

SYMPOSIUM NM1

Emerging Non-Graphene 2D Materials
April 17 - April 21, 2017

Symposium Organizers

Linyou Cao, North Carolina State University
Bruce Claffin, Air Force Research Laboratory
Thomas Mueller, Vienna University of Technology
Hua Zhang, Nanyang Technological University

Symposium Support

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Proceedings Statement

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* Invited Paper

SESSION NM1.1: Phonon and Thermal Properties of 2D Materials
Session Chairs: Linyou Cao and Xiuling Li
Monday Morning, April 17, 2017
PCC West, 100 Level, Room 106 AB

8:30 AM *NM1.1.01

2D Layered Material—From Transistors to Interconnects H.-S. Philip Wong; Stanford University, United States.

9:00 AM NM1.1.02

In Situ Characterization and Dynamic Control of the Anisotropic Thermal Properties and Phonon Spectra of Black Phosphorus Yongjie Hu; University of California, Los Angeles (UCLA), United States.

9:15 AM *NM1.1.03

Interlayer Phonons in Transition Metal Dichalcogenide Atomic Layers Rui He; University of Northern Iowa, United States.

9:45 AM NM1.1.04

Probing Electrical and Thermal Properties in Electrochemically Li-Intercalated MoS₂ Nanosheets with Raman Spectroscopy Feng Xiong^{1,2}; ¹University of Pittsburgh, United States; ²Stanford University, United States.

10:00 AM BREAK

10:30 AM *NM1.1.05

Devices, Nanofunctions and Unconventional Applications of 2D Materials Eric Pop; Stanford University, United States.

11:00 AM NM1.1.06

Effects of Defects on the Temperature Dependent Thermal Conductivity of Suspended Monolayer MoS₂ Grown by Chemical Vapor Deposition Milad Yarali; University of Houston, United States.

11:15 AM *NM1.1.07

Probing Interlayer Coupling of Two-Dimensional Layered Materials beyond Graphene by Raman Spectroscopy PingHeng Tan; Institute of Semiconductors, Chinese Academy of Sciences, China.

11:45 AM NM1.1.08

Large Area van der Waals Epitaxy of MoS₂ on III-Nitride Substrates Xiuling Li; University of Illinois at Urbana-Champaign, United States.

SESSION NM1.2: Controlled Scalable Synthesis of 2D TMDC Materials and Heterostructures I

Session Chairs: Linyou Cao and Thomas Mueller
Monday Afternoon, April 17, 2017
PCC West, 100 Level, Room 106 AB

1:30 PM *NM1.2.01

Possibilities for Growing and Scaling CVD Graphene and hBN and Progress on Diamane Rodney S. Ruoff; Ulsan National Institute of Science and Technology (UNIST), Korea (the Republic of).

2:00 PM *NM1.2.02

Defect Engineering in Monolayer MoSe₂ through Controlled Synthesis and Doping Kai Xiao; Oak Ridge National Laboratory, United States.

2:30 PM NM1.2.03

Van der Waals Epitaxy and Layer by Layer Nanoscale Patterning of 2D Transition Metal Dichalcogenides Bruce A. Parkinson; University of Wyoming, United States.

2:45 PM BREAK

3:15 PM *NM1.2.04

High-Resolution Probes of Metal Chalcogenide Semiconductors—Growth, Electronic Structure, Light-Matter Interactions Peter Sutter; University of Nebraska—Lincoln, United States.

3:45 PM *NM1.2.05

Paper and Circuits Only Atoms Thick Jiwoong Park; University of Chicago, United States.

4:15 PM *NM1.2.06

Two-Dimensional Layered Transitional Metal Dichalcogenides—Growth Dynamics and Electron Device Yang Chai; The Hong Kong Polytechnic University, Hong Kong.

SESSION NM1.3: Optical Properties and Devices of 2D Materials I

Session Chair: Wenjuan Zhu
Tuesday Morning, April 18, 2017
PCC West, 100 Level, Room 106 AB

10:30 AM *NM1.3.01

Layer-Dependent Infrared Response of Few-Layer Black Phosphorus Hugen Yan; Fudan University, China.

11:00 AM *NM1.3.02

Enhanced Photocurrent Generation at WS₂/Graphene Interfaces by Interlayer Coupling Libai Huang; Purdue University, United States.

11:30 AM *NM1.3.03

Ultrafast Interlayer Charge Transfer in van der Waals Heterostructures Hui Zhao; University of Kansas, United States.

SESSION NM1.4: Electronic Properties and Devices of 2D Materials I

Session Chairs: Linyou Cao and Yongjie Hu
Tuesday Afternoon, April 18, 2017
PCC West, 100 Level, Room 106 AB

1:30 PM *NM1.4.01

Electrical Generation and Control of Valley Polarization in 2D Materials Xiang Zhang; University of California, Berkeley, United States.

2:00 PM NM1.4.02

Effect of Ionic Strength on the Electron Mobility of Electrolyte-Gated 2D Field-Effect Transistors [Ming-Pei Lu](#); National Nano Device Labs, Taiwan.

2:15 PM *NM1.4.03

Two-Dimensional Materials and Their Heterostructures—Exciting Opportunities in Materials Research [Chakrapani V. Varanasi](#); U.S. Army Research Laboratory, United States.

2:45 PM NM1.4.04

MoS₂ Transistors with 1-Nanometer Gate Lengths [Sujay B. Desai](#); University of California, Berkeley, United States.

3:00 PM BREAK

3:30 PM *NM1.4.05

Transition from Quasi-2D to Quasi-1D van der Waals Materials—Electronic Properties of Monoclinic Tantalum Triselenide Capped with Boron Nitride Layers [Alexander A. Balandin](#); University of California, Riverside, United States.

4:00 PM NM1.4.06

DFT Simulation Study for MoS₂ Contact Material [Junsen Gao](#); Department of Electrical and Computer Engineering, Canada.

4:15 PM *NM1.4.07

Electronic Transport and Device Applications of 2D Materials [Feng Miao](#); Nanjing University, China.

4:45 PM NM1.4.08

Fully Flexible and Transparent CVD-Grown Monolayer MoS₂ Field-Effect Transistors with all Inkjet-Printed Components [Tae-Young Kim](#); Seoul National University, Korea (the Republic of).

SESSION NM1.5: Poster Session I

Tuesday Afternoon, April 18, 2017

8:00 PM - 10:00 PM

Sheraton, Third Level, Phoenix Ballroom

NM1.5.01

Nanoscale Thermometer for Different 2D Materials [Xuan Hu](#); University of Illinois at Chicago, United States.

NM1.5.02

Synthesis of Transition Metal Dichalcogenide Films by Chemical Transformation of Solid Thin Films [Shaul Aloni](#); Lawrence Berkeley National Lab, United States.

NM1.5.03

2D-Transition Metals Carbides (MXenes) with Outstanding EMI Shielding Properties [Mohamed Alhabeib](#); Drexel University, United States.

NM1.5.04

Organic Semiconductor Exfoliated Nanoscale WS₂ towards Organic Optoelectronics [Abdus S. Sarkar](#); IIT Mandi, India.

NM1.5.05

CVD Growth of Vertically Aligned MoS₂ and WS₂ Two-Dimensional Nanostructures and Their Anisotropic Properties [Viswanath Balakrishnan](#); Indian Institute of Technology Mandi, India.

NM1.5.06

Selective Patterning of Amorphous Silicon on MoS₂ for Enabling Transition-Metal Dichalcogenide Heterostructures [Markus Heyne](#)^{1,2,3}; ¹KU Leuven, Belgium; ²University of Antwerp, Belgium; ³imec, Belgium.

NM1.5.07

A Robust Method for the Synthesis of Colloidal PbS Nanosheets [Liangfeng Sun](#); Bowling Green State University, United States.

NM1.5.08

Tribological Researching of Atomically Thin TMDCs Using Raman Spectral and AFM [Dameng Liu](#); Tsinghua University, China.

NM1.5.09

Characterization of Grain Boundaries and Impact of Plasma-Induced Patterning in 2D Materials [Daniele Chiappe](#); imec, Belgium.

NM1.5.10

Interaction of Light with Liquid Suspensions of 2D Nanomaterials—Nonlinear Optics, Thermal Lens Effect and Flow-Induced Alignment [Yanan Wang](#)^{1,5}; ¹University of Electronic Science and Technology of China, China; ⁵University of Houston, United States.

NM1.5.11

Liquid Phase Exfoliation and Sensor Properties of Titanium Trisulfide (TiS₃) [Alexey Lipatov](#); University of Nebraska - Lincoln, United States.

NM1.5.12

The First-Principle Investigation on the Phase Change and Band Alignment of Monolayer and Heterostructure Transition Metal Dichalcogenides (TMDs) [Chenxi Zhang](#); University of Texas at Dallas, United States.

NM1.5.13

Machine Learnt Bond Order Potential for Stanene to Probe Thermal Transport Using Molecular Dynamics Simulations [Mathew J. Cherukara](#); Argonne National Lab, United States.

NM1.5.14

Exploration of the Growth of MoS₂ on Naturally Grown Pyrite [Huimin Hao](#)^{1,2}; ¹Taiyuan University of Technology, China; ²University of Minnesota, United States.

NM1.5.15

Effects of Strain on Structural Rippling in Phosphorene [Oswaldo Sanchez](#); Iowa State University, United States.

NM1.5.16

Epitaxial Group V 2D Materials—Growth and Electronic Properties [Matthieu Fortin-Deschenes](#); Polytechnique Montréal, Canada.

NM1.5.17

Mechanisms and Dynamics of Two-Dimensional Black Phosphorus Sublimation [Matthieu Fortin-Deschenes](#); Polytechnique Montréal, Canada.

NM1.5.18

Few-Layer Zinc Oxide Nanosheets Grown at Water-Air and Water-Oil Interface [Xin Yin](#); University of Wisconsin-Madison, United States.

NM1.5.19

Nanoscale Characterization of WSe₂ for Solar Cell Applications [Nirmal Adhikari](#); University of Texas at El Paso, United States.

NM1.5.20

Phase Engineering of 2D Metal Chalcogenide Crystals [Zafer Mutlu](#); University of California, Riverside, United States.

NM1.5.21

Anti-MoS₂ Material—2D Nanosheets of Acanthite by Liquid Phase Exfoliation [Malik D. Khan](#)^{1,2}; ¹University of Zululand, South Africa; ²University of Manchester, United Kingdom.

NM1.5.22

A Versatile Method to Grow Single Crystal 2D Transition Metal Dichalcogenide (MoS₂) from Self-Correcting Polymer Template [Xining Zang](#)^{1,2}; ¹University of California, Berkeley, United States; ²Berkeley Sensor and Actuator Center, United States.

NM1.5.23

Ab Initio Design of *In Situ* Composite Morphology through Control of Nucleation Parameters [Rahul Basu](#); Adarsha Institute of Technology, India.

NM1.5.24

Developing Au@MoS₂ Core-Shell Heterostructures with Strong Light-Matter Interactions [Yuan Li](#); Northwestern University, United States.

NM1.5.25

A Single-Molecule-Thin Organic Layer on Black Phosphorous and Transitional Metal Dichalcogenides as Corrosion Inhibitor and Its Characterizations [Cong Su](#)^{1,2}; ¹Massachusetts Institute of Technology, United States; ²Massachusetts Institute of Technology, United States.

NM1.5.26

Scanning Tunneling Microscopy and Spectroscopy of Air Exposure Effects on Metal Dichalcogenides [Jun Hong Park](#); University of California, San Diego, United States.

NM1.5.27

Highly Crystalline CVD-Grown Multilayer MoSe₂ Films and their Applications [Na Liu](#); Sungkyunkwan University, Korea (the Republic of).

NM1.5.28

Electrical Characterization of Atomically Thin InSe Layers [Himani Arora](#)^{1,2}; ¹Helmholtz-Zentrum Dresden-Rossendorf, Germany; ²Technical University Dresden, Germany.

NM1.5.29

Large Scale Density Functional Theory Calculations of Homogeneous and Heterogeneous Two-Dimensional (2D) Materials [Mahesh Neupane](#)^{2,1}; ¹US Army Research Laboratory, United States; ²US Army Research Lab, United States.

SESSION NM1.6: Optical Properties and Devices of 2D Materials II

Session Chairs: Thomas Mueller and Hua Zhang

Wednesday Morning, April 19, 2017

PCC West, 100 Level, Room 106 AB

8:30 AM *NM1.6.01

Exciton Dissociation and Electron Cooling in 2D Material Heterostructure [Frank Koppens](#)^{1,2}; ¹The Barcelona Institute of Science and Technology, Spain; ²ICREA – Institució Catalana de Recerca i Estudis Avançats, Spain.

9:00 AM NM1.6.02

Giant Gating Tunability of Refractive Index in Transition Metal Dichalcogenide Monolayers [Yiling Yu](#); North Carolina State University, United States.

9:15 AM NM1.6.03

Enhancing Photocurrent Generation in WS₂-Graphene Heterostructure by Interlayer Coupling [Long Yuan](#); Purdue University, United States.

9:30 AM *NM1.6.04

Light-Exciton Interactions in van der Waals Materials Coupled to Photonic Structures [Ertugrul Cubukcu](#); University of California, San Diego, United States.

10:00 AM BREAK**10:30 AM *NM1.6.05**

Photonics and Polaritonics with van der Waals Heterostructures [Alexander Tartakovskii](#); University of Sheffield, United Kingdom.

11:00 AM NM1.6.06

Ultrathin van der Waals Heterostructure Solar Cells with High External Quantum Efficiency [Deep M. Jariwala](#); California Institute of Technology, United States.

11:15 AM *NM1.6.07

Nanoscale Positioning of Single-Photon Emitters in Atomically Thin WSe₂ [Rudolf Bratschitsch](#); University of Muenster, Germany.

11:45 AM NM1.6.08

Nanostructured Heterojunctions for Photocurrent Enhancements in MoS₂ Based Photodetectors [Edgar Palacios](#); Northwestern University, United States.

SESSION NM1.7: Chemical/Biological Functionalities of 2D Materials

Session Chairs: Bruce Clafin and Hua Zhang

Wednesday Afternoon, April 19, 2017

PCC West, 100 Level, Room 106 AB

1:30 PM *NM1.7.01

Chemical and Functional Imaging of 2D Materials and Heterostructure Devices [Lincoln J. Lauhon](#); Northwestern University, United States.

2:00 PM *NM1.7.02

Regulation of Electric Behavior of Two-Dimensional Inorganic Solids for Highly-Efficient Electrocatalyst [Changzheng Wu](#); University of Science and Technology of China, China.

2:30 PM BREAK**3:30 PM *NM1.7.03**

Two-Dimensional Material Based Artificial Synaptic Devices for Neuromorphic Computing [Han Wang](#); University of Southern California, United States.

4:00 PM *NM1.7.04

“Beyond” Graphene-Enabled Bio-Nano Hybrids for Programmable Chemical Detection [A.T. Charlie Johnson](#); University of Pennsylvania, United States.

4:30 PM *NM1.7.05

Graphene Plasmonics [Shin Mou](#); Air Force Research Laboratory, United States.

SESSION NM1.8: Controlled Scalable Synthesis of 2D TMDC Materials and Heterostructures II

Session Chairs: Linyou Cao and Qing Hua Wang

Thursday Morning, April 20, 2017

PCC West, 100 Level, Room 106 AB

8:30 AM *NM1.8.01

Processing and Applications of Monodisperse Two-Dimensional Nanomaterial Inks [Mark C. Hersam](#); Northwestern University, United States.

9:00 AM NM1.8.02

Growth of Monolayer TMDs in the 1H and 1T' Phase and Possible Applications [Carl H. Naylor](#); University of Pennsylvania, United States.

9:15 AM NM1.8.03

CVD Growth of Few Layer MoTe₂ in the 2H, 1T' and 1T Phases—Tunable Properties of MoTe₂ Films [Thomas Empante](#); University of California Riverside, United States.

9:30 AM *NM1.8.04

High-Mobility Two-Dimensional Crystals—Controlled Synthesis and Optoelectronic Devices [Hailin Peng](#); Peking University, China.

10:00 AM BREAK**10:30 AM *NM1.8.05**

Synthesis and Properties of Monolayer WS₂—Manipulating the Photoluminescence [Berend T. Jonker](#); Naval Research Laboratory, United States.

11:00 AM NM1.8.06

In Situ TEM Observation of Dynamic Change in Atomic-Layers MoS₂ [Kuo-Lun Tai](#); National Chiao Tung University, Taiwan.

11:15 AM NM1.8.07

Lower Temperature 2D MoS₂ Deposition Utilizing Plasma Processing [Philip M. Campbell](#)^{1,2}; ¹Georgia Institute of Technology, United States; ²Georgia Tech Research Institute, United States.

11:30 AM NM1.8.08

Synthesis of Few Layer MoSe₂ on Homogeneous Single Layer Epitaxial Graphene on Si-Face 6H-SiC [Luke Nyakiti](#); Texas A&M University, United States.

SESSION NM1.9: Electronic Properties and Devices of 2D Materials II

Session Chairs: Bruce Claflin and Pinshane Huang

Thursday Afternoon, April 20, 2017

PCC West, 100 Level, Room 106 AB

1:30 PM *NM1.9.01

2D Carbides and Nitrides (MXenes)—Synthesis, Properties and Applications Yury Gogotsi^{1,2}; ¹Drexel University, United States; ²Drexel University, United States.

2:00 PM NM1.9.02

Thickness Control of Few-Layer Black Phosphorus and Its Device Applications Geonyeop Lee; Korea University, Korea (the Republic of).

2:15 PM NM1.9.03

Te-Doped Black Phosphorus Field-Effect Transistors Zhongming Zeng^{1,2}; ¹State Key Laboratory of Metastable Materials Science and Technology, China; ²Chinese Academy of Sciences, China.

2:30 PM *NM1.9.04

Multifunctional Few Layered Black Phosphorus Composite Qingyu Yan; Nanyang Technological University, Singapore.

3:00 PM BREAK

3:30 PM NM1.9.05

Atomically Thin Two-Dimensional Organic-Inorganic Hybrid Perovskites Letian Dou; University of California, Berkeley, United States.

3:45 PM NM1.9.06

Low-Frequency Current Fluctuations in the Charge-Density-Wave Quasi-2D 1T-TaS₂ Thin Films Guanxiong Liu; University of California, Riverside, United States.

4:00 PM NM1.9.07

Plasma-Enhanced Atomic Layer Deposition of Uniform Hexagonal Boron Nitride Films Hamin Park; KAIST, Korea (the Republic of).

4:15 PM NM1.9.08

Large Area Synthesis of Black Arsenic-Phosphorus—Next Generation Two-Dimensional Infrared Semiconductors Eric P. Young^{1,2}; ¹Northrop Grumman, United States; ²University of California, Los Angeles, United States.

SESSION NM1.10: Poster Session II

Thursday Afternoon, April 20, 2017

8:00 PM - 10:00 PM

Sheraton, Third Level, Phoenix Ballroom

NM1.10.01

Bulk Electronic Structure and Topologically Trivial Fermi-Arcs in WTe₂ Flavio Y. Bruno; University of Geneva, Switzerland.

NM1.10.02

Layer-Dependent Measurements of Electronic Band Alignment for Individual MoS₂, WS₂ and MoSe₂ Flakes Supported on SiO₂ Using Photoemission Electron Microscopy (PEEM) with Deep Ultraviolet Illumination Morgann Berg; Sandia National Laboratories, United States.

NM1.10.03

Dual Gated Bilayer Graphene-on-MoS₂ Phototransistor with Single Photon Detection Capability Kallol Roy; Indian Institute of Science, India.

NM1.10.04

Metal-Organic Chemical Vapor Deposition of Hexagonal Boron Nitride Anthony Rice; Sandia National Laboratories, United States.

NM1.10.05

Interaction Mechanism and Pseudocapacitance of Polar and Non-Polar Polyfluorenes with 2D Titanium Carbide (MXene) Muhammad Boota; Drexel University, United States.

NM1.10.06

Solution-Phase Production and Application of Two-Dimensional Metal Diborides Ahmed Yousaf^{1,2}; ¹Arizona State University, United States; ²Arizona State University, United States.

NM1.10.07

Ultraflat Stanene on Cu(111) Surface Aidi Zhao; University of Science and Technology of China, China.

NM1.10.08

MoS₂-Graphene Heterostructure Based Field-Effect Transistor for Sensing of Volatile Organic Compounds Tung Pham; University of California, Riverside, United States.

NM1.10.09

Fabrication of Transition Nickel Ditellurides for Highly Conductive Transparent Electrodes Sung Hyuk Lee; Korea University of Technology and Education, Korea (the Republic of).

NM1.10.10

Rinsing Phosphorus Oxide Bubbles on Surface of Black Phosphorus by 1,2-Ethanedithiol Treatment Dohyun Kwak; DGIST, Korea (the Republic of).

NM1.10.11

Wearable Thermoelectric Generators by Chemically Exfoliated Transition Metal Dichalcogenide Nanosheets Sun Woong Han; Yonsei University, Korea (the Republic of).

NM1.10.12

Doping and Interface Modification of TMDCs-Based Nanoelectronics Siyuan Zhang; National Institute of Standards and Technology, United States.

NM1.10.13

Raman and PL Characterization of 2D Metal Chalcogenide Crystals Antonio Cruz; University of California, Riverside, United States.

NM1.10.14

Excitons in WSe₂ with a Single Se Vacancy Jie Jiang; Air Force Research Laboratory, United States.

NM1.10.15

Chemical Exfoliation of Black Phosphorus for Inkjet Printing Misook Min; University of Texas at El Paso, United States.

NM1.10.16

Spatially-Resolved Investigation of Transport Properties of Transition Metal Dichalcogenide Single-Layer Devices Hsi D. Lu; University of California, Riverside, United States.

NM1.10.17

Large Scale Growth of Vertical MoS₂ Using Organic Promoter for High-Performance Hydrogen Evolution Reaction Mina Kang; Korea Research Institute of Chemical Technology, Korea (the Republic of).

NM1.10.18

Radiatively Dominated Charge Carrier Recombination in Black Phosphorus Prashant Bhaskar; Delft University of Technology, Netherlands.

NM1.10.19

Optical, Charge and Resonance Transfer in Nanoparticle/2D Material Hybrids Paul Atkin^{1,2}; ¹RMIT University, Australia; ²CSIRO, Australia.

NM1.10.20

Investigation of Charge Transport in Confined-Yet-Coupled 2D Semiconductors Adam Woomer; University of North Carolina, United States.

NM1.10.21

CVD Growth and Characterization of 2D TMD Films, Alloys and Heterostructures Thereof David Barroso; University of California, Riverside, United States.

NM1.10.22

Impact of Graphene Buffer Layer on the Contact Resistance to MoS₂ Alex Mazzoni; US Army Research Laboratory, United States.

- NM1.10.23**
Investigating the Effects of Polymer Substrate Topography and Dielectric Interfaces on MoS₂-Based Radio-Frequency Transistors [Matthew L. Chin](#); US Army Research Laboratory, United States.
- NM1.10.24**
Toward Selenene and Tellurene—Two-Dimensional Topological Insulators [Elisabeth Bianco](#); Rice University, United States.
- NM1.10.25**
Optimization of Light-Matter Interactions for Enhancements in Photoluminescence and Raman Spectroscopy of MoS₂ Using Single Au Tapered Nanoresonators [Edgar Palacios](#); Northwestern University, United States.
- NM1.10.26**
Significant Field Enhancement by MoS₂ Flake—Enhanced Intensities of Fluorescence and Raman Spectrum of Dye Molecule [Masanori Sakamoto](#); Department of Chemistry, Graduate School of Science, Hiroshima University, Japan.
- NM1.10.27**
Bulk to Monolayer Properties of the Platinum Dichalcogenides [Protik Das](#); University of California-Riverside, United States.
- NM1.10.28**
Investigating Anisotropic Optical Property and Thermal Conductivity of Few-Layer Td-WTe₂ via Micro Raman Spectroscopy [Yu Chen](#); Nanyang Technological University, Singapore.
- NM1.10.29**
Schottky Barrier Heights at Lateral Two-Dimensional Metallic and Semiconducting Transition-Metal Dichalcogenide Interfaces [Adiba Zahin](#); University of California, Riverside, United States.
- NM1.10.30**
Anisotropic Etching of Hexagonal Boron Nitride Crystal on Cu-Ni Substrate [Yijing Stehle](#); Oak Ridge National Lab, United States.
- NM1.10.31**
The Effect of Stoichiometry on Carrier Mobility of Pulsed Laser Deposited Few-Layer Tungsten Disulfide Thin Films [Urmilaben P. Rathod](#); University of North Texas Denton, United States.
- NM1.10.32**
Exploring Dimensionality in Hybrid Perovskites [Aditya Sadhanala](#); University of Cambridge, United Kingdom.
- NM1.10.33**
Transparent Solar Cell Utilizing p-n Heterojunction of Two-Dimensional GaTe and InGaZnO [Ah-Jin Cho](#)^{1,2}; ¹Yonsei University, Korea (the Republic of); ²Yonsei Institute of Convergence Technology, Korea (the Republic of).
- NM1.10.34**
Ab Initio Calculation of Layer Dependent Raman Mode Evolution of Few Layer Stanene [Tonmoy Kumar Bhowmick](#); University of California Riverside, United States.
- NM1.10.35**
Layer-by-Layer Assembly of a Hybrid of Phosphorene and Molybdenum Disulfide [Hameet Kaur](#); CSIR National Physical Laboratory, India.
- NM1.10.36**
2D Layered PtSe₂ Lateral Heterojunction Device by Thickness Modulation [Yuda Zhao](#); The Hong Kong Polytechnic University, Hong Kong.
- NM1.10.37**
Thermal Analysis of Isotope-Doped Phosphorene [Oswaldo Sanchez](#); Iowa State University, United States.
- NM1.10.38**
Temperature Dependency of Tunable Few Layered Black Phosphorous Photodetector [Avra S. Bandyopadhyay](#); University of Texas at El Paso, United States.
- NM1.10.39**
Effect of Optical and Thermal Excitation on Phonon Dynamics in Monolayer Tungsten Diselenide [Avra S. Bandyopadhyay](#); University of Texas at El Paso, United States.
- NM1.10.40**
Two-Dimensional Few-Atom-Thick PbS/CdS Core/Shell Colloidal Nanosheets [Liangfeng Sun](#); Bowling Green State University, United States.
- NM1.10.41**
A Two-Dimensional Polymer Synthesized through Topochemical [2+2]-Cycloaddition on the Multigram Scale [Ralph Lange](#); ETH Zurich, Switzerland.
- NM1.10.42**
Fabrication of Orderly Arrayed 2D Porous Carbon Nanosheets [Ruowen Fu](#); Sun Yat Sen University, China.
- NM1.10.43**
Study of a WSe₂/BP/MoS₂ High-Performance Broadband Floating-Base Bipolar Phototransistor and Its Internal Gain [Jian-Bin Xu](#); Chinese University of Hong Kong, Hong Kong.
- NM1.10.44**
Modulation Doping of 2D Layered MoS₂ by Transition Metal Oxide Deposition [Kang Xu](#); The Hong Kong Polytechnic University, China.
- NM1.10.45**
Two-Step CVD Growth of Anisotropic ReS₂ and WS₂ Heterostructures [Bin Chen](#); Arizona State University, United States.
- NM1.10.46**
Effect of Passivation Layer of the Thermal Stability of a Few-Layer Phosphorene/AZO Heterostructure [Sushil K. Pandey](#); University of Minnesota, Minneapolis, United States.
- NM1.10.47**
Two-Dimensional Silicon Carbide as a Potential Thermoelectric Material [Srilok Srinivasan](#); Iowa State University, United States.
- NM1.10.48**
Novel Hybrid Perovskite-Based Nanosheets via Rapid Microwave-Assisted Reactions [Sara Akbarian-Tefaghi](#); University of New Orleans, United States.
- NM1.10.49**
Giant Magnetism in Hydrogenated Silicene Nanoflakes and Their Potential Application as Spin Devices [Sadeqh Mehdi Aghaei](#); Florida International University, United States.
- NM1.10.50**
Black Phosphorus Field Effect Transistor with Hexagonal Boron Nitride as a Dielectric/Passivation Layer [A-Young Lee](#); DGIST, Korea (the Republic of).
- NM1.10.51**
Trap-Mediated Electronic Transport Characteristics of Gate-Tunable Pentacene/MoS₂ p-n Junctions [Jae-Keun Kim](#); Seoul National University, Korea (the Republic of).
- NM1.10.52**
Optoelectronic Properties of Pristine and Deterministically Thinned 2H-MoTe₂ [Tobias J. Octon](#); University of Exeter, United Kingdom.
- NM1.10.53**
Scalable Growth of Monolayer Transition Metal Dichalcogenides Thin Film with Large Domain Size on Oxide Substrates via Chemical Vapor Deposition [Jianyong Xiang](#); Yanshan University, China.
- NM1.10.54**
Exciting Multiple Electrons by One Photon in 2D Semiconductors for Photovoltaics [Laurens Siebbeles](#); TU Delft, Netherlands.
- NM1.10.55**
Photogeneration and Mobility of Charge Carriers in Atomically Thin Colloidal InSe Nanosheets Probed by Ultrafast Terahertz Spectroscopy [Jannika Lauth](#); Delft University of Technology, Netherlands.
- NM1.10.56**
Controlled Nucleation and Growth of Monolayer Tungsten Diselenide (WSe₂) Films on Sapphire via Metalorganic Chemical Vapor Deposition [Xiaotian Zhang](#); Pennsylvania State University, United States.

- NM1.10.57**
WS₂ and h-BN Nanodispersions for Inkjet Printing Applications [Jay A. Desai](#); University of Texas at El Paso, United States.
- NM1.10.58**
Mohs Hardness—How a Simple Tool Can Be an Effective Means for Discovering 2D Materials [Tyler W. Farnsworth](#); University of North Carolina at Chapel Hill, United States.
- NM1.10.59**
Envisioning Ductile 2D Polymers and Covalent Organic Frameworks with High Toughness and Stiffness [Emil Sandoz-Rosado](#); Army Research Laboratory, United States.
- NM1.10.60**
One-Dimensional Electron Gas in Lateral Heterostructures of Single Layer Materials [Oleg Rubel](#); McMaster University, Canada.
- NM1.10.61**
Hexagonal Boron Nitride Crystal Growth from Ni-Cr Flux—Experiment and Simulation [Song Liu](#); Kansas State University, United States.
- NM1.10.62**
Jettible Functional Materials for Applications in Printed Electronics [Robert Ionescu](#); HP, United States.
- NM1.10.63**
Facile Way to Convert of Chalcogen in Transition Metal Dichalcogenide System by Introducing Accelerator [Yun Seokjoon](#)^{1,2}; ¹Sungkyunkwan University, Korea (the Republic of); ²Institute of Basic Science, Center for Integrated Nanostructure Physics, Korea (the Republic of).
- NM1.10.64**
Layered Transition Metal Dichalcogenides Bulk Heterojunctions as Photoanodes in Photoelectrochemical Cells [Federico M. Pesci](#); Imperial College London, United Kingdom.
- NM1.10.65**
Synthesis and Characterization of Two-Dimensional Nickel Selenide Nanoflakes by Chemical Vapor Deposition [Fang-Chi Hsu](#); National Taiwan University of Science and Technology, Taiwan.
- NM1.10.66**
Low Temperature Synthesis of Atomically Thin MoS₂ Using Atomic Layer Deposition and Plasma Sulphurization [Akhil Sharma](#); Eindhoven University of Technology, Netherlands.
- NM1.10.67**
Ab Initio Simulations of Stability and Electronic Properties of Cu(111)/Transition Metal Dichalcogenide Interfaces [David Guzman](#)^{1,2}; ¹Purdue University, United States; ²Birck Nanotechnology Center, United States.
- NM1.10.68**
Heterostructures of Atomically Thin Materials for Tunnel Field Effect Transistors (TFETs) [Selcuk Temiz](#); University of California, Riverside, United States.
- NM1.10.69**
Direct Observation of the Electrically Tunable Quasi-Particle Bandgap and Exciton Binding Energy in Monolayer MoS₂ [Kaiyuan Yao](#)^{1,2}; ¹Lawrence Berkeley National Lab, United States; ²University of California, Berkeley, United States.
- NM1.10.70**
MoS₂Se_{2(1-x)} Nanotubes with Tunable Composition and Interlayer Spacing for Hydrogen Evolution Reaction [Junjun Zhang](#)^{1,3}; ¹South University of Science and Technology of China, China; ³City University of Hong Kong, China.
- NM1.10.71**
Unusual Vibrational and Optical Characteristics in Pseudo-1D TiS₃ Nano-Whiskers [Kedi Wu](#); Arizona State University, United States.
- NM1.10.72**
The Gas-Sensing Performance of the Bi₂S₃-Bi₂O₃ Heterojunction to Ammonia at Room Temperature [Hao Kan](#); Huazhong University of Science and Technology, China.
- NM1.10.73**
Room-Temperature Colloidal Synthesis of Bi₂Te₃ Nanosheets [Maria Sokolikova](#); Imperial College London, United Kingdom.
- NM1.10.74**
Origins of Ripples in As-Grown Few-Layered MoS₂ Structures under Applied Strain at Atomic Scales [Jin Wang](#); University of Connecticut, United States.
- NM1.10.75**
Interlayer Excitons in 2D/Organic van der Waals Heterostructures [Tong Zhu](#); Purdue University, United States.
- NM1.10.76**
Controlling the Energetics of 2D MoS₂ with Surface Dipoles [Elisa Miller-Link](#); National Renewable Energy Laboratory, United States.
- NM1.10.77**
Experimental Demonstration of an Electride as a 2D Material [Daniel Druffel](#); University of North Carolina at Chapel Hill, United States.
- NM1.10.78**
Water-Assisted Synthesis of Large-Area WS₂ Monolayers with High Optical Quality [Pawel Palczynski](#); Imperial College London, United Kingdom.
- NM1.10.79**
Complex and Non-Centrosymmetric Stacking of Layered Chalcogenide Materials Created by Screw Dislocations [Melinda J. Shearer](#); University of Wisconsin-Madison, United States.
- NM1.10.80**
Synthesis of SnS Nanoplates—A Potential 2D Material [Nancy D. Trejo](#); University of Minnesota, United States.
- SESSION NM1.11: Electronic Properties and Devices of Non-Graphene Materials
 Session Chairs: Thomas Mueller and Sefaattin Tongay
 Friday Morning, April 21, 2017
 PCC West, 100 Level, Room 106 AB
- 8:30 AM *NM1.11.01**
Atomic Level Studies of Monolayer 2D Transition Metal Dichalcogenides [Jamie Warner](#); University of Oxford, United Kingdom.
- 9:00 AM *NM1.11.02**
Light Scattering and Emission from Hetero-Structures [Andrea C. Ferrari](#); University of Cambridge, United Kingdom.
- 9:30 AM *NM1.11.03**
Novel Field Effect Transistor Fabrication Based on Non-Graphene 2D Materials [Tian-Ling Ren](#); Tsinghua University, China.
- 10:00 AM BREAK**
- 10:30 AM *NM1.11.04**
Preparation and Characterization of Electronic Materials in the Flatland [Jian-Bin Xu](#)^{1,2}; ¹Chinese University of Hong Kong, Hong Kong; ²Nanjing University, China.
- 11:00 AM *NM1.11.05**
From Semiconductor Physics to Superconductivity in Ionic Liquid Gated Transition Metal Dichalcogenides [Alberto Morpurgo](#); University of Geneva, Switzerland.
- 11:30 AM NM1.11.06**
Development of Entirely Stretchable Transistors Based on Two-Dimensional Transition Metal Dichalcogenides as Active Layer Material [Kaliannan Thiyagarajan](#); Pohang University of Science and Technology (POSTECH), Korea (the Republic of).
- 11:45 AM NM1.11.07**
De-Pinning Metal Contacts to MoTe₂ Using Monolayer h-BN [Andrew C. Yu](#); Stanford, United States.

1:30 PM NM1.12.01

Record Current Density in Monolayer P-Type WSe₂ with Ultrathin MoO₃ Hole Doping Layers Connor McClellan; Stanford University, United States.

1:45 PM NM1.12.02

Low Temperature Gate Oxide ALD on Transition Metal Dichalcogenides Ilijo Kwak; University of California, San Diego, United States.

2:00 PM NM1.12.03

Dynamic Optical Tuning of Interlayer Bonding in the Transition Metal Dichalcogenides Ehren M. Mannebach; Stanford University, United States.

2:15 PM NM1.12.04

First-Principles Kinetic Monte Carlo Simulation of the Atomic Growth of Transition Metal Dichalcogenides Yifan Nie; University of Texas at Dallas, United States.

2:30 PM NM1.12.05

Thermodynamic Calculation and Practical Pathways in Controlled Synthesis of Two-Dimensional Transition Metal Dichalcogenides Hamed Simchi; The Pennsylvania State University, United States.

2:45 PM NM1.12.06

Resonant Bonding Driven Giant Phonon Anharmonicity and Low Thermal Conductivity of Phosphorene Guangzhao Qin; RWTH Aachen University, Germany.

3:00 PM BREAK

3:30 PM NM1.12.07

Frequency Dependent Thermoelectric Properties of MoS₂ in Hopping Regime Krishna V. Valavala; University of Illinois at Urbana-Champaign, United States.

3:45 PM NM1.12.08

Tuning Optical Properties of 2D MoS₂ by Alkali Atom Intercalation Faisal Mehmood; Air Force Research Laboratory, United States.

4:00 PM NM1.12.09

Order of Magnitude Enhancement of Monolayer MoS₂ Emission Due to Near-Field Energy Influx from Nanocrystal Films Anton Malko; University of Texas at Dallas, United States.

4:15 PM NM1.12.10

Optoelectrical Memories Based on Heterostructures of Transition Metal Chalcogenides and Ferroelectric Materials Alexander Sinitskii; University of Nebraska-Lincoln, United States.

4:30 PM NM1.12.11

Tuning Photoluminescence of 2D TMDs via Alloying Juhong Park; University of North Texas, United States.

4:45 PM NM1.12.12

Effect of Elastic Strain Engineering on the Optoelectronic and Vibrational Properties of Atomically Thin WSe₂ Mono- and Bi-Layers Danielle M. Leppert-Simena^{1,2}; ¹DePaul University, United States; ²University of Connecticut, United States.