS, Student) Growth Optimization of InSbBi Alloys for Wavelength Extension on InSb
10:15 am			Break

GG: Oxide Semiconductors: Charge Transport and Optical Properties

10:45 am	Jade Cowsky	GG01	(Student) Defects and Dopants at Ultra-Thin Film Indium Tin Oxide (ITO) Interfaces
11:00 am	Mian Wei	GG02	(Student) Modulation of Optical and Electrical Properties for Transparent Oxide Semiconductor ASnO ₃ by the A-Site Ion Substitution
11:15 am	Mingyuan Liu	GG03	(Student) Thermal and Bias Stability of InAlZnO-Based Amorphous Thin-Film Transistors
11:30 am	Maytal Caspary Toroker	GG04	Charge Transport in Ternary Spinel Oxides
11:45 am	Elaheh Kheirandish	GG05	(Student) Charge Transport and Photoconduction Effects in Quasi Two-Dimensional γ -Al ₂ O ₃ Grown by Graphene Assisted Atomic Layer Deposition

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HH: Group III-Nitride LED I			
9:00 am	Evyn Lee Routh	HH01	(Student) Towards Device-Quality Higher Mole Fraction $\text{In}_x\text{Ga}_{1-x}\text{N}$ Relaxed Templates ($0 < x < 15\%$)
9:15 am	Keisuke Motoki	HH02	(Student) Observation of Interfacial Strain Relaxation in High Indium, AlInN/GaN Heterostructures by Transmission Electron Microscope
9:30 am	Huabin Yu	HH03	(Student) Micro-Scale AlGaIn -Based Deep Ultraviolet Light-Emitting Diodes Emitting at 265 nm
9:45 am	Walter Jin Shin	HH04	(Student) Demonstration of High Q Aluminum Nitride on Sapphire Microring Resonator at Green and UV Wavelengths
10:00 am	Ankit Udai	HH05	(Student) Carrier-Photon Dynamics in $\text{InGaIn}/\text{GaIn}$ Quantum-Dots Emitting Green Light
10:15 am			Break
II: Group III-Nitride Photodetectors			
10:45 am	Hoon Jeong	II01	(Student) Low Temperature Geiger-Mode Measurement of Gallium Nitride p-i-n Avalanche Photodiode
11:00 am	Farnood Mirkhosravi	II02	(Student) Characterization of Ga-Polar and N-Polar III-Nitride (GaIn) Diodes Under High-Dose Gamma-Ray Irradiation
11:15 am	Danhao Wang	II03	(Student) AlGaIn -Based Nanowires for Self-Powered Ultraviolet Photodetectors with High Responsivity
11:30 am	Anisha Kalra	II04	(Student) UV-Stress Induced Degradation in AlGaIn Solar-Blind Schottky and p-i-n Photodetectors
11:45 am	Marzieh Bakhtiary-Noodeh	II05	(Student) Growth and Characterization of p-i-n GaN UV 6×6 Avalanche Photodiodes Arrays with Large Detection Area
JJ: Printed and Flexible Thin Films			
9:15 am	Benoit Lessard	JJ02	Low Voltage Operation of Flexible Organic Thin-Film Transistors Using Poly(Ionic Liquid) Block Copolymer Based Gating Materials
9:30 am	Annatoma Arif	JJ03	(Student) Inkjet Printed 3D Metal Electrodes on Shape Memory Polymer Towards Improved Electrochemical Bio-Sensing Performance
9:45 am	Nam-In Kim	JJ04	(Student) Skin-Attachable Physical Sensors Using Single-Crystalline III-N Piezoelectric Thin Film for Personal Health and Safety Monitoring
10:00 am	Mohan Panth	JJ05	(Student) High Performance Strain Sensors Based on Zinc Oxide Nanowire Array/Graphene Nanohybrids
10:15 am			Break
KK: MBE: Selective Area Growth and Doping			
10:45 am	Shotaro Kobayashi	KK01	(Student) Control of Nucleation Layers for (110) Oriented ZnTe Thin Film Growth on Sapphire r, S-Plane Nano-Facet Substrates
11:00 am	Ashlee Garcia	KK02	(Student) Experimentally-Calibrated Modeling of Molecular Beam Epitaxy Selective Area Regrowth
11:15 am	Alec Mason Skipper	KK03	(Student) Selective Area Doping and Lateral Overgrowth by Solid-Source Molecular Beam Epitaxy
11:30 am	Kamruzzaman Khan	KK04	(Student) Demonstration of Self-Assembled $\text{InGaIn}/\text{GaIn}$ Superlattice on GaN Template Grown by Plasma-Assisted Molecular Beam Epitaxy
11:45 am	Kamruzzaman Khan	KK05	(Student) Investigation of $1\mu\text{m}$ -Thick InGaIn Films Grown on O-Face ZnO by Plasma-Assisted Molecular Beam Epitaxy
LL: Materials Processing and Integration			
9:00 am	Evan M Anderson	LL01	Reduced Temperature Preparation of Atomically Clean Si Surfaces to Augment CMOS with Atomic Precision Devices
9:15 am	Galih R. Suwito	LL02	(Student) Kinetics and Mechanism of Metal-Catalyzed Lateral Epitaxy for Growing Lattice-Mismatched Heterostructures via Vapor-Liquid-Solid
9:30 am	Guohai Chen	LL03	Carbon Nanotube-Cu Through-Silicon-via Interposer for Microelectronic Packaging Applications
9:45 am	Noah Paulson	LL04	Autonomous Optimization of Atomic Layer Deposition via Artificially Intelligent Agents
10:00 am	Rachel Cherry	LL05	(Student) Nanosphere Coatings for Photonic Light Trapping in Ultra-Thin Film Photoconductive Absorber Layers for THz Generation
10:15 am			Break
MM: Gallium Oxide Epitaxy II			
10:45 am	Yuichi Oshima	MM01	In-Plane Orientation Control of (001) $\kappa\text{-Ga}_2\text{O}_3$ by Epitaxial Lateral Overgrowth Through a Geometrical Natural Selection Mechanism
11:00 am	Hitoshi Takane	MM02	(Student) On the Initial Growth Mechanisms of α -Phase Ga_2O_3 on C-Plane Sapphire by Mist CVD
11:15 am	Jingyu Tang	MM03	Phase Composition and Microstructure of Gallium Oxide Heteroepitaxial Films—Effect of MOCVD Growth Conditions
11:30 am	Debabrata Das	MM04	Realization of Self-Assisted Growth of Nano-Columnar $\beta\text{-Ga}_2\text{O}_3$ Thin Film on Silicon Substrate
11:45 am	Jonathan McCandless	MM05	(LATE NEWS, Student) Stabilizing $\alpha\text{-Ga}_2\text{O}_3$ and $\alpha\text{-(AlGa)}_2\text{O}_3$ up to 900°C

PROGRAM AT-A-GLANCE

FRIDAY

All times are EDT

NN: Group III-Nitride Defects

1:00 pm	Fiaz Ahmed	NN01	(Student) Imaging Photocurrent Distributions from Sub-Bandgap Defects by Polarity Resolved Scanning Photocurrent Microscopy (SPCM) in III-Nitride Devices
1:15 pm	Alexander Chang	NN02	Oxygen Doping Distribution in GaN Lateral Polarity Junction
1:30 pm	Shanshan Hu	NN03	(Student) Characterization of Prismatic Slip in PVT-Grown AlN Crystals
1:45 pm	Vincent E. Meyers	NN04	Microwave-Induced Annealing, Its Impact on Mg Diffusion and Photoluminescence Activity in Implanted and <i>In Situ</i> Doped GaN
2:00 pm	Shashwat Rathkanthiwar	NN05	(LATE NEWS) Point Defect Management in Homo-Epitaxially Grown Si-Doped GaN by MOCVD for Vertical Power Devices

OO: Novel Materials

1:15 pm	Md Rezaul Karim	OO01	(Student) Experimental Determination of Valence Band Offsets of ZnGeN_2 and $(\text{ZnGe})_{0.94}\text{Ga}_{0.12}\text{N}_2$ with GaN
1:30 pm	Mina Moradnia	OO03	(Student) Hybrid Vapor Phase Epitaxy (HybVPE) of Transition-Metal-Alloyed Single-Crystalline Wide-Bandgap Piezoelectric Semiconductor Films
1:45 pm	Benthara Hewage Dinushi Jayatunga	OO04	(Student) Progress in MOCVD Growth and Characterization of $\text{ZnGeGa}_2\text{N}_4$ Films
2:00 pm	Oleg Maksimov	OO05	Low-Temperature Epitaxial Growth of Anti-Ferromagnetic MnTe at Bi_2Te_3

PP: Oxide Thin Film Transistors

1:00 pm	Yong Zhang	PP01	(Student) Control of Transistor Operation Modes for SnO -TFT
1:15 pm	Jaesung Jo	PP02	(Student) Understanding the Differences Between Hall Mobility and FE Mobility for P-Type Cu_2O Thin-Film Transistor
1:30 pm	Christopher R. Allemang	PP03	(Student) Temporal Stability of Zinc Tin Oxide TFTs with Active Layers Deposited by Atomic Layer Deposition
1:45 pm	Adam Weidling	PP04	(Student) Photonic Curing of Solution-Processed Indium Zinc Oxide Thin-Film Transistors
2:00 pm	William J Scheideler	PP05	Designing Printed High-k Modulation-Doping Layers for InO_x Transistors to Break Thermal Processing Barriers

QQ: Group III-Nitride LED II

1:00 pm	Jiaying Lu	QQ01	(Student) Analysis on the Internal Quantum Efficiency of Deep-Ultraviolet Emitting AlGaIn Nanowires
1:15 pm	Woncheol Lee	QQ02	(Student) Deep Ultraviolet Luminescence and Charge-Transfer Excitons in Atomically Thin GaN Quantum Wells
1:30 pm	Haotian Xue	QQ04	(Student) Red-Emitting InGaIn/AlGaIn/GaN Multiple Quantum Wells with Various Underlayers
1:45 pm	Barbara Anna Kazanowska	QQ05	(Student) Exploring $\text{Al}_{(x)}\text{Ga}_{(1-x)}\text{N}$ Nanostructures Fabricated via Top-Down Chemical Wet Etching

RR: LATE NEWS—Novel Properties, Processing, Modeling and Characterization Methods

1:00 pm	Christopher M. Matthews	RR01	(LATE NEWS, Student) Kinetic Model of Vertical Indium Segregation During InGaIn Epitaxy
1:15 pm	Patrick Ryan Sohr	RR02	(LATE NEWS) Strong Coupling in Semiconductor Hyperbolic Metamaterials
1:30 pm	Barys Korzun	RR03	(LATE NEWS) Preparation by Melt Method and Phase Equilibria in the $\text{CuFeS}_2\text{-}\delta$ – CuAlS_2 System
1:45 pm	Briana Laubacker	RR04	(LATE NEWS, Student) Nanostructured Semiconductors Prepared Using High Pressure Chemical Vapor Deposition with Mesoporous Templates
2:00 pm	Daniel E. Autrey	RR05	(LATE NEWS) Tuning the Magnetic Properties of Two-Dimensional MXenes by Chemical Etching