

# Program Key

## Conference Topics

<b>2D</b>	2D Materials
<b>AC</b>	Actinides and Rare Earths Focus Topic
<b>AP</b>	Atomic Scale Processing Focus Topic
<b>AS</b>	Applied Surface Science Division
<b>BI</b>	Biomaterial Interfaces Division
<b>BP</b>	Biomaterials Plenary Session
<b>CA</b>	Chemical Analysis and Imaging Interfaces Focus Topic
<b>DM</b>	Fundamental Aspects of Material Degradation Focus Topic
<b>EL</b>	Spectroscopic Ellipsometry Focus Topic
<b>EM</b>	Electronic Materials and Photonics Division
<b>EW</b>	Exhibitor Technology Spotlight Workshops
<b>HC</b>	Fundamental Discoveries in Heterogeneous Catalysis Focus Topic
<b>HI</b>	Advanced Ion Microscopy and Ion Beam Nano-engineering Focus Topic
<b>LS</b>	Frontiers of New Light Sources Applied to Materials, Interfaces, and Processing Focus Topic
<b>MI</b>	Magnetic Interfaces and Nanostructures Division
<b>MN</b>	MEMS and NEMS Group
<b>MS</b>	Manufacturing Science and Technology Group
<b>NS</b>	Nanometer-scale Science and Technology Division
<b>OX</b>	Complex Oxides: Fundamental Properties and Applications Focus Topic
<b>PS</b>	Plasma Science and Technology Division
<b>QS</b>	Materials and Processes for Quantum Information, Computing and Science Focus Topic
<b>RA</b>	New Challenges to Reproducible Data and Analysis Focus Topic
<b>SE</b>	Advanced Surface Engineering Division
<b>SS</b>	Surface Science Division
<b>TF</b>	Thin Films Division
<b>TL</b>	Energy Transition Focus Topic
<b>VT</b>	Vacuum Technology Division

## Key to Session/Paper Numbers

Sessions sponsored by multiple topics are labeled with all topic acronyms (e.g. **AC+EM+SS**), then a number to indicate simultaneous sessions sponsored by the same topic(s) (e.g. **SS1, SS2**), then a dash followed by the first two characters of the day of the week:

**Monday, Tuesday, Wednesday, Thursday, Friday,**

then a single letter for **Morning, Afternoon, Evening, Poster,**

and finally a number indicating the starting time slot for the paper.

Example: **SS1-MoM9** (Surface Science, Monday morning, 11:00 am).

# Program Overview

Room /Time	A120-121	A122-123	A124-125	A210	A211
SuA	BP-SuA: Biomaterials Interfaces Plenary (ALL INVITED SESSION)				
MoM	BI+AS+NS-MoM: Biofabrication, Bioanalytics, Biosensors, Diagnostics, Biolubrication and Wear	TF+EM+MI+MN+OX+PS-MoM: Functional Thin Films: Ferroelectric, Multiferroics, and Magnetic Materials	TF-MoM: Thin Films for Electrochemistry and Energy Storage	MN-MoM: MEMS, BioMEMS, and MEMS for Energy: Processes, Materials, and Devices I	AS+BI+RA-MoM: Quantitative Surface Analysis I/Reproducibility Issues in Quantitative XPS
MoA	BI+AS-MoA: Cutting Edge Bio: Bio-Nano, Bio-Energy, 3D Bio	TF+SE-MoA: HiPIMS and Reactive HiPIMS for Novel Thin Films	TF+2D+AP+EL+SS-MoA: ALD and CVD: Nucleation, Surface Reactions, Mechanisms, and Kinetics	MN-MoA: Microfabricated Systems for Gas Chromatography and Nanomechanical Mass Sensing	RA+AS+NS+SS-MoA: Quantitative Surface Analysis II/Big Data, Theory and Reproducibility
TuM	BI+AS-TuM: Characterization of Biological and Biomaterial Surfaces	TF+EM+MI-TuM: Thin Films for Microelectronics, Photonics, and Optoelectronic	TF+AP-TuM: ALD and CVD: Precursors and Process Development	MN-TuM: MEMS, BioMEMS, and MEMS For Energy: Processes, Materials, and Devices II	AS+BI+RA-TuM: Quantitative Surface Analysis III/Other Surface Analysis Methods
TuL					
TuA	BI+AS-TuA: Biomolecules and Biophysics and Interfaces & Flash Session	TF-TuA: Emerging Applications for Thin Films	TF+PS-TuA: Epitaxial Thin Films	MN+QS-TuA: Devices for Quantum Information and Quantum Nanomechanics	AS+BI+CA+LS-TuA: Beyond Traditional Surface Analysis
TuP					
WeM	BI+AS-WeM: Microbes and Fouling at Surfaces	TF1-WeM: Vapor Deposition of Functional Polymer Thin Films and Composites	RA+AS+CA+PS+TF-WeM: Reproducibility in Science and Engineering, including materials and energy systems	MI+2D-WeM: Emerging Multifunctional Magnetic Materials I and Magnetocaloric Materials	
WeA	CA+NS+SS+VT-WeA: Chemical Analysis and Imaging of Liquid/Vapor/Solid Interfaces I	TF+EM-WeA: Emerging Thin Film Materials: Ultra-wide Bandgap and Phase Change Materials	RA+AS+BI-WeA: Addressing Reproducibility Challenges using Multi-Technique Approaches	MI+2D-WeA: Emerging Multifunctional Magnetic Materials II	AS+CA+LS-WeA: Operando Characterization Techniques for In situ Surface Analysis of
ThM	CA+2D+AS+BI+NS-ThM: Chemical Analysis and Imaging of Liquid/Vapor/Solid Interfaces II	TF+EM+NS+SS-ThM: Thin Films for Energy Harvesting and Conversion	LS+AS+SS-ThM: Operando Methods for Unraveling Fundamental Mechanisms in Devices Towards Renewable	MI+2D+AS+EM-ThM: Novel Magnetic Materials and Device Concept for Energy efficient Information Processing	AS-ThM: Advances in Depth Profiling, Imaging and Time-resolved Analysis
ThA	CA+NS+SS+VT-ThA: Progress in Instrumentation and Methods for Spectro-microscopy of Interfaces	TF+SS-ThA: Metal Halide Perovskites, Other Organic/Inorganic Hybrid Thin Films & Flash Session	TF+AS+EL+PS+RA-ThA: Characterization of Thin Film Processes and Properties	LS+AC+HC+SS-ThA: Emerging Methods with New Coherent Light Sources IS+AC+NS-ThA: Photon	AS-ThA: Role of Surfaces and Interfaces in Energy Material and Industrial Problems
ThP					
FrM					

# Program Overview

Room /Time	A212	A213	A214	A215	A216
SuA					
MoM	HC+SS-MoM: Utilization of Theoretical Models, Machine Learning, and Artificial Intelligence for Heterogeneously-	VT-MoM: Pumping, Outgassing, leaks, and Vacuum Pressure Measurement	AP+2D+EM+PS+TF-MoM: Area Selective Deposition and Selective-Area Patterning	AC+LS+MI-MoM: Magnetism, Complexity, Superconductivity, and Electron Correlations in the Actinides and Rare	2D+EM+MI+NS-MoM: Properties of 2D Materials including Electronic, Magnetic, Mechanical, Optical, and
MoA	TL+2D+HC+SS-MoA: Surface Reaction Mechanisms in Energy Conversion (ALL INVITED SESSION)	VT-MoA: Gas Dynamics, Surface Science for Accelerators, and Ultra-Clean Vacuum Systems	EM+PS+TF-MoA: New Devices and Materials for Logic and Memory	AC-MoA: Early Career Scientists	2D+AP+EM+MI+NS+PS+TF-MoA: 2D Materials Growth and Fabrication
TuM	TL+MS+VT-TuM: Implications of Implementation: Making Energy Transition a Reality (ALL INVITED)	VT-TuM: Accelerators and Large Vacuum Systems	EM+2D+AP+NS+PS-TuM: New Devices and Materials for Electronics and Photonics	AC+AS+LS-TuM: Chemistry and Physics of the Actinides and Rare Earths	2D+AS+MI+NS-TuM: 2D Materials Characterization including Microscopy and Spectroscopy
TuL					
TuA		VT-TuA: Advanced Applications of Vacuum Technology	EM+OX+TF-TuA: Nikolaus Dietz Memorial Session: Wide and Ultra-wide Band Gap Materials and Devices	AC+AS+LS-TuA: Forensics, Science and Processing for Nuclear Energy	2D+EM+MI+NS-TuA: Properties of 2D Materials including Electronic, Magnetic, Mechanical Optical, and
TuP					
WeM	EL+AS+EM+TF-WeM: Optical Characterization of Thin Films and Nanostructures	HC+2D+SS-WeM: Exotic Nanostructured Surfaces for Heterogeneously-Catalyzed Reactions	EM+2D+AS+MI+MN+NS+TF-WeM: Nanostructures and Nanocharacterization of Electronic and Photonic		2D+AS+MI+NS-WeM: 2D Materials Characterization by Scanning Probe Microscopy and
WeA	EL+EM-WeA: Spectroscopic Ellipsometry: Novel Applications and Theoretical Approaches	HC+OX+SS-WeA: Metal-Support Interactions Driving Heterogeneously-Catalyzed Reactions	EM+2D+NS+TF-WeA: THEME Session: Electronics and Photonics for a Low-Carbon Future	SE+AS+TF-WeA: Nanostructured Thin Films and Coatings	2D+EM+MN+NS-WeA: 2D Device Physics and Applications
ThM	DM+BI+SS-ThM: Material Stabilities and Technology for Degradation Protection	HC+2D+SS-ThM: Nanoscale Surface Structure in Heterogeneously-Catalyzed Reactions	EM+AP+MS+NS+TF-ThM: Advanced Processes for Interconnects and Devices	SE+PS-ThM: Plasma-assisted Surface Modification and Deposition Processes	2D+EM+MI+NS+QS+SS-ThM: Dopants, Defects, and Interfaces in 2D Materials
ThA	DM1+BI+SS-ThA: Low Fouling Interfaces and Environmental Degradation DM2+BI+SS-ThA	HC+SS+TL-ThA: Reaction Pathways and Addressing Challenges for Energy Production in the 21st Century &		EL-ThA: Spectroscopic Ellipsometry Late New Session SE-ThA: New Challenges and Opportunities in	2D+AS+BI+HC+MN+NS+PS+SS+TL-ThA: Surface Chemistry, Functionalization, Bio, Energy and Sensor
ThP					
FrM		HC+SS-FrM: Catalysis at Complex Interfaces		2D-FrM: 2D Late News Session SE+AS+SS-FrM: Tribology: From Nano to Macro-scale	TF-FrM: Theory and Characterization of Thin Film Properties

# Program Overview

Room /Time	A220-221	A222	A226	B130
SuA				
MoM				PS2-MoM: Plasma Modeling
MoA	SS+HC-MoA: CO <sub>2</sub> , CO, Water, and Small Molecule Chemistry at Surfaces		2D+AP+EM+MI+MN+NS+PS+TF-MoA: Nanostructures including Heterostructures and Patterning of 2D Materials	PS+AS+EM+SS+TF-MoA: Plasma-Surface Interactions
TuM	SS+2D+HC-TuM: Atom Manipulation and Synthesis/Oxide Surface Reactions & Flash Session		2D+EM+MI+MN+NS+QS-TuM: Novel Quantum Phenomena	PS-TuM: Plasma Diagnostics and Sources I
TuL				
TuA	OX+EM+HC+MI+NS+SS+TF-TuA: Complex Oxides: Catalysis, Dielectric Properties and Memory Applications	NS-TuA: Recent Advances in Nanoscale Probing and Fabrication	TL+AS+SS+TF-TuA: Breakthroughs and Challenges in Applied Materials for Energy Transition (ALL INVITED SESSION) & Panel Discussion	AP+EL+MS+PS+SS+TF-TuA: Advancing Metrology and Characterization to enable Atomic Layer Processing
TuP				
WeM	OX+EM+MI+SS-WeM: Electronic and Magnetic Properties of Complex Oxide Surfaces and Interfaces	NS-WeM: Optics and Scattering on the Nanoscale	2D+EM+MI+MN+NS+QS-WeM: Novel 2D Materials	AP+BI+PS+TF-WeM: Surface Reaction Analysis and Emerging Applications of Atomic Scale Processing
WeA	SS+AS+HC+OX-WeA: Reactions at Alloy Surfaces and Single Atom Catalysis	NS+2D+AS-WeA: Probing and Modifying Surface and Interfacial Chemistry at the Nanoscale	MS-WeA: Science and Technology for Manufacturing: Solid State Batteries (ALL INVITED SESSION)	PS-WeA: Commemorating the Career of John Coburn (ALL INVITED SESSION)
ThM	SS+AS+HC+TL-ThM: Surface Science of Energy Conversion and Storage	NS+2D+QS-ThM: Direct Atomic Fabrication by Electron and Particle Beams & Flash Session	MS+EM+QS-ThM: Science and Technology for Manufacturing: Neuromorphic and Quantum Computing (ALL INVITED SESSION)	AP+PS+TF-ThM: Thermal Atomic Layer Etching
ThA	SS+2D+AP+AS+OX+SE-ThA: Dynamics at Surfaces/Reactions and Imaging of Oxide Surfaces	NS-ThA: SPM for Functional Characterization		PS+2D+EM+SS+TF-ThA: Plasma-Enhanced Atomic Layer Etching
ThP				
FrM	SS+HC+PS-FrM: Planetary, Ambient, and Operando Environments	NS+AS-FrM: Electron-Beam Promoted Nanoscience	CA+AS+NS+SE+SS-FrM: Novel Applications and Approaches in Interfacial Analysis	PS+2D+SE+TF-FrM: Plasma Deposition and Plasma-Enhanced Atomic Layer Deposition

# Program Overview

Room /Time	B131	B231-232	Hall A	Union Station AB
SuA				
MoM	PS1+SE-MoM: Atmospheric-Pressure Plasmas	QS+EM+MN+NS-MoM: High Coherence Qubits for Quantum Computing		
MoA	PS1-MoA: Plasma-Liquid Interactions, Medicine, and Agriculture	QS+EM+MN+NS+VT-MoA: Systems and Devices for Quantum Computing		
TuM	PS+EM-TuM: Advanced FEOL	QS-TuM: AVS Quantum Science (ALL INVITED SESSION)	EW-TuM: Exhibitor Technology Spotlight I	
TuL			EW-TuL: Exhibitor Technology Spotlight Workshop II	
TuA	PS+EM-TuA: Advanced BEOL/Interconnect Etching and Advanced Memory and Patterning	QS+2D+EM+MN+NS-TuA: Materials for Quantum Sciences		
TuP				Poster Sessions
WeM	PS+EM-WeM: Plasma Processing of Materials for Energy TF2-WeM: Thin Film Late News Session	QS+2D+EM+MN+NS+VT-WeM: Material Systems and Applications for Quantum Sciences		
WeA		HI+AS+CA-WeA: Advanced Ion Microscopy and Surface Analysis Applications		
ThM	PS-ThM: Plasma Diagnostics and Sources II	HI+NS-ThM: Novel Beam Induced Material Engineering and Nano-Patterning		
ThA	PS+SS-ThA: Plasma Conversion and Enhanced Catalysis for Chemical Synthesis	HI+NS-ThA: Emerging Ion Sources, Optics, and Applications & Flash Session		
ThP				Poster Sessions
FrM				

# Anticipated Schedule Sunday, October 20, 2019

## Anticipated Schedule Sunday Lunch, October 20

When \_\_\_\_\_

Where \_\_\_\_\_

With \_\_\_\_\_

## Anticipated Schedule Sunday Afternoon, October 20

1:00 PM \_\_\_\_\_

1:20 PM \_\_\_\_\_

1:40 PM \_\_\_\_\_

2:00 PM \_\_\_\_\_

2:20 PM \_\_\_\_\_

2:40 PM \_\_\_\_\_

3:00 PM \_\_\_\_\_

3:20 PM \_\_\_\_\_

3:40 PM \_\_\_\_\_

# Special Events Sunday

## Special Events Sunday

- 8:00 AM AVS Board of Directors' Executive Session (CLOSED SESSION)/King-Hilton (by invitation)
- 9:00 AM AVS Board of Directors' Meeting/King-Hilton
- 3:00 PM JVST Associate Editors' Meeting/Bellows E-Hilton (by invitation)
- 5:30 PM ASTM E-42 Business Meeting/Bellows F-Hilton
- 6:00 PM Science Educators' Workshop Teachers' Reception/Pierce A-Hilton (by invitation)
- 6:00 PM Vacuum Technology Division Executive Committee Meeting & Dinner/Hayden-Hilton (by invitation)
- 7:00 PM International Dignitaries & Chapter Chairs Reception/Pierce B-Hilton (by invitation)
- 7:00 PM Short Course Executive Committee Meeting/Hawkins Boardroom-Hilton (by invitation)

# Sunday Afternoon, October 20, 2019

**Biomaterials Plenary Session**  
**Room A120-121 - Session BP-SuA**  
**Biomaterials Interfaces Plenary (ALL INVITED SESSION)**  
**Moderator:** Caitlin Howell, University of Maine

3:00pm	<b>INVITED: BP-SuA-1</b> Microbial Electron Conduits: Adventures at the Biotic-Abiotic Interface, <i>Mohamed El-Naggar</i> , University of Southern California	
3:20pm	Invited talk continues.	
3:40pm	<b>INVITED: BP-SuA-3</b> Conductive Biofilms As Living Electronic Materials, <i>Sarah Glaven</i> , U.S. Naval Research Laboratory; <i>L Bird, E Onderko</i> , National Research Council; <i>D Phillips, R Mickol</i> , American Society for Engineering Education; <i>A Malanoski, M Yates, B Eddie</i> , U.S. Naval Research Laboratory	
4:00pm	Invited talk continues.	



# Anticipated Schedule Monday, October 21, 2019

## Anticipated Schedule Monday Morning, October 21

8:20 AM	_____
8:40 AM	_____
9:00 AM	_____
9:20 AM	_____
9:40 AM	_____
10:00 AM	_____
10:20 AM	_____
10:40 AM	_____
11:00 AM	_____
11:20 AM	_____
11:40 AM	_____
12:00 PM	_____

## Anticipated Schedule Monday Lunch, October 21

When	_____
Where	_____
With	_____

## Anticipated Schedule Monday Afternoon, October 21

1:00 PM	_____
1:20 PM	_____
1:40 PM	_____
2:00 PM	_____
2:20 PM	_____
2:40 PM	_____
3:00 PM	_____
3:20 PM	_____
3:40 PM	_____
4:00 PM	_____
4:20 PM	_____
4:40 PM	_____
5:00 PM	_____

# Special Events Monday

## Special Events Monday

- 6:00 AM AVS Yoga--Pre-Registration Required/Pierce A-Hilton
- 7:00 AM Member Center: Free Coffee for 2019 AVS Members/A111-112
- 7:00 AM Professional Leadership Committee Meeting & Breakfast/Gallerie Bistro-Lamp-Hilton (by invitation)
- 8:00 AM Science Educators' Workshop/B234-235 (by invitation)
- 9:00 AM AVS Member Center: "Inclusion and Diversity at the Workplace: Your Suggestions for Best Practices"/A111-112
- 12:00 PM AVS Quantum Science Associate Editors' Meeting & Lunch/Hopkins-Hilton (by invitation)
- 12:15 PM 2020 AVS Program Committee Meeting and Lunch/Pierce B-Hilton (by invitation)
- 12:15 PM AVS Member Center: "Welcome to AVS Overview & Lunch\*"/A111-112
- 12:15 PM Recommended Practices Committee Meeting & Lunch/Hayden-Hilton (by invitation)
- 3:00 PM AVS Member Center: "Speed Networking for Young Professionals"/A111-112
- 4:00 PM Publications Committee Meeting/Hopkins-Hilton (by invitation)
- 5:30 PM Plenary Lecture: Nathan S. Lewis, George L. Argyros Prof. of Chemistry, California Institute of Technology, "Roles of Surface and Materials Science in the Direct Production of Fuels from Sunlight"/Battelle AB North
- 6:30 PM Biointerphases Reception/Even at Hyde Park-Offsite (by invitation)
- 6:30 PM Welcome Mixer/Union Station AB
- 7:00 PM ASSD Executive Committee Meeting & Dinner/Hayden-Hilton (by invitation)
- 7:15 PM MIND Executive Committee Meeting and Dinner/Hopkins-Hilton (by invitation)
- 7:30 PM Thin Film Division/Harper Award TED-Talk Competition/A122-123
- 7:45 PM Publications Committee Meeting & Dinner/Black Point Restaurant-Offsite (by invitation)

# Monday Morning, October 21, 2019

<b>2D Materials</b> <b>Room A216 - Session 2D+EM+MI+NS-MoM</b> <b>Properties of 2D Materials including Electronic, Magnetic, Mechanical, Optical, and Thermal Properties I</b> <b>Moderator:</b> Jeehwan Kim, Massachusetts Institute of Technology		<b>Actinides and Rare Earths Focus Topic</b> <b>Room A215 - Session AC+LS+MI-MoM</b> <b>Magnetism, Complexity, Superconductivity, and Electron Correlations in the Actinides and Rare Earths</b> <b>Moderators:</b> Krzysztof Gofryk, Idaho National Laboratory, Ladislav Havela, Charles University, Prague, Czech Republic	
8:20am	<b>2D+EM+MI+NS-MoM-1</b> Extreme Fatigue Life of Graphene, <i>Teng Cui, S Mukherjee, P Sudeep, G Colas, J Tam</i> , University of Toronto, Canada; <i>P Ajayan</i> , Rice University; <i>C Singh, Y Sun, T Filleter</i> , University of Toronto, Canada	<b>INVITED: AC+LS+MI-MoM-1</b> Possible Structural Quantum Phase Transition in UCr <sub>2</sub> Si <sub>2</sub> Accessed Through Cr → Ru Chemical Substitution, <i>Ryan Baumbach</i> , Florida State University	
8:40am	<b>2D+EM+MI+NS-MoM-2</b> Epitaxial Growth and Thermal Degradation of Monolayer MoS <sub>2</sub> on SrTiO <sub>3</sub> Single Crystal Substrates, <i>Peiyu Chen, W Xu, Y Gao, P Holdway, J Warner, M Castell</i> , University of Oxford, UK	Invited talk continues.	
9:00am	<b>2D+EM+MI+NS-MoM-3</b> 3D Printed and Injection Molded Polymer Matrix Composites with 2D Layered Materials, <i>Sangram Mazumder</i> , University of North Texas; <i>J Catalan</i> , University of Texas at El Paso; <i>N Hnatchuk, I Chen</i> , University of North Texas; <i>P Perez</i> , University of Texas at El Paso; <i>W Brostow, A Kaul</i> , University of North Texas	<b>INVITED: AC+LS+MI-MoM-3</b> Dynamic Spin Transport in Antiferromagnetic Insulators: Angular Dependent Spin Pumping in Y <sub>3</sub> Fe <sub>5</sub> O <sub>12</sub> /NiO/Pt Trilayers, <i>Fengyuan Yang</i> , The Ohio State University	
9:20am	<b>2D+EM+MI+NS-MoM-4</b> Semiconducting WS <sub>2</sub> and h-BN Inks for Printing Optically-active Nanodevices, <i>Jay A. Desai</i> , University of Texas at El Paso; <i>S Mazumder, A Kaul</i> , University of North Texas	Invited talk continues.	
9:40am	<b>2D+EM+MI+NS-MoM-5</b> Transparent PEDOT:PSS Based Electro-Chromic/Thermal Devices With Excellent Durability For Applications In Smart Electronics, <i>Hossein Sojoudi, S Nemani</i> , University of Toledo	<b>INVITED: AC+LS+MI-MoM-5</b> Pressure Studies of Strongly Correlated Phases in Rare Earth Compounds, <i>Rena Zieve</i> , University of California, Davis	
10:00am	<b>2D+EM+MI+NS-MoM-6</b> Edge Dominated Graphene/h-BN Lateral Hybrid Nanostructures for Electronic and Spintronic Applications, <i>Gour P. Das</i> , IIT Kharagpur India, India	Invited talk continues.	
10:20am	<b>BREAK</b>	<b>BREAK</b>	
10:40am	<b>INVITED: 2D+EM+MI+NS-MoM-8</b> Engineering Interfaces in the Atomically-Thin Limit, <i>Deep Jariwala</i> , University of Pennsylvania	<b>AC+LS+MI-MoM-8</b> Fermi Surface Reconstructions and Transport Properties in Heavy-fermion Materials, <i>Gertrud Zwicknagl</i> , Institut f. Mathemat. Physics, TU Braunschweig, Germany	
11:00am	Invited talk continues.	<b>AC+LS+MI-MoM-9</b> Direct Measurement the 5 f <sub>5/2</sub> and 5 f <sub>7/2</sub> Unoccupied Density of States of UO <sub>2</sub> , <i>James G. Tobin</i> , University of Wisconsin-Oshkosh; <i>S Nowak</i> , SLAC National Accelerator Laboratory; <i>C Booth</i> , Lawrence Berkeley National Laboratory; <i>E Bauer</i> , Los Alamos National Laboratory; <i>S Yu</i> , Lawrence Livermore National Laboratory; <i>R Alonso-Mori, T Kroll, D Nordlund, T Weng, D Sokaras</i> , SLAC National Accelerator Laboratory	
11:20am	<b>2D+EM+MI+NS-MoM-10</b> Ultrasoft Slip-mediated Bending in Few-layer Graphene, <i>Jaehyung Yu, E Han, E Annevelink, J Son, E Ertekin, P Huang, A van der Zande</i> , University of Illinois at Urbana-Champaign	<b>AC+LS+MI-MoM-10</b> Optimizing the Magnetic Performance of Tetragonal ReFe <sub>12-x</sub> M <sub>x</sub> Phases by First Principles Computational Simulations, <i>Heike Christine Herper, O Vekilova, P Thunström, O Eriksson</i> , Uppsala University, Sweden	
11:40am	<b>2D+EM+MI+NS-MoM-11</b> Experimental Study on Vanadium Oxides Films by Sputtering, <i>Chuan Li</i> , National Yang Ming University, Taiwan, Republic of China; <i>J Hsieh</i> , Ming Chi University of Technology, Taiwan, Republic of China; <i>C Su</i> , National Yang Ming University, Taiwan, Republic of China	<b>AC+LS+MI-MoM-11</b> Optical Excitation Effect on Magnetodielectric and Photodielectric Properties of Rare Earth doped ZnO:Na Nanoparticles, <i>W Jadwisieniczak, Mohammed Bstee, F Inbanathan</i> , Ohio University; <i>R Martinez</i> , University of Puerto Rico; <i>H Huhtinen</i> , University of Turku, Finland; <i>R Palai</i> , University of Puerto Rico	

# Monday Morning, October 21, 2019

<p><b>Atomic Scale Processing Focus Topic</b>  <b>Room A214 - Session AP+2D+EM+PS+TF-MoM</b>  <b>Area Selective Deposition and Selective-Area Patterning</b>  <b>Moderators:</b> Satoshi Hamaguchi, Osaka University, Japan, Eric A. Joseph, IBM Research Division, T.J. Watson Research Center</p>		<p><b>Applied Surface Science Division</b>  <b>Room A211 - Session AS+BI+RA-MoM</b>  <b>Quantitative Surface Analysis I/Reproducibility Issues in Quantitative XPS</b>  <b>Moderators:</b> Donald Baer, Pacific Northwest National Laboratory, Mark Engelhard, EMSL, Environmental Molecular Sciences Laboratory</p>	
8:20am		<p><b>INVITED: AS+BI+RA-MoM-1</b> Improving Accuracy in Quantitation by XPS: Standards, Cross-sections, Satellite Structure, <b>C. Richard Brundle</b>, C.R.Brundle &amp; Associates; <b>P Bagus</b>, University of North Texas; <b>B Crist</b>, XPS International LLC</p>	
8:40am	<p><b>AP+2D+EM+PS+TF-MoM-2</b> Surface Pre-functionalization of SiN<sub>x</sub> and SiO<sub>2</sub> to Enhance Selectivity in Plasma-Assisted Atomic Layer Etching, <b>Ryan Gasvoda</b>, Colorado School of Mines; <b>Z Zhang, S Wang, E Hudson</b>, Lam Research Corporation; <b>S Agarwal</b>, Colorado School of Mines</p>	<p>Invited talk continues.</p>	
9:00am	<p><b>AP+2D+EM+PS+TF-MoM-3</b> Area-selective Atmospheric-pressure Spatial ALD of SiO<sub>2</sub> using Interleaved Back-etch steps Yielding Selectivity &gt; 10 nm, <b>A Mameli</b>, Holst Centre / TNO, The Netherlands; <b>F Roozeboom, Paul Poedt</b>, Holst Centre / TNO, The Netherlands, Netherlands</p>	<p><b>AS+BI+RA-MoM-3</b> A Rigorous Approach to the Calculation of the Uncertainties in XPS Analysis, <b>A Herrera-Gomez</b>, CINVESTAV-Unidad Queretaro, México; <b>Orlando Cortazar-Martinez</b>, CINVESTAV-Unidad Queretaro, Mexico</p>	
9:20am	<p><b>AP+2D+EM+PS+TF-MoM-4</b> Mechanisms of Precursor Blocking during Area-selective Atomic Layer Deposition using Inhibitors in ABC-type Cycles, <b>M Merckx</b>, Eindhoven University of Technology, The Netherlands; <b>D Hausmann</b>, Lam Research Corporation; <b>E Kessels</b>, Eindhoven University of Technology, The Netherlands, Netherlands; <b>T Sandoval</b>, Universidad Técnica Federico Santa María, Chile; <b>Adrie Mackus</b><sup>1</sup>, Eindhoven University of Technology, The Netherlands, Nederland</p>	<p><b>AS+BI+RA-MoM-4</b> Gross Errors in XPS Peak Fitting, <b>Matthew Linford, V Jain, G Major</b>, Brigham Young University</p>	
9:40am	<p><b>INVITED: AP+2D+EM+PS+TF-MoM-5</b> Area-Selective Deposition of TiO<sub>2</sub> using Isothermal Integrated Atomic Layer Deposition and Atomic Layer Etching in a Single Reaction Chamber, <b>Gregory Parsons, S Song, H Saare</b>, North Carolina State University</p>	<p><b>AS+BI+RA-MoM-5</b> Improved Energy Referencing in XPS, <b>Hagai Cohen</b>, Weizmann Institute of Science, Israel</p>	
10:00am	<p>Invited talk continues.</p>	<p><b>AS+BI+RA-MoM-6</b> How to Avoid Errors in the Interpretation of XPS Data?, <b>Andreas Thissen, P Dietrich</b>, SPECS Surface Nano Analysis GmbH, Germany; <b>W Unger</b>, Bundesanstalt für Materialforschung und -prüfung - Berlin (Germany), Germany</p>	
10:20am	<p><b>BREAK</b></p>	<p><b>BREAK</b></p>	
10:40am	<p><b>AP+2D+EM+PS+TF-MoM-8</b> Area-Selective Atomic Layer Deposition of Metal Oxides on an Inhibitor-Functionalized SiO<sub>2</sub> Surface, <b>Wanxing Xu</b>, Colorado School of Mines; <b>P Lemaire, K Sharma, D Hausmann</b>, Lam Research Corporation; <b>S Agarwal</b>, Colorado School of Mines</p>	<p><b>AS+BI+RA-MoM-8</b> Misinterpretations in the Spectroscopic Analysis of Heterogeneous Materials and Defected Structures, <b>Lisa Swartz, K Artyushkova, J Mann, B Schmidt, J Newman</b>, Physical Electronics</p>	
11:00am	<p><b>AP+2D+EM+PS+TF-MoM-9</b> Area-selective Deposition Achieved in a Continuous Process using Competitive Adsorption, <b>Taewon Suh, Y Yang, K Lao, R DiStasio, Jr., J Engstrom</b>, Cornell University</p>	<p><b>AS+BI+RA-MoM-9</b> Current Issues and Solutions for Reliable, Robust and Reproducible XPS Spectral Acquisition and Data Reporting, <b>J Counsell, C Blomfield</b>, Kratos Analytical Limited, UK; <b>Christopher Maffitt</b>, Kratos Analytical Limited; <b>N Gerrard, S Coultas</b>, Kratos Analytical Limited, UK</p>	
11:20am	<p><b>INVITED: AP+2D+EM+PS+TF-MoM-10</b> Surface Chemistry during Plasma-Assisted ALE: What Can We Learn from ALD?, <b>Sumit Agarwal</b>, Colorado School of Mines</p>	<p><b>AS+BI+RA-MoM-10</b> Intensity Calibration and Sensitivity Factors for XPS Instruments with Monochromatic Ag L<math>\alpha</math> and Al K<math>\alpha</math> Sources, <b>Alexander Shard</b>, National Physical Laboratory, UK; <b>J Counsell, C Blomfield</b>, Kratos Analytical Limited, UK; <b>D Cant</b>, National Physical Laboratory, UK; <b>E Smith</b>, University of Nottingham, UK; <b>P Navabpour</b>, Teer Coatings Ltd, UK</p>	
11:40am	<p>Invited talk continues.</p>	<p><b>AS+BI+RA-MoM-11</b> Reporting XPS Measurements and How Can We Do Better to Minimize Reproducibility Problems, <b>Karen Gaskell</b>, University of Maryland, College Park</p>	

# Monday Morning, October 21, 2019

<b>Biomaterial Interfaces Division</b> <b>Room A120-121 - Session BI+AS+NS-MoM</b> <b>Biofabrication, Bioanalytics, Biosensors, Diagnostics,</b> <b>Biolubrication and Wear</b> <b>Moderators:</b> Joe Baio, Oregon State University, Caitlin Howell, University of Maine		<b>Fundamental Discoveries in Heterogeneous Catalysis</b> <b>Focus Topic</b> <b>Room A212 - Session HC+SS-MoM</b> <b>Utilization of Theoretical Models, Machine Learning, and</b> <b>Artificial Intelligence for Heterogeneously-Catalyzed</b> <b>Reactions</b> <b>Moderators:</b> Liney Arnadottir, Oregon State University, Sharani Roy, University of Tennessee Knoxville	
8:20am	<b>BI+AS+NS-MoM-1</b> Bio-inspired Peptide-polymer Hybrid Mucin Analogues: Applications in Osteoarthritis and Kidney Stone Disease, <i>Daniel L. French, L Navarro, S Zauscher</i> , Duke University		
8:40am	<b>BI+AS+NS-MoM-2</b> Investigation of the Mechanical and Dielectric Properties of Bone Scaffolds, <i>Kimberly Cook-Chennault</i> , Rutgers University	<b>HC+SS-MoM-2</b> Theoretical Study of Acetic Acid Decomposition on Pd (111) using Density Functional Theory, <i>Kingsley Chukwu, L Arnadottir</i> , Oregon State University	
9:00am	<b>INVITED: BI+AS+NS-MoM-3</b> Bioelectronics with Graphene and Graphene-Based Hybrid-Nanomaterials – From Transparent to Fuzzy Interfaces, <i>Tzahi Cohen-Karni</i> , Carnegie Mellon University	<b>INVITED: HC+SS-MoM-3</b> Towards a Chemically Accurate Description of Reactions of Molecules with Transition Metal Surfaces, <i>Geert-Jan Kroes</i> , Leiden University, Netherlands	
9:20am	Invited talk continues.	Invited talk continues.	
9:40am	<b>BI+AS+NS-MoM-5</b> Experimental Observation of Multiple Plasmon Induced Transparency and Fano Resonance in Titanium Nitride Based Devices, <i>J Asencios, Arturo Talledo, R Moro, C Luyo</i> , Facultad De Ciencias Universidad Nacional De Ingeniería, Perú	<b>HC+SS-MoM-5</b> The Apparent Activation Energy for Complex Mechanisms: A Simple Relationship via Degrees of Rate Control, <i>Zhongtian Mao<sup>1,2</sup>, C Campbell</i> , University of Washington	
10:00am	<b>BI+AS+NS-MoM-6</b> Breaking the Mass Resolution Limit of Shear Wave Resonators in Liquid through Integrated Microfluidic Channels, <i>Z Parlak, S Zhao, D French, Stefan Zauscher</i> , Duke University	<b>HC+SS-MoM-6</b> First-Principles Kinetic Monte Carlo Simulation of CO Oxidation on PdO(101): Role of Oxygen Vacancies, <i>Minkyu Kim, A Asthagiri</i> , The Ohio State University	
10:20am	<b>BREAK</b>	<b>BREAK</b>	
10:40am	<b>INVITED: BI+AS+NS-MoM-8</b> Designing Anti-Fouling Lubricious Surfaces Based on Modular Approaches, <i>T Galhenage, C Khatri, A Vena, A Labak, T Banks, G Tremelling, Philseok Kim</i> , Adaptive Surface Technologies, Inc.	<b>HC+SS-MoM-8</b> Accelerating <i>ab initio</i> Simulations using Surrogate Machine Learning Models, <i>Jose A. Garrido Torres, P Jennings, M Hansen</i> , Stanford University; <i>T Bligaard</i> , SLAC National Accelerator Laboratory	
11:00am	Invited talk continues.	<b>HC+SS-MoM-9</b> Integrating Materials Databases and Autonomous Workflows for the Discovery of New Heterogeneous Catalysts, <i>Kirsten Winther, T Bligaard</i> , SLAC National Accelerator Laboratory	
11:20am	<b>BI+AS+NS-MoM-10</b> All Inkjet Printed Biosensor for Easy and Rapid Detection of Immunoglobulin G (IgG) Protein, <i>Ridwan Fayaz Hossain, A Kaul</i> , University of North Texas	<b>INVITED: HC+SS-MoM-10</b> Knowledge-Based Approaches in Catalysis and Energy Modelling, <i>Karsten Reuter</i> , Technical University of Munich, Germany	
11:40am	<b>BI+AS+NS-MoM-11</b> Biosensing Applications of Silver Nanorods Array Fabricated by Glancing Angle Deposition (GLAD), <i>Shashank Gahlaut</i> , Indian Institute of Technology Delhi, India	Invited talk continues.	

<sup>1</sup> Heterogeneous Catalysis Graduate Student Presentation Award Finalist

<sup>2</sup> Morton S. Traum Award Finalist

# Monday Morning, October 21, 2019

<b>MEMS and NEMS Group</b> <b>Room A210 - Session MN-MoM</b> <b>MEMS, BioMEMS, and MEMS for Energy: Processes, Materials, and Devices I</b> <b>Moderators:</b> B. Robert Ilic, National Institute for Science and Technology (NIST), Zenghui Wang, Case Western Reserve University		<b>Plasma Science and Technology Division</b> <b>Room B131 - Session PS1+SE-MoM</b> <b>Atmospheric-Pressure Plasmas</b> <b>Moderators:</b> Michael Gordon, University of California at Santa Barbara, François Reniers, Université Libre de Bruxelles	
8:20am	<b>INVITED: MN-MoM-1</b> Piezoelectrics Meets Photonics – Acousto-Optic Microsystems, <i>Gianluca Piazza</i> , Carnegie Mellon University	<b>INVITED: PS1+SE-MoM-1</b> On the Versatility of Atmospheric Non-equilibrium Plasmas: Material Synthesis, Packaging Sanitation and Oncological Applications, <i>Matteo Gherardi</i> , <i>V Colombo</i> , <i>F Barletta</i> , <i>A Bisag</i> , <i>C Bucci</i> , <i>F Capelli</i> , <i>R Laurita</i> , Alma Mater Studiorum-University of Bologna, Italy; <i>E Mezzofanti</i> , AlmaPlasma srl; <i>T Galligani</i> , Alma Mater Studiorum-University of Bologna, Italy, Italia; <i>G Girolimetti</i> , <i>S Coluccelli</i> , <i>L Amato</i> , <i>G Gasparre</i> , S.Orsola-Malpighi Hospital, Bologna, Italy; <i>M Perrone</i> , S. Orsola-Malpighi Hospital, Bologna, Italy; <i>A Porcelli</i> , Alma Mater Studiorum- University of Bologna, Italy; <i>P De Iaco</i> , S. Orsola-Malpighi Hospital, Bologna, Italy	Invited talk continues.
8:40am	Invited talk continues.	Invited talk continues.	
9:00am	<b>MN-MoM-3</b> On-chip Silicon Photonics Radiation Sensors, <i>Nikolai Klimov</i> , <i>Z Ahmed</i> , <i>R Fitzgerald</i> , <i>L Cumberland</i> , <i>I Pazos</i> , <i>R Tosh</i> , National Institute of Standards and Technology (NIST)	<b>PS1+SE-MoM-3</b> Spectroscopic Characterization of a Multi-pins Plasma System, <i>M Gulan</i> , <i>R Muddiman</i> , <i>Vladimir Milosavljevic</i> , Technological University Dublin, Ireland	
9:20am	<b>MN-MoM-4</b> Synthesis and Characterization of Nanoscale 3 dimensional Plasmonic Architectures, <i>Grace Pakeltis</i> , <i>E Mutunga</i> , University of Tennessee Knoxville; <i>Z Hu</i> , <i>D Masiello</i> , University of Washington; <i>J Idrobo</i> , Oak Ridge National Laboratory; <i>H Plank</i> , Graz University of Technology, Austria; <i>J Fowlkes</i> , Oak Ridge National Laboratory; <i>P Rack</i> , University of Tennessee Knoxville	<b>PS1+SE-MoM-4</b> Breaching Debye Law by Coupling of Y2O3 Vapor Carrying Focused Atmospheric ICP Beam Penetrating Showerhead's Holes with Opposite CCP Discharge during Chemical Corrosion Barrier Coating in Open Air, <i>Yuri Glukhoy</i> , Nanocoating Plasma Systems Inc	
9:40am	<b>MN-MoM-5</b> 2D Raman Imaging and Characterization of Surface Acoustic Waves on GaAs Substrates, <i>Brian Douglas Rummel</i> , <i>G Heileman</i> , University of New Mexico; <i>M Henry</i> , Sandia National Laboratories; <i>S Han</i> , University of New Mexico	<b>PS1+SE-MoM-5</b> Streamers Effects in Cold Atmospheric Plasma Applications: Coatings, Gas Conversion, Surface Chemistries, <i>A Ozkan</i> , <i>J Mertens</i> , <i>François Reniers</i> , Université Libre de Bruxelles, Belgium	
10:00am	<b>MN-MoM-6</b> Impacts of Stress and Dissipation in van der Waals Interfaces on 2D Material Nanoelectromechanical Systems, <i>SunPhil Kim</i> , <i>A van der Zande</i> , University of Illinois at Urbana-Champaign	<b>PS1+SE-MoM-6</b> Improved Water Intrusion Resistance on Adhesive Bonded Metals using Atmospheric CVD SiO <sub>2</sub> Barrier Coatings, <i>Zachary Jeckell</i> , <i>D Patel</i> , <i>T Choi</i> , <i>M Schmid</i> , <i>L Bónová</i> , <i>D Barlaz</i> , <i>D Ruzic</i> , University of Illinois at Urbana-Champaign; <i>I Shchelkanov</i> , <i>B Jurczyk</i> , Starfire Industries LLC	
10:20am	<b>BREAK</b>	<b>BREAK</b>	
10:40am	<b>INVITED: MN-MoM-8</b> Nanomechanical Sensing for the Life Sciences, <i>Montserrat Calleja</i> , IMN-CSIC, Spain	<b>PS1+SE-MoM-8</b> OES Imaging and Double Langmuir Probe Studies of Flow-through, Supersonic Microplasma Jet Sources, <i>K Mackie</i> , <i>Michael Gordon</i> , University of California at Santa Barbara	
11:00am	Invited talk continues.	<b>PS1+SE-MoM-9</b> Time-resolved Optical Emission Spectroscopy of an Atmospheric Pressure Plasma Jet – Surface Interaction, <i>Michael Johnson</i> , <i>D Boris</i> , <i>T Petrova</i> , <i>S Walton</i> , U.S. Naval Research Laboratory	
11:20am	<b>MN-MoM-10</b> Neutral Mass Spectrometry of Metallic Nanoparticles with Optomechanical Resonators, <i>Marc Sansa</i> , <i>M Defoort</i> , <i>M Hermoet</i> , <i>L Banniard</i> , <i>A Fafin</i> , <i>M Gely</i> , Université Grenoble Alpes, CEA, LETI, France; <i>I Favero</i> , Centre de Nanosciences et de Nanotechnologies, CNRS, Université Paris-Sud, Université Paris-Saclay, France; <i>G Jourdan</i> , Université Grenoble Alpes, CEA, LETI, France; <i>A Brenac</i> , Université Grenoble Alpes, CEA, CNRS, Grenoble INP, INAC-Spintec, France; <i>S Hentz</i> , Université Grenoble Alpes, CEA, LETI, France	<b>INVITED: PS1+SE-MoM-10</b> Atmospheric-Pressure Plasmas As Ionization Sources For Atomic, Molecular, And Biological Mass Spectrometry, <i>Jacob Shelley</i> , <i>S Badal</i> , <i>C Walton</i> , <i>G MacLean</i> , Rensselaer Polytechnic Institute; <i>I Ayodeji</i> , University of South Florida; <i>G Chan</i> , Lawrence Berkeley National Laboratory; <i>T Evans-Nguyen</i> , University of South Florida	
11:40am	<b>MN-MoM-11</b> Mass Calibration of Nanomechanical Resonators from Electrical Measurements for Mass Spectrometry Applications, <i>Bagdan Vysotskyi</i> , CEA/LETI-University Grenoble Alpes, France; <i>S Lai</i> , CEA/IRIG-University Grenoble Alpes, France; <i>M Defoort</i> , <i>M Sansa</i> , CEA/LETI-University Grenoble Alpes, France; <i>K Clement</i> , CEA/IRIG-University Grenoble Alpes, France; <i>M Gely</i> , CEA/LETI-University Grenoble Alpes, France; <i>C Masselon</i> , CEA/IRIG-University Grenoble Alpes, France; <i>S Hentz</i> , CEA/LETI-University Grenoble Alpes, France	Invited talk continues.	

# Monday Morning, October 21, 2019

<p><b>Plasma Science and Technology Division</b>  <b>Room B130 - Session PS2-MoM</b>  <b>Plasma Modeling</b>  <b>Moderators:</b> Mingmei Wang, TEL Technology Center, America, LLC, Nathan Marchack, IBM T.J. Watson Research Center</p>		<p><b>Materials and Processes for Quantum Information, Computing and Science Focus Topic</b>  <b>Room B231-232 - Session QS+EM+MN+NS-MoM</b>  <b>High Coherence Qubits for Quantum Computing</b>  <b>Moderators:</b> Vivekananda Adiga, IBM, T.J. Watson Research Center, Martina Esposito, Oxford University, UK</p>	
8:20am	<p><b>PS2-MoM-1</b> Computational Modeling of Capacitively Coupled Plasmas at Moderate Pressures in gases of Argon, Helium and Nitrogen, <i>Wei Tian</i>, Applied Materials; <i>D Peterson</i>, <i>S Shannon</i>, North Carolina State University; <i>S Rauf</i>, Applied Materials</p>		<p><b>QS+EM+MN+NS-MoM-1</b> Measurement of a Two-Level-System Dipole Distribution in a Nanoscale Aluminum Oxide Barrier, <i>Chih-Chiao Hung</i>, <i>N Foroozani</i>, <i>K Osborn</i>, University of Maryland</p>
8:40am	<p><b>PS2-MoM-2</b> Relation between Atomic Interaction Parameters of a Surface Material and its Physical Sputtering Yield; How to Predict the Etching Rate based on the Surface Material Properties, <i>Nicolas Mauchamp</i>, <i>M Isobe</i>, <i>S Hamaguchi</i>, Osaka University, Japan</p>		<p><b>QS+EM+MN+NS-MoM-2</b> Mapping Quantum Systems to Quantum Computers using Symmetry, <i>Daniel Gunlycke</i>, <i>S Fischer</i>, <i>S Hellberg</i>, <i>S Policastro</i>, <i>S Tafur</i>, U.S. Naval Research Laboratory</p>
9:00am	<p><b>INVITED: PS2-MoM-3</b> Investigation on the Uniformity Control of the Electron and the Ion Kinetics in a Capacitively Coupled Plasma Reactor using a Parallelized Particle-in-Cell Simulation, <i>Hae June Lee</i>, Pusan National University, Republic of Korea; <i>H Kim</i>, Dong A University, Republic of Korea; <i>J Kim</i>, Tokyo Electron Technology Solutions Limited, Japan</p>		<p><b>INVITED: QS+EM+MN+NS-MoM-3</b> History of Superconducting Qubit Coherence and the Current Challenges, <i>Hanhee Paik</i>, IBM T.J. Watson Research Center</p>
9:20am	Invited talk continues.		Invited talk continues.
9:40am	<p><b>PS2-MoM-5</b> Capacitively Coupled Plasma Uniformity Improvement Using Phase and Amplitude Control of Electrode Potential, <i>Xiaopu Li</i>, <i>K Bera</i>, <i>S Rauf</i>, Applied Materials</p>		<p><b>INVITED: QS+EM+MN+NS-MoM-5</b> Loss and Decoherence Benchmarking of Superconducting Transmon Qubits, <i>Jonas Bylander</i>, Chalmers University of Technology, Sweden</p>
10:00am	<p><b>PS2-MoM-6</b> Kinetic Modeling of Non-Equilibrium Plasmas for Modern Applications, <i>Igor Kaganovich</i>, <i>A Khrabrov</i>, <i>A Powis</i>, Princeton Plasma Physics Laboratory</p>		Invited talk continues.
10:20am	<b>BREAK</b>		<b>BREAK</b>
10:40am	<p><b>PS2-MoM-8</b> Automated Reduction of Plasma Chemistry Sets, <i>Sebastian Mohr</i>, Quantemol Ltd., UK; <i>M Hanicinc</i>, University College London, UK; <i>A Dzarasova</i>, Quantemol Ltd., UK; <i>J Tennyson</i>, University College London, UK</p>		<p><b>INVITED: QS+EM+MN+NS-MoM-8</b> Towards PAMBE Grown Nitride Superconductors for Epitaxial Josephson Junctions and Quantum Circuits, <i>Christopher Richardson</i>, <i>A Alexander</i>, <i>C Weddle</i>, Laboratory for Physical Sciences; <i>M Olszta</i>, <i>B Arey</i>, Pacific Northwest National Laboratory</p>
11:00am	<p><b>PS2-MoM-9</b> Prediction of Etch Rates for New Materials by Machine Learning - Case Study for Physical Sputtering, <i>Kazumasa Ikuse</i>, Osaka University, Japan; <i>H Kino</i>, National Institute for Materials Science (NIMS), Japan; <i>S Hamaguchi</i>, Osaka University, Japan</p>		Invited talk continues.
11:20am	<p><b>PS2-MoM-10</b> Maskless and Contactless Patterned Silicon Deposition using a Localized PECVD Process, <i>Ronan Leal</i>, <i>B Bruneau</i>, <i>P Bulkin</i>, <i>T Novikova</i>, <i>F Silva</i>, LPICM, CNRS, Ecole Polytechnique, Institut Polytechnique de Paris, France; <i>N Habka</i>, TOTAL GRP - New Energies, France; <i>E Johnson</i>, LPICM, CNRS, Ecole Polytechnique, Institut Polytechnique de Paris, France</p>		<p><b>QS+EM+MN+NS-MoM-10</b> Josephson Junction Metrology for Superconducting Quantum Device Design, <i>Ruichen Zhao</i>, <i>M Bal</i>, <i>J Long</i>, <i>R Lake</i>, <i>X Wu</i>, <i>C Rae McRae</i>, <i>H Ku</i>, <i>H Wang</i>, <i>D Pappas</i>, National Institute of Standards and Technology (NIST)</p>
11:40am			<p><b>QS+EM+MN+NS-MoM-11</b> Superconducting Metamaterial Resonator Spectrum and Interaction with Qubit, <i>Haozhi Wang</i>, <i>S Indrajeet</i>, <i>M Hutchings</i>, <i>M LaHaye</i>, <i>B Plourde</i>, Syracuse University; <i>B Taketani</i>, <i>F Wilhelm</i>, Saarland University</p>

# Monday Morning, October 21, 2019

<b>Thin Films Division</b> <b>Room A122-123 - Session TF+EM+MI+MN+OX+PS-MoM</b> <b>Functional Thin Films: Ferroelectric, Multiferroics, and Magnetic Materials</b> <b>Moderators:</b> Christophe Vallee, LTM - MINATEC - CEA/LETI, France, Jessica Kachian, Intel Corporation		<b>Thin Films Division</b> <b>Room A124-125 - Session TF-MoM</b> <b>Thin Films for Electrochemistry and Energy Storage</b> <b>Moderators:</b> Parag Banerjee, University of Central Florida, Jason Avila, U.S. Naval Research Laboratory	
8:20am	<b>INVITED: TF+EM+MI+MN+OX+PS-MoM-1</b> A Room-Temperature Magnetoelectric Multiferroic made by Thin Film Alchemy, <i>D Schlom, Megan Holtz</i> , Cornell University	<b>INVITED: TF-MoM-1</b> Enabling Energy Dense Lithium Batteries Using Thin Film Technology, <i>Wyatt Tenhaeff</i> , University of Rochester	
8:40am	Invited talk continues.	Invited talk continues.	
9:00am	<b>TF+EM+MI+MN+OX+PS-MoM-3</b> Magnetic Losses in FeGa/NiFe/Al <sub>2</sub> O <sub>3</sub> Laminates for Strain-Mediated Multiferroic Micro-Antenna Applications, <i>Kevin Fitzell, A Acosta, C Rementer, D Schneider, Z Yao</i> , University of California, Los Angeles; <i>C Dong</i> , Northeastern University; <i>M Jamer, D Gopman, J Borchers, B Kirby</i> , National Institute of Standards and Technology (NIST); <i>N Sun</i> , Northeastern University; <i>Y Wang, G Carman, J Chang</i> , University of California, Los Angeles	<b>TF-MoM-3</b> Molecular Layer Deposition of Organic Li-containing Thin Film for Li Ion Solid-state Batteries, <i>Haotian Wang</i> , University of Maryland, College Park	
9:20am	<b>TF+EM+MI+MN+OX+PS-MoM-4</b> Multiferroic Gd-substituted HfO <sub>2</sub> Thin Films, <i>John Hayden, F Scurti, J Schwartz, J Maria</i> , Pennsylvania State University	<b>TF-MoM-4</b> Organic/Inorganic Solid Electrolytes and Electrode Coatings for 3D Lithium-ion Microbatteries, <i>Ryan Sheip, J Lau</i> , University of California, Los Angeles; <i>K Jungjohann</i> , Sandia National Laboratories; <i>J Yoo</i> , Los Alamos National Laboratory; <i>B Dunn, J Chang</i> , University of California, Los Angeles	
9:40am	<b>TF+EM+MI+MN+OX+PS-MoM-5</b> Epitaxial Growth of Antiferromagnetic NiO Films by Off-axis Sputtering for Spintronic Devices, <i>A Churikova, G Beach</i> , Massachusetts Institute of Technology; <i>Larry Scipioni, A Shepard, J Greer, T Newhouse-Illige</i> , PVD Products, Inc.	<b>TF-MoM-5</b> Structural Rearrangement in Li <sub>x</sub> V <sub>2</sub> O <sub>5</sub> Thin Films, a Cathode Material for All-solid-state Batteries, <i>Angelique Jarry</i> , University of Maryland, College Park; <i>N Pronin, M Walker</i> , The Ohio State University; <i>J Ballard</i> , University of Maryland; <i>D Stewart</i> , University of Maryland, College Park; <i>L Brillson</i> , The Ohio State University; <i>G Rubloff</i> , University of Maryland, College Park	
10:00am	<b>TF+EM+MI+MN+OX+PS-MoM-6</b> Structural and Magnetic Properties of CoPd Alloys for Non-Volatile Memory Applications, <i>S Gupta, J Abugri, B Clark</i> , University of Alabama; <i>P Komninou</i> , Aristotle University of Thessaloniki; <i>Sujan Budhathoki, A Hauser, P Visscher</i> , University of Alabama	<b>TF-MoM-6</b> Atomic Layer Deposition and Performance of Sodium and Potassium Electrolytes for Conformal Solid State Batteries, <i>Blake Nuwayhid, A Jarry, G Rubloff, K Gregorczyk</i> , University of Maryland, College Park	
10:20am	<b>BREAK</b>	<b>BREAK</b>	
10:40am	<b>INVITED: TF+EM+MI+MN+OX+PS-MoM-8</b> Size Effects of the Electromechanical Response in Ferroic Thin Films: Phase Transitions to the Rescue, <i>Nazanin Bassiri-Gharb</i> , Georgia Institute of Technology	<b>INVITED: TF-MoM-8</b> ALD as Tool for Bottom-up Synthesis of Catalyst Powders, <i>Frank Rosowski</i> , BASF Se, Germany	
11:00am	Invited talk continues.	Invited talk continues.	
11:20am	<b>TF+EM+MI+MN+OX+PS-MoM-10</b> Ferroelectrics Meet Ionics in the Land of van der Waals, <i>S Neumayer</i> , Center for Nanophase Materials Sciences, Oak Ridge National Laboratory; <i>J Brehm</i> , Vanderbilt University; <i>M McGuire</i> , Oak Ridge National Laboratory; <i>M Susner</i> , Air Force Research Laboratory; <i>E Eliseev</i> , National Academy of Sciences of Ukraine; <i>S Jesse, S Kalinin</i> , Center for Nanophase Materials Sciences, Oak Ridge National Laboratory; <i>A Morozovska</i> , National Academy of Sciences of Ukraine; <i>S Pantelides</i> , Vanderbilt University; <i>N Balke, Petro Maksymovych</i> , Center for Nanophase Materials Sciences, Oak Ridge National Laboratory	<b>TF-MoM-10</b> Strategies for the Stabilization of Metal Anodes for Li and Na Metal Batteries, <i>Yang Zhao<sup>2</sup>, X Sun</i> , University of Western Ontario, Canada	
11:40am	<b>TF+EM+MI+MN+OX+PS-MoM-11</b> Adsorption-controlled Epitaxial Growth of the Hyperferroelectric Candidate LiZnSb on GaSb (111), <i>D Du, P Strohbeen</i> , University of Wisconsin - Madison; <i>H Paik</i> , Cornell University; <i>C Zhang, P Voyles, Jason Kawasaki</i> , University of Wisconsin - Madison	<b>TF-MoM-11</b> Competition Between Incorporation and Desorption of Nitrogen in Plasma-Enhanced Atomic Layer Deposition of Cobalt and Cobalt Nitride Catalysts, <i>Gerben van Straaten</i> , Eindhoven University of Technology, The Netherlands, Netherlands; <i>H Fredriksson</i> , Syngaschem BV, Netherlands; <i>R Deckers</i> , Eindhoven University of Technology, Netherlands; <i>M Vos</i> , Eindhoven University of Technology, The Netherlands, Netherlands; <i>K Weststrate</i> , Syngaschem BV, Netherlands; <i>E Kessels</i> , Eindhoven University of Technology, The Netherlands, Netherlands; <i>A Creatore</i> , Eindhoven University of Technology, Netherlands	

<sup>1</sup> TFD James Harper Award Finalist

<sup>2</sup> Late-Abstract Energy Transition Symposium Theme Award



# Monday Morning, October 21, 2019

<p><b>Vacuum Technology Division</b>  <b>Room A213 - Session VT-MoM</b>  <b>Pumping, Outgassing, leaks, and Vacuum Pressure Measurement</b>  <b>Moderators:</b> Scott Heinbuch, MKS Granville-Phillips Division, Longmont, Giulia Lanza, SLAC National Accelerator Laboratory</p>		
8:20am	<p><b>VT-MoM-1</b> Operational Experiences of Compact Non-Evaporable Getter Pumps in CHESS-U and CBETA, <b>Yulin Li</b>, <i>Y Lushtak, L Ying</i>, Cornell University</p>	
8:40am	<p><b>VT-MoM-2</b> Al<sub>2</sub>O<sub>3</sub> Coated Stainless Steel Vacuum Chamber and Parts, <b>Martin Wüest</b>, <i>Y Kuzminykh, G Mata Osoro, W Fuchs, J Gabathuler, L Ospelt</i>, INFICON Ltd., Liechtenstein</p>	
9:00am	<p><b>VT-MoM-3</b> Comparative Outgassing Study of Identical Vacuum Chambers, <b>James Fedchak</b>, National Institute of Standards and Technology (NIST)</p>	
9:20am	<p><b>VT-MoM-4</b> The NIST VACuum LEaks System (VALES): a new system for the primary and comparison calibration of small gas flows., <b>Julia Scherschligt</b>, <i>J Fedchak, R Vest</i>, National Institute of Standards and Technology (NIST)</p>	
9:40am	<p><b>VT-MoM-5</b> Creating a Controlled Gas Environment for Lifetime Testing of EUV Optics, <b>Timo Huijser</b>, <i>M van Putten, M van der Lans</i>, TNO, Netherlands</p>	
10:00am	<p><b>VT-MoM-6</b> Sampling System Design to Predict Mixture Composition at a Quadrupole Mass Spectrometer Ion Source, <b>Robert Ellefson</b>, REVac Consulting</p>	
10:20am	<b>BREAK</b>	
10:40am	<p><b>INVITED: VT-MoM-8</b> Quantum Pressure Standard in the range 200 Pa to 20 kPa using Superconducting Microwave Cavity, <b>Laurent Pitre</b>, LNE Cnam-LCM, France; <i>P Gambette</i>, LNE-Cnam LCM, France; <i>R Gaviglio, D Ripa</i>, INRiM, Italy; <i>M Plimmer</i>, LNE-Cnam LCM, France</p>	
11:00am	Invited talk continues.	
11:20am	<p><b>VT-MoM-10</b> Progress Toward Primary Pressure Measurements based on Refractive Index, <b>Kevin Douglass</b>, <i>J Ricker, J Hendricks</i>, National Institute of Standards and Technology (NIST)</p>	
11:40am	<p><b>VT-MoM-11</b> Application of Porous Conductance Element for High Vacuum Gauge Calibration, <b>Martin-Viktor Johansson</b>, Aix Marseille University, France; <i>M Wüest</i>, INFICON Ltd., Liechtenstein; <i>P Perrier</i>, Aix Marseille University, France; <i>I Graur</i>, Aix-Marseille University, France</p>	

# Monday Afternoon, October 21, 2019

<b>2D Materials</b> <b>Room A226 - Session 2D+AP+EM+MI+MN+NS+PS+TF-MoA</b> <b>Nanostructures including Heterostructures and Patterning of 2D Materials</b> <b>Moderator: Deep Jariwala, University of Pennsylvania</b>		<b>2D Materials</b> <b>Room A216 - Session 2D+AP+EM+MI+NS+PS+TF-MoA</b> <b>2D Materials Growth and Fabrication</b> <b>Moderator: Sarah Haigh, University of Manchester, UK</b>	
1:40pm	<b>INVITED: 2D+AP+EM+MI+MN+NS+PS+TF-MoA-1</b> Tailoring and Patterning 2D Material Interfaces Through Chemical Functionalization, <i>Arend van der Zande</i> , University of Illinois at Urbana-Champaign	<b>2D+AP+EM+MI+NS+PS+TF-MoA-1</b> Two-dimensional Non-layered Indium Sulfide for Electronic and Optical Applications, <i>Jian Zhen Ou</i> , <i>A Jannat</i> , <i>K Xu</i> , RMIT University, Australia	
2:00pm	Invited talk continues.	<b>2D+AP+EM+MI+NS+PS+TF-MoA-2</b> Synthesis of High Quality Monolayer Transition Metal Dichalcogenides using Direct Liquid Injection, <i>Kathleen M. McCreary</i> , <i>E Cobas</i> , <i>A Hanbicki</i> , <i>M Rosenberger</i> , <i>H Chuang</i> , <i>B Jonker</i> , U.S. Naval Research Laboratory	
2:20pm	<b>2D+AP+EM+MI+MN+NS+PS+TF-MoA-3</b> Dual-Route Hydrogenation of the Graphene/Ni Interface, <i>Rosanna Larciprete</i> , CNR-Institute for Complex Systems, Roma, Italy; <i>D Lizzit</i> , Elettra - Sincrotrone Trieste, Trieste, Italy; <i>M Trioni</i> , CNR-Institute of Molecular Science and Technologies, Milano, Italy; <i>P Lacovig</i> , <i>L Bignardi</i> , <i>S Lizzit</i> , Elettra - Sincrotrone Trieste, Trieste, Italy; <i>R Martinazzo</i> , Università degli Studi di Milano, Milano, Italy	<b>INVITED: 2D+AP+EM+MI+NS+PS+TF-MoA-3</b> Understanding and Controlling the Growth of 2D Materials with Non-Equilibrium Methods and in situ Diagnostics, <i>David Geohagan</i> , <i>Y Lin</i> , <i>Y Yu</i> , Oak Ridge National Laboratory; <i>C Liu</i> , <i>G Duscher</i> , University of Tennessee Knoxville; <i>A Strasser</i> , University of Texas at Dallas; <i>A Puzos</i> , Oak Ridge National Laboratory; <i>K Wang</i> , Intel Corporation, USA; <i>M Yoon</i> , <i>C Rouleau</i> , Oak Ridge National Laboratory; <i>S Canulescu</i> , DTU Nanolab, Technical University of Denmark; <i>P Rack</i> , University of Tennessee Knoxville; <i>L Liang</i> , <i>W Zhang</i> , <i>H Cai</i> , <i>Y Gu</i> , <i>G Eres</i> , <i>K Xiao</i> , Oak Ridge National Laboratory	
2:40pm	<b>2D+AP+EM+MI+MN+NS+PS+TF-MoA-4</b> Assembly of Arrays of Predefined Monolayer Features into vdW Heterostructure by a Continuous Exfoliate-align-Release Process, <i>Vu Nguyen</i> , <i>H Taylor</i> , University of California at Berkeley	Invited talk continues.	
3:00pm	<b>2D+AP+EM+MI+MN+NS+PS+TF-MoA-5</b> van der Waals Heterojunction Photothermoelectric Effect in MoS <sub>2</sub> /Graphene Monolayers, <i>Yunqiu Kelly Luo</i> , The Ohio State University; <i>T Zhou</i> , University at Buffalo, State University of New York; <i>M Newburger</i> , The Ohio State University; <i>R Bailey-Crandell</i> , <i>I Lyalin</i> , The Ohio State University; <i>M Neupane</i> , U.S. Army Research Laboratory; <i>A Matos-Abiad</i> , Wayne State University; <i>I Zutic</i> , University at Buffalo, State University of New York; <i>R Kawakami</i> , The Ohio State University	<b>2D+AP+EM+MI+NS+PS+TF-MoA-5</b> Area-Selective Atomic Layer Deposition of 2D WS <sub>2</sub> Nanolayers, <i>Shashank Balasubramanyam</i> <sup>1</sup> , Eindhoven University of Technology, The Netherlands, Noord Brabant; <i>M Merckx</i> , Eindhoven University of Technology, The Netherlands; <i>E Kessels</i> , Eindhoven University of Technology, The Netherlands, Netherlands; <i>A Mackus</i> , Eindhoven University of Technology, The Netherlands, Nederland; <i>A Bol</i> , Eindhoven University of Technology, The Netherlands, Netherlands	
3:20pm	<b>2D+AP+EM+MI+MN+NS+PS+TF-MoA-6</b> Formation of Edge-bonded MoS <sub>2</sub> -graphene Nanoribbons by On-surface Synthesis, <i>Mark Hastrup</i> , <i>M Mammen</i> , <i>J Rodriguez-Fernández</i> , <i>J Lauritsen</i> , Aarhus University, Denmark	<b>2D+AP+EM+MI+NS+PS+TF-MoA-6</b> Growth Behavior of Hexagonal Boron Nitride on Cu-Ni Binary Alloys, <i>Karthik Sridhara</i> , Texas A&M University; <i>J Wollmershauser</i> , U.S. Naval Research Laboratory; <i>L Nyakiti</i> , Texas A&M University; <i>B Feigelson</i> , U.S. Naval Research Laboratory	
3:40pm	<b>BREAK</b>	<b>BREAK</b>	
4:00pm	<b>2D+AP+EM+MI+MN+NS+PS+TF-MoA-8</b> The Effects of Metal-modification and Two Dimensional (2D) Lamellar Structure on Catalytic Performance of MFI Zeolite for Ethylene Conversion into Liquid Aromatics, <i>Laleh Emdadi</i> , <i>L Mahoney</i> , <i>D Tran</i> , <i>I Lee</i> , US Army Research Laboratory	<b>2D+AP+EM+MI+NS+PS+TF-MoA-8</b> Chemical Deposition of Vanadium Disulfide on Silicon for Optoelectronic Applications, <i>Mathias Fraccaroli</i> , <i>R Gassilloud</i> , <i>S Cadot</i> , CEA-LETI, France; <i>B Pellissier</i> , LTM, Univ. Grenoble Alpes, CNRS, France; <i>C Vallée</i> , LTM, Univ. Grenoble Alpes, CEA-LETI, France; <i>A Sylvestre</i> , G2Elab, Univ. Grenoble Alpes, France	
4:20pm	<b>2D+AP+EM+MI+MN+NS+PS+TF-MoA-9</b> Structural Stability of Graphene Nanoflakes: From the View Point of Aromaticity, <i>M Ushirozaka</i> , <i>H Matsuyama</i> , <i>A Akaishi</i> , <i>Jun Nakamura</i> , The University of Electro-Communications (UEC-Tokyo), Japan	<b>2D+AP+EM+MI+NS+PS+TF-MoA-9</b> Controlled Growth of Transition Metal Dichalcogenide Monolayers for Applications in Nanoelectronic and Nanophotonic Devices, <i>A George</i> , <i>C Neumann</i> , <i>D Kaiser</i> , <i>R Mupparapu</i> , Friedrich Schiller University Jena, Germany; <i>U Hübner</i> , Leibniz Institute of Photonic Technology, Jena, Germany; <i>Z Tang</i> , <i>A Winter</i> , <i>I Staude</i> , <b>Andrey Turchanin</b> , Friedrich Schiller University Jena, Germany	
4:40pm	<b>INVITED: 2D+AP+EM+MI+MN+NS+PS+TF-MoA-10</b> Wafer-scale 2D-3D Mixed Heterostructures Enabled by Remote Epitaxy through Graphene, <i>Jeewan Kim</i> , Massachusetts Institute of Technology	<b>2D+AP+EM+MI+NS+PS+TF-MoA-10</b> Atomic Layer Deposition of BN as a Novel Capping Barrier for B <sub>2</sub> O <sub>3</sub> , <i>Aparna Pilli</i> , <i>J Jones</i> , <i>J Kelber</i> , University of North Texas; <i>A LaVoie</i> , <i>F Pasquale</i> , Lam Research Corporation	
5:00pm	Invited talk continues.	<b>2D+AP+EM+MI+NS+PS+TF-MoA-11</b> Atomic Layer Deposition of SiO <sub>2</sub> on Group VIII Metals: Towards Formation of a 2D Dielectric, <i>T Suh</i> , <i>R Yaliso</i> , <i>James Engstrom</i> , Cornell University	

# Monday Afternoon, October 21, 2019

<b>Actinides and Rare Earths Focus Topic</b> <b>Room A215 - Session AC-MoA</b> <b>Early Career Scientists</b> <b>Moderators:</b> Art Nelson, Lawrence Livermore National Laboratory, David Shuh, Lawrence Berkeley National Laboratory, Evgeniya Tereshina-Chitrova, Charles University, Prague, Czech Republic		<b>Biomaterial Interfaces Division</b> <b>Room A120-121 - Session BI+AS-MoA</b> <b>Cutting Edge Bio: Bio-Nano, Bio-Energy, 3D Bio</b> <b>Moderators:</b> Heather Canavan, University of New Mexico, Jordan Lerach, ImaBiotech Corp.	
1:40pm	<b>INVITED: AC-MoA-1</b> Advanced Characterization of Nuclear Fuels, <i>Lingfeng He</i> , <i>T Yao</i> , Idaho National Laboratory; <i>V Chauhan</i> , The Ohio State University; <i>A Sen</i> , Purdue University; <i>Z Hua</i> , <i>M Bachhav</i> , Idaho National Laboratory; <i>M Khafizov</i> , The Ohio State University; <i>J Wharry</i> , Purdue University; <i>M Mann</i> , Air Force Research Laboratory; <i>T Wiss</i> , European Commission, Joint Research Centre (JRC); <i>J Gan</i> , <i>D Hurley</i> , Idaho National Laboratory	<b>INVITED: BI+AS-MoA-1</b> Emulsion-templated Asymmetric Vesicles, <i>Laura Arriaga</i> , University of Madrid, Spain	
2:00pm	Invited talk continues.	Invited talk continues.	
2:20pm	<b>INVITED: AC-MoA-3</b> The Influence of Relative Humidity on the Oxidation of $\delta$ -Pu, <i>Scott Donald</i> , <i>J Stanford</i> , <i>A Nelson</i> , <i>B McLean</i> , Lawrence Livermore National Laboratory	<b>BI+AS-MoA-3</b> Antimicrobial Cyclic Peptide Polymer Nanopores, <i>Kenan Fears</i> , <i>L Estrella</i> , US Naval Research Laboratory	
2:40pm	Invited talk continues.	<b>BI+AS-MoA-4</b> ToF-SIMS Analysis of the Distribution of <i>p</i> -Hydroxybenzoate in Wood, <i>Robyn E. Goacher</i> , Niagara University; <i>Y Mottiar</i> , University of British Columbia, Canada	
3:00pm	<b>AC-MoA-5</b> Magnetization and Transport Properties of Delta Phase Uranium, <i>Xiaxin Ding</i> , <i>N Poudel</i> , <i>T Yao</i> , <i>J Harp</i> , <i>K Gofryk</i> , Idaho National Laboratory	<b>INVITED: BI+AS-MoA-5</b> Feeling the Force; Probing the Cues that Influence Stem Cell Behaviour, <i>Stephanie Allen</i> , School of Pharmacy, The University of Nottingham, UK	
3:20pm	<b>AC-MoA-6</b> Using Fused Filament Fabrication to Develop Customized Materials which Attenuate Ionizing Radiation, <i>Zachary Brounstein</i> , <i>E Murphy</i> , <i>J Dumont</i> , <i>S Talley</i> , <i>K Lee</i> , <i>A Labouriau</i> , Los Alamos National Laboratory	Invited talk continues.	
3:40pm	<b>BREAK</b>	<b>BREAK</b>	
4:00pm	<b>AC-MoA-8</b> Thermodynamic and Thermal Transport Properties of Thorium Dioxide single crystals, <i>Narayan Poudel</i> , <i>X Ding</i> , Idaho National Laboratory; <i>J Mann</i> , Air Force Research Laboratory; <i>K Gofryk</i> , Idaho National Laboratory		
4:20pm	<b>AC-MoA-9</b> Magnetic Nanoparticles for Biomedical Applications, <i>Iliana Medina-Ramirez</i> , <i>A Diaz de Leon Olmos</i> , Universidad Autonoma de Aguascalientes, Mexico; <i>J Zapfen</i> , City University of Hong Kong	<b>BI+AS-MoA-9</b> Angstrom-Resolved Characterization of Electrochemical Interfaces in Real Time during Polarization, <i>Markus Valtiner</i> , Vienna University of Technology, Austria	
4:40pm		<b>INVITED: BI+AS-MoA-10</b> New Electrochemical Methods for Probing Metalloenzymes, <i>Alison Parkin</i> , University of York, UK	
5:00pm		Invited talk continues.	

# Monday Afternoon, October 21, 2019

<b>Electronic Materials and Photonics Division</b> <b>Room A214 - Session EM+PS+TF-MoA</b> <b>New Devices and Materials for Logic and Memory</b> <b>Moderators:</b> Rehan Kapadia, University of Southern California, Nicholas Strandwitz, Lehigh University		<b>MEMS and NEMS Group</b> <b>Room A210 - Session MN-MoA</b> <b>Microfabricated Systems for Gas Chromatography and</b> <b>Nanomechanical Mass Sensing</b> <b>Moderators:</b> Robert Davis, Brigham Young University, Christian Zorman, Case Western Reserve University	
1:40pm	<b>EM+PS+TF-MoA-1</b> Short-term Plasticity to Long-term Plasticity Transition Mimicked by High Mobility InP FETs with TiO <sub>2</sub> Trapping Layer, <i>Jun Tao, R Kapadia</i> , University of Southern California	<b>INVITED: MN-MoA-1</b> Micromachined Silicon Micro-pillar Arrays for Liquid and Gas Chromatography, <i>Gert Desmet</i> , Vrije Universiteit Brussel, Belgium	
2:00pm	<b>EM+PS+TF-MoA-2</b> Magnetic Domain Wall Devices for Artificial Neural Network, <i>Saima Siddiqui, S Dutta, A Tang, L Liu, M Baldo, C Ross</i> , MIT	Invited talk continues.	
2:20pm	<b>INVITED: EM+PS+TF-MoA-3</b> Ferroelectric Devices for Non-von Neumann Computing, <i>Z Wang, Asif Khan</i> , Georgia Institute of Technology	<b>INVITED: MN-MoA-3</b> An Integrated Passive $\mu$ Preconcentrator with Progressively-Heated $\mu$ Injector for $\mu$ GC, <i>R Hower, C Zhan, M Akbar, N Nuñovero, J Wang, J Potkay, Edward Zellers</i> , University of Michigan	
2:40pm	Invited talk continues.	Invited talk continues.	
3:00pm	<b>EM+PS+TF-MoA-5</b> Ultrafast Measurement of Nanoseconds Polarization Switching in Ferroelectric Hafnium Zirconium Oxide, <i>Mengwei Si, P Ye</i> , Purdue University	<b>MN-MoA-5</b> Developments and Challenges in Full-range Microchip Gas Chromatography, <i>Abhijit Ghosh</i> , Honeywell UOP, Des Plaines, IL, USA.; <i>M Lee</i> , Brigham Young University	
3:20pm	<b>EM+PS+TF-MoA-6</b> Interfacial Charge Engineering in Ferroelectric-Gated Mott Transistors, <i>X Chen, Y Hao, L Zhang, Xia Hong</i> , University of Nebraska-Lincoln	<b>MN-MoA-6</b> Fabrication of Thermally Isolated micro-Column for Gas Chromatography, <i>James Harkness, H Davis, A Davis, R Davis, B Jensen, R Vanfleet</i> , Brigham Young University	
3:40pm	<b>BREAK</b>	<b>BREAK</b>	
4:00pm	<b>EM+PS+TF-MoA-8</b> The Interface of Transition Metal Dichalcogenides and Ferroelectric Oxides, <i>Maria Gabriela Sales, S Jaszewski, S Fields, R Christopher, N Shukla, J Ihlefeld, S McDonnell</i> , University of Virginia	<b>MN-MoA-8</b> Control of Surface Geometry and Chemistry to enable integration of Microfabricated Structures into High Performance Microscale Gas Chromatography Systems, <i>Henry Davis, D McKenna, J Harkness, D Kane, R Vanfleet, R Davis</i> , Brigham Young University	
4:20pm	<b>EM+PS+TF-MoA-9</b> Electronic and Thermal Properties of 2D Materials, <i>Connor McClellan, E Yalon, K Smithe, C English, S Vaziri, C Bailey, A Sood, M Chen, E Pop</i> , Stanford University	<b>INVITED: MN-MoA-9</b> Constructive Utilization of Nonlinear Dynamics in MEMS/NEMS, <i>Hanna Cho</i> , The Ohio State University	
4:40pm	<b>INVITED: EM+PS+TF-MoA-10</b> Electronics in Flatland, <i>Sanjay Banerjee</i> , University of Texas at Austin	Invited talk continues.	
5:00pm	Invited talk continues.	<b>MN-MoA-11</b> Frequency Stabilization in a MEMS Oscillator Via Tunable Internal Resonance, <i>Jun Yu, H Cho</i> , The Ohio State University	

# Monday Afternoon, October 21, 2019

<b>Plasma Science and Technology Division</b> <b>Room B130 - Session PS+AS+EM+SS+TF-MoA</b> <b>Plasma-Surface Interactions</b> <b>Moderators:</b> Sebastian Engelmann, IBM T.J. Watson Research Center, Sumit Agarwal, Colorado School of Mines		<b>Plasma Science and Technology Division</b> <b>Room B131 - Session PS1-MoA</b> <b>Plasma-Liquid Interactions, Medicine, and Agriculture</b> <b>Moderators:</b> Kazunori Koga, Kyushu University, Japan, Deborah O'Connell, University of York, UK	
1:40pm	<b>PS+AS+EM+SS+TF-MoA-1</b> Cleaning Chamber Walls after ITO Plasma Etching Process, <i>Salma Younesy</i> , C Petit-Etienne, LTM/CNRS, France; <i>S Barnola</i> , CEA-LETI, France; <i>P Gouraud</i> , ST Microelectronics, France; <i>G Cunge</i> , LTM/CNRS, France	<b>INVITED: PS1-MoA-1</b> Peroxynitric acid (HOONO <sub>2</sub> ) Chemistry in Plasma-treated Water for Effective and Safety Disinfection, <i>Katsuhisa Kitano</i> , Osaka University, Japan; <i>S Ikawa</i> , Y <i>Nakashima</i> , Osaka Research Institute of Industrial Science and Technology, Japan; <i>T Yokoyama</i> , Osaka University, Japan; <i>A Tani</i> , Kobe University, Japan	
2:00pm	<b>PS+AS+EM+SS+TF-MoA-2</b> Plasma Resistance of Sintered Yttrium Oxyfluoride (YOF) with Various Y, O, and F Composition Ratios, <i>Tetsuya Goto</i> , <i>Y Shiba</i> , <i>A Teramoto</i> , Tohoku University, Japan; <i>Y Kishi</i> , Nippon Yttrium Co., Ltd, Japan; <i>S Sugawa</i> , Tohoku University, Japan	Invited talk continues.	
2:20pm	<b>INVITED: PS+AS+EM+SS+TF-MoA-3</b> Understanding Atomic Layer Etching: Thermodynamics, Kinetics and Surface Chemistry, <i>Jane P. Chang</i> <sup>1</sup> , University of California, Los Angeles	<b>PS1-MoA-3</b> Impact of Solution Properties on Plasma Formation in DC Plasma Electrolysis, <i>Hernan E. Delgado</i> <sup>2</sup> , <i>D Bartels</i> , <i>P Rumbach</i> , <i>D Go</i> , University of Notre Dame	
2:40pm	Invited talk continues.	<b>INVITED: PS1-MoA-4</b> Plasma Reactive Species Formation in Liquids, <i>Sylwia Ptasinska</i> , University of Notre Dame	
3:00pm	<b>PS+AS+EM+SS+TF-MoA-5</b> Comparison of Silicon Surface Chemistry between Photo-Assisted Etching and Ion-Assisted Etching, <i>Emilia Hirsch</i> , <i>L Du</i> , <i>V Donnelly</i> , <i>D Economou</i> , University of Houston	Invited talk continues.	
3:20pm	<b>PS+AS+EM+SS+TF-MoA-6</b> Chemical Reaction Probabilities in the Etching of Si by Fluorine Atoms Produced in a Mixture of NF <sub>3</sub> /SF <sub>6</sub> Plasma, <i>Priyanka Arora</i> <sup>2</sup> , <i>T Nguyen</i> , University of Houston; <i>S Nam</i> , Samsung Electronic Company, Republic of Korea; <i>V Donnelly</i> , University of Houston	<b>PS1-MoA-6</b> In-flight Synthesis and Online Characterization of Silver Nanoparticles from Aerosol Droplets Reacting in a Non-thermal Plasma, <i>Tommaso Galligani</i> , Alma Mater Studiorum-University of Bologna, Italy, Italy; <i>N Abuyazid</i> , Case Western Reserve University; <i>M Gherardi</i> , <i>V Colombo</i> , Alma Mater Studiorum-University of Bologna, Italy; <i>C Hogan</i> , University of Minnesota, Minneapolis; <i>M Sankaran</i> , Case Western Reserve University	
3:40pm	<b>BREAK</b>	<b>BREAK</b>	
4:00pm	<b>INVITED: PS+AS+EM+SS+TF-MoA-8</b> John Thornton Memorial Award Lecture: Low Temperature Plasma-Materials Interactions: Foundations of Nanofabrication And Emerging Novel Applications At Atmospheric Pressure, <i>Gottlieb S. Oehrlein</i> <sup>3</sup> , University of Maryland, College Park	<b>INVITED: PS1-MoA-8</b> Plasma-assisted Fabrication and Functionalization of Materials for Applications at the Nano-biointerface, <i>Cristina Satriano</i> , University of Catania, Italy	
4:20pm	Invited talk continues.	Invited talk continues.	
4:40pm	<b>PS+AS+EM+SS+TF-MoA-10</b> Determining Surface Recombination Probabilities during Plasma-enhanced ALD using Lateral High Aspect Ratio Structures, <i>Karsten Arts</i> , Eindhoven University of Technology, The Netherlands, Netherlands; <i>M Utriainen</i> , VTT Technical Research Centre of Finland, Finland; <i>R Puurunen</i> , Aalto University School of Chemical Engineering, Finland; <i>E Kessels</i> , Eindhoven University of Technology, The Netherlands, Netherlands; <i>H Knoops</i> , Eindhoven University of Technology, The Netherlands	<b>INVITED: PS1-MoA-10</b> Cold Plasma Jets, Liquids and Biomaterials for Bone Cancer Therapy, <i>Cristina Canal</i> , Universitat Politècnica de Catalunya, Spain	
5:00pm	<b>PS+AS+EM+SS+TF-MoA-11</b> Study of Plasma-Photoresist Interactions for Atomic Layer Etching Processes, <i>Adam Pranda</i> <sup>2</sup> , <i>K Lin</i> , <i>G Oehrlein</i> , University of Maryland, College Park	Invited talk continues.	

<sup>1</sup> PSTD Plasma Prize Winner

<sup>2</sup> Coburn & Winters Student Award Finalist

<sup>3</sup> John A. Thornton Memorial Award Winner

# Monday Afternoon, October 21, 2019

<b>Materials and Processes for Quantum Information, Computing and Science Focus Topic</b> <b>Room B231-232 - Session QS+EM+MN+NS+VT-MoA</b> <b>Systems and Devices for Quantum Computing</b> <b>Moderators:</b> Jonas Bylander, Chalmers University of Technology, Sweden, Ruichen Zhao, National Institute of Standards and Technology (NIST)		<b>New Challenges to Reproducible Data and Analysis Focus Topic</b> <b>Room A211 - Session RA+AS+NS+SS-MoA</b> <b>Quantitative Surface Analysis II/Big Data, Theory and Reproducibility</b> <b>Moderators:</b> Kateryna Artyushkova, Physical Electronics, Donald Baer, Pacific Northwest National Laboratory	
1:40pm	<b>QS+EM+MN+NS+VT-MoA-1</b> DEMUXYZ Gate Using Single Microwave Drive Line for Multiple Qubits, <i>Matteo Mariani</i> , University of Waterloo, Canada; <i>C Earnest</i> , University of Waterloo, Canada; <i>J Béjanin</i> , University of Waterloo, Canada	<b>INVITED: RA+AS+NS+SS-MoA-1</b> A Data-Centric View of Reproducibility, <i>Anne Plant</i> , National Institute of Standards and Technology (NIST); <i>J Elliott</i> , NIST; <i>R Hanisch</i> , National Institute of Standards and Technology (NIST)	
2:00pm	<b>QS+EM+MN+NS+VT-MoA-2</b> Structural and Electronic Characterization of a Novel Si/SiGe Heterostructure for Quantum Computing, <i>Thomas Mclunkin</i> , <i>E MacQuarrie</i> , <i>S Neyens</i> , <i>B Thorgrimsson</i> , <i>J Corrigan</i> , <i>J Dodson</i> , <i>D Savage</i> , <i>M Lagally</i> , <i>R Joynt</i> , <i>M Friesen</i> , <i>S Coppersmith</i> , <i>M Eriksson</i> , University of Wisconsin - Madison	Invited talk continues.	
2:20pm	<b>INVITED: QS+EM+MN+NS+VT-MoA-3</b> Efficient Quantum Computation using Problem-specific Quantum Hardware and Algorithms, <i>Stefan Filipp</i> , IBM Research - Zurich, Switzerland	<b>INVITED: RA+AS+NS+SS-MoA-3</b> Enhancing Data Reliability, Accessibility and Sharing using Stealthy Approaches for Metadata Capture, <i>Steven Wiley</i> , Pacific Northwest National Laboratory	
2:40pm	Invited talk continues.	Invited talk continues.	
3:00pm	<b>INVITED: QS+EM+MN+NS+VT-MoA-5</b> Reconfigurable Magnetic Textures for Quantum Information Applications, <i>Alex Matos-Abiague</i> , Wayne State University	<b>INVITED: RA+AS+NS+SS-MoA-5</b> From Electrons to X-rays: Tackling Big Data Problems through AI, <i>Mathew Cherukara</i> , <i>Y Liu</i> , <i>M Holt</i> , <i>H Liu</i> , <i>T Gage</i> , <i>J Wen</i> , <i>I Arslan</i> , Argonne National Laboratory	
3:20pm	Invited talk continues.	Invited talk continues.	
3:40pm	<b>BREAK</b>	<b>BREAK</b>	
4:00pm	<b>INVITED: QS+EM+MN+NS+VT-MoA-8</b> Coaxial Multilayer Superconducting Circuits for Quantum Computing, <i>Peter Leek</i> , University of Oxford, UK	<b>INVITED: RA+AS+NS+SS-MoA-8</b> Quantifying Shell Thicknesses of Core-Shell Nanoparticles by means of X-ray Photoelectron Spectroscopy, <i>Wolfgang Werner</i> , Vienna University of Technology, Austria	
4:20pm	Invited talk continues.	Invited talk continues.	
4:40pm	<b>QS+EM+MN+NS+VT-MoA-10</b> Josephson Parametric Amplifiers based on Micron Scale Overlap Junctions (O-JPA), <i>Mustafa Bal</i> , <i>J Long</i> , <i>R Zhao</i> , <i>H Wang</i> , National Institute of Standards and Technology (NIST); <i>C McRae</i> , National Institute of Standards and Technology (NIST) and University of Colorado Boulder; <i>R Lake</i> , <i>X Wu</i> , <i>H Ku</i> , <i>D Pappas</i> , National Institute of Standards and Technology (NIST)	<b>RA+AS+NS+SS-MoA-10</b> Modeling the Inelastic Background in X-ray Photoemission Spectra for Finite Thickness Films, <i>Alberto Herrera-Gomez</i> , CINVESTAV-Unidad Queretaro, México	
5:00pm	<b>QS+EM+MN+NS+VT-MoA-11</b> Development and Characterization of a Flux-pumped Josephson Parametric Amplifier, <i>Martina Esposito</i> , University of Oxford, UK	<b>RA+AS+NS+SS-MoA-11</b> R2R(Raw-to-Repository) Characterization Data Conversion for Reproducible and Repeatable Measurements, <i>Mineharu Suzuki</i> , <i>H Nagao</i> , <i>H Shinotsuka</i> , National Institute for Materials Science (NIMS), Japan; <i>K Watanabe</i> , ULVAC-PHI Inc., Japan; <i>A Sasaki</i> , Rigaku Corp., Japan; <i>A Matsuda</i> , <i>K Kimoto</i> , <i>H Yoshikawa</i> , National Institute for Materials Science (NIMS), Japan	

# Monday Afternoon, October 21, 2019

<b>Surface Science Division</b> <b>Room A220-221 - Session SS+HC-MoA</b> <b>CO<sub>2</sub>, CO, Water, and Small Molecule Chemistry at Surfaces</b> <b>Moderators:</b> Donna Chen, University of South Carolina, Omur E. Dagdeviren, Yale University		<b>Thin Films Division</b> <b>Room A124-125 - Session TF+2D+AP+EL+SS-MoA</b> <b>ALD and CVD: Nucleation, Surface Reactions, Mechanisms, and Kinetics</b> <b>Moderators:</b> Adrie Mackus, Eindhoven University, Netherlands, Qing Peng, University of Alabama	
1:40pm	<b>INVITED: SS+HC-MoA-1</b> Calculations of the Electrochemical Reduction of CO <sub>2</sub> and the Competing Hydrogen Evolution Reaction, <i>Hannes Jónsson</i> , University of Iceland, Iceland	<b>INVITED: TF+2D+AP+EL+SS-MoA-1</b> ALD on Particles: What is Different from Wafers?, <i>Ruud van Ommen</i> , Delft University of Technology, Netherlands	
2:00pm	Invited talk continues.	Invited talk continues.	
2:20pm	<b>SS+HC-MoA-3</b> CO <sub>2</sub> Adsorption on the O-Cu(100) Surface Studied by STM and DFT, <i>S Tjung, Q Zhang, J Repicky, S Yuk</i> , The Ohio State University; <i>X Nie</i> , Dalian University of Technology; <i>Seth Shields</i> , The Ohio State University; <i>N Santagata</i> , University of Memphis; <i>A Asthagiri, J Gupta</i> , The Ohio State University	<b>TF+2D+AP+EL+SS-MoA-3</b> Insights into Particle ALD Peculiarities from In- and Ex-Situ Characterization, <i>Benjamin Greenberg</i> , American Society for Engineering Education; <i>J Wollmershauser, B Feygelson</i> , U.S. Naval Research Laboratory	
2:40pm	<b>SS+HC-MoA-4</b> Employing Carbon Monoxide and Carbon Dioxide Plasmas to Improve the Gas Sensing Performance of Tin(IV) Oxide, <i>Kimberly Hiyoto, E Fisher</i> , Colorado State University	<b>TF+2D+AP+EL+SS-MoA-4</b> Impact of Medium Energy Ions on HfO <sub>2</sub> Nucleation Mechanisms on Si, SiO <sub>2</sub> , TiN Substrates in PEALD Processes Investigated by In situ Ellipsometry, Optical Emission Spectroscopy, AFM and XPS Analyses, <i>Marceline Bonvalot, S belahcen, A Bsiesy, C Vallée</i> , LTM, Univ. Grenoble Alpes, CEA-LETI, France	
3:00pm	<b>INVITED: SS+HC-MoA-5</b> The Role of Steps in the Dissociation of CO <sub>2</sub> on Cu, <i>Johan Gustafson, B Hagman</i> , Lund University, Sweden; <i>A Posada-Borbón, A Schaefer</i> , Chalmers University of Technology, Sweden; <i>M Shipilin</i> , Stockholm University, Sweden; <i>C Zhang</i> , Lund University, Sweden; <i>L Merte</i> , Malmö University, Sweden; <i>A Hellman</i> , Chalmers University of Technology, Sweden; <i>E Lundgren</i> , Lund University, Sweden; <i>H Grönbeck</i> , Chalmers University of Technology, Sweden	<b>TF+2D+AP+EL+SS-MoA-5</b> Controlling the Nucleation of CVD Cobalt Films on SiO <sub>2</sub> : Combining an Amido-based Nucleation Promotor with an Amine-based Growth Inhibitor to Afford Atomically-smooth Surfaces, <i>Zhejun Zhang, G Girolami, J Abelson</i> , University of Illinois at Urbana-Champaign	
3:20pm	Invited talk continues.	<b>TF+2D+AP+EL+SS-MoA-6</b> Plasma-assisted Atomic Layer Epitaxy of Indium Aluminum Nitride Studied Using <i>in situ</i> Grazing Incidence Small-angle X-ray Scattering, <i>Jeffrey M. Woodward</i> , ASEE (residing at US Naval Research Laboratory); <i>S Rosenberg</i> , American Society for Engineering Education (residing at US Naval Research Laboratory); <i>S Johnson, N Nepal</i> , U.S. Naval Research Laboratory; <i>Z Robinson</i> , SUNY Brockport; <i>K Ludwig</i> , Boston University; <i>C Eddy</i> , U.S. Naval Research Laboratory	
3:40pm	<b>BREAK</b>	<b>BREAK</b>	
4:00pm	<b>SS+HC-MoA-8</b> Surface Temperature Dependence of Methane Dissociation on Ni(997), <i>Daniel Tinney, E High, L Joseph, A Utz</i> , Tufts University	<b>INVITED: TF+2D+AP+EL+SS-MoA-8</b> Real-time Monitoring of the Surface Chemistry of Atomic Layer Deposition by Ambient Pressure X-ray Photoelectron Spectroscopy, <i>Joachim Schnadt, P Shayesteh</i> , Lund University, Sweden; <i>R Tsyshkevskiy</i> , University of Maryland; <i>G Jean-Jacques, F Bourneil</i> , Sorbonne Université, France; <i>R Timm</i> , Lund University, Sweden; <i>A Head</i> , Brookhaven National Laboratory; <i>G D'Acunato, F Rehman, S Chaudhary</i> , Lund University, Sweden; <i>R Sánchez-de-Armas</i> , Uppsala University, Sweden; <i>F Rochet</i> , Sorbonne Université, France; <i>B Brena</i> , Uppsala University, Sweden; <i>A Mikkelsen, S Urpelainen, A Troian, S Yngman, J Knudsen</i> , Lund University, Sweden	
4:20pm	<b>SS+HC-MoA-9</b> Promotion and Inhibition of Methane Dissociation by Carbon on Ni Single Crystal Surfaces, <i>Arthur Utz, E High, D Tinney</i> , Tufts University	Invited talk continues.	
4:40pm	<b>SS+HC-MoA-10</b> Two-Dimensional Polymorphism as a Result of Non-Equilibrium Self-Assembly, <i>Angela Silski<sup>1</sup>, J Petersen</i> , University of Notre Dame; <i>R Brown</i> , Clarkson University; <i>S Kandel</i> , University of Notre Dame	<b>TF+2D+AP+EL+SS-MoA-10</b> Kinetics during TMA-H <sub>2</sub> O ALD: The Possible Role of Cooperative Surface Reactions, <i>Brent Sperleng, B Kalanyan, J Maslar</i> , National Institute of Standards and Technology (NIST)	
5:00pm		<b>TF+2D+AP+EL+SS-MoA-11</b> Atomic Layer Deposition of Metal Sulfides: Growth and Surface Chemistry, <i>Xinwei Wang</i> , Shenzhen Graduate School, Peking University, China	

# Monday Afternoon, October 21, 2019

<b>Thin Films Division</b> <b>Room A122-123 - Session TF+SE-MoA</b> <b>HiPIMS and Reactive HiPIMS for Novel Thin Films</b> <b>Moderators:</b> Joe Becker, Kurt J. Lesker Company, Megan Holtz, Cornell University		<b>Energy Transition Focus Topic</b> <b>Room A212 - Session TL+2D+HC+SS-MoA</b> <b>Surface Reaction Mechanisms in Energy Conversion (ALL INVITED SESSION)</b> <b>Moderators:</b> Marie Turano, Loyola University Chicago, Sarah Zaccarine, Colorado School of Mines	
1:40pm	<b>TF+SE-MoA-1</b> The Influence of the Magnetic Field on the Deposition Rate and Ionized Flux Fraction in the HiPIMS Discharge, <i>H Hajihoseini</i> , University of Iceland, Iceland; <i>M Cada, Z Hubicka</i> , Academy of Sciences of the Czech Republic, Czech Republic; <i>S Unaldi</i> , LPGP Université Paris-Sud, France; <i>M Raadu, N Brenning</i> , KTH Royal Institute of Technology, Sweden; <b>Jon Tomas Gudmundsson</b> , University of Iceland, Iceland; <i>D Lundin</i> , LPGP Université Paris-Sud, France	INVITED: TL+2D+HC+SS-MoA-1	Selective Photo-driven Organic Reactions on the Surfaces of Colloidal Quantum Dots, <i>Y Jiang, K McClelland, C Rogers, Emily Weiss</i> , Northwestern University
2:00pm	<b>TF+SE-MoA-2</b> HiPIMS and Magnetron Sputtering of Niobium for use in Josephson Junctions, <b>George Major</b> , <i>M Linford</i> , Brigham Young University	Invited talk continues.	
2:20pm	<b>INVITED: TF+SE-MoA-3</b> Thin Film Crystal Growth of Oxides, Nitrides and Carbides using High Impulse Magnetron Sputtering, <b>Jon-Paul Maria</b> , The Pennsylvania State University	INVITED: TL+2D+HC+SS-MoA-3	Single-Atom Alloy Catalysts: Born in a Vacuum, Tested in Reactors, and Understood In Silico, <b>Charles Sykes</b> , Tufts University
2:40pm	Invited talk continues.		Invited talk continues.
3:00pm	<b>TF+SE-MoA-5</b> Reactive Bipolar High Power Impulse Magnetron Sputtering (B-HiPIMS) for Deposition of High Entropy Carbides, <b>Trent Borman</b> , <i>M Hossain, J Maria</i> , The Pennsylvania State University	INVITED: TL+2D+HC+SS-MoA-5	Understanding Fundamental Energy Conversion Mechanisms: How Surface Science Can Help, <b>Ulrike Diebold</b> , Institute of Applied Physics, TU Wien, Austria
3:20pm	<b>TF+SE-MoA-6</b> High Density Titanium Oxide and Silicon Oxide Films Deposited by Current-Controlled High Power Impulse Magnetron Sputtering, <b>Arutiun P. Ehasarian</b> , <i>P Hovsepian, D Loch</i> , Sheffield Hallam University, UK	Invited talk continues.	
3:40pm	<b>BREAK</b>		<b>BREAK</b>
4:00pm	<b>TF+SE-MoA-8</b> Epitaxial Growth and Surface Morphology of Thin Film GaN via HiPIMS, <b>Kevin Ferri</b> , <i>E Runnerstrom</i> , Pennsylvania State University; <i>A Klump, Z Sitar, R Collazo</i> , North Carolina State University; <i>J Maria</i> , The Pennsylvania State University	INVITED: TL+2D+HC+SS-MoA-8	Atomically-defined Model Interfaces in Energy-related Catalysis, Electrochemistry, and Photoelectrochemistry, <b>Jörg Libuda</b> , University Erlangen-Nuremberg, Germany
4:20pm	<b>TF+SE-MoA-9</b> Reactive HiPIMS Deposition of a Thick Cu:CuCN <sub>x</sub> Multilayered Nano-composite Coating Material for Improving Machining Process Performance in Rough Turning, <b>Md.Masud-Ur Rashid</b> , <i>C Nicolescu</i> , KTH Royal Institute of Technology, Plasmatrix Materials AB, Sweden; <i>A Archenti</i> , KTH Royal Institute of Technology, Sweden; <i>G Shuai</i> , KTH Royal Institute of Technology; <i>R Tomkowski</i> , KTH Royal Institute of Technology, Sweden	Invited talk continues.	
4:40pm	<b>TF+SE-MoA-10</b> The Residual Stress Control in Hard Metal Films by Energetic Deposition, <b>Y.G. Li</b> , <i>Y Qu, Z Jiang, M Lei</i> , Dalian University of Technology, China	INVITED: TL+2D+HC+SS-MoA-10	Controlling Ultrafast Photochemical Reactions in Photocatalysis, <b>Annemarie Huijser</b> , University of Twente, The Netherlands, The Netherlands
5:00pm	<b>TF+SE-MoA-11</b> Advanced HiPIMS Coatings Through Kick Pulse Technology, <b>Jason Hrebik</b> , Kurt J. Lesker Company	Invited talk continues.	



# Monday Afternoon, October 21, 2019

<p><b>Vacuum Technology Division</b>  <b>Room A213 - Session VT-MoA</b>  <b>Gas Dynamics, Surface Science for Accelerators, and</b>  <b>Ultra-Clean Vacuum Systems</b>  <b>Moderators:</b> Jason Carter, Argonne National Laboratory, James Fedchak, National Institute of Standards and Technology</p>		
1:40pm	<p><b>INVITED: VT-MoA-1</b> Advancement in Transient Flow Simulations: Applications to Channel and Porous Media Conductance Modeling, <i>Irina Graur Martin</i>, Aix Marseille University, France</p>	
2:00pm	Invited talk continues.	
2:20pm	<p><b>VT-MoA-3</b> A Multiphysics Simulation Tool for Storage Ring Vacuum System Design and Optimization, <i>Nicholas Goldring, Z Wu, D Bruhwiler, B Nash</i>, RadiaSoft LLC; <i>J Carter, J Lerch, K Suthar</i>, Argonne National Laboratory; <i>R Nagler</i>, RadiaSoft LLC; <i>P Den Hartog</i>, Argonne National Laboratory</p>	
2:40pm	<p><b>VT-MoA-4</b> Vacuum System Design and Modeling for the Jefferson Lab Electron Ion Collider Interaction Region, <i>Marcy Stutzman</i>, Jefferson Lab</p>	
3:00pm	<p><b>VT-MoA-5</b> Photocathode Growth and Diagnostic Systems for LCLS-II, <i>Xianghong Liu, T Vecchione, B Dunham</i>, SLAC National Accelerator Laboratory</p>	
3:20pm	<p><b>VT-MoA-6</b> Characterization of NbTiN Thin Film Structures, <i>David Beverstock, A Valente-Feliciano</i>, Jefferson Lab; <i>V Smolyaninova</i>, Towson University; <i>M Kelley</i>, The College of William and Mary</p>	
3:40pm	<b>BREAK</b>	
4:00pm	<p><b>INVITED: VT-MoA-8</b> Future Laser Interferometer Gravitational Wave Observatories and their Vacuum Requirements, <i>Chandra Romel</i>, California Institute of Technology; <i>R Weiss</i>, Massachusetts Institute of Technology; <i>M Zucker</i>, California Institute of Technology; <i>H Dylla</i>, American Institute of Physics</p>	
4:20pm	Invited talk continues.	
4:40pm	<p><b>VT-MoA-10</b> Status Update on the New Space Calibration Facility at TNO, <i>Freek Molkenboer, R Jansen, F Driessen, T Luijkx</i>, TNO, The Netherlands</p>	
5:00pm	<p><b>VT-MoA-11</b> Advancements in Monitoring and Operating Thermal Vacuum Environmental Test Chambers for Next-Generation Space Exploration Hardware, <i>Maxwell Martin, A Wong, W Hoey, J Alred, P Boeder, C Soares</i>, Jet Propulsion Laboratory, California Institute of Technology</p>	

# Anticipated Schedule Tuesday, October 22, 2019

## Anticipated Schedule Tuesday Morning, October 22

8:00 AM	_____
8:20 AM	_____
8:40 AM	_____
9:00 AM	_____
9:20 AM	_____
9:40 AM	_____
10:00 AM	_____
10:20 AM	_____
10:40 AM	_____
11:00 AM	_____
11:20 AM	_____
11:40 AM	_____
12:00 PM	_____

## Anticipated Schedule Tuesday Lunch, October 22

When	_____
Where	_____
With	_____

## Anticipated Schedule Tuesday Afternoon, October 22

1:00 PM	_____
1:20 PM	_____
1:40 PM	_____
2:00 PM	_____
2:20 PM	_____
2:40 PM	_____
3:00 PM	_____
3:20 PM	_____
3:40 PM	_____
4:00 PM	_____
4:20 PM	_____
4:40 PM	_____
5:00 PM	_____
5:20 PM	_____
5:40 PM	_____
6:00 PM	_____

# Special Events Tuesday

## Special Events Tuesday

- 6:00 AM AVS Yoga--Pre-Registration Required/Pierce A-Hilton
- 7:00 AM Member Center: Free Coffee for 2019 AVS Members/A111-112
- 7:00 AM Membership Committee Meeting & Breakfast/Gallerie Bistro-Lamp-Hilton (by invitation)
- 7:30 AM Awards Committee Meeting and Lunch/Hayden-Hilton (by invitation)
- 8:00 AM ASED Business Meeting/Hopkins-Hilton
- 8:00 AM Science Educators' Workshop/B234-235 (by invitation)
- 8:15 AM ASED Executive Committee Meeting & Lunch/Hopkins-Hilton (by invitation)
- 10:00 AM AVS Member Center: "Modern Job Searching Process"/A111-112
- 10:00 AM Session Coffee Break/Hall A
- 11:40 AM Surface Science Flash Session/A220-221
- 12:15 PM AVS Member Center: Job Information Forum and Lunch/A111-112
- 12:20 PM Exhibit Hall Lunch/Hall A
- 12:30 PM Chapters, Divisions, and Groups Meeting and Lunch/Pierce AB-Hilton (by invitation)
- 12:30 PM MSTG Technical Group Executive Committee Meeting and Lunch/Gallerie Bistro-Lamp-Hilton (by invitation)
- 2:00 PM Member Center: Modern Resumes and CVs/A111-112
- 3:30 PM AVS Career Center: SIGN UP:\*\*One-on-One Career Expert Advice at the Career Center (Booth #146)
- Pre-Registration Required in Member Center, A111-112/Hall A (by invitation)
- 3:40 PM Session Refreshment Break/Hall A
- 5:20 PM Transition Energy Leaders Panel Discussion/A226
- 5:40 PM Biomaterial Interfaces Flash Session/A120-121
- 6:20 PM BID Business Meeting/A120-121
- 6:25 PM EMPD Business Meeting/A214
- 6:25 PM MIND Business Meeting/A210
- 6:25 PM NSTD Business Meeting/A222
- 6:25 PM PSTD Business Meeting & 2019 Plasma Prize Award Announcement/B131
- 6:25 PM SSD Business Meeting/A220-221
- 6:25 PM TFD Business Meeting/A122-123
- 6:25 PM VTD Business Meeting/A213
- 6:30 PM Tuesday Poster Session & Refreshments/Union Station AB
- 7:00 PM MEMS/NEMS Executive Committee Meeting and Dinner/Hayden-Hilton (by invitation)
- 7:00 PM NSTD Executive Committee Meeting and Dinner/Bellows E-Hilton (by invitation)
- 7:30 PM ASSD Business Meeting/King-Hilton
- 7:30 PM PSTD Executive Committee Meeting and Dinner/Pierce A-Hilton (by invitation)
- 7:30 PM SSD Executive Committee Meeting and Dinner/Private Dining Room-Hilton (by invitation)
- 7:30 PM TFD Executive Committee Meeting and Dinner/Pierce B-Hilton (by invitation)
- 7:45 PM BID Executive Committee Meeting and Dinner/Burkhart A-Hilton (by invitation)
- 7:45 PM EMPD Executive Committee Meeting and Dinner/Burkhart B-Hilton (by invitation)
- 8:00 PM ASTM E-42 and Applied Surface Science Joint Workshop: "What Do We Know About What We Don't Know? - A Panel Discussion/King-Hilton

# Tuesday Morning, October 22, 2019

	<b>2D Materials</b> <b>Room A216 - Session 2D+AS+MI+NS-TuM</b> <b>2D Materials Characterization including Microscopy and Spectroscopy</b> <b>Moderator: David Geohegan, Oak Ridge National Laboratory</b>	<b>2D Materials</b> <b>Room A226 - Session 2D+EM+MI+MN+NS+QS-TuM</b> <b>Novel Quantum Phenomena</b> <b>Moderator: Arend van der Zande, University of Illinois at Urbana Champaign</b>
8:00am	<b>2D+AS+MI+NS-TuM-1</b> Near-field Infrared Spectroscopy of Single Layer MnPS <sub>3</sub> , <i>Sabine Neal</i> , University of Tennessee Knoxville; <i>H Kim</i> , Rutgers University; <i>K Smith, A Haglund, D Mandrus</i> , University of Tennessee Knoxville; <i>H Bechtel</i> , Advanced Light Source, Lawrence Berkeley National Laboratory; <i>L Carr</i> , National Synchrotron Light Source II, Brookhaven National Lab; <i>K Haule, D Vanderbilt</i> , Rutgers University; <i>J Musfeldt</i> , University of Tennessee Knoxville	<b>INVITED: 2D+EM+MI+MN+NS+QS-TuM-1</b> Charge Density-Wave States in Single-Layer Transition-Metal Dichalcogenides, <i>Phil King</i> , University of St Andrews, UK  Invited talk continues.
8:20am	<b>2D+AS+MI+NS-TuM-2</b> Multi-parameter Analysis of Genesis and Evolution of Secondary Electrons produced in the Low Energy Regime, <i>Alessandra Bellissimo</i> , ETH Zürich, Switzerland; <i>G Pierantozzi</i> , CNR - Istituto Officine Materiali, Italy; <i>A Ruocco, G Stefani</i> , Università degli Studi Roma Tre, Italy; <i>O Ridzel, V Astašauskas, W Werner</i> , Technische Universität Wien, Austria; <i>M Taborelli</i> , CERN, Switzerland; <i>G Bertolini, U Ramsperger</i> , ETH Zürich, Switzerland; <i>O Gürlü</i> , ETH Zürich, Switzerland, Turkey; <i>D Pescia</i> , ETH Zürich, Switzerland	
8:40am	<b>INVITED: 2D+AS+MI+NS-TuM-3</b> Probing Point Defects, Folds and Interfaces in 2D Material Heterostructures using Scanning Transmission Electron Microscopy, <i>Sarah Haigh</i> , University of Manchester, UK	<b>2D+EM+MI+MN+NS+QS-TuM-3</b> Sublattice Symmetry Breaking and Kondo-effect Enhancement in Strained Graphene, <i>D Zhai</i> , Ohio University; <i>K Ingersent</i> , University of Florida; <i>S Ulloa, Nancy Sandler</i> , Ohio University
9:00am	Invited talk continues.	<b>2D+EM+MI+MN+NS+QS-TuM-4</b> Indirect Transition and Opposite Circular Polarization of Interlayer Exciton in a MoSe <sub>2</sub> WSe <sub>2</sub> van der Waals Heterostructure, <i>Hsun-Jen Chuang</i> , <i>A Hanbicki, M Rosenberger, C Hellberg, S Sivaram, K McCreary, I Mazin, B Jonker</i> , U.S. Naval Research Laboratory
9:20am	<b>2D+AS+MI+NS-TuM-5</b> Low-Energy Electron Induced Disorder and Decomposition of Self-assembled Monolayers on Au(111), <i>Jodi Grzeskowiak</i> <sup>1</sup> , University at Albany - SUNY; <i>C Ventrice, Jr.</i> , SUNY Polytechnic Institute	<b>2D+EM+MI+MN+NS+QS-TuM-5</b> Integrating 2D Magnet 1T-MnSe <sub>2</sub> with Topological Insulator Bi <sub>2</sub> Se <sub>3</sub> , <i>Tiancong Zhu</i> , The Ohio State University; <i>D O'Hara</i> , University of California, Riverside; <i>J Repicky, S Yu, M Zhu, B Noesges, T Liu, M Brenner, L Brillson, J Hwang, F Yang, J Gupta, R Kawakami</i> , The Ohio State University
9:40am	<b>2D+AS+MI+NS-TuM-6</b> Continuous Silicene, Silicene Ribbons and Surface Reconstructions on h-MoS <sub>2</sub> , <i>Anna Costine, C Volders</i> , University of Virginia; <i>M Fu</i> , Oak Ridge National Laboratory; <i>P Reinke</i> , University of Virginia	<b>2D+EM+MI+MN+NS+QS-TuM-6</b> Effect of Exchange-correlation Functional and Structural Constraints on the Transition Temperature of Two-Dimensional Ferroelectrics, <i>Shiva P. Poudel, J Villanova, B Miller, A Pandit, S Barraza-Lopez</i> , University of Arkansas, Fayetteville
10:00am	<b>BREAK - Complimentary Coffee in Exhibit Hall</b>	<b>BREAK - Complimentary Coffee in Exhibit Hall</b>
10:20am	<b>BREAK - Complimentary Coffee in Exhibit Hall</b>	<b>BREAK - Complimentary Coffee in Exhibit Hall</b>
10:40am	<b>BREAK - Complimentary Coffee in Exhibit Hall</b>	<b>BREAK - Complimentary Coffee in Exhibit Hall</b>
11:00am	<b>2D+AS+MI+NS-TuM-10</b> Epitaxial Growth and Characterization of Single-Orientation Single-Layer Transition Metal Dichalcogenides on Au(111), <i>L Bignardi</i> , University of Trieste, Italy; <i>Daniel Lizzit</i> , Elettra - Sincrotrone Trieste, Trieste, Italy; <i>B Harsh, E Travaglia</i> , Department of Physics, University of Trieste, Italy; <i>C Sanders</i> , iNANO, Aarhus University, Denmark, UK; <i>M Dendzik</i> , Aarhus University, Denmark, Germany; <i>P Lacovig</i> , Elettra-Sincrotrone Trieste, Italy; <i>M Michiardi</i> , iNANO, Aarhus University, Denmark, Canada; <i>M Bianchi</i> , Aarhus University, Denmark; <i>R Larciprete</i> , CNR-Institute for Complex Systems, Roma, Italy; <i>J Flege, J Falta</i> , University of Bremen, Germany; <i>P Das</i> , Abdus Salam International Centre for Theoretical Physics, Trieste, Italy; <i>J Fujii, I Vobornik</i> , IOM-CNR, Laboratorio TASC, Trieste, Italy; <i>M Ewert, L Buß</i> , University of Bremen, Germany; <i>A Baraldi</i> , University of Trieste, Italy; <i>P Hofmann</i> , Aarhus University, Denmark; <i>S Lizzit</i> , Elettra - Sincrotrone Trieste, Trieste, Italy	<b>2D+EM+MI+MN+NS+QS-TuM-10</b> Sign-change Pairing Symmetry in Single Layer FeSe/SrTiO <sub>3</sub> Film, <i>Huimin Zhang</i> , West Virginia University; <i>Z Ge, M Weinert</i> , University of Wisconsin; <i>L Li</i> , West Virginia University
11:20am	<b>2D+AS+MI+NS-TuM-11</b> Surface Reactivity of MoS <sub>2</sub> by ambient pressure X-ray Photoelectron Spectroscopy, <i>Rafik Addou, D Dardzinsky, G Herman</i> , Oregon State University	<b>2D+EM+MI+MN+NS+QS-TuM-11</b> High Temperature Superconductivity in Epitaxial Single Layer FeTe <sub>1-x</sub> Se <sub>x</sub> /STO(001), <i>Qiang Zou, Z Ge, C Yan, H Zhang, L Li</i> , West Virginia University
11:40am	<b>2D+AS+MI+NS-TuM-12</b> Surface Characterization of 2D Materials and their 3D Analogues using XPS, <i>Jonathan Counsell, S Coultas, C Blomfield, N Gerrard</i> , Kratos Analytical Limited, UK; <i>C Maffitt</i> , Kratos Analytical Limited; <i>A Roberts</i> , Kratos Analytical Limited, UK	<b>INVITED: 2D+EM+MI+MN+NS+QS-TuM-12</b> The Observation of Majorana Zero Mode and Conductance Plateau in an Iron-based Superconductor, <i>Hong-Jun Gao</i> , Institute of Physics, Chinese Academy of Sciences, China
12:00pm	<b>2D+AS+MI+NS-TuM-13</b> Characterization of Catalytic Active Sites on the Surface of MoS <sub>2</sub> 2-D Materials, <i>Miguel Jose Yacamán</i> , University of Texas at San Antonio; <i>T Zepeda, S Fuentes Moyado</i> , CNYN UNAM Ensenada, Mexico	Invited talk continues.

# Tuesday Morning, October 22, 2019

<b>Actinides and Rare Earths Focus Topic</b> <b>Room A215 - Session AC+AS+LS-TuM</b> <b>Chemistry and Physics of the Actinides and Rare Earths</b> <b>Moderators:</b> Melissa Denecke, University of Manchester, UK, James G. Tobin, University of Wisconsin-Oshkosh		<b>Applied Surface Science Division</b> <b>Room A211 - Session AS+BI+RA-TuM</b> <b>Quantitative Surface Analysis III/Other Surface Analysis</b> <b>Methods</b> <b>Moderators:</b> Karen Gaskell, University of Maryland, College Park, Alexander Shard, National Physical Laboratory	
8:00am	<b>INVITED: AC+AS+LS-TuM-1</b> Study of the Early Actinide Oxides and Fluorides – Systematics of the Electronic Structure, <i>Thomas Gouder, R Eloidri, R Caciuffo</i> , European Commission - Joint Research Centre, Germany	8:20am	Invited talk continues.
8:40am	<b>INVITED: AC+AS+LS-TuM-3</b> Broadening of the XPS Spectra of U Oxides, <i>Paul S. Bagus</i> , University of North Texas; <i>C Nelin</i> , Consultant	9:00am	Invited talk continues.
9:20am	<b>INVITED: AC+AS+LS-TuM-5</b> Multiscale Characterization of Lanthanide and Actinide Nanoparticles Embedded in Porous Materials, <i>Stefan Minasian, S Alayoglu, S Aloni</i> , Lawrence Berkeley National Laboratory; <i>J Arnold</i> , University of California at Berkeley; <i>E Batista</i> , Los Alamos National Laboratory; <i>A Braun, C Booth, A Herve</i> , Lawrence Berkeley National Laboratory; <i>Y Liu</i> , University of California at Berkeley; <i>L Moreau</i> , Lawrence Berkeley National Laboratory; <i>T Lohrey, J Long, M Straub, S Robin, D Russo</i> , University of California at Berkeley; <i>D Shuh</i> , Lawrence Berkeley National Laboratory; <i>J Su, P Yang, X Zhang</i> , Los Alamos National Laboratory	9:40am	Invited talk continues.
10:00am	<b>BREAK - Complimentary Coffee in Exhibit Hall</b>	10:20am	<b>BREAK - Complimentary Coffee in Exhibit Hall</b>
10:40am	<b>BREAK - Complimentary Coffee in Exhibit Hall</b>	11:00am	<b>BREAK - Complimentary Coffee in Exhibit Hall</b>
11:00am	<b>AC+AS+LS-TuM-10</b> Multiple Forms of Uranium Hydrides and their Electronic Properties, <i>Ladislav Havela, V Buturlim, E Chitrova, O Koloskova, P Minarik, M Cieslar, M Dopita, L Horak, M Divis, I Turek</i> , Charles University, Prague, Czech Republic; <i>D Legut</i> , VSB-Technical University of Ostrava, Czech Republic; <i>T Gouder</i> , European Commission - Joint Research Centre, Germany	11:20am	<b>AS+BI+RA-TuM-10</b> Extreme-Ultraviolet-Assisted Atom Probe Tomography, <i>Norman Sanford, L Maja Avila</i> , National Institute of Standards and Technology (NIST); <i>P Blanchard</i> , National Institute of Standards and Technology (NIST); <i>D Diercks, B Gorman</i> , Colorado School of Mines; <i>A Chiaramonti</i> , National Institute of Standards and Technology (NIST)
11:40am	<b>AC+AS+LS-TuM-11</b> Hafnium L-Edge X-ray Absorption Near Edge Structure Spectra Reveals Crystal Field Splitting, <i>David Shuh, D Caulder</i> , Lawrence Berkeley National Laboratory; <i>L Davis</i> , Pacific Northwest National Laboratory; <i>M Mara</i> , University of California at Berkeley; <i>C Booth</i> , Lawrence Berkeley National Laboratory; <i>J Darab, J Icenhower, D Strachan</i> , Pacific Northwest National Laboratory	12:00pm	<b>AS+BI+RA-TuM-11</b> A Multi-Technique Approach for Complete Thin Film Characterisation, <i>Sarah Coultas, J Counsell, N Gerrard, C Blomfield</i> , Kratos Analytical Limited, UK; <i>C Moffitt</i> , Kratos Analytical Limited; <i>T Conard</i> , IMEC, Belgium
11:40am	<b>AC+AS+LS-TuM-12</b> Electrical Resistivity in Uranium-based Thin Films, <i>Evgeniya Tereshina-Chitrova, L Havela, M Paukov, M Dopita, L Horak, M Cieslar</i> , Charles University, Prague, Czech Republic; <i>Z Soban</i> , Institute of Physics, Academy of Sciences of the Czech Republic, Czech Republic; <i>T Gouder, F Huber, A Seibert</i> , Joint Research Center, European Commission, Germany	12:00pm	<b>AS+BI+RA-TuM-12</b> Polymeric Barrier Coatings for Silicone Elastomer against Diffusion of Isocyanate in Vacuum Casting Processes, <i>Martin Wortmann, R Petkau</i> , Bielefeld University of Applied Sciences, Germany; <i>N Frese</i> , Bielefeld University, Germany; <i>E Moritzer</i> , Paderborn University, Germany; <i>A Götzhäuser</i> , Bielefeld University, Germany; <i>B Hüsgen</i> , Bielefeld University of Applied Sciences, Germany
12:00pm		12:00pm	<b>AS+BI+RA-TuM-13</b> pARXPS Study of GeSbTe Surface Oxidation, <i>Ludovic Goffart</i> , ST Microelectronics/LTM/CEA-LETI, France; <i>C Vallée</i> , Laboratoire des Technologies de la Microélectronique (LTM), France; <i>B Pelissier</i> , LTM, Univ. Grenoble Alpes, CEA-LETI, France; <i>J Reynard, D Benoit</i> , ST Microelectronics, France; <i>G Navarro</i> , CEA-LETI, France

# Tuesday Morning, October 22, 2019

<b>Biomaterial Interfaces Division</b> <b>Room A120-121 - Session BI+AS-TuM</b> <b>Characterization of Biological and Biomaterial Surfaces</b> <b>Moderators:</b> Karyn Jarvis, Swinburne University of Technology, Sally McArthur, Swinburne University of Technology, Australia		<b>Electronic Materials and Photonics Division</b> <b>Room A214 - Session EM+2D+AP+NS+PS-TuM</b> <b>New Devices and Materials for Electronics and Photonics</b> <b>Moderators:</b> Sean W. King, Intel Corporation, Michelle M. Paquette, University of Missouri-Kansas City	
8:00am	<b>BI+AS-TuM-1</b> Characterizing Protein Fiber Structures in Solution with Vibrational Sum-Frequency Scattering Spectroscopy, <i>David G. Castner, P Johansson</i> , University of Washington	<b>INVITED: EM+2D+AP+NS+PS-TuM-1</b> Performance Modeling and Design for Spintronic Logic and Memory Devices, <i>Azad Naeemi</i> , Georgia Institute of Technology	
8:20am	<b>BI+AS-TuM-2</b> Near-Ambient Pressure XPS Surface Characterisation of Bacteria and Biofilms - Model Systems and Sample Preparation, <i>Marit Kjaervik</i> , Bundesanstalt für Materialforschung und -prüfung, Germany; <i>P Dietrich, A Thissen</i> , SPECS Surface Nano Analysis GmbH, Germany; <i>K Schwibbert, W Unger</i> , Bundesanstalt für Materialforschung und -prüfung, Germany	Invited talk continues.	
8:40am	<b>BI+AS-TuM-3</b> ToF-SIMS Imaging of Plant seed Interactions with Plant-growth Promoting Bacteria, <i>Yuchen Zhang, X Yu</i> , Pacific Northwest National Laboratory	<b>EM+2D+AP+NS+PS-TuM-3</b> High Yield, Low Variability HfO <sub>2</sub> 1T1R Cells Fabricated in 65nm CMOS, <i>Jubin Hazra, M Liehr, K Beckmann, N Cady</i> , SUNY Polytechnic Institute	
9:00am	<b>BI+AS-TuM-4</b> Visualization of Signaling Molecules in Brain Tissue by Multimodal Imaging with Matrix Assisted Laser Desorption/Ionization Mass Spectrometry and Time-of-Flight Secondary Ion Mass Spectrometry, <i>Matthias Lorenz, S King, N Borodinov, C Steed, J Chae, A Ievlev, O Ovchinnikova</i> , Oak Ridge National Laboratory	<b>EM+2D+AP+NS+PS-TuM-4</b> Heat Transfer Proximity Effects in Resistive Memory Crossbar Arrays, <i>Marius Orlowski, M Al-Mamun</i> , Virginia Tech	
9:20am	<b>BI+AS-TuM-5</b> <i>In situ</i> Observation of Triacylglycerol (C39:0) and Acylceramide (C17) Colocalization in Lipid Droplets of Apoptotic Cells using ToF-SIMS, <i>Shohini Sen-Britain, N Li, G Atilla-Gokcumen, J Gardella Jr.</i> , State University of New York, Buffalo	<b>EM+2D+AP+NS+PS-TuM-5</b> High Performance Memristive Action in Methylammonium Bismuth Iodide([MA]3Bi2I9) Films, <i>P Cheng</i> , Vanderbilt University; <i>G Luo</i> , Washington University in St. Louis; <i>Z Gao</i> , University of Central Florida; <i>A Thind, R Mishra</i> , Washington University in St. Louis; <i>Parag Banerjee</i> , University of Central Florida	
9:40am	<b>BI+AS-TuM-6</b> Customizing Decellularized Biopolymer Matrices to Serve as Cell-instructive Microenvironments: A ToF-SIMS Study, <i>Mirko Nitschke, V Magno, R Zimmermann, N Dennison</i> , Leibniz Institute of Polymer Research Dresden, Germany; <i>C Werner</i> , Leibniz Institute of Polymer Research Dresden, Germany, Deutschland, Germany	<b>EM+2D+AP+NS+PS-TuM-6</b> Mechanism of Chalcogen Passivation of GaAs Surfaces, <i>Takayuki Suga, S Goto</i> , UEC-Tokyo, Japan; <i>A Ohtake</i> , NIMS, Japan; <i>J Nakamura</i> , UEC-Tokyo, Japan	
10:00am	<b>BREAK - Complimentary Coffee in Exhibit Hall</b>	<b>BREAK - Complimentary Coffee in Exhibit Hall</b>	
10:20am	<b>BREAK - Complimentary Coffee in Exhibit Hall</b>	<b>BREAK - Complimentary Coffee in Exhibit Hall</b>	
10:40am	<b>BREAK - Complimentary Coffee in Exhibit Hall</b>	<b>BREAK - Complimentary Coffee in Exhibit Hall</b>	
11:00am	<b>INVITED: BI+AS-TuM-10</b> Hierarchical Changes in Protein Structure: from Surface Influence to Cell Control, <i>Sapun Parekh</i> , University of Texas at Austin	<b>INVITED: EM+2D+AP+NS+PS-TuM-10</b> Combining 2D and 1D Atomic Scale Tailored Nanowire Surfaces for Novel Electronics and Photonics, <i>Anders Mikkelsen</i> , Lund University, Sweden	
11:20am	Invited talk continues.	Invited talk continues.	
11:40am	<b>BI+AS-TuM-12</b> The Role of Cr-N phases Prepared by Plasma Processes on 316L Stainless Steel and the Potential Use in Biocompatible Systems, <i>Diana Galeano-Osorio, S Vargas-Giraldo, C Castano</i> , Virginia Commonwealth University	<b>EM+2D+AP+NS+PS-TuM-12</b> Nanoflower Decorated GaN and AlGaIn/GaN based Catalyst-free CO Sensors, <i>Monu Mishra, G Gupta</i> , National Physical Laboratory, India	
12:00pm	<b>BI+AS-TuM-13</b> Direct Interspecies Electron Transfer (DIET) in Syntrophic Microbes, <i>Cuiyun Yang, X Yu</i> , Pacific Northwest National Laboratory	<b>EM+2D+AP+NS+PS-TuM-13</b> Surface Transfer Doping of Diamond by Complex Metal Oxides for Power Electronics: A Combined Experimental and Simulation Study, <i>Vihar Georgiev, D Moran, J McGhee</i> , University of Glasgow, UK	

# Tuesday Morning, October 22, 2019

<b>Exhibitor Technology Spotlight Workshops</b> <b>Room Hall A - Session EW-TuM</b> <b>Exhibitor Technology Spotlight I</b> <b>Moderator:</b> Christopher Moffitt, Kratos Analytical Inc		<b>MEMS and NEMS Group</b> <b>Room A210 - Session MN-TuM</b> <b>MEMS, BioMEMS, and MEMS For Energy: Processes, Materials, and Devices II</b> <b>Moderators:</b> Robert Davis, Brigham Young University, Zenghui Wang, Case Western Reserve University	
8:00am		<b>INVITED: MN-TuM-1</b> Near-Zero Power Integrated Microsystems for the IoT, <b>Matteo Rinaldi</b> , Northeastern University	
8:20am		Invited talk continues.	
8:40am		<b>MN-TuM-3</b> Development of Inorganic Metal Salt Inks for Printable Sensor Applications, <i>Y Sui</i> , Case Western Reserve University; <i>A Hess-Dunning</i> , Louis Stokes Cleveland VA Medical Center; <i>M Sankaran</i> , <b>Christian Zorman</b> , Case Western Reserve University	
9:00am		<b>MN-TuM-4</b> Void-Free Copper Electrodeposition in Full Wafer Thickness Through-Silicon Vias with 10:1 Aspect Ratios, <b>Rebecca Schmitt</b> , <i>L Menk</i> , <i>C Sadler</i> , <i>E Baca</i> , <i>A Hollowell</i> , Sandia National Laboratories	
9:20am		<b>MN-TuM-5</b> Ion-Conducting Materials and Devices for Cold Atom Microsystems, <b>Christopher Roper</b> , HRL Laboratories, LLC; <i>S Kang</i> , NIST; <i>R Mott</i> , <i>A Mis</i> , HRL Laboratories, LLC; <i>E Donley</i> , <i>J Kitching</i> , NIST	
9:40am		<b>MN-TuM-6</b> Determining the Material Properties of Carbon Nanotube Structures Through Cantilever Resonances, <b>Richard Cass</b> , Brigham Young University; <i>E Eion Hindsman-Curry</i> , University of Alabama; <i>R Vanfleet</i> , <i>R Davis</i> , <i>D Allred</i> , <i>B Anderson</i> , <i>R Vanfleet</i> , Brigham Young University	
10:00am	<b>BREAK - Complimentary Coffee in Exhibit Hall</b>	<b>BREAK - Complimentary Coffee in Exhibit Hall</b>	
10:20am	<b>BREAK - Complimentary Coffee in Exhibit Hall</b>	<b>BREAK - Complimentary Coffee in Exhibit Hall</b>	
10:40am	<b>EW-TuM-9</b> eSpectra: The Data Analysis Resource for You, or for Your Customers, <b>Jessica Hoy</b> , AIPP/AVS	<b>BREAK - Complimentary Coffee in Exhibit Hall</b>	
11:00am		<b>MN-TuM-10</b> Nanoporous Titanium Nitride Electrodes for Biosensing, <b>Mark Ming-Cheng Cheng</b> , <i>G Chen</i> , Wayne State University	
11:20am		<b>MN-TuM-11</b> Toward a Simple Process for Fabricating Multi-channel Neural Probes on Optical Fiber Substrates, <b>Md Ashiqur Khan</b> , <i>M Gheewala</i> , <i>V Jonnalagadda</i> , <i>T Tisa</i> , <i>M Rao</i> , <i>A Awale</i> , <i>P Motwani</i> , <i>N Randhawa</i> , <i>H Sojedi</i> , <i>W Shih</i> , <i>J Wolfe</i> , University of Houston; <i>J Dani</i> , University of Pennsylvania; <i>P Mauger</i> , No Matching Affiliation	
11:40am		<b>MN-TuM-12</b> A Low-Temperature Packaging Process for Mechanically-Adaptive Neural Interfaces for Microfluidic-Aided Drug Delivery, <i>E Szabo</i> , <i>L Greenwood</i> , Case Western Reserve University; <b>Allison Hess-Dunning</b> , Louis Stokes Cleveland VA Medical Center	
12:00pm		<b>MN-TuM-13</b> Vascular Graft Pressure-Flow Monitoring Using Nanocomposite Carbon Black/PDMS Based Strain Sensors, <b>Hao Chang</b> , Case Western Reserve University; <i>S Majerus</i> , Louis Stokes Cleveland VA Medical Center; <i>J Liu</i> , <i>C Zorman</i> , Case Western Reserve University	

# Tuesday Morning, October 22, 2019

<b>Plasma Science and Technology Division</b> <b>Room B131 - Session PS+EM-TuM</b> <b>Advanced FEOL</b> <b>Moderators:</b> Keren Kanarik, Lam Research Corporation, Alok Ranjan, TEL Technology Center, America, LLC		<b>Plasma Science and Technology Division</b> <b>Room B130 - Session PS-TuM</b> <b>Plasma Diagnostics and Sources I</b> <b>Moderators:</b> Tetsuya Tatsumi, Sony Semiconductor Solutions Corporation, Geun Young Yeom, Sungkyunkwan University, Korea	
8:00am	<b>INVITED: PS+EM-TuM-1</b> Investigation on Plasma Etch Technology Enabling Si/SiGe MOSFET Process Integration, <b>Yohei Ishii</b> , Hitachi High Technologies America Inc.; <i>Y Lee, W Wu</i> , Taiwan Semiconductor Research Institute, Taiwan, Republic of China; <i>R Sugano</i> , Hitachi, Ltd., Japan; <i>K Maeda</i> , Hitachi High Technologies America Inc.; <i>H Ishimura</i> , Hitachi High-Technologies Taiwan Corp., Taiwan, Republic of China; <i>M Miura</i> , Hitachi High Technologies, Japan		<b>PS-TuM-1</b> Optimizing Power Delivery in a Pulsed Inductively Coupled Plasma Using Set-Point Impedance Match and Frequency Tuning, <b>Chenhui Qu</b> , University of Michigan; <i>J Brandon, C Smith, S Shannon</i> , North Carolina State University; <i>D Coumou, S White</i> , MKS Instruments; <i>M Kushner</i> , University of Michigan
8:20am	Invited talk continues.		<b>PS-TuM-2</b> Compact Surface Wave Plasma Source, <i>G Panici, David Ruzic, D Qerimi, D Barlas</i> , University of Illinois at Urbana-Champaign; <i>B Jurczyk</i> , Starfire Industries LLC
8:40am	<b>PS+EM-TuM-3</b> Etching of Sub-10 nm Half-pitch High Chi Block Copolymers for Directed Self-Assembly (DSA) Application, <b>Maria Gabriela Gusmão Cacho</b> , <i>P Pimenta-Barros, K Benotmane, A Gharbi, M Argoud</i> , CEA-LETI, France; <i>C Navarro</i> , Arkema France, France; <i>K Sakavuyi</i> , Brewer Science Inc.; <i>R Tiron, N Possémé, S Barnola</i> , CEA-LETI, France		<b>INVITED: PS-TuM-3</b> Overview of Linear Plasma Sources as Applied to Ribbon ion and Plasma Beam Processing of Scanned Substrates, <b>Peter Kurunzi</b> , Applied Materials, Varian Semiconductor Equipment
9:00am	<b>PS+EM-TuM-4</b> Mechanism of Highly Selective SiCN Etchings Using NF <sub>3</sub> /Ar-based Gases, <b>Miyako Matsui</b> , Hitachi Ltd., Japan; <i>K Kuwahara</i> , Hitachi High-Technologies Corp., Japan		Invited talk continues.
9:20am	<b>PS+EM-TuM-5</b> Impact of Plasma Process on Source/Drain Epitaxy Film, <b>Yun Han</b> , <i>B Messer, M Sapel, H Kim, Y Shi, M Wang, Y Trickett, K Maekawa</i> , TEL Technology Center, America, LLC; <i>K Taniguchi, S Morikita</i> , Tokyo Electron Miyagi Ltd., Japan; <i>A Metz, P Biolsi</i> , TEL Technology Center, America, LLC		<b>PS-TuM-5</b> Online Diagnostics of Non-Thermal Plasma Nanoparticle-Laden Systems by Ion Mobility Spectrometry, <b>Xiaoshuang Chen</b> , <i>S Ghosh, D Buckley</i> , University of Minnesota, Minneapolis; <i>M Sankaran</i> , Case Western Reserve University; <i>T Seto</i> , Kanazawa University, Japan; <i>U Kortshagen, C Hogan</i> , University of Minnesota, Minneapolis
9:40am	<b>PS+EM-TuM-6</b> CCP Dry Clean Process Development Using Quadrupole Mass Spectrometer and Optical Emission Spectroscopy, <b>Harutyun Melikyan</b> , <i>A Martinez, S Pandey, M Koltonski, G Sandhu</i> , Micron Technology		<b>PS-TuM-6</b> Experiment-Model Comparisons in Capacitively Coupled Plasmas at Moderate Pressures for Argon, Helium and Nitrogen, <b>David J. Peterson</b> , North Carolina State University; <i>T Koh, T Chua, W Tian, K Bera, S Rauf, P Kraus</i> , Applied Materials, Inc.; <i>S Shannon</i> , North Carolina State University
10:00am	<b>BREAK - Complimentary Coffee in Exhibit Hall</b>		<b>BREAK - Complimentary Coffee in Exhibit Hall</b>
10:20am	<b>BREAK - Complimentary Coffee in Exhibit Hall</b>		<b>BREAK - Complimentary Coffee in Exhibit Hall</b>
10:40am	<b>BREAK - Complimentary Coffee in Exhibit Hall</b>		<b>BREAK - Complimentary Coffee in Exhibit Hall</b>
11:00am	<b>PS+EM-TuM-10</b> Surface Reaction of Atomic Hydrogen with SiGe Surface Compared with Si Through Ab-initio Calculations, <b>Ryoko Sugano</b> , Hitachi, Ltd., Japan; <i>Y Ishii, K Maeda</i> , Hitachi High Technologies America Inc.; <i>M Miura, K Kuwahara</i> , Hitachi High Technologies, Japan		<b>PS-TuM-10</b> Optical and Mass Spectrometric Measurements of O <sub>2</sub> and NF <sub>3</sub> Dissociation in a Low Frequency, High Density, Remote Plasma, <b>Hanyang Li</b> , <i>Y Zhou, V Donnelly</i> , University of Houston; <i>J Chiu, X Chen</i> , MKS Plasma & Reactive Gas Solutions
11:20am	<b>PS+EM-TuM-11</b> Nanopantography with Reusable Membrane-based Electrostatic Lens Arrays, <b>Ryan Sawadichai</b> , <i>Y Chen, P Basu, V Donnelly, P Ruchhoeft, D Economou</i> , University of Houston		<b>PS-TuM-11</b> A Combined Experimental and Modeling Study of Reactive Vapor-nanoparticle-plasma Interactions in a Dusty Atmospheric-pressure Plasma, <b>Nabiel Abuyazid</b> , Case Western Reserve University; <i>X Chen</i> , University of Minnesota, Minneapolis; <i>D Mariotti, P Maguire</i> , University of Ulster, UK; <i>C Hogan</i> , University of Minnesota, Minneapolis; <i>M Sankaran</i> , Case Western Reserve University



# Tuesday Morning, October 22, 2019

<p><b>Materials and Processes for Quantum Information, Computing and Science Focus Topic</b>  <b>Room B231-232 - Session QS-TuM</b>  <b>AVS Quantum Science (ALL INVITED SESSION)</b>  <b>Moderators:</b> Eray Aydil, New York University, Ivan Petrov, University of Illinois at Urbana-Champaign</p>		<p><b>Surface Science Division</b>  <b>Room A220-221 - Session SS+2D+HC-TuM</b>  <b>Atom Manipulation and Synthesis/Oxide Surface Reactions &amp; Flash Session</b>  <b>Moderators:</b> Liney Arnadottir, Oregon State University, Stephen McDonnell, University of Virginia, Martin Setvin, TU Wien, Austria</p>	
8:00am	<p><b>INVITED: QS-TuM-1</b> Quantum Technologies from Cold Atoms to Matter-waves, <i>Philippe Bouyer</i>, CNRS, France</p>	<p><b>SS+2D+HC-TuM-1</b> Angstrom Scale Chemical Analysis of Metal Supported <i>Trans</i>- and <i>Cis</i>-Regioisomers by Ultrahigh Vacuum Tip-Enhanced Raman Mapping, <i>S Mahapatra, J Schultz, L Li, Nan Jiang</i>, University of Illinois at Chicago</p>	
8:20am	Invited talk continues.	<p><b>SS+2D+HC-TuM-2</b> Theoretical Modeling of Metal Release from Complex Oxide Surfaces, <i>Sara Mason</i>, University of Iowa</p>	
8:40am	<p><b>INVITED: QS-TuM-3</b> Generating Maximal Entanglement Between Spectrally Distinct Solid-state Emitters, <i>D Hurst</i>, University of Sheffield, UK; <i>K Joanesarson</i>, University of Sheffield, UK, Tech. University of Denmark; <i>J Iles-Smith</i>, University of Sheffield, UK; <i>J Mork</i>, University of Denmark; <i>Pieter Kok</i>, University of Sheffield, UK</p>	<p><b>INVITED: SS+2D+HC-TuM-3</b> On-surface Synthesis by Atom Manipulation Studied with Atomic Force Microscopy, <i>Leo Gross</i>, IBM Research - Zurich, Switzerland</p>	
9:00am	Invited talk continues.	Invited talk continues.	
9:20am	<p><b>INVITED: QS-TuM-5</b> From Quantum Atom Optics to Living Cells with Sculpted Light, <i>Halina Rubinsztein-Dunlop, T Neely, G Gauthier, T Bell, A Pritchard, K Goddard-Lee, A Stilgo, I Favre-Bulle, S Zhang, T Nieminen, I Lenton</i>, University of Queensland, Australia</p>	<p><b>SS+2D+HC-TuM-5</b> The Large Effect of Solvents on Heats of Adsorption versus Gas Phase Explained with a Simple Bond-additivity Model: A Case Study with Phenol on Pt(111) in Water, <i>Charles T. Campbell</i>, University of Washington; <i>N Singh</i>, University of Michigan; <i>J Rumpitz</i>, University of Washington</p>	
9:40am	Invited talk continues.	<p><b>SS+2D+HC-TuM-6</b> Atomic-Scale Growth Mechanisms of Niobium Hydrides on Hydrogen Infused Nb(100), <i>Rachael Farber, D Veit, S Sibener</i>, The University of Chicago</p>	
10:00am	<b>BREAK - Complimentary Coffee in Exhibit Hall</b>	<b>BREAK - Complimentary Coffee in Exhibit Hall</b>	
10:20am	<b>BREAK - Complimentary Coffee in Exhibit Hall</b>	<b>BREAK - Complimentary Coffee in Exhibit Hall</b>	
10:40am	<b>BREAK - Complimentary Coffee in Exhibit Hall</b>	<b>BREAK - Complimentary Coffee in Exhibit Hall</b>	
11:00am	<p><b>INVITED: QS-TuM-10</b> Spin-helical Particles: An Enabling Platform for Quantum Matter and Quantum Technologies, <i>Yong P. Chen</i>, Purdue University</p>	<p><b>SS+2D+HC-TuM-10</b> Water induced restructuring of Vanadium oxide clusters, <i>Kraen Christoffer Adamsen, J Lauritsen, S Chirik, B Hammer</i>, Aarhus University, Denmark</p>	
11:20am	Invited talk continues.	<p><b>SS+2D+HC-TuM-11</b> Hydrogenation of Titanium Dioxide with Low-energy Hydrogen Ions and Atomic Hydrogen, <i>N Nagatsuka, Y Ohashi</i>, Institute of Industrial Science, The University of Tokyo, Japan; <i>M Fujimoto, M Matsumoto</i>, Tokyo Gakugei University, Japan; <i>Katsuyuki Fukutani</i>, Institute of Industrial Science, The University of Tokyo, Japan</p>	
11:40am		<p><b>SS+2D+HC-TuM-12</b> Direct Observation of Atomic Exchange during Surface Self-diffusion, <i>Matthew Koppa, P Schwoebel, D Dunlap</i>, University of New Mexico</p>	

# Tuesday Morning, October 22, 2019

<b>Thin Films Division</b> <b>Room A124-125 - Session TF+AP-TuM</b> <b>ALD and CVD: Precursors and Process Development</b> <b>Moderators:</b> Paul Poodt, Holst Centre / TNO, Erwin Kessels, Eindhoven University of Technology, the Netherlands		<b>Thin Films Division</b> <b>Room A122-123 - Session TF+EM+MI-TuM</b> <b>Thin Films for Microelectronics, Photonics, and Optoelectronic Applications</b> <b>Moderators:</b> John F. Conley, Jr., Oregon State University, Halil Akyildiz, Uludag University, Turkey	
8:00am	<b>INVITED: TF+AP-TuM-1</b> Mechanism-Based Precursor Design for CVD of Metal Oxides and Sulfides, <i>Lisa McElwee-White</i> , University of Florida	<b>INVITED: TF+EM+MI-TuM-1</b> Monolithic Integration of III-Vs on Si for Electronic and Photonic Applications, <i>P Staudinger, S Mauthe, N Vico Trivino, M Sousa, C Convertino, Y Baumgartner, P Tiwari, H Schmid, Kirsten Moselund</i> , IBM Research Zurich, Switzerland	
8:20am	Invited talk continues.	Invited talk continues.	
8:40am	<b>TF+AP-TuM-3</b> Improved Control of Atomic Scale Processing: Characterization and Optimization of Precursor Mass Delivery Utilizing a Novel Thermal Sensor, <i>Daniel Alvarez, J Spiegelman, C Ramos, Z Shamsi</i> , RASIRC	<b>TF+EM+MI-TuM-3</b> A Scheme for Better Future Technology by developing AlGaIn based Highly Responsive Photosensing Devices, <i>Neha Aggarwal, S Krishna, L Goswami, G Gupta</i> , CSIR-National Physical Laboratory, India	
9:00am	<b>TF+AP-TuM-4</b> Effect of Co-Reactant on the Atomic Layer Deposition of Copper Oxide, <i>Jason Avila, N Nepal, V Wheeler</i> , U.S. Naval Research Laboratory	<b>TF+EM+MI-TuM-4</b> Correlating the Optical Property Evolution in the Au-Ni Binary Thin Films: From Metastable Solid Solution to Phase Separated Alloy, <i>Robyn Collette, Y Wu, P Rack</i> , University of Tennessee Knoxville	
9:20am	<b>TF+AP-TuM-5</b> Electron Enhanced Atomic Layer Deposition (EE-ALD) of Cobalt Films and Development of New Hollow Cathode Plasma Electron Source, <i>Zachary Sobell</i> , CU Boulder; <i>A Cavanagh, S George</i> , University of Colorado at Boulder	<b>TF+EM+MI-TuM-5</b> Integration of Electro-optically Active BaTiO <sub>3</sub> and Ba <sub>x</sub> Sr <sub>1-x</sub> TiO <sub>3</sub> with Buffered Si (001) by Chemical Methods, <i>John G. Ekerdt, B Edmondson, E Lin</i> , University of Texas at Austin; <i>S Kwon</i> , University of Texas at Dallas; <i>A Demkov</i> , University of Texas at Austin; <i>M Kim</i> , University of Texas at Dallas	
9:40am	<b>TF+AP-TuM-6</b> Surface Science Studies of GaN Substrates Subjected to Plasma-Assisted Atomic Level Processes, <i>Samantha G. Rosenberg</i> , American Society for Engineering Education (residing at U.S. Naval Research Laboratory); <i>D Pennachio, E Young, Y Chang, H Inbar</i> , University of California at Santa Barbara; <i>J Woodward</i> , U.S. Naval Research Laboratory; <i>Z Robinson</i> , SUNY Brockport; <i>J Grzeskowiak</i> , University at Albany - SUNY; <i>C Ventrice, Jr.</i> , SUNY Polytechnic Institute; <i>C Palmstrøm</i> , University of California at Santa Barbara; <i>C Eddy, Jr.</i> , U.S. Naval Research Laboratory	<b>TF+EM+MI-TuM-6</b> Nonlinear Optical Properties of TiO <sub>2</sub> -based ALD Thin Films, <i>Theodosia Gougousi, R Kuis, I Basaldua, P Burkins, J Kropp, A Johnson</i> , University of Maryland, Baltimore County	
10:00am	<b>BREAK - Complimentary Coffee in Exhibit Hall</b>	<b>BREAK - Complimentary Coffee in Exhibit Hall</b>	
10:20am	<b>BREAK - Complimentary Coffee in Exhibit Hall</b>	<b>BREAK - Complimentary Coffee in Exhibit Hall</b>	
10:40am	<b>BREAK - Complimentary Coffee in Exhibit Hall</b>	<b>BREAK - Complimentary Coffee in Exhibit Hall</b>	
11:00am	<b>TF+AP-TuM-10</b> Reaction Pathways in Photolytic CVD of Platinum on Organic Thin Films, <i>Bryan G. Salazar</i> , University of Texas at Dallas; <i>H Liu, L McElwee-White</i> , University of Florida; <i>A Walker</i> , University of Texas at Dallas	<b>TF+EM+MI-TuM-10</b> Atomic Layer Deposition on Hexagonal Ge and SiGe Nanowires for Surface Passivation, <i>Willem-Jan Berghuis</i> , Department of Applied Physics, Eindhoven University of Technology, Postbus 513, 5600 MB Eindhoven, The Netherlands; <i>E Kessels</i> , Eindhoven University of Technology, The Netherlands, Netherlands; <i>J Haverkort, E Bakkers, A Dijkstra, E Fadaly, M Verheijen</i> , Eindhoven University of Technology, The Netherlands	
11:20am	<b>TF+AP-TuM-11</b> Process Development and Mechanism Analysis of Low Temperature ALD TiN with TiCl <sub>4</sub> /Monomethylhydrazine, <i>Taiki Kato, Z Ni, M Matsukuma, H Nakamura, Y Ideno, Y Serizawa</i> , Tokyo Electron Technology Solutions Limited, Japan	<b>TF+EM+MI-TuM-11</b> Oxidation Studies of Silicon Germanium (SiGe) using In-Situ Steam Generated (ISSG) and Plasma Enhanced Atomic Layer Deposited (PEALD) Oxides, <i>Yi Song, S Siddiqui, C Durfee, A Pana, J Li, M Belyansky, S Naczas, E Stuckert, L Jiang, J Demarest, V Basker, D Guo, H Bu</i> , IBM Research Division, Albany, NY	
11:40am	<b>TF+AP-TuM-12</b> Atomic Layer Deposition of Aluminum, Hafnium and Zirconium Oxyfluoride Films with Tunable Stoichiometry, <i>Neha Mahuli, J Wallas, S George</i> , University of Colorado at Boulder	<b>TF+EM+MI-TuM-12</b> Precision Defect Engineering of Metal/Insulator/Metal (MIM) Diodes using Localized ALD Transition Metal Impurities in Al <sub>2</sub> O <sub>3</sub> Tunnel Barriers, <i>Konner Holden<sup>1</sup>, Y Qi, J Conley, Jr.</i> , Oregon State University	
12:00pm	<b>TF+AP-TuM-13</b> ALD on Thermally and Chemically Treated Fused Silica and Glass Surfaces, <i>Tahereh Gholian Aaval, G Hodges, V Carver, M Linford</i> , Brigham Young University	<b>TF+EM+MI-TuM-13</b> Improvement in the Electrical Characteristics of a-ZTO based TFTs via Microwave Assisted Annealing of Channel Layer, <i>Sunil Uprety, M Khanal, H Lee, S Sarwar</i> , Auburn University; <i>A Subramanian</i> , Stony Brook University; <i>E Hassani, T Oh, X Zhang</i> , Auburn University; <i>C Nam</i> , Brookhaven National Laboratory; <i>M Park</i> , Auburn University	

# Tuesday Morning, October 22, 2019

<b>Energy Transition Focus Topic</b> <b>Room A212 - Session TL+MS+VT-TuM</b> <b>Implications of Implementation: Making Energy Transition a Reality (ALL INVITED SESSION)</b> <b>Moderators:</b> Margaret Fitzgerald, Colorado School of Mines, Natalie Seitzman, Colorado School of Mines		<b>Vacuum Technology Division</b> <b>Room A213 - Session VT-TuM</b> <b>Accelerators and Large Vacuum Systems</b> <b>Moderators:</b> Yulin Li, Cornell University, Marcy Stutzman, Jefferson Lab	
8:00am	<b>INVITED: TL+MS+VT-TuM-1</b> The Energy Transition: Science and Technology Development Aspects, <i>Richard M.C.M. van de Sanden</i> , DIFFER, Eindhoven University, The Netherlands, Netherlands	<b>INVITED: VT-TuM-1</b> Vacuum Operation and Future Upgrade of the LHC Accelerator Complex, <i>Giuseppe Bregliozzi</i> , CERN, Switzerland	
8:20am	Invited talk continues.	Invited talk continues.	
8:40am	<b>INVITED: TL+MS+VT-TuM-3</b> Electrochemical CO2 Reduction Across Scales: From Fundamental Mechanisms to Practical Applications, <i>Wilson Smith</i> , Delft University of Technology The Netherlands, The Netherlands	<b>VT-TuM-3</b> Final Design into Production for the APS-Upgrade Storage Ring Vacuum System, <i>Jason Carter</i> , Argonne National Laboratory	
9:00am	Invited talk continues.	<b>VT-TuM-4</b> The Design of the Advanced Photon Source Upgrade (APSU) Insertion Device (ID) Straight Section Vacuum Systems, <i>Jason Lerch, M Szubert, E Anliker, T Bender</i> , Argonne National Laboratory	
9:20am	<b>INVITED: TL+MS+VT-TuM-5</b> Perspectives on the Research and Development of Nanomaterials for Hydrogen Production, <i>Marcelo Carmo</i> , Forschungszentrum Jülich, Germany	<b>VT-TuM-5</b> The Vacuum Commissioning and Simulation of Non-Evaporable Getter Dominated Cornell High Energy Synchrotron Source Upgrade., <i>Yevgeniy Lushtak, Y Li, X Liu</i> , Cornell University	
9:40am	Invited talk continues.	<b>VT-TuM-6</b> Advanced Light Source Upgrade Vacuum Controls and Instrumentation Design, <i>Sol Omalayo</i> , Lawrence Berkeley Lab, University of California, Berkeley	
10:00am	<b>BREAK - Complimentary Coffee in Exhibit Hall</b>	<b>BREAK - Complimentary Coffee in Exhibit Hall</b>	
10:20am	<b>BREAK - Complimentary Coffee in Exhibit Hall</b>	<b>BREAK - Complimentary Coffee in Exhibit Hall</b>	
10:40am	<b>BREAK - Complimentary Coffee in Exhibit Hall</b>	<b>BREAK - Complimentary Coffee in Exhibit Hall</b>	
11:00am	<b>TL+MS+VT-TuM-10</b> Impacts and Adaptation Strategies in Ethiopia, <i>Aschale Dagnachew Siyoum</i> , Xavier University of Louisiana	<b>INVITED: VT-TuM-10</b> Vacuum Electronics Community Pioneers Additive Manufacturing of Copper, <i>Diana Gamzina</i> , SLAC National Accelerator Laboratory; <i>T Horn, C Ledford</i> , North Carolina State University; <i>C Nantista</i> , SLAC National Accelerator Laboratory; <i>P Frigola</i> , Radiabeam	
11:20am	<b>INVITED: TL+MS+VT-TuM-11</b> Developing and Scaling Up the Manufacturing of Thin Film Materials for the Future of Energy Production, Storage, and Reduction, <i>Ken Nauman</i> , Von Ardenne North America	Invited talk continues.	
11:40am	Invited talk continues.	<b>VT-TuM-12</b> Particle-Free Manufacturing and Installation for LCLS-II Vacuum Systems, <i>Arnela Gamzina</i> , SLAC National Accelerator Laboratory	
12:00pm		<b>VT-TuM-13</b> Development of Remote Handleable Axially Decoupled Radiation Resistant Vacuum Seal, <i>Geoff Hodgson</i> , TRIUMF, Canada	

# Tuesday Afternoon, October 22, 2019

<b>Exhibitor Technology Spotlight Workshops</b> <b>Room Hall A - Session EW-TuL</b> <b>Exhibitor Technology Spotlight Workshop II</b> <b>Moderator:</b> Christopher Moffitt, Kratos Analytical Inc		
12:00pm		
12:20pm	<b>EW-TuL-2</b> New Developments from Thermo Fisher Scientific, <b>Timothy Nunney</b> , P Mack, R Simpson, A Bushell, Thermo Fisher Scientific, UK	
12:40pm	<b>EW-TuL-3</b> New Trends in Photoelectron Spectroscopy: Momentum Resolved Photoelectron Spectroscopy, Spin-resolved ARPES, Small Spot and Hard X-ray XPS, A <i>Thissen</i> , SPECS Surface Nano Analysis GmbH, Germany; <b>Thomas Stempel Pereira</b> , SPECS Surface Nano Analysis GmbH	
1:00pm	<b>EW-TuL-4</b> Latest Trends and Instrumentation for TOF-SIMS, <b>Nathan Havercroft</b> , IONTOF USA, Inc.	
1:20pm		
1:40pm	<b>EW-TuL-6</b> Kratos Analytical – 50 Years of XPS, <b>Christopher Blomfield</b> , Kratos Analytical Limited, UK	
2:00pm	<b>EW-TuL-7</b> What's New at PHI, <i>K Artyushkova, J Mann, B Schmidt, L Swartz, John Newman</i> , Physical Electronics	

# Tuesday Afternoon, October 22, 2019

	<p><b>2D Materials</b>  <b>Room A216 - Session 2D+EM+MI+NS-TuA</b>  <b>Properties of 2D Materials including Electronic, Magnetic, Mechanical, Optical, and Thermal Properties II</b>  <b>Moderator:</b> Roland Wiesendanger, University of Hamburg, Germany</p>	<p><b>Actinides and Rare Earths Focus Topic</b>  <b>Room A215 - Session AC+AS+LS-TuA</b>  <b>Forensics, Science and Processing for Nuclear Energy</b>  <b>Moderators:</b> Paul S. Bagus, University of North Texas, Tomasz Durakiewicz, National Science Foundation, David Geeson, AWE</p>
2:20pm	<p><b>2D+EM+MI+NS-TuA-1</b> Boundary Conditions for a Continuum Model of Lateral Interfaces in Transition Metal Dichalcogenides, <i>Kaelyn Ferris</i>, Ohio University</p>	<p><b>INVITED: AC+AS+LS-TuA-1</b> Helium Implantation Studies in Metals and Ceramics for Nuclear Energy Applications, Microstructure and Properties, <i>Peter Hosemann, M Balooch, S Stevenson, A Scott</i>, University of California, Berkeley; <i>Y Yang</i>, Lawrence Berkeley Lab, University of California, Berkeley</p>
2:40pm	<p><b>2D+EM+MI+NS-TuA-2</b> Resolving the Structural and Electronic Properties of Graphene/Ge(110), <i>Luca Camilli</i>, Technical University of Denmark, Denmark; <i>M Galbati</i>, Technical University of Denmark; <i>L Persichetti, M De Seta</i>, Università degli Studi Roma Tre, Italy; <i>F Fabbri</i>, Italian Institute of Technology, Italy; <i>A Scaparro</i>, Università degli Studi Roma Tre, Italy; <i>A Notargiacomo</i>, Centro Nazionale di Ricerca, Italy; <i>V Miseikis, C Coletti</i>, Italian Institute of Technology, Italy; <i>L Di Gaspare</i>, Università degli Studi Roma Tre, Italy</p>	<p>Invited talk continues.</p>
3:00pm	<p><b>2D+EM+MI+NS-TuA-3</b> Array of Strain Induced Quantum Dots in Graphene, <i>Md Tareq Mahmud, N Sandler</i>, Ohio University</p>	<p><b>INVITED: AC+AS+LS-TuA-3</b> Origin of Element Selectivity during Solvent Extraction of Rare Earths: Studies of Model Interfaces using Synchrotron Radiation, <i>M Miller, Y Liang, H Li, M Chu, S Yoo</i>, Northwestern University; <i>W Bu</i>, University of Chicago; <i>M Olvera de la Cruz, Pulak Dutta</i>, Northwestern University</p>
3:20pm	<p><b>2D+EM+MI+NS-TuA-4</b> Ultrafast Spin and Charge Dynamics in Monolayer WSe<sub>2</sub>-Graphene Heterostructure Devices, <i>Michael Newburger, K Luo</i>, The Ohio State University; <i>K McCreary</i>, U.S. Naval Research Laboratory; <i>I Martin, E McCormick</i>, The Ohio State University; <i>B Jonker</i>, U.S. Naval Research Laboratory; <i>R Kawakami</i>, The Ohio State University</p>	<p>Invited talk continues.</p>
3:40pm	<b>BREAK</b>	<b>BREAK</b>
4:00pm	<b>BREAK</b>	<b>BREAK</b>
4:20pm	<p><b>2D+EM+MI+NS-TuA-7</b> Spatially Selective Enhancement of Photoluminescence in MoS by Exciton-Mediated Adsorption and Defect Passivation, <i>Saujan V. Sivaram, A Hanbicki, M Rosenberger, G Jernigan, H Chuang, K McCreary, B Jonker</i>, U.S. Naval Research Laboratory</p>	<p><b>INVITED: AC+AS+LS-TuA-7</b> Analysis of Aged Uranium Particles via X-ray Xpctromicroscopy, <i>Andrew Duffin, J Ward</i>, Pacific Northwest National Laboratory</p>
4:40pm	<p><b>2D+EM+MI+NS-TuA-8</b> Strained Graphene in the Quantum Hall Regime: Valley Splitting and Extra Conducting Channels, <i>Daiara Faria</i>, Ohio University / Universidade do Estado do Rio de Janeiro; <i>C León</i>, Brigham Young University; <i>L Lima</i>, Universidade Rural do Rio de Janeiro, Brazil; <i>A Latgé</i>, Universidade Federal Fluminense, Brazil; <i>N Sandler</i>, Ohio University</p>	<p>Invited talk continues.</p>
5:00pm	<p><b>INVITED: 2D+EM+MI+NS-TuA-9</b> Unraveling the Novel Quantum Phenomena in Two-dimensional Materials using Transport and Photoemission Spectroscopy, <i>Jyoti Katoch</i>, Carnegie Mellon University</p>	<p><b>INVITED: AC+AS+LS-TuA-9</b> Heat Transfer and Phase Stability of Early Actinides and Actinide Compounds, <i>Dominik Legut, L Kývala, U Wdowik, G Jaglo, P Piekarz</i>, Technical University of Ostrava, Ostrava, Czechia; <i>L Havela</i>, Charles University, Prague, Czechia</p>
5:20pm	<p>Invited talk continues.</p>	<p>Invited talk continues.</p>
5:40pm	<p><b>2D+EM+MI+NS-TuA-11</b> Electronic Properties and Charge Density Wave Transition in Single-layer VSe<sub>2</sub>, <i>Kien Nguyen-Cong, P Neto, M Batzill, I Oleynik</i>, University of South Florida</p>	<p><b>AC+AS+LS-TuA-11</b> Reactivity of Potential TRISO Fuel Barrier Layers (SiC and ZrN) with H<sub>2</sub>O Probed with Ambient Pressure Photoelectron Spectroscopy, <i>Jeff Terry, M Warren</i>, Illinois Institute of Technology; <i>R Addou, G Herman</i>, Oregon State University</p>
6:00pm	<p><b>2D+EM+MI+NS-TuA-12</b> Tunable Band Gap and Thermal Conductivity Measurements of Monolayer MoSe<sub>2</sub> by S Incorporation, <i>Shyama Rath, V Singh</i>, University of Delhi, India</p>	

# Tuesday Afternoon, October 22, 2019

<b>Atomic Scale Processing Focus Topic</b> <b>Room B130 - Session AP+EL+MS+PS+SS+TF-TuA</b> <b>Advancing Metrology and Characterization to enable Atomic Layer Processing</b> <b>Moderators:</b> Eric A. Joseph, IBM Research Division, T.J. Watson Research Center, Jessica Kachian, Intel Corporation		<b>Applied Surface Science Division</b> <b>Room A211 - Session AS+BI+CA+LS-TuA</b> <b>Beyond Traditional Surface Analysis</b> <b>Moderators:</b> Michaelleen Pacholski, The Dow Chemical Company, Xiao-Ying Yu, Pacific Northwest National Laboratory	
2:20pm	<b>INVITED: AP+EL+MS+PS+SS+TF-TuA-1</b> In Situ Ellipsometry Characterization Of Atomic Layer Processes: A Review, <i>James Hilfiker, G Pribil, J VanDerslice</i> , J.A. Woollam Co., Inc.	<b>INVITED: AS+BI+CA+LS-TuA-1</b> Nanotechnology as a Driver for Going Beyond Traditional Surface Analysis, <i>Olivier Renault</i> , CEA-LETI, France	
2:40pm	Invited talk continues.	Invited talk continues.	
3:00pm	<b>INVITED: AP+EL+MS+PS+SS+TF-TuA-3</b> Elucidating the Mechanisms for Atomic Layer Growth through In Situ Studies, <i>Jeffrey Elam</i> , Argonne National Laboratory	<b>AS+BI+CA+LS-TuA-3</b> Core Levels Sub-shell Photo-ionization Cross-sections of Au, Ag, Cu in the Hard X-ray Photon Energy Range of 7-26 keV, <i>Germán Rafael Castro, J Rubio Zuazo</i> , Spanish CRG BM25-Spline Beamline at the ESRF, France	
3:20pm	Invited talk continues.	<b>AS+BI+CA+LS-TuA-4</b> Interfacial Photochemistry of Pyruvic Acid in Atmospheric Chemistry, <i>Yanjie Shen, Y Fu</i> , Pacific Northwest National Laboratory; <i>X Yao</i> , Ocean University of China; <i>Z Zhu</i> , Pacific Northwest National Laboratory; <i>X Yu</i> , Earth and Biological Sciences Directorate	
3:40pm	<b>BREAK</b>	<b>BREAK</b>	
4:00pm	<b>BREAK</b>	<b>BREAK</b>	
4:20pm	<b>INVITED: AP+EL+MS+PS+SS+TF-TuA-7</b> Surface, Interface, or Film: A Discussion of the Metrology of ALD Materials in Semiconductor Applications, <i>G. Andrew Antonelli, N Keller</i> , Nanometrics	<b>INVITED: AS+BI+CA+LS-TuA-7</b> Nanoscale Tomographic Mapping the Liquid-Solid Interface with Cryo-APT, <i>Daniel Perea, D Schreiber, J Evans, J Ryan</i> , Pacific Northwest National Laboratory	
4:40pm	Invited talk continues.	Invited talk continues.	
5:00pm	<b>AP+EL+MS+PS+SS+TF-TuA-9</b> In Line and Ex Situ Metrology and Characterization to Enable Area Selective Deposition, <i>Christophe Vallee, M Bonvalot, B Pelissier, J Tortai, S David, S belahcen, V Pesce, M Jaffal, A Bsiesy</i> , LTM, Univ. Grenoble Alpes, CEA-LETI, France; <i>R Gassilloud, N Posseme</i> , CEA-LETI, France; <i>T Grehl, P Bruner</i> , IONTOF GmbH, Germany; <i>A Uedono</i> , University of Tsukuba, Japan	<b>AS+BI+CA+LS-TuA-9</b> Characterization of Electronic Materials using Low Energy Inverse Photoemission Spectroscopy, <i>Benjamin Schmidt, J Newman, J Mann, K Artyushkova, L Swartz</i> , Physical Electronics; <i>M Terashima, T Miyayama</i> , ULVAC-PHI Inc., Japan	
5:20pm	<b>INVITED: AP+EL+MS+PS+SS+TF-TuA-10</b> Recent Progress in Thin Film Conformality Analysis with Microscopic Lateral High-aspect-ratio Test Structures, <i>Riikka Puurunen</i> , Aalto University, Finland	<b>AS+BI+CA+LS-TuA-10</b> Deconvolution of Atom Probe Tomography on Nanomaterials for Renewable Energy, <i>Margaret Fitzgerald, M Dzara, D Diercks</i> , Colorado School of Mines; <i>N Leick, S Christensen</i> , National Renewable Energy Laboratory; <i>T Gennett, S Pylypenko</i> , Colorado School of Mines	
5:40pm	Invited talk continues.	<b>AS+BI+CA+LS-TuA-11</b> Mass Spectrometric Investigation of Ion Solvation in Liquids, a Comparison of <i>in situ</i> Liquid SIMS to Regular ESI-MS, <i>Yanyan Zhang</i> , Institute of Chemistry, Chinese Academy of Sciences, China; <i>D Baer, Z Zhu</i> , Pacific Northwest National Laboratory	
6:00pm	<b>AP+EL+MS+PS+SS+TF-TuA-12</b> <i>In operando</i> XPS Study on Atomic Layer Etching of Fe and Co Using Cl <sub>2</sub> and Acetylacetone or Hexafluoroacetylacetone, <i>Zijian Wang, O Melton, D Angel, B Yuan, R Opila</i> , University of Delaware	<b>AS+BI+CA+LS-TuA-12</b> Characterizing the Thickness and Physical Properties of Nearly Ideal Zirconium Oxide Surfaces Using Ellipsometry, ESCA, Profilometry and FIB, <i>Edward Gillman</i> , Naval Nuclear Laboratory	

# Tuesday Afternoon, October 22, 2019

<b>Biomaterial Interfaces Division</b> <b>Room A120-121 - Session BI+AS-TuA</b> <b>Biomolecules and Biophysics and Interfaces &amp; Flash Session</b> <b>Moderators:</b> Markus Valtiner, Vienna University of Technology, Austria, Tobias Weidner, Aarhus University, Denmark		<b>Electronic Materials and Photonics Division</b> <b>Room A214 - Session EM+OX+TF-TuA</b> <b>Nikolaus Dietz Memorial Session: Wide and Ultra-wide Band Gap Materials and Devices</b> <b>Moderators:</b> Seth King, University of Wisconsin - La Crosse, David Aspnes, North Carolina State University	
2:20pm	<b>BI+AS-TuA-1</b> Electrochemical Surface Reactivity of Catechol Derivatives: Competitive Adsorption and Ion Effects, <i>Laila Moreno Ostertag, L Mears, D Dworschak, M Valtiner</i> , Vienna University of Technology, Austria	<b>INVITED: EM+OX+TF-TuA-1</b> Nitride-Based Semiconducting Materials: A Long Pathway to Advanced Nuclear Detection Capabilities, <i>Vincent Woods, L Hubbard</i> , Pacific Northwest National Laboratory; <i>Z Sitar</i> , North Carolina State University; <i>A Kozhanov</i> , Georgia State University	
2:40pm	<b>BI+AS-TuA-2</b> Direct Observation of Lysozyme Interaction with a Curved Lipid Membrane Surface by Sum Frequency Scattering Vibrational Spectroscopy, <i>Thaddeus Golbek</i> , Aarhus University, Denmark, Denmark; <i>H Okur, S Kulik, J Dedic, S Roke</i> , École Polytechnique Fédérale de Lausanne (EPFL), Switzerland; <i>T Weidner</i> , Aarhus University, Denmark	Invited talk continues.	
3:00pm	<b>INVITED: BI+AS-TuA-3</b> Iron Speciation at Aqueous Surfaces, <i>Heather Allen</i> , Ohio State University	<b>EM+OX+TF-TuA-3</b> New Mg-based Ternary Nitrides for Wide Band Gap Device Applications, <i>K York, R Makin III, Steven Durbin</i> , Western Michigan University; <i>R Reeves</i> , University of Canterbury, New Zealand; <i>N Senabulya, R Clarke</i> , University of Michigan	
3:20pm	Invited talk continues.	<b>EM+OX+TF-TuA-4</b> Low Temperature Growth of InN by Atomic Layer Epitaxy, <i>Charles R. Eddy, Jr.</i> , U.S. Naval Research Laboratory; <i>S Rosenberg, J Woodward</i> , American Society for Engineering Education (residing at U.S. Naval Research Laboratory); <i>K Ludwig</i> , Boston University; <i>N Nepal</i> , U.S. Naval Research Laboratory	
3:40pm	<b>BREAK</b>	<b>BREAK</b>	
4:00pm	<b>BREAK</b>	<b>BREAK</b>	
4:20pm	<b>BI+AS-TuA-7</b> Identifying the Molecular Mechanisms that Mediate Cell Membrane Repair by Sum Frequency Generation Spectroscopy, <i>T Golbek</i> , Oregon State University; <i>S Roeters, T Weidner</i> , Aarhus University, Denmark; <i>C Johnson, Joe Baio</i> , Oregon State University	<b>EM+OX+TF-TuA-7</b> Stoichiometry- and Orientation-Dependent Native Point Defects of MOCVD-Grown ZnGeN <sub>2</sub> Films, <i>Micah Haseman, D Ramdin, R Karim</i> , The Ohio State University; <i>D Jayatunga</i> , Case Western Reserve University; <i>H Zhao</i> , The Ohio State University; <i>K Kash</i> , Case Western Reserve University; <i>L Brillson</i> , The Ohio State University	
4:40pm	<b>BI+AS-TuA-8</b> Fishing Manganese out from Cellulose: Impact of Coupling Desferrioxamine B to Stainless Steel Beads on the Circular Economy of Paper and Pulp Industry, <i>Jeff Wilkesman</i> , Mannheim University of Applied Sciences, Germany; <i>K Mörnter, I Sommer, P Kunz</i> , Mannheim University of Applied Sciences, Deutschland	<b>EM+OX+TF-TuA-8</b> Low-temperature Growth of Wide Bandgap Nitride and Oxide Thin Films via Plasma-assisted Atomic Layer Deposition: Influence of rf-plasma Source and Plasma Power, <i>Necmi Biyikli, S Ilhom, A Mohammad, D Shukla</i> , University of Connecticut	
5:00pm	<b>BI+AS-TuA-9</b> The Hybrid Nano-biointerfaces Between Gold, Graphene Oxide and Angiogenin for Wound Repair, <i>Diego La Mendola</i> , University of Pisa, Italy; <i>L Cucci, G Villaggio, C Satriano</i> , University of Catania, Italy	<b>INVITED: EM+OX+TF-TuA-9</b> Wide Bandgap Dilute Magnetic Semiconductors for Room Temperature Spintronic Applications, <i>V Saravade, A Ghods</i> , Missouri University of Science and Technology, Rolla, MO, USA; <i>N Ben Sedrine</i> , Universidade de Aveiro, Portugal; <i>C Zhou, Ian Ferguson</i> , Missouri University of Science and Technology	
5:20pm	<b>BI+AS-TuA-10</b> Improved Antibacterial Sandwich system for Urological Purposes, <i>Sara Bröskamp, G Franz</i> , Munich University of Applied Sciences, Germany; <i>D Jocham</i> , University Hospital of Schleswig-Holstein, Germany	Invited talk continues.	
5:40pm	<b>BI+AS-TuA-11</b> Quantitative Characterization of Piezoelectric Property in Biological System via Piezoresponse Force Microscopy, <i>Jinha Kwon, D Kim, H Cho</i> , The Ohio State University	<b>EM+OX+TF-TuA-11</b> Processing and Characterization of Schottky and Ohmic contacts on (100) β-Ga <sub>2</sub> O <sub>3</sub> , <i>Luke Lyle, K Jiang, E Favela, D Moody, T Lin, P Chung</i> , Carnegie Mellon University; <i>K Das</i> , North Carolina State University; <i>Z Galazka, A Popp, G Wagner</i> , Leibniz-Institut für Kristallzüchtung, Germany; <i>L Porter</i> , Carnegie Mellon University	
6:00pm		<b>EM+OX+TF-TuA-12</b> III-Nitrides: Enabling Applications with Wide to Ultra-Wide Bandgap Materials and Devices, <i>Erica Douglas, A Baca, B Klein, A Allerman, A Armstrong, A Colon, C Stephenson, R Kaplar</i> , Sandia National Laboratories	

# Tuesday Afternoon, October 22, 2019

<b>MEMS and NEMS Group</b> <b>Room A210 - Session MN+QS-TuA</b> <b>Devices for Quantum Information and Quantum Nanomechanics</b> <b>Moderators:</b> Sebastian Hentz, CEA-LETI, France, Matthew Jordan, Sandia National Laboratories		<b>Nanometer-scale Science and Technology Division</b> <b>Room A222 - Session NS-TuA</b> <b>Recent Advances in Nanoscale Probing and Fabrication</b> <b>Moderator:</b> Jay Mody, GLOBALFOUNDRIES Inc.	
2:20pm	<b>INVITED: MN+QS-TuA-1</b> Fabrication Challenges in Quantum Optomechanics, <i>Simon Groeblacher</i> , Delft University of Technology, The Netherlands, Netherlands		
2:40pm	Invited talk continues.		
3:00pm	<b>INVITED: MN+QS-TuA-3</b> Floquet Dynamics and Time Symmetry Breaking in Arrays of Driven Nanoresonators, <i>Mark Dykman</i> , Michigan State University		
3:20pm	Invited talk continues.		
3:40pm	<b>BREAK</b>	<b>BREAK</b>	
4:00pm	<b>BREAK</b>	<b>BREAK</b>	
4:20pm	<b>INVITED: MN+QS-TuA-7</b> Engineering Quantum Signal Transduction in Atomic Layer 2D Devices, <i>Philip Feng</i> , Case Western Reserve University	<b>NS-TuA-7</b> Electrical, Photovoltaic, and Nano-Optical Characterization of TMD Lateral Heterostructures, <i>Marudachalam Shanmugasundaram</i> , HORIBA Scientific; <i>A Elias, M Terrones</i> , The Pennsylvania State University; <i>H Terrones</i> , Rensselaer Polytechnic Institute	
4:40pm	Invited talk continues.	<b>NS-TuA-8</b> Development of Near-Field Electrospinning for 3D Nanofabrication for tissue engineering applications, <i>Alex Nagle</i> , University of Wollongong, Australia	
5:00pm	<b>INVITED: MN+QS-TuA-9</b> Superconducting Resonators as Diagnostics for Qubit Fabrication, <i>Rupert Lewis</i> , Sandia National Laboratories	<b>NS-TuA-9</b> The Fundamentals of Silica Nanoparticle-based Hydrophilic Antifouling Coating, <i>Dan Yang</i> , University of Wollongong, Australia; <i>P Molino</i> , University of Wollongong, Australia; <i>M Higgins</i> , University of Wollongong	
5:20pm	Invited talk continues.	<b>NS-TuA-10</b> The Effects of Atomic-Scale Strain Relaxation on the Electronic Properties of Monolayer MoS <sub>2</sub> , <i>Daniel Trainer</i> , Y Zhang, Argonne National Laboratory; <i>F Bobba</i> , University of Salerno, Italy; <i>X Xi</i> , Temple University; <i>S Hla</i> , Argonne National Laboratory; <i>M Iavarone</i> , Temple University	
5:40pm	<b>INVITED: MN+QS-TuA-11</b> Surface Ion Trap Device Fabrication for Experiments in Quantum Information Science, <i>Matthew Blain</i> , Sandia National Laboratories	<b>NS-TuA-11</b> Understanding Tip-induced Nanoscale Wear for Tomographic Atomic Force Microscopy, <i>Umberto Celano</i> , IMEC, Belgium; <i>X Hu</i> , University of California-Merced; <i>L Wouters, K Paredis, T Hatschel, P van der Heide</i> , IMEC, Belgium; <i>A Martini</i> , University of California-Merced	
6:00pm	Invited talk continues.	<b>NS-TuA-12</b> Probing the Viscoelastic Properties of Polymer Composites with AFM-based Dynamic Mechanical Analysis, <i>Bede Pittenger</i> , <i>S Osechinskiy, J Thornton, S Loire, T Mueller</i> , Bruker Corporation	



# Tuesday Afternoon, October 22, 2019

<b>Complex Oxides: Fundamental Properties and Applications Focus Topic</b> <b>Room A220-221 - Session OX+EM+HC+MI+NS+SS+TF-TuA</b> <b>Complex Oxides: Catalysis, Dielectric Properties and Memory Applications</b> <b>Moderators:</b> Alexander Demkov, University of Texas at Austin, Jeffrey Kelber, University of North Texas		<b>Plasma Science and Technology Division</b> <b>Room B131 - Session PS+EM-TuA</b> <b>Advanced BEOL/Interconnect Etching and Advanced Memory and Patterning</b> <b>Moderators:</b> Hisataka Hayashi, Toshiba, Japan, Kenji Maeda, Hitachi High Technologies America Inc.	
2:20pm	<b>INVITED: OX+EM+HC+MI+NS+SS+TF-TuA-1</b> Novel Multiferroic and Ferroelectric Ferrite Thin Films, <i>Peter A. Dowben, C Binek, X Xu</i> , University of Nebraska-Lincoln	<b>INVITED: PS+EM-TuA-1</b> BEOL Etch Challenges and Solutions for Advanced Process Nodes, <i>Angélique Raley, K Lutker-Lee, X Sun, Y Lu, Q Lou, N Joy, M Edley</i> , TEL Technology Center, America, LLC; <i>K Taniguchi, M Honda</i> , TEL Miyagi Limited, Japan; <i>P Biolsi</i> , TEL Technology Center, America, LLC	
2:40pm	Invited talk continues.	Invited talk continues.	
3:00pm	<b>INVITED: OX+EM+HC+MI+NS+SS+TF-TuA-3</b> Potential Applications and Challenges for Complex Oxides in Advanced Memory and Computing Applications, <i>Sebastian Engelmann, T Ando, V Narayanan</i> , IBM T.J. Watson Research Center	<b>PS+EM-TuA-3</b> Enabling Fully Aligned Via for Advanced BEOL Nodes Scaling -Etch and Film Co-optimization, <i>Xinghua Sun, A Raley</i> , TEL Technology Center, America, LLC; <i>J Lee, J Arnold</i> , IBM Research Division, Albany, NY; <i>K Taniguchi</i> , TEL Miyagi Limited, Japan; <i>M Edley, K Lutker-Lee</i> , TEL Technology Center, America, LLC; <i>D O'Meara</i> , Tokyo Electron America, Inc.; <i>K Tapily, Y Lu, P Biolsi</i> , TEL Technology Center, America, LLC	
3:20pm	Invited talk continues.	<b>PS+EM-TuA-4</b> Non-selective Silicon Oxide and Nitride Etch in Oxygen/Nitrogen-containing Fluorocarbon Plasmas, <i>Yu-Hao Tsai, D Zhang, Y Han, J Baillargeon, Y Shi, H Kim, M Wang</i> , TEL Technology Center, America, LLC; <i>T Yokoyama, M Iwata, Y Kihara, M Honda, W Sakamoto</i> , Tokyo Electron Miyagi Ltd., Japan; <i>A Mosden, A Metz, P Biolsi</i> , TEL Technology Center, America, LLC	
3:40pm	<b>BREAK</b>	<b>BREAK</b>	
4:00pm	<b>BREAK</b>	<b>BREAK</b>	
4:20pm	<b>INVITED: OX+EM+HC+MI+NS+SS+TF-TuA-7</b> Epitaxial Design of Complex Oxides for Catalysis and Electrocatalysis, <i>Yingge Du</i> , Pacific Northwest National Laboratory	<b>INVITED: PS+EM-TuA-7</b> Challenges in High-aspect-ratio Hole Etching for 3D Flash Memory, <i>Mitsuhiro Omura, J Hashimoto, T Adachi, Y Kondo, M Ishikawa, J Abe, I Sakai, H Hayashi</i> , Toshiba Memory Corporation, Japan	
4:40pm	Invited talk continues.	Invited talk continues.	
5:00pm	<b>OX+EM+HC+MI+NS+SS+TF-TuA-9</b> Manipulate the Electronic Structures of Complex (Ni, Co) Oxides by Hole Doping for Oxygen Evolution Reaction, <i>Kelvin Zhang</i> , Xiamen University, China	<b>PS+EM-TuA-9</b> Plasma Processing of Phase Change Materials, <i>Ernest Chen, N Altieri</i> , University of California, Los Angeles; <i>C Neumann, S Fong, H Wong</i> , Stanford University; <i>M Shen, T Lill</i> , Lam Research Corporation; <i>J Chang</i> , University of California, Los Angeles	
5:20pm	<b>OX+EM+HC+MI+NS+SS+TF-TuA-10</b> Vanadia/Tungsten Oxide on Anatase TiO <sub>2</sub> (101): a Model Catalyst Study by STM and XPS, <i>Tao Xu, J Lauritsen, K Adamsen</i> , Aarhus University, Denmark; <i>S Wendt</i> , iNANO, Aarhus University, Denmark	<b>INVITED: PS+EM-TuA-10</b> Meeting the Challenges in Patterning Phase Change Material for Next Generation Memory Devices, <i>Meihua Shen, L Thorsten, J Hoang, S Chiou, D Qian, A Routzahn, J Chen, A Dulkin, J Sims, A McKerrow, R Dylewicz</i> , Lam Research Corporation	
5:40pm	<b>OX+EM+HC+MI+NS+SS+TF-TuA-11</b> Observation of Memory Effect and Fractal Surface in SrRuO <sub>3</sub> Epitaxial Thin Films, <i>Ratnakar Palai</i> , University of Puerto Rico; <i>H Huhtinen</i> , University of Turku, Finland	Invited talk continues.	
6:00pm	<b>OX+EM+HC+MI+NS+SS+TF-TuA-12</b> <i>In situ</i> Auger Electron Spectroscopy of Complex Oxide Thin Film Surfaces Grown by Pulsed Laser Deposition, <i>Thomas Orvis, M Surendran, Y Liu, A Cunniff, J Ravichandran</i> , University of Southern California	<b>PS+EM-TuA-12</b> Utilizing Photosensitive Polymers to Estimate UV Radiation Exposures in Different Plasma Chamber Configurations, <i>Luxherta Buzi, M Sagianis, S Engelmann</i> , IBM T.J. Watson Research Center	

# Tuesday Afternoon, October 22, 2019

<p><b>Materials and Processes for Quantum Information, Computing and Science Focus Topic</b>  <b>Room B231-232 - Session QS+2D+EM+MN+NS-TuA</b>  <b>Materials for Quantum Sciences</b>  <b>Moderators:</b> Matthew R. Rosenberger, U.S. Naval Research Laboratory, Robert Walko, The Ohio State University</p>		<p><b>Thin Films Division</b>  <b>Room A124-125 - Session TF+PS-TuA</b>  <b>Epitaxial Thin Films</b>  <b>Moderator:</b> Robert Grubbs, Sandia National Laboratories</p>	
2:20pm	<p><b>QS+2D+EM+MN+NS-TuA-1</b> Electrically Detected Electron Nuclear Double Resonance Study of Defects in 4H-SiC Bipolar Junction Transistors, <i>Ryan Waskiewicz, B Manning, D McCrory, P Lenahan</i>, Pennsylvania State University</p>	<p><b>TF+PS-TuA-1</b> In-situ Epitaxy of Ultrathin Ni Ferrite Films Studied by Surface Sensitive Time-resolved High Energy X-ray Diffraction, <i>Joachim Wollschläger, M Hoppe, T Pohlmann</i>, University Osnabrück, Germany; <i>F Bertram</i>, DESY, Hamburg, Germany</p>	
2:40pm	<p><b>QS+2D+EM+MN+NS-TuA-2</b> Scanning Tunneling Microscopy Studies of Er Adatoms on GaAs (110), <i>Rebekah Smith, A Benjamin, J Gupta</i>, The Ohio State University</p>	<p><b>TF+PS-TuA-2</b> Van der Waals Layer Promoted Heteroepitaxy in Sputter-deposited Transition-metal Carbide and Sulfide Thin Films, <i>Koichi Tanaka<sup>1</sup>, P Arias, M Liao, Y Wang, H Zaid, A Aleman</i>, University of California, Los Angeles; <i>K Hojo</i>, Nagoya University, Japan; <i>A Deshpande, M Goorsky, S Kodambaka</i>, University of California, Los Angeles</p>	
3:00pm	<p><b>INVITED: QS+2D+EM+MN+NS-TuA-3</b> Defect-based Quantum Systems in Hexagonal Boron Nitride, <i>Trong Toan Tran</i>, University of Technology Sydney, Australia</p>	<p><b>INVITED: TF+PS-TuA-3</b> Molecular Beam Epitaxy Applied to Tensile-Strained Quantum Dots for Quantum Optics and Band-Structure Engineering, <i>Paul Simmonds</i>, Boise State University</p>	
3:20pm	Invited talk continues.	Invited talk continues.	
3:40pm	<b>BREAK</b>	<b>BREAK</b>	
4:00pm	<b>BREAK</b>	<b>BREAK</b>	
4:20pm	<p><b>QS+2D+EM+MN+NS-TuA-7</b> Specific Placement of V<sub>Si</sub> in 4H-SiC for Quantum Technologies using Li<sup>+</sup> Implantation, <i>S Pavunny, Rachael L. Myers-Ward, D Gaskill</i>, U.S. Naval Research Laboratory; <i>E Bielejec</i>, Sandia National Laboratories; <i>H Banks, A Yeats</i>, U.S. Naval Research Laboratory; <i>M DeJarlid</i>, Raytheon; <i>S Carter</i>, U.S. Naval Research Laboratory</p>		
4:40pm	<p><b>QS+2D+EM+MN+NS-TuA-8</b> Silicon Vacancy Point Defect in High-quality Nanobeam Photonic Crystal Cavities in 4H Silicon Carbide, <i>Mena Gadalla, X Zhang, A Greenspon</i>, Harvard University; <i>D Bracher</i>, Harvard GSAS; <i>R Dejo, E Hu</i>, Harvard University</p>		
5:00pm	<p><b>QS+2D+EM+MN+NS-TuA-9</b> Tailoring the Heterogeneities in 2D Materials by Controlled Synthesis and Processing, <i>Kai Xiao, X Li, K Wang, A Oyedele, M Yoon, S Xia, M Mahjouri-Samani, C Rouleau, A Puretzky, L Liang, R Unocic, D Geohegan</i>, Oak Ridge National Laboratory</p>	<p><b>TF+PS-TuA-9</b> Low-temperature Homoepitaxial Growth of N-type Superlattices for Ultrastable, Ultrafast X-Ray and Charged Particle Detectors, <i>April Jewell</i>, Jet Propulsion Laboratory, California Institute of Technology; <i>M Hoenk</i>, Jet Propulsion Laboratory; <i>Q Looker, M Sanchez, B Tierney</i>, Sandia National Laboratories; <i>A Carver</i>, Jet Propulsion Laboratory; <i>S Nikzad</i>, Jet Propulsion Laboratory, California Institute of Technology</p>	
5:20pm	<p><b>QS+2D+EM+MN+NS-TuA-10</b> Epitaxial Al Films for Plasmonic and Quantum Computing Applications, <i>Ka Ming Law, S Budhathoki, S Ranjit, F Martin, A Hauser</i>, The University of Alabama</p>	<p><b>TF+PS-TuA-10</b> Epitaxial Growth of Ultrathin Molybdenum Nitrides on Ru(0001) and Ag(100), <i>Asim Khaniya, M Sajid, A Kara, W Kaden</i>, University of Central Florida</p>	
5:40pm	<p><b>QS+2D+EM+MN+NS-TuA-11</b> Minimizing Coulomb Oscillation Linewidth on Silicon Quantum Dots, <i>Yanxue Hong, A Ramanayaka, M Stewart, Jr., X Wang, R Kashid, P Nambodiri, R Silver, J Pomeroy</i>, National Institute of Standards and Technology (NIST)</p>	<p><b>TF+PS-TuA-11</b> Using Time and Temperature of the Purge Step to Control Crystallinity, Phase Assemblage, and Epitaxy in Atomic Layer Deposited (ALD) Thin Films, <i>Mark Losego, B Piercy, R Petrie</i>, Georgia Institute of Technology</p>	
6:00pm	<p><b>QS+2D+EM+MN+NS-TuA-12</b> Micro-magnetic Simulations of Correlated Switching in Touching Nano-magnetic Elements, <i>Tejumade Durowade, V Metlushko</i>, University of Illinois at Chicago</p>	<p><b>TF+PS-TuA-12</b> The Role of Template Layers in Heteroepitaxial ALD Growth of Crystalline La<sub>2</sub>O<sub>3</sub> on GaN(0001), <i>Pei-Yu Chen, T Hadamek</i>, University of Texas at Austin; <i>S Kwon</i>, University of Texas at Dallas; <i>F Al-Quaiti, A Posadas</i>, University of Texas at Austin; <i>M Kim</i>, University of Texas at Dallas; <i>A Demkov, J Ekerdt</i>, University of Texas at Austin</p>	

# Tuesday Afternoon, October 22, 2019

<b>Thin Films Division</b> <b>Room A122-123 - Session TF-TuA</b> <b>Emerging Applications for Thin Films</b> <b>Moderators:</b> Emily McGuinness, Georgia Institute of Technology, Jesse Jur, North Carolina State University		<b>Energy Transition Focus Topic</b> <b>Room A226 - Session TL+AS+SS+TF-TuA</b> <b>Breakthroughs and Challenges in Applied Materials for Energy Transition (ALL INVITED SESSION) &amp; Panel Discussion</b> <b>Moderators:</b> Jason Avila, U.S. Naval Research Laboratory, Devika Choudhury, Argonne National Laboratory	
2:20pm	<b>INVITED: TF-TuA-1</b> Flexible Hybrid Electronics Process Maturation using Printed Inks, <i>John D. Williams</i> , The Boeing Company	<b>INVITED: TL+AS+SS+TF-TuA-1</b> Interface Science and Engineering for Energy-Water Systems, <i>Seth Darling</i> , Argonne National Laboratory	
2:40pm	Invited talk continues.	Invited talk continues.	
3:00pm	<b>TF-TuA-3</b> Large-Area Atmospheric Pressure Spatial ALD for Flexible OLED Display Applications, <i>C Frijters, J Smeltink, Huib Heezen, P Poodt</i> , SALDtech B.V., Netherlands	<b>INVITED: TL+AS+SS+TF-TuA-3</b> Atomic Dynamics of Noble Metal Surface in Gases Revealed by Time Resolved Environmental Transmission Electron Microscopy, <i>Seiji Takeda, N Kamiuchi, R Aso, H Yoshida, T Tamaoka</i> , Osaka University, Japan	
3:20pm	<b>TF-TuA-4</b> Printed Polymer Heat Sinks for High-Power, Flexible Electronics, <i>Katherine Burzynski</i> , University of Dayton; <i>N Glavin, E Heckman</i> , Air Force Research Laboratory; <i>C Muratore</i> , University of Dayton	Invited talk continues.	
3:40pm	<b>BREAK</b>	<b>BREAK</b>	
4:00pm	<b>BREAK</b>	<b>BREAK</b>	
4:20pm	<b>TF-TuA-7</b> Selective Deposition by Fast-ALD of Transparent Conductive Metal Oxides for Application in Organic (opto)electronic Devices, <i>M Granados, D Munoz-Rojas</i> , LMGP, France; <i>c fontelaye, G Nonglaton, Tony Maindron</i> , CEA-LETI, France	<b>TL+AS+SS+TF-TuA-7</b> Totally Organic and Organic-Inorganic Hybrid Batteries, <i>Burak Esat</i> , Fatih University, Turkey, Rutgers University; <i>S Bahceci, S Akay</i> , Fatih University, Turkey; <i>A Momchilov</i> , Bulgarian Academy of Science, Bulgaria	
4:40pm	<b>TF-TuA-8</b> Photocatalytic Antibacterial Activity of ALD Thin Films on Fibrous Materials, <i>Halil Akyildiz, S Diler</i> , Uludag University, Turkey	<b>INVITED: TL+AS+SS+TF-TuA-8</b> Electrochemical Strategies for Designing Interfaces of Battery Materials, <i>Betar Gallant</i> , Massachusetts Institute of Technology	
5:00pm	<b>TF-TuA-9</b> A Kinetic and Thermodynamic Study of Aromatic Compounds Interacting with Metal-Organic Framework Thin Films, <i>J Shankwitz, D Speed, D Sinanan, Greg Szulczewski</i> , University of Alabama	Invited talk continues.	
5:20pm	<b>TF-TuA-10</b> Carbon's Role in Reducing Alumina's Resistivity Through Catalytic Carbon Nanotube Growth, <i>Berg Dodson, R Davis, R Vanfleet</i> , Brigham Young University		
5:40pm	<b>TF-TuA-11</b> Ferroelectricity in Hafnia-Zirconia based Thin Films: Characterization and Applications, <i>Vineetha Mukundan</i> , SUNY Polytechnic Institute; <i>S Consiglio, D Triyoso, K Tapily, R Clark, G Leusink</i> , TEL Technology Center, America, LLC; <i>J Hazra, K Beckmann, N Cady, A Diebold</i> , SUNY Polytechnic Institute, Albany		
6:00pm	<b>TF-TuA-12</b> Atomic Layer Deposition-enabled Formation of Laser-Induced Graphene for Charged Membrane Applications, <i>David Bergsman, B Getachew, J Grossman</i> , Massachusetts Institute of Technology		

# Tuesday Afternoon, October 22, 2019

<b>Vacuum Technology Division</b> <b>Room A213 - Session VT-TuA</b> <b>Advanced Applications of Vacuum Technology</b> <b>Moderators:</b> Julia Scherschligt, NIST, Alan Van Drie, TAE Technologies	
2:20pm	<b>INVITED: VT-TuA-1</b> Single Atom and Single Electron Transistors for Quantum Technologies, <i>Richard Silver, X Wang, R Kashid, J Wyrick, P Nambodiri, K Liu, M Stewart, G Bryant</i> , National Institute of Standards and Technology (NIST)
2:40pm	Invited talk continues.
3:00pm	<b>VT-TuA-3</b> Turbomolecular Pump for Achieving Ultra-high Vacuum in a High-power Proton Accelerator Vacuum System, <i>Junichiro Kamiya, M Kinsho</i> , Japan Atomic Energy Agency, Japan; <i>N Ogiwara</i> , KEK, Japan; <i>M Sakurai, T Mabuchi</i> , Osaka Vacuum, Ltd., Japan; <i>K Wada</i> , Tokyo Electronics Co., Ltd., Japan
3:20pm	<b>VT-TuA-4</b> US Contributions to ITER Vacuum Auxiliary System, <i>Charles Smith</i> , Us Iter
3:40pm	<b>BREAK</b>
4:00pm	<b>BREAK</b>
4:20pm	<b>INVITED: VT-TuA-7</b> Importance of Advanced Vacuum Technology to the Present Thin Film Photovoltaics Industry, <i>Timothy Gessert</i> , Gessert Consulting, LLC
4:40pm	Invited talk continues.
5:00pm	<b>INVITED: VT-TuA-9</b> Enabling Hydrogen as an Energy Carrier through Analytical Electron Microscopy, <i>David Cullen, K More</i> , Oak Ridge National Laboratory
5:20pm	Invited talk continues.
5:40pm	<b>INVITED: VT-TuA-11</b> Defect Manipulation to Control Energy Processes in Electronic Materials, <i>Leonard Brillson</i> , The Ohio State University
6:00pm	Invited talk continues.

## 2D Materials

### Room Union Station AB - Session 2D-TuP

#### 2D Poster Session

6:30pm

**2D-TuP-1** Enhancement of Solid Solubility in 2D Alloys by Selective Orbital Coupling, *Bing Huang*, Beijing Computational Science Research Center, China

**2D-TuP-2** Black Phosphorus and Endohedral-Graphene Hybrids for Novel Optoelectronic Devices, *M Min, Srishti Chugh, A Kaul*, University of North Texas

**2D-TuP-3** Nitrogen-Doped Graphene on Cu(111): Edge-Guided Doping Process and Doping-Induced Variation of Local Work Function, *J Neilson, H Chinkeziyan, H Pirke, A Osei-Twumasi*, California State University, Northridge; *Y Li*, Peking University, China; *C Chichiri*, California State University, Northridge; *J Cho*, Myongji University, Korea; *K Palotás*, Hungarian Academy of Sciences, Hungary; *L Gan*, Peking University, China; *S Garrett, K Lau*, California State University, Northridge; *Li Gao*, California State University Northridge

**2D-TuP-4** Vibrational Progression of a Single Hydrocarbon Molecule on Graphene and Hexagonal Boron Nitride, *Alexander Mehler, N Néel, J Halle*, Technische Universität Ilmenau, Germany; *M Bocquet*, École normale supérieure, PSL University, Sorbonne Université, CNRS, France; *J Kröger*, Technische Universität Ilmenau, Germany

**2D-TuP-5** Synthesis of Layered PdS<sub>2</sub> Film and Homo-junction Device Fabrication, *C Jong*, TSRI/NARL, Taiwan, Republic of China; *Y Yang*, NTNU, Taiwan, Republic of China; *M Le*, NTHU, Taiwan, Republic of China; *P Chen*, MUST, Taiwan, Republic of China; *Chien-Bao Lin, P Chiu, C Hsiao*, TIRI/NARL, Taiwan, Republic of China

**2D-TuP-6** NanoESCA III: Momentum Microscopy on 2D Materials, *Marten Patt*, Scienta Omicron GmbH, Germany; *N Weber, M Escher, T Kuehn, M Merkel*, FOCUS GmbH, Germany

**2D-TuP-7** Shifting of Electronic States of Meso-tetrakis(pentafluorophenyl) Porphyrin Self-assembled Monolayers Due to Internal Molecular Structure, *Jose Ortiz-Garcia, M Wolf, M Guberman-Pfeffer, J Gascon, D Thuita, C Brückner, R Quardokus*, University of Connecticut

**2D-TuP-8** Reproducibility and Replicability in Science and Engineering: A Report by the National Academies, *T Winters, Jennifer Heimberg*, National Academies of Sciences, Engineering, and Medicine

**2D-TuP-9** Structural and Electronic Properties of Native Point Defects in MoTe<sub>2</sub>, *Ziling Deng, S Mueller, W Windl, J Gupta*, The Ohio State University

**2D-TuP-10** A Role of Au Atoms on Oxidized Black Phosphorus; Study using Scanning Photoelectron Microscopy, *D Kim, H Choi, Jaeyoon Baik*, Pohang Accelerator Laboratory, Republic of Korea

**2D-TuP-11** Growth and Electrical, Nano-Optical Characterization of semiconducting MoS<sub>2</sub>/WS<sub>2</sub> in-plane Heterostructures, *Sourav Garg, P Kung, S Kim*, The University of Alabama; *A Krayev*, Horiba Scientific, Novato

**2D-TuP-12** Identifying Key Parameters for the Uniformity of Nanopatterning on 2D Highly Oriented Pyrolytic Graphite Layers, *James Su*, Taiwan Instrument Research Institute, National Applied Research Laboratories, Taiwan, Republic of China

## Biomaterial Interfaces Division

### Room Union Station AB - Session BI-TuP

#### Biomaterial Interfaces Posters/Flash Session

6:30pm

**BI-TuP-1** Combining Geometry of Folded Paper with Liquid-Infused Polymer Surfaces to Concentrate and Localize Complex Solutions, *Daniel Regan, C Lilly, A Weigang, L White, E LeClair, C Howell*, University of Maine

**BI-TuP-2** Photoinduced Amphiphilic Zwitterionic Carboxybetaine Polymer Coatings with Marine Antifouling Properties, *Florian Victor Koschitzki, A Rosenhahn*, Ruhr-University Bochum, Germany

**BI-TuP-3** Peptide sequences with Ultra-Low Nonspecific Protein Adsorption and Resistance Against Marine Biofouling, *Cindy Denise Beyer, M Reback*, Ruhr-University Bochum, Germany; *J Finlay*, Newcastle University, UK; *S Gopal*, Ruhr-University Bochum, Germany; *A Clare*, Newcastle University, UK; *L Schäfer, N Metzler-Nolte, A Rosenhahn*, Ruhr-University Bochum, Germany

**BI-TuP-4** The Effect of Surface Charge and Film Hydration on the Antifouling Performance of Polyelectrolyte Multilayers, *Thavarakhan Gnanasampanthan*, Ruhr University Bochum, Germany; *A Rosenhahn*, Ruhr-University Bochum, Germany

**BI-TuP-5** Mass Spectrometric Determination of Active Adsorption sites of soil organic Carbon on Clay Mineral Surface, *Zihua Zhu, L Huang*, Pacific Northwest National Laboratory; *W Liu*, China University of Geosciences, Wuhan

**BI-TuP-6** Blood Compatible Coating using Tethered Heparin to Reduce Coagulation in Microfluidic Devices, *Ryan Faese, W Prusinski, K Schilke, A Higgins, J Baio*, Oregon State University

**BI-TuP-7** Analysing the Sequestration of Pro-inflammatory Chemokines into Immuno-modulating Hydrogels using ToF SIMS, *Nicholas Dennison, R Zimmermann, M Nitschke, V Magno, U Freudenberg, C Werner*, Leibniz Institute of Polymer Research Dresden, Germany

## MEMS and NEMS Group

### Room Union Station AB - Session MN-TuP

#### MEMS and NEMS Poster Session

6:30pm

**MN-TuP-1** Multimodal & Multifunctional Soft Sensors for Electronic Textiles, *Ashish Kapoor, T Ghosh, A Bozkurt*, North Carolina State University

## Complex Oxides: Fundamental Properties and Applications

### Focus Topic

#### Room Union Station AB - Session OX-TuP

#### Complex Oxides: Fundamental Properties and Applications

#### Poster Session

6:30pm

**OX-TuP-1** Electrical and Structural Properties of p-type Transparent Conducting La<sub>2/3</sub>Sr<sub>1/3</sub>VO<sub>3</sub> Thin Films Grown Using RF Sputtering Deposition, *D Jung, Y Oh, H So, Hosun Lee*, Kyung Hee University, Republic of Korea

**OX-TuP-2** van der Waals Heterostructures of Graphene and β-Ga<sub>2</sub>O<sub>3</sub> Nanoflake for Enhancement Mode MESFETs and Logic Applications, *Janghyuk Kim, J Kim*, Korea University, Republic of Korea

**OX-TuP-3** Structure and Reactivity of a Magnetite-Terminated Hematite Surface with Oxygen Adatoms Formed by Self-Oxidation, *Constantin Walenta, F Xu, W Chen, C O'Connor, C Friend*, Harvard University

## Plasma Science and Technology Division

### Room Union Station AB - Session PS-TuP

#### Plasma Science and Technology Poster Session

6:30pm

**PS-TuP-2** Low-temperature Atmospheric Plasma Deposition of Photocatalytic Doped Anatase TiO<sub>2</sub> Coatings on Polymer Substrates, *K Baba, M Quesada-Gonzalez, S Bulou, P Choquet, Nicolas Boscher*, Luxembourg Institute of Science and Technology, Luxembourg

**PS-TuP-3** Radical Nitriding of Silicon Surface Promoted by Surface Plasmon Resonance of Gold Nanoparticle Catalyst, *Machiko Miyake, T Kitajima, T Nakano*, National Defense Academy, Japan

**PS-TuP-4** Development and Characterization of a Small-Scale Helical Dielectric Barrier Discharge for Studying Plasma-Surface Interactions, *Nazli Turan, P Barbour, W Schneider, J Hicks, D Go*, University of Notre Dame

**PS-TuP-5** Characteristics of Magnetized High Density Plasma and its Applications, *Jung-Hyung Kim, H Lee, D Seong*, Korea Research Institute of Standards and Science, Republic of Korea

**PS-TuP-6** The Effect of Ionic Strength on the Absorption Spectrum of Plasma-Injected Solvated Electrons, *Daniel Martin, H Delgado, D Bartels, P Rumbach, D Go*, University of Notre Dame

**PS-TuP-7** Inductively Coupled Plasma Reactive Ion Etching of Copper Thin Film using Organic Chemicals and Alcohols, *Moon Hwan Cha, E Lim, J Ryu, C Chung*, Inha University, Republic of Korea

**PS-TuP-8** High Resolution Quadrupole Mass Spectrometry Analysis for Fusion Reactor and Plasma Facing Materials, *G Thier, Brian Regel, L Kephart*, Extrel CMS

**PS-TuP-9** Controlled Layer-by-Layer Etching of Copper Thin Films, *Eun Taek Lim, J Ryu, M Cha, C Chung*, Inha University, Republic of Korea

# Tuesday Evening Poster Sessions, October 22, 2019

**PS-TuP-10** Effects of Bias on Quasi-Atomic Layer Etching of Silicon Dioxide by Cyclic Ar/CaF<sub>2</sub>/O<sub>2</sub> and Ar Plasmas, **Xifeng Wang**, University of Michigan; **M Wang**, **A Mosden**, **P Biolsi**, TEL Technology Center, America, LLC; **M Kushner**, University of Michigan

**PS-TuP-11** Electron Beam Generated Produced Plasmas Produced in Oxygen: Measurements and Simulations, **Scott Walton**, **D Boris**, U.S. Naval Research Laboratory; **S Rauf**, Applied Materials, Inc.

**PS-TuP-12** Silicon Micro-Channel Definition Via ICP Plasma Etching Process Using Different Hard Masks, **Hugo da Silva Alvarez**, **J Diniz**, **C Ruiz**, **A Silva**, **F Cioldin**, **V Junior**, UNICAMP, Brazil

**PS-TuP-13** Corrosion Barrier Coatings for Aerospace Materials Deposited by Atmospheric Pressure CVD, **Dhruval Patel**, **Z Jeckell**, **T Choi**, **D Barlaz**, **L Bonova**, **D Krostad**, **D Ruzic**, University of Illinois at Urbana-Champaign; **S Chaudhuri**, University of Illinois at Chicago

**PS-TuP-14** Atmospheric Pressure Plasma: An Alternative Tool for the Synthesis of Efficient Photocatalytic Materials, **S Ptasinska**, **Amal Sebastian**, University of Notre Dame

**PS-TuP-15** Synthesis of Functional Polydopamine using Atmospheric Pressure Plasmas, **Yun Jong Jang**, **M Mun**, **J Kim**, **D Kim**, **G Yeom**, Sungkyunkwan University, Republic of Korea

**PS-TuP-16** Effect of C<sub>x</sub>(x=4~7)F<sub>8</sub> on the Etch Properties in Inductively Coupled Plasmas, **Hyun Woo Tak**, **D Sung**, **Y Shin**, **D Kim**, **G Yeom**, Sungkyunkwan University, Republic of Korea

**PS-TuP-17** Effect of Surface Charge Accumulation on Ion Current Distribution in Radio-frequency Magnetron Discharges, **Bocong Zheng**, **K Wang**, **T Schuelke**, Fraunhofer USA; **Q Fan**, Michigan State University

**PS-TuP-18** The Research of a Oxide Thin Films to be Etched Process Under Cryogenic Conditions, **Sang-Beom Han**, Samsung Electronic Company, Republic of Korea

**PS-TuP-19** Plasma Etching High Aspect Ratio Carbon Nanotube Structures for a Neural Probe, **Spencer Roberts**, **G Chen**, Brigham Young University

**PS-TuP-20** NO<sub>x</sub> Fixation by Atmospheric Pressure N<sub>2</sub>/O<sub>2</sub> Filamentary DBD Plasma over Water: Physicochemical Mechanisms of Plasma-Liquid interactions, **Nepal Roy**, **C Pattyn**, Université libre de Bruxelles, Belgium; **A Remy**, **N Maira**, **F Reniers**, Université Libre de Bruxelles, Belgium

**PS-TuP-21** Simulation Study of Capacitively Coupled Radio Frequency Silane/Hydrogen Plasma Discharges - Effect of Tailored Voltage Waveforms, **S Huang**, **Keh-Chyang Leou**, National Tsing Hua University, Taiwan, Republic of China

## Surface Science Division

### Room Union Station AB - Session SS-TuP

#### Surface Science Poster Session

6:30pm

**SS-TuP-1** Mechanistic Studies of Thermal Dry Etching of Cobalt and Iron Thin Films, **Mahsa Konh**, **A Tepyakov**, University of Delaware

**SS-TuP-2** Reaction of ZnO Nanomaterial with a Mixture of Gas-phase Prop-2-ynoic acid and Acetic Acid to Control Surface Coverage of Reactive Functional Groups, **Dhamelyz Silva-Quinones**, **A Tepyakov**, University of Delaware

**SS-TuP-3** Platinum Deposition onto OH-terminated Si (100) and Boron-impregnated Si (100) Substrates, **Sana Rani**, **C Byron**, **A Tepyakov**, University of Delaware

**SS-TuP-4** Barium Adsorption and De-wetting on W(112), **Michael Mroz**, Ohio University; **S Tenney**, **C Eads**, Brookhaven National Laboratory; **M Kordesch**, Ohio University

**SS-TuP-5** Self-Catalyzed Gas-Phase Cycloaddition on "Clickable" Nanostructured CuO Surface, **Chuan He**, **A Tepyakov**, University of Delaware

**SS-TuP-6** XPS Study of the Gas Cluster Ion Beam Sputtering of PTFE and Oxygen-treated PTFE, **Bing Luo**, University of Minnesota

**SS-TuP-7** Ultra-high Resolution Imaging of Polymers using Atomic Force Microscopy: Structure and Property at Nanoscale, **V Korolkov**, Oxford Instruments-Asylum Research; **A Summerfield**, University of Manchester, UK; **A Murphy**, **D Amabilino**, University of Nottingham, UK; **P Beton**, The University of Nottingham, UK; **M Kocun**, **Roger Proksch**, Oxford Instruments-Asylum Research

**SS-TuP-9** Determining the Surface Electrical Potential at the Air/Water Interface, **Tehseen Adel**, **S Baumler**, **H Allen**, The Ohio State University

**SS-TuP-10** Surface Photovoltage Studies of UV-driven Hydrophilic Flipping in Polysulfone Thin Films, **John Reeks**, **N Posinski**, Texas Christian University; **T Haun**, Home School High School Student; **H Hilton**, Texas Christian University; **A Dorward**, Washington and Lee University; **E Bormashenko**, Ariel University, Israel; **Y Strzheimchny**, Texas Christian University

**SS-TuP-11** Tuning Spontaneous Supramolecular Assembly via Manipulation of Intermolecular Forces and Growth Environment, **Ryan Brown**, Clarkson University

**SS-TuP-12** State-Resolved Dissociative Chemisorption Dynamics with RAIRS Product Detection, **Laurin Joseph**, **S Shepardson-Fungairino**, **A Utz**, Tufts University

**SS-TuP-13** The Two-faced Role of Steps in the Isotopic Scrambling of Hydrogen on Pt, **Richard van Lent**, **L Juurlink**, Leiden University, Netherlands

**SS-TuP-14** It's Not just the Defects - How Terrace Symmetry Impacts H<sub>2</sub>O Adsorption at Ag Step Edges, **S Auras**, **Ludo Juurlink**, Leiden University, Netherlands

**SS-TuP-15** Hydration Lubrication Between Hydrophobic and Hydrophilic Surfaces, **Nir Kampf**, **I Rosenhek-Goldian**, **W Lin**, **J Klein**, Weizmann Institute of Science, Israel

**SS-TuP-17** Common Errors in XPS Peak Fitting, **George H. Major**, Brigham Young University; **C Easton**, CSIRO Manufacturing; **W Skinner**, Future Industries Institute; **D Baer**, Pacific Northwest National Laboratory; **M Linford**, Brigham Young University

**SS-TuP-18** Exploring the Extent of Hydrogen/Deuterium Exchange on Au(111) between Molecularly-bound Surface Species, **Hasan Kaleem**, **E Maxwell**, **M DePonte**, **J Baker**, **M Gillum**, **D Boyle**, **A Baber**, James Madison University

**SS-TuP-19** First-Principles Study of on-surface and Sub-surface Oxygen in Rh(111), **Kate Fanning**, **W Walkosz**, Lake Forest College; **J Garcia**, **H Iddir**, Argonne National Laboratory; **D Killelea**, Loyola University Chicago

**SS-TuP-20** STM/S Study of Domain Walls and Atomic Defects on the Surface of Iron-based Superconductors, **Zhuozhi Ge**, **Q Zou**, **M Fu**, **L Sanjeeewa**, **A Sefat**, **Z Gai**, Oak Ridge National Laboratory

## Vacuum Technology Division

### Room Union Station AB - Session VT-TuP

#### Vacuum Technology Poster Session

6:30pm

**VT-TuP-1** Dynamic High Pressure Technique for Surface Analysis of Gas Sensors in Quasi-operating Condition, **Taku Suzuki**, **Y Adachi**, **I Sakaguchi**, National Institute for Materials Science (NIMS), Japan

**VT-TuP-2** Fundamental Study for Practical Applications of Ti-Zr-V NEG Coating to General Vacuum Systems, **Makoto Okano**, **A Niwata**, **S Kitamura**, JEOL Ltd., Japan; **Y Tanimoto**, **X Jin**, **M Yamamoto**, **T Honda**, High Energy Accelerator Research Organization (KEK), Tsukuba, Japan

**VT-TuP-3** Fabrication and Characterization of a Variable Conductance Vacuum Valve to Control Pressure Level for a High Vacuum System, **Han Wook Song**, **S Woo**, Korea Research Institute of Standards and Science, Republic of Korea

**VT-TuP-4** Hellum Gas Transmission Rate of Elastomer Seal with a Back-up Ring Seal, **Masaharu Miki**, EM Technical Lab Inc., Japan; **S Nowatari**, **H Hanada**, IIDA Co., Ltd, Japan

**VT-TuP-5** Improved NEG Sputter Deposition System, **Philip Adderley**, **M Stutzman**, Jefferson Lab

**VT-TuP-6** Concepts for Reduced Load UHV Sealing Applications, **Ryan McCall**, Technetics Group

**VT-TuP-7** Quantitative Gas Analysis with Quadrupole Mass Spectrometers - Comparison and Limitations, **Gregory Thier**, **L Kephart**, Extrel CMS; **T Whitmore**, Henniker Scientific

**VT-TuP-8** Recent Developments of Home-made UHV SPM Systems and their Applications, **Qing Huan**, **Z Wu**, **R Ma**, **G He**, **Z Gao**, **L Bao**, **J Yuan**, **K Jin**, **H Gao**, Institute of Physics CAS, China

**VT-TuP-9** An Experimentally Backed Modeling of NEG Pump Operation During Saturation, **Derek Hammar**, Coe College; **Y Lushtak**, Cornell University

**VT-TuP-10** 3D printed Mini-Channel Plates - Vacuum Compatibility and Detector Performance, **Maram Alnahhas**, **J Moore**, Robot Nose Corporation

# Anticipated Schedule Wednesday, October 23, 2019

## Anticipated Schedule Wednesday Morning, October 23

8:00 AM	_____
8:20 AM	_____
8:40 AM	_____
9:00 AM	_____
9:20 AM	_____
9:40 AM	_____
10:00 AM	_____
10:20 AM	_____
10:40 AM	_____
11:00 AM	_____
11:20 AM	_____
11:40 AM	_____
12:00 PM	_____

## Anticipated Schedule Wednesday Lunch, October 23

When	_____
Where	_____
With	_____

## Anticipated Schedule Wednesday Afternoon, October 23

1:00 PM	_____
1:20 PM	_____
1:40 PM	_____
2:00 PM	_____
2:20 PM	_____
2:40 PM	_____
3:00 PM	_____
3:20 PM	_____
3:40 PM	_____
4:00 PM	_____
4:20 PM	_____
4:40 PM	_____
5:00 PM	_____
5:20 PM	_____
5:40 PM	_____
6:00 PM	_____

# Special Events Wednesday

## Special Events Wednesday

- 6:15 AM AVS 39th Annual 5 km Run (Register at the 5 km Booth before Wednesday)/TBD-Offsite
- 7:00 AM Member Center: Free Coffee for 2019 AVS Members/A111-112
- 7:00 AM Strategic Planning Committee Meeting & Breakfast/Pierce A-Hilton (by invitation)
- 7:30 AM AVS Diversity & Inclusion Committee Meeting & Breakfast/Gallerie Bistro-Lamp-Hilton (by invitation)
- 9:00 AM AVS Member Center: "One Hour with the National Academies: From Manufacturing Innovation to Quantum Consulting"/A111-112
- 10:00 AM AVS Career Center: "One-on-One Career Expert Advice -- Pre-Registration Required in Member Center, A111-112/Hall A
- 10:00 AM Session Coffee Break/Hall A
- 12:20 PM Exhibit Hall Lunch/Hall A
- 12:20 PM NSTD Graduate Student and Postdoc Award Competitions/A222
- 12:20 PM PSTD Coburn and Winters Adjudication Session (Closed Session)/B131 (by invitation)
- 12:30 PM AVS Member Center: "Keeping Current and Connected Lunch"/A111-112
- 12:30 PM Governance Committee Meeting and Lunch/Gallerie Bistro-Lamp-Hilton (by invitation)
- 12:30 PM PacSurf Committee Meeting & Lunch/Gallerie Bistro - Fireplace-Hilton (by invitation)
- 1:00 PM Biointerphases Strategic Planning Meeting/Schille Boardroom-Hilton (by invitation)
- 2:30 PM AVS Career Center: SIGN UP:\*\*One-on-One Career Expert Advice at the Career Center (Booth #146)  
-- Pre-Registration Required in Member Center, A111-112/Hall A
- 3:40 PM Session Refreshment Break/Hall A
- 4:30 PM Exhibitors & Manufacturers' Reception (Invitation Only)/Hall A (by invitation)
- 6:30 PM AVS Awards Ceremony & Reception/Battelle AB North



# Wednesday Morning, October 23, 2019

<b>Biomaterial Interfaces Division</b> <b>Room A120-121 - Session BI+AS-WeM</b> <b>Microbes and Fouling at Surfaces</b> <b>Moderators:</b> David G. Castner, University of Washington, Kenan Fears, U.S. Naval Research Laboratory		<b>Thin Films Division</b> <b>Room A122-123 - Session TF1-WeM</b> <b>Vapor Deposition of Functional Polymer Thin Films and Composites</b> <b>Moderators:</b> Adrienne Stiff-Roberts, Duke University, John (Jack) Lyons, U.S. Naval Research Laboratory	
8:00am	<b>BI+AS-WeM-1</b> Hydrophilic Polysaccharides as Building Blocks for Marine Fouling-release Coatings, <i>Axel Rosenhahn, V Jakobi, X Cao, W Yu, T Gnanasampanthan, R Wanka, J Schwarze, J Koc</i> , Ruhr-University Bochum, Germany; <i>M Grunze</i> , Heidelberg University, Germany; <i>J Finlay, A Clare</i> , Newcastle University, UK; <i>K Hunsucker, G Swain</i> , Florida Institute of Technology	<b>INVITED: TF1-WeM-1</b> Durable Surface Energy Control with Initiated Chemical Vapor Deposited (iCVD) Polymers, <i>Karen Gleason</i> , Massachusetts Institute of Technology  Invited talk continues.	
8:20am	<b>BI+AS-WeM-2</b> A Microfluidic Assay to Test the Adhesion of the Marine Bacterium <i>Cobetia Marina</i> Under Dynamic Shear Conditions, <i>Jana Schwarze, K Nolte, R Wanka, V Jakobi, A Rosenhahn</i> , Ruhr-University Bochum, Germany		
8:40am	<b>INVITED: BI+AS-WeM-3</b> Biofilm Mechanics as a Mechanism for Survival on Surfaces from Medical Device to Ship Hulls, <i>Paul Stoodley</i> , Ohio State University	<b>TF1-WeM-3</b> Initiated Chemical Vapor Deposition of poly(N-vinylcaprolactam)-based Cross-linked Smart Hydrogel Thin Films with Tunable Temperature-responsive Swelling Behavior, <i>Fabian Muralter, A Perrotta, A Coclite</i> , Graz University of Technology, Austria	
9:00am	Invited talk continues.	<b>TF1-WeM-4</b> Enhancing the Key Properties of CVD Polymer Thin Films for Device Fabrication, <i>Xiaoxue Wang</i> , The Ohio State University; <i>K Gleason</i> , Massachusetts Institute of Technology	
9:20am	<b>BI+AS-WeM-5</b> Dendritic Polyglycerols as Fouling-release Coatings Against Marine Hard- and Soft Foulers, <i>Robin Wanka</i> , Ruhr-University Bochum, Germany; <i>N Aldred, J Finlay</i> , Newcastle University, UK; <i>K Nolte, J Koc</i> , Ruhr-University Bochum, Germany; <i>H Gardner, K Hunsucker, G Swain</i> , Florida Institute of Technology; <i>C Anderson, A Clare</i> , Newcastle University, UK; <i>A Rosenhahn</i> , Ruhr-University Bochum, Germany	<b>TF1-WeM-5</b> Conductive Directly Fused Poly (Porphyrin) Coatings by an Oxidative Chemical Vapour Deposition Approach, <i>Kamal Baba, G Bangasi, G Frache, D El Assad, J Desport</i> , Luxembourg Institute of Science and Technology, Luxembourg; <i>K Heinze</i> , Johannes Gutenberg University of Mainz, Germany; <i>N Boscher</i> , Luxembourg Institute of Science and Technology, Luxembourg	
9:40am	<b>BI+AS-WeM-6</b> Nano- and Microscale ZnO with Controllable Abundance of Surface Polarity as a Platform to Study Antibacterial Action., <i>J Reeks, B Thach</i> , Texas Christian University; <i>W Moss</i> , Texas State University; <i>R Maheshwari</i> , Texas Academy of Mathematics and Science; <i>I Ali, S McGillivray, Yuri Strzhemechny</i> , Texas Christian University	<b>TF1-WeM-6</b> Molecular Design and Vapor Phase Synthesis of Crown-Ether-Based Thin Film Materials, <i>Darrin Liao, G Rubloff, S Lee, K Gregorczyk</i> , University of Maryland, College Park	
10:00am	<b>BREAK - Complimentary Coffee in Exhibit Hall</b>	<b>BREAK - Complimentary Coffee in Exhibit Hall</b>	
10:20am	<b>BREAK - Complimentary Coffee in Exhibit Hall</b>	<b>BREAK - Complimentary Coffee in Exhibit Hall</b>	
10:40am	<b>BREAK - Complimentary Coffee in Exhibit Hall</b>	<b>BREAK - Complimentary Coffee in Exhibit Hall</b>	
11:00am	<b>BI+AS-WeM-10</b> Patterning Bacteria at Interfaces with Bio-Inspired Vascularized Polymers, <i>K Marquis, B Chasse, Caitlin Howell</i> , University of Maine	<b>TF1-WeM-10</b> Chemical Insolubility of Vapor Phase Infiltrated Poly(methyl methacrylate) / AlOx Hybrid Materials, <i>Emily McGuinness, C Leng, M Losego</i> , Georgia Institute of Technology	
11:20am	<b>BI+AS-WeM-11</b> Chemical Imaging of Root-Microbe Interactions, <i>Vaithiyalingam Shutthanandan, A Martinez, R Boiteau</i> , Pacific Northwest National Laboratory	<b>TF1-WeM-11</b> Atomic and Molecular Layer Deposition of Hybrid Mothiolate Thin Films, <i>Jingwei Shi, C MacIsaac, L Zeng, S Bent</i> , Stanford University	
11:40am	<b>BI+AS-WeM-12</b> Biocompatible Silver Nanoparticles-loaded Chitosan Membranes with Antibacterial Activity Produced by Directed Liquid-Plasma Nanosynthesis, <i>Camilo Jaramillo, A Civantos, A Mesa, J Allain</i> , University of Illinois at Urbana-Champaign	<b>TF1-WeM-12</b> Electroactive Thin Films of Conjugated Polymers: Energy Conversion and Storage, <i>Shayan Kaviani, E Tavakoli, S Nejati</i> , University of Nebraska-Lincoln	
12:00pm	<b>BI+AS-WeM-13</b> Multifunctional 2D MoS <sub>2</sub> -Based Nanoplatfrom for Multimodal Synergistic Inactivation of Superbugs, <i>Paresh Ray</i> , Jackson State University	<b>TF1-WeM-13</b> Promotion of Crystalline Polyfluorene Domains in Thin Films Deposited by RIR-MAPLE, <i>Spencer Ferguson, B Zhang, A Stiff-Roberts</i> , Duke University	

# Wednesday Morning, October 23, 2019

<b>New Challenges to Reproducible Data and Analysis</b> <b>Focus Topic</b> <b>Room A124-125 - Session RA+AS+CA+PS+TF-WeM</b> <b>Reproducibility in Science and Engineering, including materials and energy systems</b> <b>Moderators:</b> Karen Gaskell, University of Maryland, College Park, Svitlana Pylypenko, Colorado School of Mines		<b>Magnetic Interfaces and Nanostructures Division</b> <b>Room A210 - Session MI+2D-WeM</b> <b>Emerging Multifunctional Magnetic Materials I and Magnetocaloric Materials</b> <b>Moderators:</b> Greg Szulczewski, The University of Alabama, Igor Barsukov, UC Riverside	
8:00am	<b>INVITED: RA+AS+CA+PS+TF-WeM-1</b> Reproducibility and Replicability in Science and Engineering: a Report by the National Academies, <i>T Winters</i> , National Academies of Sciences, Engineering, and Medicine; <i>Dianne Chong</i> , Boeing Research and Technology (Retired)	<b>MI+2D-WeM-1</b> Spin-dependent Electron Reflection at Materials with Strong Spin-orbit Interaction, <i>Markus Donath</i> , <i>C Angrick</i> , <i>A Reimann</i> , <i>C Datzer</i> , <i>A Blob</i> , Muenster University, Germany; <i>J Braun</i> , LMU München,, Germany; <i>H Ebert</i> , LMU München, Germany	
8:20am	Invited talk continues.	<b>MI+2D-WeM-2</b> Competitive and Cooperative Electronic States in $\text{Ba}(\text{Fe}_{1-x}\text{Tx})_2\text{As}_2$ , <i>Q Zou</i> , <i>M Fu</i> , <i>Z Wu</i> , <i>L Li</i> , <i>A Li</i> , <i>D Parker</i> , <i>A Safat</i> , <b>Zheng Gai</b> , Oak Ridge National Laboratory	
8:40am	<b>INVITED: RA+AS+CA+PS+TF-WeM-3</b> Directly Assessing Reproducibility in Materials Chemistry Research Using Literature Meta-analysis, <i>David Sholl</i> , Georgia Institute of Technology	<b>INVITED: MI+2D-WeM-3</b> Microscopic Origin of High Temperature Magnetism in Multiferroic Superlattices $(\text{LuFeO}_3)_m/(\text{LuFe}_2\text{O}_4)_n$ , <i>Janice Musfeldt</i> , <i>S Fan</i> , <i>K Smith</i> , University of Tennessee Knoxville; <i>H Das</i> , <i>A Rebola</i> , Cornell University; <i>B Holinsworth</i> , University of Tennessee Knoxville; <i>J Mundy</i> , University of California at Berkeley; <i>C Brooks</i> , <i>M Holtz</i> , Cornell University; <i>R Ramesh</i> , University of California at Berkeley; <i>D Muller</i> , <i>D Schlom</i> , <i>C Fennie</i> , Cornell University; <i>S McGill</i> , National High Magnetic Field Laboratory	
9:00am	Invited talk continues.	Invited talk continues.	
9:20am	<b>INVITED: RA+AS+CA+PS+TF-WeM-5</b> Reproducibility in Fundamental and Applied Science, <i>George Crabtree</i> , Argonne National Laboratory, University of Illinois at Chicago	<b>INVITED: MI+2D-WeM-5</b> Hidden Local Spin-polarized Electronic States investigated by Spin- and Angle-resolved Photoelectron Spectroscopy, <i>Taichi Okuda</i> , Hiroshima University, Japan	
9:40am	Invited talk continues.	Invited talk continues.	
10:00am	<b>BREAK - Complimentary Coffee in Exhibit Hall</b>	<b>BREAK - Complimentary Coffee in Exhibit Hall</b>	
10:20am	<b>BREAK - Complimentary Coffee in Exhibit Hall</b>	<b>BREAK - Complimentary Coffee in Exhibit Hall</b>	
10:40am	<b>BREAK - Complimentary Coffee in Exhibit Hall</b>	<b>BREAK - Complimentary Coffee in Exhibit Hall</b>	
11:00am	<b>RA+AS+CA+PS+TF-WeM-10</b> Representativeness of a TEM image for Revealing New Phenomenon in Energy Storage Materials, <i>Chongmin Wang</i> , Pacific Northwest National Laboratory; <i>D Baer</i> , Pacific Northwest National Laboratory	<b>INVITED: MI+2D-WeM-10</b> Compositional Tuning of Magnetic Exchange Interactions and Interpretation of the Pressure Dependence of the Magnetic Curie Temperature in High Entropy Alloys., <i>Michael Mchenry</i> , Carnegie Mellon University	
11:20am	<b>RA+AS+CA+PS+TF-WeM-11</b> Reproducibility Issues when Developing Catalysts for Fuel Cell Applications, <i>M Dzara</i> , <i>S Zaccarine</i> , Colorado School of Mines; <i>K Artyushkova</i> , Physical Electronics and University of New Mexico; <i>Svitlana Pylypenko</i> , Colorado School of Mines	Invited talk continues.	
11:40am	<b>INVITED: RA+AS+CA+PS+TF-WeM-12</b> Challenges in Multimodal Spectroscopic Analysis of Energy Storage Materials, <i>Vijayakumar Murugesan</i> , Pacific Northwest National Laboratory; <i>K Mueller</i> , Joint Center for Energy Storage Research (JCESR)	<b>MI+2D-WeM-12</b> Epitaxy of Novel $\text{Co}_{1.5}\text{Ti}_{0.5}\text{FeGe}$ Heusler Alloy Thin Films, <i>Shambhu KC</i> <sup>1</sup> , <i>R Mahat</i> , <i>T Evans</i> , <i>S Budhathoki</i> , <i>G Mankey</i> , <i>A Gupta</i> , <i>P LeClair</i> , The University of Alabama	
12:00pm	Invited talk continues.	<b>MI+2D-WeM-13</b> Spin Transport in NiO Measured with Ferromagnetic Resonance, <i>G Mankey</i> , <i>T Evans</i> , <i>S KC</i> , <i>Arjun Sapkota</i> , <i>T Mewes</i> , The University of Alabama	

# Wednesday Morning, October 23, 2019

<b>Spectroscopic Ellipsometry Focus Topic</b> <b>Room A212 - Session EL+AS+EM+TF-WeM</b> <b>Optical Characterization of Thin Films and Nanostructures</b> <b>Moderators:</b> Eva Bittrich, Leibniz Institute of Polymer Research Dresden, Tino Hofmann, University of North Carolina at Charlotte		<b>Fundamental Discoveries in Heterogeneous Catalysis Focus Topic</b> <b>Room A213 - Session HC+2D+SS-WeM</b> <b>Exotic Nanostructured Surfaces for Heterogeneously-Catalyzed Reactions</b> <b>Moderators:</b> Ashleigh Baber, James Madison University, Erin Iski, University of Tulsa	
8:00am	<b>EL+AS+EM+TF-WeM-1</b> Enhanced Strong Near Band Edge Emission from Lanththanide Doped Sputter Deposited ZnO, <i>C Heng</i> , Beijing Institute of Technology, China; <i>W Xiang, T Wang</i> , Beijing Institute of Technology, China; <i>W Su</i> , Beijing Institute of Technology, China; <i>P Yin</i> , Beihang University, China; <i>Terje G Finstad</i> , University of Oslo, Norway		
8:20am	<b>EL+AS+EM+TF-WeM-2</b> Ellipsometry Study of PLD based Temperature Controlled Thin Film Depositions of CdSe on ITO Substrates, <i>Flavia Inbanathan</i> , Ohio University; <i>M Ebdah</i> , King Saud University, Kingdom of Saudi Arabia; <i>P Kumar</i> , Gurukula Kangri Vishwavidyalaya, India; <i>K Dasari</i> , Texas State University; <i>R Katiyar</i> , University of Puerto Rico; <i>W Jadwisieniczak</i> , Ohio University	<b>HC+2D+SS-WeM-2</b> Selective Alkane Chemistry on IrO <sub>2</sub> (110) Surfaces, <i>Aravind Asthagiri</i> , <i>M Kim</i> , The Ohio State University; <i>J Weaver</i> , University of Florida	
8:40am	<b>INVITED: EL+AS+EM+TF-WeM-3</b> The Application of Mueller Matrix Spectroscopic Ellipsometry to Scatterometry Measurement of Feature Dimension and Shape for Integrated Circuit Structures, <i>Alain C. Diebold</i> , SUNY Polytechnic Institute	<b>INVITED: HC+2D+SS-WeM-3</b> Design of Nanostructured Catalysts for Better Performance, <i>Francisco Zaera</i> , University of California, Riverside	
9:00am	Invited talk continues.	Invited talk continues.	
9:20am	<b>EL+AS+EM+TF-WeM-5</b> Optical Constants and Thickness of Ultrathin Thermally Evaporated Iron Films, <i>Nick Allen</i> , <i>D Shah</i> , <i>R Vanfleet</i> , <i>M Linford</i> , <i>R Davis</i> , Brigham Young University	<b>HC+2D+SS-WeM-5</b> Characterization of a Pd/Ag(111) Single Atom Alloy Surface Using CO as a Probing Molecule for H <sub>2</sub> Dissociation, <i>Mark Muir</i> , <i>M Trenary</i> , University of Illinois at Chicago	
9:40am	<b>EL+AS+EM+TF-WeM-6</b> Birefringent Photonic Crystals for Polarization-discriminating Infrared Focal Plane Arrays, <i>Marc Lata</i> , <i>Y Li</i> , <i>S Park</i> , <i>M McLamb</i> , <i>T Hofmann</i> , University of North Carolina at Charlotte	<b>HC+2D+SS-WeM-6</b> Propyne Hydrogenation over a Pd/Cu(111) Single Atom Alloy Catalyst Studied with Infrared Spectroscopy, <i>Mohammed Abdel-Rahman</i> , <i>M Trenary</i> , University of Illinois at Chicago	
10:00am	<b>BREAK - Complimentary Coffee in Exhibit Hall</b>	<b>BREAK - Complimentary Coffee in Exhibit Hall</b>	
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10:40am	<b>BREAK - Complimentary Coffee in Exhibit Hall</b>	<b>BREAK - Complimentary Coffee in Exhibit Hall</b>	
11:00am	<b>EL+AS+EM+TF-WeM-10</b> Relevance of hidden Valleys in the Dequenching of Room-temperature-emitting Ge Layers, <i>T Sakamoto</i> , <i>Y Yasutake</i> , University of Tokyo, Japan; <i>J Kanasaki</i> , Osaka City University, Japan; <i>Susumu Fukatsu</i> , University of Tokyo, Japan	<b>INVITED: HC+2D+SS-WeM-10</b> "Single-Atom" Catalysis: How Structure Influences Reactivity, <i>Gareth S. Parkinson</i> , TU Wien, Austria	
11:20am	<b>INVITED: EL+AS+EM+TF-WeM-11</b> Spectroscopic Ellipsometry on Organic Thin Films - From in-situ Bio-sensing to Active Layers for Organic Solar Cells, <i>Eva Bittrich</i> , <i>P Uhlmann</i> , <i>K Eichhorn</i> , Leibniz Institute of Polymer Research Dresden, Germany; <i>M Schubert</i> , University of Nebraska-Lincoln, Linköping University, Sweden, Leibniz Institute of Polymer Research Dresden, Germany; <i>M Levichkova</i> , <i>K Walzer</i> , Heliatek GmbH, Germany	Invited talk continues.	
11:40am	Invited talk continues.	<b>HC+2D+SS-WeM-12</b> Oxidation Reactions on Rh(111), <i>Marie Turano</i> , <i>G Hildebrandt</i> , Loyola University Chicago; <i>R Farber</i> , The University of Chicago; <i>D Killelea</i> , Loyola University Chicago	
12:00pm	<b>EL+AS+EM+TF-WeM-13</b> Optical Dielectric Function of Si(bzimpy) <sub>2</sub> – A Hexacoordinate Silicon Pincer Complex Determined by Spectroscopic Ellipsometry, <i>Yanzeng Li</i> , <i>M Kocherga</i> , <i>S Park</i> , <i>M Lata</i> , <i>M McLamb</i> , <i>G Boreman</i> , <i>T Schmedake</i> , <i>T Hofmann</i> , University of North Carolina at Charlotte	<b>HC+2D+SS-WeM-13</b> Adsorption and Motion of Atomic Oxygen on the Surface and Subsurface of Ag(111) and Ag(110), <i>S Isbill</i> , <i>C Mize</i> , <i>L Crosby</i> , <i>Sharani Roy</i> , University of Tennessee Knoxville	

# Wednesday Morning, October 23, 2019

<b>Electronic Materials and Photonics Division</b> <b>Room A214 - Session EM+2D+AS+MI+MN+NS+TF-WeM</b> <b>Nanostructures and Nanocharacterization of Electronic and Photonic Devices</b> <b>Moderators:</b> Sang M. Han, University of New Mexico, Jason Kawasaki, University of Wisconsin - Madison		<b>2D Materials</b> <b>Room A216 - Session 2D+AS+MI+NS-WeM</b> <b>2D Materials Characterization by Scanning Probe Microscopy and Spectroscopy</b> <b>Moderator:</b> Ivan Oleynik, University of South Florida	
8:00am	<b>EM+2D+AS+MI+MN+NS+TF-WeM-1</b> Photonic Thermal Conduction in Semiconductor Nanowires, <i>E Tervo, M Gustafson, Z Zhang, B Cola, Michael A. Filler</i> , Georgia Institute of Technology	<b>2D+AS+MI+NS-WeM-1</b> Plasmon Induced Excitation of Doublet Emission at the Single Molecule Level, <i>Alberto Martin-Jimenez, K Lauwaet</i> , IMDEA Nanoscience, Spain; <i>P Merino, J Martinez</i> , ICMM-CSIC, Spain; <i>R Miranda, R Otero</i> , IMDEA Nanoscience, Spain	
8:20am	<b>EM+2D+AS+MI+MN+NS+TF-WeM-2</b> Electric Field-Induced Defect Migration and Dielectric Breakdown in ZnO Nanowires, <i>Hantian Gao, M Haseman</i> , Department of Physics, The Ohio State University; <i>H von Wenckstern, M Grundmann</i> , Universität Leipzig, Felix-Bloch-Institut für Festkörperphysik; <i>L Brillson</i> , The Ohio State University	<b>2D+AS+MI+NS-WeM-2</b> Silicene like Domains on IrSi <sub>3</sub> Crystallites, <i>Nuri Oncel, D Cakir, F Fatima, D Nicholls</i> , University of North Dakota	
8:40am	<b>EM+2D+AS+MI+MN+NS+TF-WeM-3</b> Characterization of SiGe/Si Multilayer FIN Structures using X-Ray Diffraction Reciprocal Space Maps, <i>Roopa Gowda, M Korde</i> , SUNY Polytechnic Institute; <i>M Wormington</i> , Jordan Valley Semiconductors Inc.; <i>A Diebold</i> , SUNY Polytechnic Institute	<b>INVITED: 2D+AS+MI+NS-WeM-3</b> Interfacial and Topological Superconductivity in 2D Layers Studied by Spin-Resolved Scanning Tunneling Spectroscopy, <i>Roland Wiesendanger</i> , University of Hamburg, Germany	
9:00am	<b>EM+2D+AS+MI+MN+NS+TF-WeM-4</b> Nanoscale Depth and Lithiation Dependence of V <sub>2</sub> O <sub>5</sub> Band Structure by Cathodoluminescence Spectroscopy, <i>Mitchell Walker, N Pronin</i> , The Ohio State University; <i>A Jarry, J Ballard, G Rubloff</i> , University of Maryland, College Park; <i>L Brillson</i> , The Ohio State University	Invited talk continues.	
9:20am	<b>INVITED: EM+2D+AS+MI+MN+NS+TF-WeM-5</b> Electron Microscopy of Quantum Materials: From Learning Physics to Atomic Manipulation, <i>Sergei Kalinin</i> , Oak Ridge National Laboratory	<b>2D+AS+MI+NS-WeM-5</b> Geometric Imaging of Borophene Polymorphs, <i>Xiaolong Liu</i> , Northwestern University; <i>L Wang</i> , Rice University; <i>S Li, M Rahn</i> , Northwestern University; <i>B Yakobson</i> , Rice University; <i>M Hersam</i> , Northwestern University	
9:40am	Invited talk continues.	<b>2D+AS+MI+NS-WeM-6</b> Atomic Manipulation of Defects in the Layered Semiconductor 2H-MoTe <sub>2</sub> , <i>Sara Mueller, S Deng</i> , The Ohio State University; <i>B St. Laurent</i> , University of New Hampshire; <i>Y Wang, W Windl</i> , The Ohio State University; <i>S Hollen</i> , University of New Hampshire; <i>J Gupta</i> , The Ohio State University	
10:00am	<b>BREAK - Complimentary Coffee in Exhibit Hall</b>	<b>BREAK - Complimentary Coffee in Exhibit Hall</b>	
10:20am	<b>BREAK - Complimentary Coffee in Exhibit Hall</b>	<b>BREAK - Complimentary Coffee in Exhibit Hall</b>	
10:40am	<b>BREAK - Complimentary Coffee in Exhibit Hall</b>	<b>BREAK - Complimentary Coffee in Exhibit Hall</b>	
11:00am	<b>EM+2D+AS+MI+MN+NS+TF-WeM-10</b> Hot Electron Emission from Waveguide Integrated Graphene, <i>Ragib Ahsan, F Rezaeifar, H Chae, R Kapadia</i> , University of Southern California	<b>2D+AS+MI+NS-WeM-10</b> Scanning Tunneling Microscopy and Spectroscopy of a Heterotriangulene-based 2D Polymer, <i>Zachery Anderson, H Murali, R Dasari, T Parker, S Marder, H Li, Q Dai, S Thomas, J Brédas, P First</i> , Georgia Institute of Technology	
11:20am	<b>EM+2D+AS+MI+MN+NS+TF-WeM-11</b> Imaging Candidate Nanoelectronic Materials with Photoemission Electron Microscopy (PEEM), <i>Sujitra Pookpanratana, S Robey</i> , National Institute of Standards and Technology (NIST); <i>T Ohta</i> , Sandia National Laboratories	<b>2D+AS+MI+NS-WeM-11</b> Scanning Tunneling Microscopy Investigations of Molecules Adsorbed on Semiconducting Graphene Nanoribbons, <i>Sineth Premarathna, K Lat, S Hla</i> , Ohio University	
11:40am	<b>EM+2D+AS+MI+MN+NS+TF-WeM-12</b> Comparison of Features for Au and Ir Adsorbed on the Ge (110) Surface, <i>Shirley Chiang</i> , University of California, Davis; <i>R Xie, H Xing</i> , Donghua University, China; <i>T Rahman</i> , University of Central Florida; <i>C Fong</i> , University of California, Davis	<b>2D+AS+MI+NS-WeM-12</b> Molecular Flexure and Atom Trapping with Sexiphenyl Molecules by Scanning Tunneling Microscope Manipulation, <i>Y Zhang, Shaaze Wang, K Braun, S Hla</i> , Ohio University	
12:00pm	<b>EM+2D+AS+MI+MN+NS+TF-WeM-13</b> Reference Materials for Localization Microscopy, <i>C Copeland, R Dixon, L Elliott, B Ilic</i> , National Institute for Science and Technology (NIST); <i>D Kozak, K Liao</i> , FDA, National Institute for Science and Technology (NIST); <i>J Liddle</i> , NIST Center for Nanoscale Science and Technology; <i>A Madison</i> , National Institute for Science and Technology (NIST); <i>J Myung</i> , FDA; <i>A Pintar, Samuel Stavis</i> , National Institute for Science and Technology (NIST)	<b>2D+AS+MI+NS-WeM-13</b> Localized Strain Effects in Spin-Polarized Density of States for 2D-MnGaN – a Room Temperature Ferromagnetic Monolayer, <i>Y Ma</i> , Ohio University; <i>K Meng</i> , The Ohio State University; <i>D Hunt, M Barral, V Ferrari</i> , CAC-CNEA, Argentina; <i>F Yang</i> , The Ohio State University; <i>Arthur Smith</i> , Ohio University	

# Wednesday Morning, October 23, 2019

<p><b>Complex Oxides: Fundamental Properties and Applications Focus Topic</b>  <b>Room A220-221 - Session OX+EM+MI+SS-WeM</b>  <b>Electronic and Magnetic Properties of Complex Oxide Surfaces and Interfaces</b>  <b>Moderators:</b> Yingge Du, Pacific Northwest National Laboratory, Vincent Smentkowski, GE Global Research Center</p>		<p><b>Nanometer-scale Science and Technology Division</b>  <b>Room A222 - Session NS-WeM</b>  <b>Optics and Scattering on the Nanoscale</b>  <b>Moderators:</b> Alex Belianinov, Oak Ridge National Laboratory, Nancy Burnham, Worcester Polytechnic Institute</p>	
8:00am	<p><b>OX+EM+MI+SS-WeM-1</b> Charge Transfer in Lanthanum Ferrite-Strontium Nickelate Superlattices, <b>Le Wang, Z Yang, M Bowden</b>, Pacific Northwest National Laboratory; <b>J Freeland</b>, Argonne National Laboratory; <b>Y Du, S Chambers</b>, Pacific Northwest National Laboratory</p>	<p><b>INVITED: NS-WeM-1</b> Semiconductor Nanowires for Optoelectronics Applications, <b>Chennupati Jagadish<sup>1</sup></b>, Australian National University, Australia</p>	
8:20am	<p><b>OX+EM+MI+SS-WeM-2</b> Self-healing Growth of LaNiO<sub>3</sub> on Mixed-terminated (LaAlO<sub>3</sub>)<sub>0.3</sub>-(Sr<sub>2</sub>AlTaO<sub>6</sub>)<sub>0.7</sub>, <b>Friederike Wrabel, H Hong, S Cook, T Andersen, D Hong, C Liu, A Bhattacharya, D Fong</b>, Argonne National Laboratory</p>	<p>Invited talk continues.</p>	
8:40am	<p><b>INVITED: OX+EM+MI+SS-WeM-3</b> Optoelectronics with Oxides and Oxide Heterostructures, <b>Alexander Demkov</b>, University of Texas at Austin</p>	<p><b>NS-WeM-3</b> Photonic-Plasmonic Fiber Probe for Nanoscale Chemical Imaging, <b>B Birmingham, K Minn, B Ko, H Lee, Zhenrong Zhang</b>, Baylor University</p>	
9:00am	<p>Invited talk continues.</p>	<p><b>NS-WeM-4</b> Nanoscale Infrared Confinement Using Surface Phonon Polaritons, <b>Vanessa Breslin, A Grafton</b>, National Research Council Postdoctoral Fellow; <b>D Ratchford, A Giles, K Fears, C So, S Katzer, C Ellis, J Tischler</b>, U.S. Naval Research Laboratory; <b>J Caldwell</b>, Vanderbilt University; <b>A Dunkelberger, J Owrutsky</b>, U.S. Naval Research Laboratory</p>	
9:20am	<p><b>INVITED: OX+EM+MI+SS-WeM-5</b> Medard W. Welch Award Lecture: Defect-Mediated Coupling of Built-in Potentials at Buried Interfaces Involving Epitaxial Complex Oxides, <b>Scott. A Chambers<sup>2</sup></b>, Pacific Northwest National Laboratory</p>	<p><b>INVITED: NS-WeM-5</b> Actuating and Probing a Single-molecule Switch at Femtosecond Timescales, <b>D Peller, L Kastner, T Buchner, C Roelcke, F Albrecht, R Huber, Jascha Repp</b>, University of Regensburg, Germany</p>	
9:40am	<p>Invited talk continues.</p>	<p>Invited talk continues.</p>	
10:00am	<p><b>BREAK - Complimentary Coffee in Exhibit Hall</b></p>	<p><b>BREAK - Complimentary Coffee in Exhibit Hall</b></p>	
10:20am	<p><b>BREAK - Complimentary Coffee in Exhibit Hall</b></p>	<p><b>BREAK - Complimentary Coffee in Exhibit Hall</b></p>	
10:40am	<p><b>BREAK - Complimentary Coffee in Exhibit Hall</b></p>	<p><b>BREAK - Complimentary Coffee in Exhibit Hall</b></p>	
11:00am	<p><b>OX+EM+MI+SS-WeM-10</b> Spin Transport Studies on Epitaxial Ultrathin SrIrO<sub>3</sub> Films Grown using Pulsed Laser Deposition (PLD), <b>M S Ramachandra Rao</b>, Indian Institute of Technology, India; <b>K Sethupathi, T Suraj, S Suresh</b>, Indian Institute of Technology Madras, India</p>	<p><b>INVITED: NS-WeM-10</b> Nanoscale Structural Imaging through Bragg Diffraction Microscopy, <b>Martin Holt</b>, Argonne National Laboratory</p>	
11:20am	<p><b>OX+EM+MI+SS-WeM-11</b> Structural and Dielectric Characterization of Epitaxial Entropy-Stabilized Oxide Thin Films, <b>George Kotsonis, J Maria</b>, Pennsylvania State University</p>	<p>Invited talk continues.</p>	
11:40am	<p><b>OX+EM+MI+SS-WeM-12</b> Oxygen Vacancy-Mediated Epitaxy: TiO<sub>2</sub>(111)/Al<sub>2</sub>O<sub>3</sub>(0001) and Ferromagnetic Cr<sub>2</sub>O<sub>3</sub>(0001)/TiO<sub>2</sub>(111), <b>C Ladewig, F Anwar, Jeffrey Kelber</b>, University of North Texas; <b>S Shah, P Dowben</b>, University of Nebraska-Lincoln</p>	<p><b>NS-WeM-12</b> First Launch of XTIP - The World's First User Program for the Combination of Scanning Tunneling Microscopy with Synchrotron Radiation, <b>Volker Rose, N Shirato, D Rosenmann, M Fisher, S Hla</b>, Argonne National Laboratory</p>	
12:00pm	<p><b>OX+EM+MI+SS-WeM-13</b> Incorporation of Ti into Epitaxial Films of Magnetite, <b>Tiffany Kaspar, S Spurgeon, D Schreiber, S Taylor, M Bowden, S Chambers</b>, Pacific Northwest National Laboratory</p>	<p><b>NS-WeM-13</b> Application of Scanning Tunneling Microscopy and Tip-Enhanced Raman Spectroscopy to the Study of Intermolecular and Molecule-Substrate Interactions, <b>Jeremy Schultz<sup>3</sup>, N Jiang</b>, University of Illinois at Chicago</p>	

<sup>1</sup> NSTD Recognition Award

<sup>2</sup> Medard W. Welch Award Winner

<sup>3</sup> NSTD Graduate Student Award Finalist

# Wednesday Morning, October 23, 2019

<b>2D Materials</b> <b>Room A226 - Session 2D+EM+MI+MN+NS+QS-WeM</b> <b>Novel 2D Materials</b> <b>Moderator:</b> Phil King, University of St Andrews		<b>Atomic Scale Processing Focus Topic</b> <b>Room B130 - Session AP+BI+PS+TF-WeM</b> <b>Surface Reaction Analysis and Emerging Applications of Atomic Scale Processing</b> <b>Moderator:</b> Eric A. Joseph, IBM Research Division, T.J. Watson Research Center	
8:00am	<b>INVITED: 2D+EM+MI+MN+NS+QS-WeM-1</b> A Safari Through Thousands of Layered Materials Guided by Data Science Techniques, <i>Evan Reed, G Cheon</i> , Stanford University	8:00am	<b>INVITED: AP+BI+PS+TF-WeM-1</b> Open Spaces in Al <sub>2</sub> O <sub>3</sub> Film Deposited on Widegap Semiconductors Probed by Monoenergetic Positron Beams, <i>Akira Uedono</i> , University of Tsukuba, Japan; <i>T Nabatame</i> , NIMS, Japan; <i>W Egger</i> , <i>T Koschne</i> , Universität der Bundeswehr München, Germany; <i>C Hugenschmidt</i> , <i>M Dickmann</i> , Technische Universität München, Germany; <i>M Sumiya</i> , NIMS, Japan; <i>S Ishibashi</i> , AIST, Japan
8:20am	Invited talk continues.	8:20am	Invited talk continues.
8:40am	<b>2D+EM+MI+MN+NS+QS-WeM-3</b> 2D Ferroelectric Semiconductor $\alpha$ -In <sub>2</sub> Se <sub>3</sub> for Non-Volatile Memory Applications, <i>M Si, Peide Ye</i> , Purdue University	8:40am	<b>AP+BI+PS+TF-WeM-3</b> Surface Reaction Analyses of Atomic-layer Etching by Controlled Beam Experiments, <i>Kazuhiro Karahashi, T Ito, S Hamaguchi</i> , Osaka University, Japan
9:00am	<b>2D+EM+MI+MN+NS+QS-WeM-4</b> <i>Ab initio</i> Informed Theory of Axis-dependent Conduction Polarity in Goniopolar Materials, <i>Yaxian Wang, B He, M Arguilla, N Cultrara, M Scudder, J Goldberger, J Heremans, W Windl</i> , The Ohio State University	9:00am	<b>AP+BI+PS+TF-WeM-4</b> Surface Reaction Analysis of Fluorine-based Reactive Ion Etching (RIE) and Atomic Layer Etching (ALE) by Molecular Dynamics (MD) Simulation, <i>Erin Joy Tinacba, M Isobe, K Karahashi, S Hamaguchi</i> , Osaka University, Japan
9:20am	<b>2D+EM+MI+MN+NS+QS-WeM-5</b> In-Plane Mechanical Properties and Strain Engineering of 2D Hybrid Organic-Inorganic Perovskites, <i>Qing Tu, I Spanopoulos, S Hao, C Wolverton, M Kanatzidis, G Shekawat, V David</i> , Northwestern University	9:20am	<b>AP+BI+PS+TF-WeM-5</b> Analysis of Metal Surface during Atomic Layer Etching with Gas Cluster Ion Beam and Organic Acid, <i>Noriaki Toyoda, K Uematsu</i> , University of Hyogo, Japan
9:40am	<b>2D+EM+MI+MN+NS+QS-WeM-6</b> Collective Electronic States of Epitaxial Monolayer 1T-NbSe <sub>2</sub> , <i>Zhuozhi Ge</i> , University of Wisconsin; <i>H Zhang, L Liu, C Yan</i> , West Virginia University; <i>M Weinert</i> , University of Wisconsin; <i>L Li</i> , West Virginia University	9:40am	<b>AP+BI+PS+TF-WeM-6</b> In-situ Characterization of Growth Kinetics of Piezoelectric Films Grown by Atomic Layer Deposition Utilizing an Ultra-high Purity Process Environment, <i>Nicholas Strnad</i> , General Technical Services, LLC; <i>D Potrepka</i> , U.S. Army Research Laboratory; <i>N O'Toole, B Rayner</i> , Kurt J. Lesker Company; <i>J Pulskamp</i> , U.S. Army Research Laboratory
10:00am	<b>BREAK - Complimentary Coffee in Exhibit Hall</b>	10:00am	<b>BREAK - Complimentary Coffee in Exhibit Hall</b>
10:20am	<b>BREAK - Complimentary Coffee in Exhibit Hall</b>	10:20am	<b>BREAK - Complimentary Coffee in Exhibit Hall</b>
10:40am	<b>BREAK - Complimentary Coffee in Exhibit Hall</b>	10:40am	<b>BREAK - Complimentary Coffee in Exhibit Hall</b>
11:00am	<b>2D+EM+MI+MN+NS+QS-WeM-10</b> Magnetic Interfaces of MnSe <sub>2</sub> Monolayer, <i>Tomas Rojas, S Ulloa</i> , Ohio University	11:00am	<b>INVITED: AP+BI+PS+TF-WeM-10</b> Nanoscale Surface Modification of Medical Devices using Accelerated Neutral Atom Beam Technology, <i>Dmitry Shashkov, J Khoury, B Phok</i> , Exogenesis Corp.
11:20am	<b>2D+EM+MI+MN+NS+QS-WeM-11</b> Orbital Design of Topological Insulators from Two-dimensional Semiconductors, <i>Shixuan Du</i> , Institute of Physics, Chinese Academy of Sciences, China	11:20am	Invited talk continues.
11:40am	<b>INVITED: 2D+EM+MI+MN+NS+QS-WeM-12</b> Rotationally Controlled van der Waals Heterostructures of 2D Materials, <i>Emanuel Tutuc, K Kim, G Burg, H Movva</i> , The University of Texas at Austin	11:40am	<b>AP+BI+PS+TF-WeM-12</b> Chemically Enhanced Patterning of Nickel for Next Generation EUV Mask, <i>Xia (Gary) Sang, E Chen</i> , University of California, Los Angeles; <i>T Tronic, C Choi</i> , Intel Corporation; <i>J Chang</i> , University of California, Los Angeles
12:00pm	Invited talk continues.	12:00pm	<b>AP+BI+PS+TF-WeM-13</b> Surface Reactions of Low Energy Electrons and Ions with Organometallic Precursors and their Relevance to Charged Particle Deposition Processes, <i>Rachel Thorman</i> , Johns Hopkins University; <i>E Bilgiliysoy</i> , FAU Erlangen-Nürnberg, Germany; <i>S Matsuda, L McElwee-White</i> , University of Florida; <i>D Fairbrother</i> , Johns Hopkins University

# Wednesday Morning, October 23, 2019

Room B131		
8:00am	<b>INVITED: PS+EM-WeM-1</b> Plasma Processes for High Efficiency Multi-Junction Solar Cells Fabrication, <i>Maxime Darnon, M Volatier, P Albert, M de Lafontaine, P St-Pierre, G Hamon</i> , LN2, CNRS / Université de Sherbrooke, 3IT, Canada; <i>C Petit-Etienne, G Gay, E Pargon</i> , LTM, CNRS / Université Grenoble Alpes, France; <i>V Aimez, S Fafard, A Jaouad</i> , LN2, CNRS / Université de Sherbrooke, 3IT, Canada	<b>Plasma Science and Technology Division</b> <b>Session PS+EM-WeM</b> <b>Plasma Processing of Materials for Energy</b> <b>Moderators:</b> Ankur Agarwal, KLA-Tencor, Saravanapriyan Sriraman, Lam Research Corp
8:20am	Invited talk continues.	
8:40am	<b>PS+EM-WeM-3</b> Combinatorial Synthesis of Ternary Oxides by Reactive Sputtering for CdTe Solar Cells, <i>Yegor Samoilenko, G Yeung, C Wolden</i> , Colorado School of Mines	
9:00am	<b>PS+EM-WeM-4</b> Potential Applications of TiN-based Plasmonic Nanoparticles: From Plasmon-induced Chemistry to Photothermal Absorption, <i>A Alvarez Barragan, C Berrospe Rodriguez, Lorenzo Mangolini</i> , University of California, Riverside	
9:20am	<b>PS+EM-WeM-5</b> Plasma-induced Strain in MoS <sub>2</sub> Films for the Electrochemical Hydrogen Evolution Reaction, <i>T Liu, X Liu, Souvik Bhattacharya</i> , Case Western Reserve University; <i>Z Ye, R He</i> , Texas Tech University; <i>X Gao, R Akolkar, R Sankaran</i> , Case Western Reserve University	
9:40am	<b>PS+EM-WeM-6</b> Comparison of Pulsed and Continuous Wave Argon Plasmas for the Synthesis of Vertical Graphene Nanosheets, <i>Zoe Mann, E Fisher</i> , Colorado State University	
10:00am	<b>BREAK - Complimentary Coffee in Exhibit Hall</b>	
10:20am	<b>BREAK - Complimentary Coffee in Exhibit Hall</b>	
10:40am	<b>BREAK - Complimentary Coffee in Exhibit Hall</b>	
11:00am	<b>INVITED: TF2-WeM-10</b> Peter Mark Memorial Award Lecture: Molecular Beam Epitaxial Growth of Novel Plasmonic Materials: Heavily-doped Semiconductors and Topological Insulators, <i>Stephanie Law</i> <sup>1</sup> , University of Delaware	
11:20am	Invited talk continues.	
11:40am	<b>TF2-WeM-12</b> Impact of Interface Quality on the Strength of Volume Plasmon Polaritons in Hyperbolic Metamaterials, <i>Patrick Sohr, D Wei</i> , University of Delaware; <i>S Tomasulo, M Yakes</i> , U.S. Naval Research Laboratory; <i>S Law</i> , University of Delaware	
12:00pm	<b>TF2-WeM-13</b> Transparent Microelectrode Arrays made by Ion Beam Assisted Deposition for Neuronal Cell <i>in vitro</i> Recordings, <i>Tomi Ryyänen</i> , Tampere University, Finland; <i>R Mzezewa, E Meriläinen, T Hyvärinen, J Lekkala, S Narkilahti, P Kallio</i> , Tampere University	

<sup>1</sup> Peter Mark Memorial Award Winner

# Wednesday Morning, October 23, 2019

<b>Room B231-232</b>		
8:00am	<b>QS+2D+EM+MN+NS+VT-WeM-1</b> Quantum Information at the Molecular Foundry - An Overview of New Toolsets for QIS Research, <i>Adam Schwartzberg, S Cabrini, D Ogletree, A Weber-Bargioni</i> , Lawrence Berkeley National Laboratory (LBNL)	<b>Materials and Processes for Quantum Information, Computing and Science Focus Topic Session QS+2D+EM+MN+NS+VT-WeM Material Systems and Applications for Quantum Sciences</b>  <b>Moderators:</b> Mena Gadalla, Harvard University, Kai Xiao, Oak Ridge National Laboratory
8:20am	<b>QS+2D+EM+MN+NS+VT-WeM-2</b> Quantum Vacuum Metrology to Advance Quantum Science Capabilities, <i>Jay Hendricks, J Ricker, K Douglass</i> , National Institute of Standards and Technology (NIST); <i>J Fedchak, J Scherschligt</i> , National Institute of Standards and Technology (NIST)	
8:40am	<b>INVITED: QS+2D+EM+MN+NS+VT-WeM-3</b> Quantum Control of Spins in Silicon Carbide with Photons and Phonons, <i>David Awschalom, S Whiteley, G Wolfowicz, K Miao</i> , University of Chicago	
9:00am	Invited talk continues.	
9:20am	<b>QS+2D+EM+MN+NS+VT-WeM-5</b> Tunable Control over InSb(110) Surface Conductance Utilizing Charged Defects, <i>Robert Walko, S Mueller, S Gant, J Repicky, S Tjung, E Lang, E Fuller, K Werner</i> , The Ohio State University; <i>F Bergmann</i> , Bergmann Messgeraete Entwicklung; <i>E Chowdhury, J Gupta</i> , The Ohio State University	
9:40am	<b>QS+2D+EM+MN+NS+VT-WeM-6</b> Quantum Calligraphy: Writing Single-Photon Emitters in a Two-Dimensional Materials Platform, <i>Matthew R. Rosenberger</i> , U.S. Naval Research Laboratory; <i>C Dass</i> , Air Force Research Laboratory; <i>H Chuang, S Sivaram, K McCreary</i> , U.S. Naval Research Laboratory; <i>J Hendrickson</i> , Air Force Research Laboratory; <i>B Jonker</i> , U.S. Naval Research Laboratory	
10:00am	<b>BREAK - Complimentary Coffee in Exhibit Hall</b>	
10:20am	<b>BREAK - Complimentary Coffee in Exhibit Hall</b>	
10:40am	<b>BREAK - Complimentary Coffee in Exhibit Hall</b>	
11:00am	<b>INVITED: QS+2D+EM+MN+NS+VT-WeM-10</b> Challenges in Topological and Quantum Materials, <i>David Alan Tennant</i> , Oak Ridge National Laboratory	
11:20am	Invited talk continues.	
11:40am	<b>QS+2D+EM+MN+NS+VT-WeM-12</b> Rare Earth Silicon Photonics Engineering for Quantum Applications, <i>A Nandi, X Jiang, D Pak</i> , Purdue University; <i>D Perry, E Bielejec</i> , Sandia National Laboratories; <i>Y Xuan, Mahdi Hosseini</i> , Purdue University	



# Wednesday Afternoon, October 23, 2019

<b>2D Materials</b> <b>Room A216 - Session 2D+EM+MN+NS-WeA</b> <b>2D Device Physics and Applications</b> <b>Moderator: Jyoti Katoch, Carnegie Mellon University</b>		<b>Applied Surface Science Division</b> <b>Room A211 - Session AS+CA+LS-WeA</b> <b>Operando Characterization Techniques for In situ Surface Analysis of Energy Devices</b> <b>Moderator: Svitlana Pylypenko, Colorado School of Mines</b>	
2:20pm	<b>INVITED: 2D+EM+MN+NS-WeA-1</b> Monolayer Electronics and Optoelectronics - Advances, Opportunities and Challenges, <i>Ali Javey</i> , University of California at Berkeley	<b>INVITED: AS+CA+LS-WeA-1</b> Probing the Electronic Structure of Electrocatalysts and the Formation of Reaction Intermediates, <i>Kelsey Stoerzinger</i> , Oregon State University	
2:40pm	Invited talk continues.	Invited talk continues.	
3:00pm	<b>2D+EM+MN+NS-WeA-3</b> Investigation on Graphene Band-gap Engineering for Graphene Transistors Applications, <i>Benfdila Arezki</i> , University M. Mammeri Tizi-Ouzou, Algeria	<b>AS+CA+LS-WeA-3</b> Surface Characterization of Battery Electrode/Electrolyte Materials Using XPS and ToF-SIMS, <i>Elisa Harrison, S Peczonczyk, S Simko</i> , Ford Motor Company; <i>K Wujcik</i> , Blue Current; <i>A Sharafi, A Drews</i> , Ford Motor Company	
3:20pm	<b>2D+EM+MN+NS-WeA-4</b> Fully Inkjet Printed, High Photo-responsive, 2D WSe <sub>2</sub> -Graphene Based Flexible Photodetector, <i>R Hossain, A Kaul, Avra Bandyopadhyay</i> , University of North Texas	<b>AS+CA+LS-WeA-4</b> In Operando Molecular Imaging of Microbes as an Electrode, <i>Xiao-Ying Yu</i> , Pacific Northwest National Laboratory	
3:40pm	<b>BREAK</b>	<b>BREAK</b>	
4:00pm	<b>BREAK</b>	<b>BREAK</b>	
4:20pm	<b>2D+EM+MN+NS-WeA-7</b> Chemical Vapor Sensing with Transition Metal Dichalcogenides via Photoluminescence Modulation, <i>Aubrey T. Hanbicki, P Campbell, S Sivaram</i> , U.S. Naval Research Laboratory; <i>A Kusterbeck</i> , Nova Research, Inc.; <i>V Nguyen, A McGill, K McCreary, B Jonker, E Cobas, K Perkins</i> , U.S. Naval Research Laboratory; <i>A Friedman</i> , Laboratory for Physical Sciences	<b>INVITED: AS+CA+LS-WeA-7</b> Operando-XPS Investigation of Low-Volatile Liquids and Their Interfaces using Lab-Based Instruments, <i>Sefik Suzer</i> , Bilkent University, Turkey	
4:40pm	<b>2D+EM+MN+NS-WeA-8</b> Effective and Robust Graphene Immunological Sensors Functionalized through Non-covalent Ninding of Antibody-Conjugated Tripodal Compound, <i>A Hugo</i> , CEA-LETI, France; <i>C Sun</i> , Northwestern University; <i>M Kumar</i> , CEA-LETI, France; <i>R Othmen, J Renard, V Bouchiat</i> , CNRS-Institut Néel, France; <i>J Mann</i> , Northwestern University; <i>J Parpia, H Craighead</i> , Cornell University; <i>P Mailley</i> , CEA-LETI, France; <i>W Dichtel</i> , Northwestern University; <b>Thomas ALAVA</b> , CEA-LETI, France	Invited talk continues.	
5:00pm	<b>INVITED: 2D+EM+MN+NS-WeA-9</b> Electronic Properties of Ultra-Thin Na <sub>3</sub> Bi: A Platform for a Topological Transistor, <i>Mark Edmonds</i> , Monash University, Australia	<b>AS+CA+LS-WeA-9</b> Decoupling Surface and Interface Evolution in Polymer Electrolyte Membrane Systems Through In Situ X-Ray Photoelectron Spectroscopy, <i>Michael Dzara</i> <sup>1,2</sup> , Colorado School of Mines; <i>K Artyushkova</i> , Physical Electronics; <i>H Eskandari, K Karan</i> , University of Calgary, Canada; <i>K Neyerlin</i> , National Renewable Energy Laboratory; <i>S Pylypenko</i> , Colorado School of Mines	
5:20pm	Invited talk continues.	<b>AS+CA+LS-WeA-10</b> Low Temperature Scanning Tunneling Microscopy and Spectroscopy of Semiconductor Nanowire Device Surfaces, <i>Yen-Po Liu, Y Liu, S Mousavi, L Sodergren, F Lindelöw, S Lehmann, K Dick Thelander, E Lind, R Timm, A Mikkelsen</i> , Lund University, Sweden	
5:40pm	<b>2D+EM+MN+NS-WeA-11</b> Transparent Conductive Oxides in Contact with 2-D Materials, <i>Ravindra Mehta, A Bandyopadhyay, A Kaul</i> , University of North Texas	<b>AS+CA+LS-WeA-11</b> Work-function Estimation and In situ Measurement of Photoemission Spectroscopy of CuFeO <sub>2</sub> under Near Ambient Condition, <i>Soumya Banerjee, P Sapkota</i> , University of Notre Dame; <i>A Cabrera</i> , Pontificia Universidad Católica de Chile, Chile; <i>S Ptasinska</i> , University of Notre Dame	
6:00pm	<b>2D+EM+MN+NS-WeA-12</b> Negative Fermi-level Pinning Effect Induced by Graphene Interlayer in Metal/Graphene/Semiconductor Junction, <i>H Yoon, W Song</i> , Ulsan National Institute of Science and Technology (UNIST), Republic of Korea; <i>S Jung</i> , SK Hynix, Republic of Korea; <i>J Kim</i> , Ulsan National Institute of Science and Technology (UNIST); <i>K Mo, G Choi, H Jeong, J Lee, Kibog Park</i> , Ulsan National Institute of Science and Technology (UNIST), Republic of Korea	<b>AS+CA+LS-WeA-12</b> In-situ X-ray Photoelectron Spectroscopic Study of III-V Semiconductor/H <sub>2</sub> O Interfaces under Light Illumination, <i>Pitambar Sapkota, S Ptasinska</i> , University of Notre Dame	

<sup>1</sup> ASSD Student Award Finalist

<sup>2</sup> National Student Award Finalist

# Wednesday Afternoon, October 23, 2019

	<b>Chemical Analysis and Imaging Interfaces Focus Topic</b> <b>Room A120-121 - Session CA+NS+SS+VT-WeA</b> <b>Chemical Analysis and Imaging of Liquid/Vapor/Solid Interfaces I</b> <b>Moderators:</b> Juan Yao, Pacific Northwest National Laboratory, Andrei Kolmakov, National Institute of Standards and Technology (NIST)	<b>Spectroscopic Ellipsometry Focus Topic</b> <b>Room A212 - Session EL+EM-WeA</b> <b>Spectroscopic Ellipsometry: Novel Applications and Theoretical Approaches</b> <b>Moderators:</b> Vanya Darakchieva, Linköping University, Sweden, Nikolas Podraza, University of Toledo
2:20pm	<b>INVITED: CA+NS+SS+VT-WeA-1</b> Chemical Analysis and Imaging of Environmental Interfaces, <i>Vicki Grassian</i> , University of California at San Diego	<b>EL+EM-WeA-1</b> Optical Hall Effect in the Multi-valley Semiconductor Te-doped GaSb, <i>Farzin Abadizaman</i> , <i>C Emminger</i> , New Mexico State University; <i>S Knight</i> , University of Nebraska-Lincoln; <i>M Schubert</i> , University of Nebraska-Lincoln, Linköping University, Sweden, Leibniz Institute of Polymer Research Dresden, Germany; <i>S Zollner</i> , New Mexico State University
2:40pm	Invited talk continues.	<b>EL+EM-WeA-2</b> Study of the Temperature-dependent Optical Constants of Noble Metals based on High Temperature Spectroscopic Ellipsometry, <i>Jiamin Liu</i> , <i>H Jiang</i> , <i>S Liu</i> , Huazhong University of Science and Technology, China
3:00pm	<b>INVITED: CA+NS+SS+VT-WeA-3</b> Liquid/Vapor Interfaces Investigated with Photoelectron Spectroscopy, <i>Hendrik Bluhm</i> , Fritz Haber Institute of the MPG, Germany	<b>EL+EM-WeA-3</b> Optical Monitor for the Attitude Tracking using Polarimetry, <i>Song Zhang</i> , <i>H Gu</i> , <i>H Jiang</i> , <i>S Liu</i> , Huazhong University of Science and Technology, China
3:20pm	Invited talk continues.	<b>EL+EM-WeA-4</b> New Progress on the Channeled Spectroscopic Ellipsometry and its Applications, <i>Gai Chin</i> , ULVAC Inc., Japan
3:40pm	<b>BREAK</b>	<b>BREAK</b>
4:00pm	<b>BREAK</b>	<b>BREAK</b>
4:20pm	<b>CA+NS+SS+VT-WeA-7</b> Methanol Hydration Studied by Liquid $\mu$ -jet XPS and DFT Simulations, <i>Jordi Fraxedas</i> , Catalan Institute of Nanoscience and Nanotechnology (ICN2), CSIC and BIST, Spain; <i>E Pellegrin</i> , <i>V Perez-Dieste</i> , <i>C Escudero</i> , CELLS-ALBA, Spain; <i>P Rejmak</i> , Institute of Physics PAS, Poland; <i>N Gonzalez</i> , <i>A Fontserè</i> , <i>J Prat</i> , <i>S Ferrer</i> , CELLS-ALBA, Spain	<b>INVITED: EL+EM-WeA-7</b> The Physics of Low Symmetry Metal Oxides: Applications of Ellipsometry, <i>Alyssa Mock</i> , U.S. Naval Research Laboratory; <i>S Knight</i> , <i>M Hilfiker</i> , University of Nebraska-Lincoln; <i>V Darakchieva</i> , <i>A Papamichail</i> , Linköping University, Sweden; <i>R Korlacki</i> , University of Nebraska-Lincoln; <i>M Tadjer</i> , U.S. Naval Research Laboratory; <i>Z Galazka</i> , <i>G Wagner</i> , Leibniz-Institut für Kristallzüchtung, Germany; <i>N Blumenschein</i> , North Carolina State University; <i>A Kuramata</i> , Novel Crystal Technology, Inc., Japan; <i>K Goto</i> , <i>H Murakami</i> , <i>Y Kumagai</i> , Tokyo University of Agriculture and Technology, Japan; <i>M Higashiwaki</i> , National Institute of Information and Communications Technology, Japan; <i>A Mauze</i> , <i>Y Zhang</i> , <i>J Speck</i> , University of California Santa Barbara; <i>M Schubert</i> , University of Nebraska-Lincoln, Linköping University, Sweden, Leibniz Institute of Polymer Research Dresden, Germany
4:40pm	<b>CA+NS+SS+VT-WeA-8</b> Survey of Ionic Liquid Interfaces under Vacuum and Ambient Conditions: An XPS Perspective, <i>Yehia Khalifa</i> , Ohio State University; <i>A Broderick</i> , <i>J Newberg</i> , University of Delaware; <i>Y Zhang</i> , <i>E Maginn</i> , University of Notre Dame	Invited talk continues.
5:00pm	<b>CA+NS+SS+VT-WeA-9</b> Ambient Pressure XPS Study of Gallium-Indium Eutectic (EGaIn) Surface under Oxygen and Water Vapor, <i>Meng Jia</i> , <i>J Newberg</i> , University of Delaware	<b>EL+EM-WeA-9</b> Terahertz Dielectric Anisotropy in Randomly Distributed, Spatially Coherent Polymethacrylate Microwire Arrays Fabricated by Stereolithography, <i>Serang Park</i> , University of North Carolina at Charlotte; <i>Y Li</i> , University Of North Carolina at Charlotte; <i>S Lee</i> , Harris Corp.; <i>S Schöche</i> , <i>C Herzinger</i> , J.A. Woollam Co., Inc.; <i>T Hofmann</i> , University Of North Carolina at Charlotte
5:20pm	<b>CA+NS+SS+VT-WeA-10</b> Laboratory-based Hard X-ray Photoelectron System for the study of Interfaces, <i>Susanna Eriksson</i> , Scienta Omicron	<b>EL+EM-WeA-10</b> Ultrafast Dynamics of Ge, InP and Si Proved by Time-Resolved Ellipsometry, <i>Shirly Espinoza</i> , <i>S Richter</i> , <i>M Rebarz</i> , Institute of Physics, Academy of Sciences of the Czech Republic, Czechia; <i>O Herrfurth</i> , <i>R Schmidt</i> , Universität Leipzig, Felix-Bloch-Institut für Festkörperphysik, Germany; <i>J Andreasson</i> , Institute of Physics, Academy of Sciences of the Czech Republic, Czechia; <i>S Zollner</i> , New Mexico State University
5:40pm		<b>EL+EM-WeA-11</b> Optical Properties of Organic-Inorganic Lead Halide Perovskite Thin Films for Photovoltaics, <i>Biwas Subedi</i> , <i>M Junda</i> , <i>K Ghimire</i> , <i>N Podraza</i> , University of Toledo
6:00pm		<b>EL+EM-WeA-12</b> Optical Constants of Ni at 300 K from 0.03 to 6.0 eV, <i>Stefan Zollner</i> , <i>F Abadizaman</i> , New Mexico State University

# Wednesday Afternoon, October 23, 2019

<b>Electronic Materials and Photonics Division</b> <b>Room A214 - Session EM+2D+NS+TF-WeA</b> <b>THEME Session: Electronics and Photonics for a Low-Carbon Future</b> <b>Moderators:</b> Michael A. Filler, Georgia Institute of Technology, Stephen McDonnell, University of Virginia		<b>Fundamental Discoveries in Heterogeneous Catalysis</b> <b>Focus Topic</b> <b>Room A213 - Session HC+OX+SS-WeA</b> <b>Metal-Support Interactions Driving Heterogeneously-Catalyzed Reactions</b> <b>Moderators:</b> Aravind Asthagiri, The Ohio State University, Jason Weaver, University of Florida	
2:20pm	<b>INVITED: EM+2D+NS+TF-WeA-1</b> Uncovering the Materials Paradigm for Solar Absorbers through In situ Imaging and Characterization, <i>Mariana Bertoni</i> , Arizona State University	<b>HC+OX+SS-WeA-1</b> Yttria-stabilized Zirconia (YSZ) Supports for Low Temperature Ammonia Synthesis, <i>Z Zhang, S Livingston</i> , Colorado School of Mines; <i>L Fitzgerald</i> , University College Dublin; <i>D Way, Colin Wolden</i> , Colorado School of Mines	
2:40pm	Invited talk continues.	<b>HC+OX+SS-WeA-2</b> Operando PTRF-XAFS Technique for 3D Structure Determination of Active Metal Sites on a Model Catalyst Surface under Working Conditions, <i>Satoru Takakusagi, L Bang, D Kido, Y Sato, K Asakura</i> , Hokkaido University, Japan	
3:00pm	<b>INVITED: EM+2D+NS+TF-WeA-3</b> Atomic Layer Deposition's Potential in Sustainability, <i>Karen Buechler</i> , ALD NanoSolutions	<b>INVITED: HC+OX+SS-WeA-3</b> Understanding and Tuning Catalytic Materials Using Nanocrystal Precursors, <i>Matteo Cargnello</i> , Stanford University	
3:20pm	Invited talk continues.	Invited talk continues.	
3:40pm	<b>BREAK</b>	<b>BREAK</b>	
4:00pm	<b>BREAK</b>	<b>BREAK</b>	
4:20pm	<b>EM+2D+NS+TF-WeA-7</b> Challenges in Materials and Processing to Implementation of Energy Efficient SiC Technology, <i>Mei-Chien Lu</i> , Monte Rosa Technology	<b>HC+OX+SS-WeA-7</b> CO <sub>2</sub> Hydrogenation on Supported Zirconium Oxide Clusters, <i>Yilin Ma<sup>1</sup></i> , Stony Brook University; <i>M White</i> , Brookhaven National Laboratory	
4:40pm	<b>EM+2D+NS+TF-WeA-8</b> High Efficiency of Hot Electron Transfer at a Metal-Insulator-Semiconductor to Electrolyte Interface, <i>Hyun Uk Chae, R Ahsan, Q Lin, R Kapadia</i> , University of Southern California	<b>HC+OX+SS-WeA-8</b> Tuning Surface Hydrophobicity to Enhance Reaction Rate of the Lewis Acid Zeolite Nano Sn Beta for Alcohol Ring Opening of Epoxides, <i>Nicholas Brunelli, A Spanos, A Parulkar, N Deshpande</i> , The Ohio State University	
5:00pm	<b>INVITED: EM+2D+NS+TF-WeA-9</b> Integrated Photocathodes for Solar Driven Conversion of Carbon Dioxide to value-added Products, <i>Joel Ager</i> , Lawrence Berkeley Lab, University of California, Berkeley	<b>INVITED: HC+OX+SS-WeA-9</b> Understanding Metal-Metal and Metal-Support Interactions in Bimetallic Catalysts, <i>Donna Chen</i> , University of South Carolina; <i>S Farzandh, D Shakya, A Brandt, T Maddumapatabandi</i> , University of South Carolina	
5:20pm	Invited talk continues.	Invited talk continues.	
5:40pm	<b>EM+2D+NS+TF-WeA-11</b> Modeling of Optical Scattering in White Beetle Scales, <i>Seung Ho Lee, S Han, S Han</i> , University of New Mexico		
6:00pm	<b>EM+2D+NS+TF-WeA-12</b> Boosting the Performance of WO <sub>3</sub> /n-Si for Photo-electrochemical Water Splitting: From the Role of Si to Interface Engineering, <i>Yihui Zhao</i> , Electrochemical Materials and Interfaces (EMI), Dutch Institute for Fundamental Energy Research (DIFFER), The Netherlands; <i>A Bieberle-Hütter</i> , Electrochemical Materials and Interfaces (EMI), Dutch Institute for Fundamental Energy Research (DIFFER), The Netherlands, The Netherlands; <i>G Brocks</i> , Center for Computational Energy Research, Department of Applied Physics, Eindhoven University of Technology; Computational Materials Science, Faculty of Science and Technology and MESA+ Institute for Nanotechnology, University of Twente, The Netherla, The Netherlands; <i>H Genuit</i> , Dutch Institute for Fundamental Energy Research (DIFFER), The Netherlands; <i>R Lavrijsen</i> , Physics of Nanostructures and Center for NanoMaterials (cNM), Department of Applied Physics, Eindhoven University of Technology, The Netherlands		

# Wednesday Afternoon, October 23, 2019

	<p><b>Advanced Ion Microscopy and Ion Beam Nano-engineering Focus Topic</b>  <b>Room B231-232 - Session HI+AS+CA-WeA</b>  <b>Advanced Ion Microscopy and Surface Analysis Applications</b>  <b>Moderators:</b> Richard Livengood, Intel Corporation, Armin Götzhäuser, University of Bielefeld, Germany</p>	<p><b>Magnetic Interfaces and Nanostructures Division</b>  <b>Room A210 - Session MI+2D-WeA</b>  <b>Emerging Multifunctional Magnetic Materials II</b>  <b>Moderators:</b> Valeria Lauter, Oak Ridge National Laboratory, Axel Hoffmann, Technical University of Berlin</p>
2:20pm	<p><b>INVITED: HI+AS+CA-WeA-1</b> Analytical Capabilities on FIB Instruments using SIMS: Applications, Current Developments and Prospects, <b>Tom Wirtz</b>, Luxembourg Institute of Science and Technology, Luxembourg; <i>J Audinot</i>, Luxembourg Institute of Science and Technology, Luxembourg; <i>J Lovric</i>, <i>O De Castro</i>, Luxembourg Institute of Science and Technology, Luxembourg</p>	<p><b>INVITED: MI+2D-WeA-1</b> Field and Current Control of the Electrical Conductivity of an Artificial Two-Dimensional Honeycomb Lattice, <b>Deepak Singh</b>, University of Missouri</p>
2:40pm	Invited talk continues.	Invited talk continues.
3:00pm	<p><b>HI+AS+CA-WeA-3</b> Correlated Materials Characterization via Multimodal Chemical Imaging using HIM-SIMS, <i>A Belianinov</i>, Oak Ridge National Laboratory; <i>S Kim</i>, Pusan National University, South Korea; <i>A Trofimov</i>, <b>Olga S. Ovchinnikova</b>, Oak Ridge National Laboratory</p>	<p><b>INVITED: MI+2D-WeA-3</b> Emergence and Dynamics of Magnetic Order in Metamagnetic Nanostructures, <b>Vojtech Uhlik</b>, CEITEC BUT, Brno University of Technology, Czech Republic</p>
3:20pm	<p><b>HI+AS+CA-WeA-4</b> Compositional Characterization of Biogenic Nanoparticles using the ORION NanoFab with SIMS, <b>Christelle Guillermier</b>, <i>F Khanom</i>, Carl Zeiss PCS, Inc.; <i>D Medina</i>, Northeastern University; <i>J Audinot</i>, Luxembourg Institute of Science and Technology, Luxembourg</p>	Invited talk continues.
3:40pm	<b>BREAK</b>	<b>BREAK</b>
4:00pm	<b>BREAK</b>	<b>BREAK</b>
4:20pm	<p><b>INVITED: HI+AS+CA-WeA-7</b> Effects of Ion Irradiation on Two-Dimensional Targets: What is Different from Bulk Materials, <b>Arkady V. Krasheninnikov</b>, Helmholtz-Zentrum Dresden-Rossendorf, Germany</p>	<p><b>MI+2D-WeA-7</b> Time Dependence in <math>\text{La}_{0.7}\text{Sr}_{0.3}\text{MnO}_3</math> Thin Films with Magnetic Competition, <b>Mikel B. Holcomb</b>, <i>R Trappen</i>, <i>N Mottaghi</i>, <i>S Yousefi</i>, <i>G Cabrera</i>, <i>G Bhandari</i>, <i>M Seehra</i>, West Virginia University</p>
4:40pm	Invited talk continues.	<p><b>INVITED: MI+2D-WeA-8</b> Optically Induced Magnetization through Spin States at Perovskite/Ferromagnetic Interface Revealed by Neutron Magnetorefectivity Studies, <b>Bin Hu</b>, University of Tennessee Knoxville</p>
5:00pm	<p><b>HI+AS+CA-WeA-9</b> Effects of He Ion Irradiation on Gold Nanoclusters: a Molecular Dynamics Study, <b>Sadegh Ghaderzadeh</b>, <i>M Ghorbani-Asl</i>, <i>S Kretschmer</i>, <i>G Hlawacek</i>, Helmholtz-Zentrum Dresden Rossendorf, Germany; <i>A Krasheninnikov</i>, Helmholtz-Zentrum Dresden-Rossendorf, Germany</p>	Invited talk continues.
5:20pm	<p><b>HI+AS+CA-WeA-10</b> Low Damage Imaging of Polymers with the Helium Ion Microscope, <b>Doug Wei</b>, Carl Zeiss, RMS, Inc.; <i>J Notte</i>, Carl Zeiss PCS, Inc.; <i>A Stratulat</i>, Carl Zeiss Microscopy, Ltd., UK</p>	<p><b>MI+2D-WeA-10</b> Effect of Interlayer and Underlayers on the Microstructure and Magnetic Softness in FeGa-based Ferromagnetic Composites, <b>Adrian Acosta</b>, <i>K Fitzell</i>, University of California, Los Angeles; <i>C Dong</i>, Northeastern University; <i>M Zurbuchen</i>, <i>N Sun</i>, <i>J Chang</i>, University of California, Los Angeles</p>
5:40pm	<p><b>HI+AS+CA-WeA-11</b> Imaging of Biological Cells with Helium-Ion Microscopy, <b>Natalie Frese</b>, <i>A Beyer</i>, <i>C Kaltschmidt</i>, <i>B Kaltschmidt</i>, Bielefeld University, Germany; <i>A Thomas</i>, Institute for Metallic Materials Dresden, Germany; <i>W Parak</i>, University of Hamburg, Germany; <i>A Götzhäuser</i>, Bielefeld University, Germany</p>	<p><b>MI+2D-WeA-11</b> Tunable Spin-polarized Edge Effects in Transition Metal Dichalcogenides on FM and AFM Substrates, <i>N Cortes</i>, Universidad Tecnica Federico Santa Maria, Chile; <b>Oscar Avalos-Ovando</b>, Ohio University; <i>L Rosales</i>, <i>P Orellana</i>, Universidad Tecnica Federico Santa Maria, Chile; <i>S Ulloa</i>, Ohio University</p>
6:00pm	<p><b>HI+AS+CA-WeA-12</b> Channeling in the Helium Ion Microscope, <b>Husein Hijazi</b>, <i>L Feldman</i>, <i>R Thorpe</i>, <i>M Li</i>, <i>T Gustafsson</i>, Rutgers University; <i>D Barbacci</i>, <i>A Schultz</i>, Ionwerks</p>	<p><b>MI+2D-WeA-12</b> Magnetocaloric Properties of Thin Film <math>\text{La}_{0.7}\text{Sr}_{0.3}\text{MnO}_3</math>: Magnetic Field Dependence and Effects of Superparamagnetism, <b>Navid Mottaghi</b><sup>1</sup>, <i>M Seehra</i>, <i>C Huang</i>, <i>S Kumari</i>, <i>S Yousefi Sarraf</i>, <i>G Cabrera</i>, <i>G Bhandari</i>, <i>R Trappen</i>, <i>M Holcomb</i>, West Virginia University</p>

# Wednesday Afternoon, October 23, 2019

<b>Manufacturing Science and Technology Group</b> <b>Room A226 - Session MS-WeA</b> <b>Science and Technology for Manufacturing: Solid State Batteries (ALL INVITED SESSION)</b> <b>Moderators:</b> Kelsy Hatzell, Vanderbilt University, Gary Rubloff, University of Maryland, College Park		<b>Nanometer-scale Science and Technology Division</b> <b>Room A222 - Session NS+2D+AS-WeA</b> <b>Probing and Modifying Surface and Interfacial Chemistry at the Nanoscale</b> <b>Moderators:</b> Phillip First, Georgia Institute of Technology, Adina Luican-Mayer, University of Ottawa, Canada	
2:20pm	<b>INVITED: MS-WeA-1</b> The Importance of Modifying the Nothing Within 3D Electrode Architectures for Solid-State Energy Storage, <i>Debra Rolison, M Sassin, C Chervin, J Parker, J Long</i> , U.S. Naval Research Laboratory		<b>NS+2D+AS-WeA-1</b> Bitumen's Microstructures are Correlated with its Bulk Thermal and Rheological Properties, <i>X Yu</i> , Worcester Polytechnic Institute; <i>S Granados-Facil</i> , Clark University; <i>M Tao, Nancy Burnham</i> , Worcester Polytechnic Institute
2:40pm	Invited talk continues.		<b>NS+2D+AS-WeA-2</b> Energetics and Statistical Mechanical Analysis of Complexation on Metal Surfaces, <i>J Lee, J Evans, T Windus, P Thiel, Da-Jiang Liu</i> , Ames Laboratory and Iowa State University
3:00pm	<b>INVITED: MS-WeA-3</b> Precision 3D Solid State Battery Architectures: Science, Challenges and Manufacturing Opportunity, <i>Sang Bok Lee Lee, G Rubloff</i> , University of Maryland, College Park		<b>INVITED: NS+2D+AS-WeA-3</b> Adding the Chemical Dimension to Lithography at All Scales: Enabling Cellular Therapies & Other Adventures in Biology and Medicine, <i>Paul S. Weiss<sup>1</sup></i> , University of California, Los Angeles
3:20pm	Invited talk continues.		Invited talk continues.
3:40pm	<b>BREAK</b>		<b>BREAK</b>
4:00pm	<b>BREAK</b>		<b>BREAK</b>
4:20pm	<b>INVITED: MS-WeA-7</b> Understanding the Electronic and Mechanical Properties of High Energy Density Anodes on 3D Structures, <i>Amy Prieto, J Ma, M Schulze</i> , Colorado State University		<b>NS+2D+AS-WeA-7</b> STM Directed Synthesis of Armchair Graphene Nanoribbons and Their Oxidation, <i>C Ma</i> , Oak Ridge National Laboratory; <i>Z Xiao</i> , North Carolina State University; <i>A Puzetky, Arthur Baddorf</i> , Oak Ridge National Laboratory; <i>W Lu</i> , North Carolina State University; <i>K Hong</i> , Oak Ridge National Laboratory; <i>J Bernholc</i> , North Carolina State University; <i>A Li</i> , Oak Ridge National Laboratory
4:40pm	Invited talk continues.		<b>NS+2D+AS-WeA-8</b> Carbon-based Two-dimensional Materials from Surface-catalyzed Reactions of Small Molecules, <i>M Wolf, C Gerber, Rebecca Quardokus</i> , University of Connecticut
5:00pm	<b>INVITED: MS-WeA-9</b> Enabling High Cycle Life Alkali Metal Anodes through Imposed Thermal Gradients, <i>R Atkinson III, EXCET, Inc.; R Carter, Corey Love</i> , U.S. Naval Research Laboratory		<b>INVITED: NS+2D+AS-WeA-9</b> Bottom-up Fabrication of 2D Molecular Networks via On-surface Reactions, <i>Sabine Maier</i> , University of Erlangen-Nürnberg, Germany
5:20pm	Invited talk continues.		Invited talk continues.
5:40pm			<b>NS+2D+AS-WeA-11</b> Determining the Jahn-Teller Stabilization Energy of Surface Vacancies on Si(111)-√3 x √3:B, <i>Daejin Eom</i> , Korea Research Institute of Standards and Science, Republic of Korea; <i>C Moon</i> , Korea Research Institute of Standards and Science; <i>J Koo</i> , Korea Research Institute of Standards and Science, Republic of Korea
6:00pm			<b>NS+2D+AS-WeA-12</b> Influence of the Substrate on Self-Assembly: Terphenyl Monolayers investigated by NC-AFM and FM-KPFM, <i>Niklas Biere<sup>2</sup></i> , Experimental Biophysics & Applied Nanoscience, University of Bielefeld, Germany; <i>S Koch, P Stohmann, Y Yang, A Götzhäuser</i> , Physics of Supramolecular Systems and Surfaces, University of Bielefeld, Germany; <i>D Anselmetti</i> , Experimental Biophysics & Applied Nanoscience, University of Bielefeld, Germany

<sup>1</sup> NSTD Recognition Award

<sup>2</sup> NSTD Graduate Student Award Finalist

# Wednesday Afternoon, October 23, 2019

<p><b>Plasma Science and Technology Division</b>  <b>Room B130 - Session PS-WeA</b>  <b>Commemorating the Career of John Coburn (ALL INVITED SESSION)</b>  <b>Moderators:</b> David Graves, University of California, Berkeley, R. Mohan Sankaran, Case Western Reserve University</p>		<p><b>New Challenges to Reproducible Data and Analysis</b>  <b>Focus Topic</b>  <b>Room A124-125 - Session RA+AS+BI-WeA</b>  <b>Addressing Reproducibility Challenges using Multi-Technique Approaches</b>  <b>Moderators:</b> Tony Ohlhausen, Sandia National Laboratory, Vincent Smentkowski, GE Global Research Center</p>
2:20pm	<p><b>PS-WeA-1</b> INVITED TALK: A Tribute to John W. Coburn, <i>David Graves</i>, University of California at Berkeley</p>	<p><b>RA+AS+BI-WeA-1</b> Responding to New and Old Challenges to Data, Analysis and Scientific Study Reproducibility, <i>Donald Baer</i>, Pacific Northwest National Laboratory; <i>I Gilmore</i>, National Physical Laboratory, UK</p>
2:40pm	<p><b>PS-WeA-2</b> INVITED TALK: Interfacial Chemistry in Highly Reactive Systems, <i>Frances Houle</i>, Lawrence Berkeley National Laboratory</p>	<p><b>RA+AS+BI-WeA-2</b> Achieving Reproducible Data: Examples from Surface Analysis in Semiconductor Technology, <i>Thierry Conard</i>, <i>P van der Heide</i>, <i>A Vanleenhove</i>, <i>C Zborowski</i>, <i>W Vandervorst</i>, IMEC, Belgium</p>
3:00pm	<p><b>PS-WeA-3</b> INVITED TALK: Rare Gas Actinometry Turns Thirty Nine and is Still Finding Applications, <i>Vincent M. Donnelly</i>, University of Houston</p>	<p><b>INVITED: RA+AS+BI-WeA-3</b> New Challenges in Analytical Reproducibility Illustrated with Old and New Case Studies, <i>Thomas Beebe Jr</i>, University of Delaware</p>
3:20pm	<p><b>PS-WeA-4</b> INVITED TALK: A Leader In Etching (ALE): How John Coburn Paved the way for Atomic Layer Etching, <i>Jane P. Chang</i>, University of California, Los Angeles</p>	<p>Invited talk continues.</p>
3:40pm	<p><b>BREAK</b></p>	<p><b>BREAK</b></p>
4:00pm	<p><b>BREAK</b></p>	<p><b>BREAK</b></p>
4:20pm	<p><b>PS-WeA-7</b> INVITED TALK: Materials Processing Using Low Temperature Plasma Surface Interactions: Examples of the Influence of John Coburn, <i>Gottlieb S. Oehrlein</i>, University of Maryland, College Park</p>	<p><b>INVITED: RA+AS+BI-WeA-7</b> Challenges and Approaches to Addressing Reproducibility in Biointerface Science and Engineering, <i>Sally McArthur</i>, Swinburne University of Technology and CSIRO. Australia, Australia</p>
4:40pm	<p><b>PS-WeA-8</b> INVITED TALK: A Brief Overview on Molecular Dynamics Simulations of Plasma-surface Interaction in Reactive Ion Etching, <i>Emilie Despiou-Pujo</i>, LTM, Univ. Grenoble Alpes, CNRS, France</p>	<p>Invited talk continues.</p>
5:00pm	<p><b>PS-WeA-9</b> INVITED TALK: Plasma ALD – A Discussion of Mechanisms, <i>K Arts</i>, <i>V Vandalon</i>, Eindhoven University of Technology, The Netherlands, Netherlands; <i>H Knoops</i>, Eindhoven University of Technology, The Netherlands; <i>Erwin Kessels</i>, Eindhoven University of Technology, The Netherlands, Netherlands</p>	<p><b>INVITED: RA+AS+BI-WeA-9</b> Complementary Measurements of Colloidal Nanoparticles and their Coatings by In-situ and Vacuum-based Methods, <i>Caterina Minelli</i>, National Physical Laboratory, UK</p>
5:20pm	<p><b>PS-WeA-10</b> INVITED TALK: RF Plasmas for Material Etching, Deposition, and Surface Modification, <i>Dennis Hess</i>, Georgia Institute of Technology</p>	<p>Invited talk continues.</p>
5:40pm		<p><b>RA+AS+BI-WeA-11</b> Multiple Technique Analysis of Perovskite Materials used in Battery and Fuel Cell Components, <i>Robin Simpson</i>, <i>P Mack</i>, <i>T Nunney</i>, Thermo Fisher Scientific, UK</p>
6:00pm		<p><b>RA+AS+BI-WeA-12</b> Mapping Local Physical Properties by Combining ToF-SIMS Analysis with Advanced Scanning Probe Microscopy, <i>Maiglid Andreina Moreno Villavicencio</i>, <i>N Chevalier</i>, <i>J Barnes</i>, CEA-LETI, France; <i>P Kermagoret</i>, <i>F Lorut</i>, ST Microelectronics, France; <i>B Gautier</i>, Université de Lyon, France</p>

# Wednesday Afternoon, October 23, 2019

<b>Advanced Surface Engineering Division</b> <b>Room A215 - Session SE+AS+TF-WeA</b> <b>Nanostructured Thin Films and Coatings</b> <b>Moderators:</b> Mehran Golizadeh, Montanuniversität Leoben, Austria, Suneel Kodambaka, University of California Los Angeles		<b>Surface Science Division</b> <b>Room A220-221 - Session SS+AS+HC+OX-WeA</b> <b>Reactions at Alloy Surfaces and Single Atom Catalysis</b> <b>Moderators:</b> Erin Iski, University of Tulsa, Bruce E. Koel, Princeton University	
2:20pm	<b>SE+AS+TF-WeA-1</b> Structural and Optical Properties of Pulsed-Laser Deposited $\beta$ -Ga <sub>2</sub> O <sub>3</sub> Thin Films, <i>Mallesham Bandi, V Zade, R Chintalapalle</i> , University of Texas at El Paso	<b>INVITED: SS+AS+HC+OX-WeA-1</b> Correlating Structure and Function for Nanoparticle Catalysts, <i>Graeme Henkelman</i> , University of Texas at Austin	
2:40pm	<b>SE+AS+TF-WeA-2</b> Structural, Electrical, and Optical Properties of Mo-Ga Alloy Thin Films, <i>Nivedita Lalitha Raveendran, R Chintalapalle</i> , University of Texas at El Paso	Invited talk continues.	
3:00pm	<b>SE+AS+TF-WeA-3</b> Metallic Glass: From Coating to First-Ever Nanotube Arrays, <i>Jinn P. Chu</i> , National Taiwan University of Science and Technology, Taiwan, Republic of China	<b>SS+AS+HC+OX-WeA-3</b> Surface Reactivity of PtAg and PdAg: From Single-Atom Alloys to Supported Nanoparticles, <i>Dipna Patel</i> <sup>1,2</sup> , Tufts University; <i>C O'Connor, R Madix, C Friend</i> , Harvard University; <i>E Sykes</i> , Tufts University	
3:20pm	<b>SE+AS+TF-WeA-4</b> Tin Oxide Nanoaggregate Fragmentation and Restructuring during Supersonic Impaction based Thin Film Deposition Processes, <i>Sauvik Ghosh, X Chen, C Li, B Olson, C Hogan</i> , University of Minnesota, Minneapolis	<b>SS+AS+HC+OX-WeA-4</b> Single-site Catalysts by Metal-ligand Complexation at Surfaces: From Model Systems in Vacuum to High-pressure Catalysis on Oxide Supports, <i>Steven L. Tait</i> , Indiana University	
3:40pm	<b>BREAK</b>	<b>BREAK</b>	
4:00pm	<b>BREAK</b>	<b>BREAK</b>	
4:20pm	<b>INVITED: SE+AS+TF-WeA-7</b> From Gas-ion to Metal-ion-controlled Irradiation: A Paradigm Shift in the Thin Film Growth by Magnetron Sputtering, <i>Grzegorz Greczynski</i> , Linköping University, Sweden; <i>I Petrov, J Greene</i> , University of Illinois at Urbana-Champaign; <i>L Hultman</i> , Linköping University, Sweden	<b>INVITED: SS+AS+HC+OX-WeA-7</b> Controlling the Local Coordination and Reactivity of Oxide-supported Atomically Dispersed Pt-group Species, <i>Phillip Christopher</i> , University of California at Santa Barbara	
4:40pm	Invited talk continues.	Invited talk continues.	
5:00pm	<b>SE+AS+TF-WeA-9</b> Atomic Layer Deposition of Silver Thin Film on Polydimethylsiloxane (PDMS), <i>Sarah Hashemi Astaneh, C Sukotjo, C Takoudis</i> , University of Illinois at Chicago	<b>SS+AS+HC+OX-WeA-9</b> Coordination Defines Reactivity of a Model Single-atom Catalyst: Ir <sub>1</sub> /Fe <sub>3</sub> O <sub>4</sub> (001), <i>Zdenek Jakub</i> <sup>1</sup> , <i>J Hulva, M Meier, U Diebold, G Parkinson</i> , TU Wien, Austria	
5:20pm	<b>SE+AS+TF-WeA-10</b> Fabrication of 2D Photonic Crystals using Block Copolymer Lithography on Flexible Substrates and Fibers for Wearable Technology, <i>Wade Ingram, R Spontak, J Jur</i> , North Carolina State University	<b>SS+AS+HC+OX-WeA-10</b> Capturing the Early Stages of Oxidation on Low-Index Ni and Ni-Cr Surfaces, <i>William H. Blades, P Reinke</i> , University of Virginia	
5:40pm	<b>SE+AS+TF-WeA-11</b> Use of an Einzel Lens to Enhance Electrohydrodynamic Printing Technology, <i>Matthew Strohmayer</i> <sup>3</sup> , <i>A Dhall, P Ramesh, N Tokranova, C Ventrice, Jr.</i> , SUNY Polytechnic Institute	<b>SS+AS+HC+OX-WeA-11</b> Evolution of Steady-state Material Properties during Catalysis: Oxidative Coupling of Methanol over Nanoporous Ag <sub>0.03</sub> Au <sub>0.97</sub> , <i>Matthijs van Spronsen</i> , Lawrence Berkeley National Laboratory; <i>B Zugic</i> , Harvard University; <i>M Salmeron</i> , Lawrence Berkeley National Laboratory; <i>C Friend</i> , Harvard University	
6:00pm		<b>SS+AS+HC+OX-WeA-12</b> Reduction and Oxidation of Transition Metal Oxides: From Tailoring the Surface and Interface Properties to the New Crystalline Phases Formation, <i>Dominik Wrana</i> , Jagiellonian University, Poland; <i>C Rodenbücher</i> , Forschungszentrum Jülich GmbH, Germany; <i>K Cieřlik, B Jany</i> , Jagiellonian University, Poland; <i>K Szot</i> , Forschungszentrum Jülich GmbH, Germany; <i>F Krok</i> , Jagiellonian University, Poland	

<sup>1</sup> Morton S. Traum Award Finalist

<sup>2</sup> National Student Award Finalist

<sup>3</sup> ASSD Student Award Finalist

# Wednesday Afternoon, October 23, 2019

<p><b>Thin Films Division</b>  <b>Room A122-123 - Session TF+EM-WeA</b>  <b>Emerging Thin Film Materials: Ultra-wide Bandgap and Phase Change Materials</b>  <b>Moderators:</b> Cary Pint, Vanderbilt University, Brent Sperling, National Institute of Standards and Technology (NIST), Jin-Seong Park, Hanyang University, Korea</p>		
2:20pm	<p><b>TF+EM-WeA-1</b> MOCVD Growth and Characterization of ZnGeN<sub>2</sub>-GaN Alloy Films, <b>Benthara Hewage Dinushi Jayatunga, K Kash</b>, Case Western Reserve University; <b>K Reza, H Zhao</b>, The Ohio State University; <b>O Ohanaka, R Lalk</b>, Case Western Reserve University; <b>M Zhu, J Hwang</b>, The Ohio State University</p>	
2:40pm	<p><b>TF+EM-WeA-2</b> Device Quality <math>\beta</math>-Ga<sub>2</sub>O<sub>3</sub> and Related Alloys by MOCVD, <b>Andrei Osinsky, F Alema</b>, Agnitron Technology, Inc.; <b>Y Zhang, A Mauze, J Speck</b>, University of California, Santa Barbara; <b>P Mukhopadhyay, W Schoenfeld</b>, University of Central Florida</p>	
3:00pm	<p><b>INVITED: TF+EM-WeA-3</b> Development of the <math>\beta</math>-(Al<sub>x</sub>Ga<sub>1-x</sub>)<sub>2</sub>O<sub>3</sub>/<math>\beta</math>-Ga<sub>2</sub>O<sub>3</sub> (010) Heterostructures by Plasma-assisted Molecular Beam Epitaxy, <b>James Speck</b>, University of California at Santa Barbara</p>	
3:20pm	Invited talk continues.	
3:40pm	<b>BREAK</b>	
4:00pm	<b>BREAK</b>	
4:20pm	<p><b>INVITED: TF+EM-WeA-7</b> Phase-Change Memory: A Quest from Material Engineering Towards the Device Performances, <b>Guillaume Bourgeois, G Navarro, M Cyrille, J Garrione, C Sabbione, M Bernard, E Nolot, E Nowak</b>, CEA-LETI, France</p>	
4:40pm	Invited talk continues.	
5:00pm	<p><b>TF+EM-WeA-9</b> Neuromorphic Materials and Architectures for Dynamic Learning and Edge Processing Applications, <b>Angel Yanguas-Gil</b>, Argonne National Laboratory</p>	
5:20pm	<p><b>TF+EM-WeA-10</b> Atomic Layer Deposited VO<sub>2</sub> Thin Films Towards Modulated Infrared Optoelectronic Devices, <b>Virginia Wheeler, C Ellis, M Currie, J Avila, M Meeker, A Giles</b>, U.S. Naval Research Laboratory; <b>J Caldwell</b>, Vanderbilt University; <b>J Tischler</b>, U.S. Naval Research Laboratory</p>	
5:40pm	<p><b>TF+EM-WeA-11</b> Deposition Process for Vanadium Dioxide Thin Films for RF Applications, <b>Mark Lust, S Chen, N Ghalichechian</b>, The Ohio State University</p>	
6:00pm	<p><b>TF+EM-WeA-12</b> Low Power, Microwave Solid State Oscillators Based on Phase Change Materials, <b>Yang Liu, Z Du, B Zhao, H Wang, J Ravichandran</b>, University of Southern California</p>	



# Anticipated Schedule Thursday, October 24, 2019

## Anticipated Schedule Thursday Morning, October 24

8:00 AM	_____
8:20 AM	_____
8:40 AM	_____
9:00 AM	_____
9:20 AM	_____
9:40 AM	_____
10:00 AM	_____
10:20 AM	_____
10:40 AM	_____
11:00 AM	_____
11:20 AM	_____
11:40 AM	_____
12:00 PM	_____

## Anticipated Schedule Thursday Lunch, October 24

When	_____
Where	_____
With	_____

## Anticipated Schedule Thursday Afternoon, October 24

1:00 PM	_____
1:20 PM	_____
1:40 PM	_____
2:00 PM	_____
2:20 PM	_____
2:40 PM	_____
3:00 PM	_____
3:20 PM	_____
3:40 PM	_____
4:00 PM	_____
4:20 PM	_____
4:40 PM	_____
5:00 PM	_____
5:20 PM	_____
5:40 PM	_____

# Special Events Thursday

## Special Events Thursday

- 7:00 AM Member Center: Free Coffee for 2019 AVS Members/A111-112
- 10:00 AM Session Coffee Break/Hall A
- 12:00 PM Nanometer-scale Science & Technology Flash Session/A222
- 12:20 PM Exhibit Finale & Refreshments/Hall A
- 12:20 PM PSTD Coburn and Winters Award Ceremony/B131
- 12:20 PM Surface Science Division Mort Traum Awards Ceremony/A220-221
- 12:30 PM 2020 Program Committee Chairs' Meeting & Lunch/Pierce B-Hilton (by invitation)
- 12:30 PM AVS Business Meeting/A120-121
- 12:30 PM AVS Member Center: "Writers Workshop and Lunch"/A111-112
- 3:00 PM AVS Member Center: "XPS for the Non-Analyst: Curve Fitting the Good, the Bad, and the Awful"/A111-112
- 3:30 PM History Committee Meeting/Hayden-Hilton (by invitation)
- 5:00 PM Advanced Ion Microscopy and Ion Beam Nano-engineering Flash Session/B231-232
- 5:20 PM How to Lead by Inspiration/A226
- 5:40 PM Heterogeneous Catalysis Graduate Student Presentation/A213
- 5:40 PM Thin Films Flash Session/A122-123
- 6:30 PM 2019/2020 Program Committee Reception and Dinner/Pierce AB-Hilton (by invitation)
- 6:30 PM Thursday Poster Session & Refreshments/Hall A
- 7:00 PM SSS Editorial Board Dinner/King-Hilton (by invitation)

# Thursday Morning, October 24, 2019

	<p><b>Chemical Analysis and Imaging Interfaces Focus Topic</b>  <b>Room A120-121 - Session CA+2D+AS+BI+NS-ThM</b>  <b>Chemical Analysis and Imaging of Liquid/Vapor/Solid Interfaces II</b>  <b>Moderators:</b> Utkur Mirsaidov, National University of Singapore, Xiao-Ying Yu, Pacific Northwest National Laboratory</p>	<p><b>Thin Films Division</b>  <b>Room A122-123 - Session TF+EM+NS+SS-ThM</b>  <b>Thin Films for Energy Harvesting and Conversion</b>  <b>Moderators:</b> Siamak Nejati, University of Nebraska-Lincoln, Xinwei Wang, Shenzhen Graduate School, Peking University</p>
8:00am	<p><b>INVITED: CA+2D+AS+BI+NS-ThM-1</b> From Surfaces to Solid-Gas and Solid-liquid Interfaces: Ambient Pressure XPS and Beyond, <b>Miquel B. Salmeron</b>, Lawrence Berkeley Lab, University of California, Berkeley</p>	<p><b>INVITED: TF+EM+NS+SS-ThM-1</b> Redesigning Batteries into Efficient Energy Harvesters and Sensors for Wearable Applications, <b>Cary Pint</b>, Vanderbilt University</p>
8:20am	Invited talk continues.	Invited talk continues.
8:40am	<p><b>CA+2D+AS+BI+NS-ThM-3</b> Probing Solid-liquid Interfaces with Tender X-rays, <b>Zbynek Novotny</b>, <i>N Comini</i>, <i>B Tobler</i>, University of Zuerich, Switzerland; <i>D Aegerter</i>, <i>E Fabbri</i>, Paul Scherrer Institute, Switzerland; <i>U Maier</i>, Ferrovac GmbH, Switzerland; <i>L Artiglia</i>, <i>J Raabe</i>, <i>T Huthwelker</i>, Paul Scherrer Institute, Switzerland; <i>J Osterwalder</i>, University of Zuerich, Switzerland</p>	<p><b>TF+EM+NS+SS-ThM-3</b> Engineering Effective Back Contact Barrier by interfacial MoSe<sub>2</sub> defect states for CZTSe: nanolayer Ge solar cells., <b>Sanghyun Lee</b>, Indiana State University</p>
9:00am	<p><b>CA+2D+AS+BI+NS-ThM-4</b> X-ray Photoelectron Spectroscopy Insight into X-ray Induced Radiolysis at Heterogenous Liquid Electrolyte Interface, <b>Christopher Arble</b>, National Institute of Standards and Technology (NIST); <i>H Guo</i>, Southeast University, China; <i>E Strelcov</i>, <i>B Hoskins</i>, National Institute of Standards and Technology (NIST); <i>M Amati</i>, <i>P Zeller</i>, <i>L Gregoratti</i>, Elettra-Sincrotrone Trieste, Italy; <i>A Kolmakov</i>, National Institute of Standards and Technology (NIST)</p>	<p><b>TF+EM+NS+SS-ThM-4</b> Development of Low-Cost, Crack-Tolerant Metallization Using Screen Printing for Increased Durability of Silicon Solar Cell Modules, <i>O Abudayyeh</i>, Osazda Energy; <i>A Chavez</i>, University of New Mexico; <i>J Chavez</i>, Osazda Energy; <b>Sang M. Han</b>, University of New Mexico; <i>F Zimbardi</i>, <i>B Rounsaville</i>, <i>V Upadhyaya</i>, <i>A Rohatgi</i>, Georgia Institute of Technology; <i>B McDonold</i>, <i>T Silverman</i>, National Renewable Energy Laboratory</p>
9:20am	<p><b>INVITED: CA+2D+AS+BI+NS-ThM-5</b> Theoretical Investigation of Reactivity at Complex Solid-Liquid Interfaces, <b>Roger Rousseau</b>, Pacific Northwest National Laboratory</p>	<p><b>TF+EM+NS+SS-ThM-5</b> Fabrication of Optical Test Structures for Enhanced Absorption in Thin Multi-junction Solar Cells, <b>Erin Cleveland</b>, <i>N Kotulak</i>, <i>S Tomasulo</i>, <i>P Jenkins</i>, U.S. Naval Research Laboratory; <i>A Mellor</i>, <i>P Pearce</i>, Imperial College London, UK; <i>N Ekins-Daukes</i>, University of New South Wales, Australia; <i>M Yakes</i>, U.S. Naval Research Laboratory</p>
9:40am	Invited talk continues.	<p><b>TF+EM+NS+SS-ThM-6</b> Phosphorus as a p-Dopant in Pyrite FeS<sub>2</sub>, a Potential Low-cost earth-abundant Thin Film Solar Absorber, <b>Bryan Voigt</b><sup>1</sup>, <i>W Moore</i>, <i>D Ray</i>, <i>M Manno</i>, University of Minnesota, Minneapolis; <i>J Jeremiason</i>, Gustavus Adolphus College; <i>L Gagliardi</i>, <i>E Aydil</i>, <i>C Leighton</i>, University of Minnesota, Minneapolis</p>
10:00am	<b>BREAK - Complimentary Coffee in Exhibit Hall</b>	<b>BREAK - Complimentary Coffee in Exhibit Hall</b>
10:20am	<b>BREAK - Complimentary Coffee in Exhibit Hall</b>	<b>BREAK - Complimentary Coffee in Exhibit Hall</b>
10:40am	<b>BREAK - Complimentary Coffee in Exhibit Hall</b>	<b>BREAK - Complimentary Coffee in Exhibit Hall</b>
11:00am	<p><b>CA+2D+AS+BI+NS-ThM-10</b> In-situ/Operando Soft X-ray Spectroscopy for Interfacial Characterization of Energy Materials and Devices, <i>Y Liu</i>, <i>X Feng</i>, <b>Jinghua Guo</b>, Lawrence Berkeley National Laboratory</p>	<p><b>TF+EM+NS+SS-ThM-10</b> Relaxor-ferroelectric Thin Films for Energy Harvesting from Low-grade Waste-heat, <b>Amrit Sharma</b>, <i>B Xiao</i>, <i>S Pradhan</i>, <i>M Bahoura</i>, Norfolk State University</p>
11:20am	<p><b>CA+2D+AS+BI+NS-ThM-11</b> The Importance of Amino Acid Adsorption on Polymer Surfaces in <i>P. Aeruginosa</i> Biofilm Formation, <b>Olutoba Sanni</b>, University of Nottingham, UK</p>	<p><b>TF+EM+NS+SS-ThM-11</b> Thermal Treatment Effects on the Thermoelectric Devices from Sn/Sn+SnO<sub>2</sub> Thin Films, <b>Satilmis Budak</b>, <i>E McGhee</i>, <i>Z Xiao</i>, <i>E Barnes</i>, <i>R Norwood</i>, Alabama A&amp;M University</p>
11:40am		<p><b>TF+EM+NS+SS-ThM-12</b> Thermoelectric Properties of Efficient Thermoelectric Devices from Sb/Sb+SnO<sub>2</sub> Thin Films, <b>Eshirdanya McGhee</b>, <i>S Budak</i>, <i>Z Xiao</i>, <i>N Caver</i>, <i>B McNeal</i>, Alabama A&amp;M University</p>
12:00pm		<p><b>TF+EM+NS+SS-ThM-13</b> 3D Printed Triboelectric Nanogenerator, <i>I Fattah</i>, <i>E Utterback</i>, <b>Naga Srinivas Korivi</b>, <i>V Rangari</i>, Tuskegee University</p>

# Thursday Morning, October 24, 2019

<b>Room A124-125</b>		
8:00am	<b>INVITED: LS+AS+SS-ThM-1</b> X-Ray Insight into Fuel Cell Catalysis: Operando Studies of Model Surfaces and Working Devices, <i>Jakub Drnec</i> , <i>I Martens</i> , European Synchrotron Radiation Facility, France; <i>T Fuchs</i> , University of Kiel, Germany; <i>T Wiegmann</i> , European Synchrotron Radiation Facility, Germany; <i>A Vamvakeros</i> , Finden Ltd., UK; <i>R Chattot</i> , European Synchrotron Radiation Facility, France; <i>O Magnussen</i> , University of Kiel, Germany	<b>Frontiers of New Light Sources Applied to Materials, Interfaces, and Processing Focus Topic Session LS+AS+SS-ThM</b> <b>Operando Methods for Unraveling Fundamental Mechanisms in Devices Towards Renewable Energies</b> <b>Moderator:</b> Olivier Renault, CEA-University Grenoble Alps, France
8:20am	Invited talk continues.	
8:40am	<b>LS+AS+SS-ThM-3</b> Multi-scale Operando X-ray Tomography of Solid-state Li Battery Electrolytes at Elevated Temperatures and Pressures, <i>Natalie Seitzman</i> , Colorado School of Mines; <i>J Nelson Weker</i> , SLAC National Accelerator Laboratory; <i>M Al-Jassim</i> , National Renewable Energy Laboratory; <i>S Pylypenko</i> , Colorado School of Mines	
9:00am	<b>LS+AS+SS-ThM-4</b> Correlating the Atomic and Electronic Structure in the Formation 2DEGs in Complex Oxides, <i>Jessica McChesney</i> , <i>X Yan</i> , <i>F Wrabel</i> , <i>H Hong</i> , <i>D Fong</i> , Argonne National Laboratory	
9:20am	<b>INVITED: LS+AS+SS-ThM-5</b> Uncover the Mystery of Oxygen Chemistry in Batteries through High-Efficiency mRIXS and Theory, <i>Wanli Yang</i> , Lawrence Berkeley National Laboratory	
9:40am	Invited talk continues.	
10:00am	<b>BREAK - Complimentary Coffee in Exhibit Hall</b>	
10:20am	<b>BREAK - Complimentary Coffee in Exhibit Hall</b>	
10:40am	<b>BREAK - Complimentary Coffee in Exhibit Hall</b>	
11:00am	<b>LS+HC+SS-ThM-10</b> How to Probe Solid/Liquid Interfaces using Standing-wave Photoemission?, <i>Slavomir Nemsak</i> , Lawrence Berkeley National Laboratory; <i>H Bluhm</i> , Fritz Haber Institute, Germany; <i>C Fadley</i> , University of California, Davis	
11:20am	<b>LS+HC+SS-ThM-11</b> <i>In situ</i> Spectroscopy of Synthesis of Next-Generation Cathodes for Batteries, <i>Feng Wang</i> , Brookhaven National Laboratory	
11:40am	<b>INVITED: LS+HC+SS-ThM-12</b> Structural Heterogeneity and Dynamics of 2D Materials Studied by Full-field X-ray Diffraction Microscopy and Ultrafast Surface X-ray Diffraction, <i>Haidan Wen</i> , Argonne National Laboratory	
12:00pm	Invited talk continues.	

# Thursday Morning, October 24, 2019

<b>Magnetic Interfaces and Nanostructures Division</b> <b>Room A210 - Session MI+2D+AS+EM-ThM</b> <b>Novel Magnetic Materials and Device Concept for</b> <b>Energy efficient Information Processing and Storage</b> <b>Moderators:</b> Mikel B. Holcomb, West Virginia University, Markus Donath, Muenster University, Germany		<b>Applied Surface Science Division</b> <b>Room A211 - Session AS-ThM</b> <b>Advances in Depth Profiling, Imaging and Time-resolved</b> <b>Analysis</b> <b>Moderators:</b> Jeffrey Fenton, Medtronic, Inc., Carl A. Ventrice, Jr., SUNY Polytechnic Institute	
8:00am	<b>INVITED: MI+2D+AS+EM-ThM-1</b> Using Novel Magnonic Device Concepts for Efficient Information Processing, <b>Burkard Hillebrands</b> , Technical University Kaiserslautern, Germany	<b>INVITED: AS-ThM-1</b> What Really Lies Beneath the AVS Surface? Depth Profiling Can Help Provide the Answer, <b>Fred Stevie</b> , <i>C Zhou, R Garcia</i> , North Carolina State University	
8:20am	Invited talk continues.	Invited talk continues.	
8:40am	<b>MI+2D+AS+EM-ThM-3</b> Spin-Polarized Scanning Tunneling Microscopy of <10 nm Skyrmions in SrIrO <sub>3</sub> /SrRuO <sub>3</sub> Bilayers, <b>Joseph Corbett</b> , <i>J Rowland, A Ahmed, J Repicky</i> , The Ohio State University; <i>K Meng</i> , The Ohio State University; <i>F Yang, M Randeria, J Gupta</i> , The Ohio State University	<b>AS-ThM-3</b> TOF-SIMS Tandem MS Imaging of (Sub-)Monolayer Coatings for Device Processing, <b>David M. Carr</b> , <i>G Fisher</i> , Physical Electronics	
9:00am	<b>INVITED: MI+2D+AS+EM-ThM-4</b> Relieving YIG from its Substrate Constraints - YIG Resonators on Various Crystalline Substrate Materials, <b>Georg Schmidt</b> , Martin-Luther-Universität Halle-Wittenberg, Germany	<b>AS-ThM-4</b> TOF-SIMS at the Edge, <b>Alan Spool</b> , <i>D Bilich</i> , Western Digital Corporation	
9:20am	Invited talk continues.	<b>AS-ThM-5</b> Variation of SIMS Secondary Ion Yield of Si and Mg Dopants in GaN Grown by MOCVD, <b>M. K. Indika Senevirathna</b> , Clark Atlanta University; <i>A Kozhanov, M Vernon, G Cross</i> , Georgia State University; <i>G Cooke</i> , Hiden Analytical Ltd, UK; <i>M Williams</i> , Clark Atlanta University	
9:40am	<b>MI+2D+AS+EM-ThM-6</b> Magnetic Textures in Chiral Magnet MnGe Observed with SP-STM, <b>Jacob Repicky</b> , <i>J Corbett, T Liu, R Bennett, A Ahmed</i> , The Ohio State University; <i>J Guerrero-Sanchez</i> , National Autonomous University of Mexico; <i>R Kawakami, J Gupta</i> , The Ohio State University	<b>AS-ThM-6</b> Impact of the Molecular Weight on the Depth Profiling of Polymer Thin Films using Low Energy Cs <sup>+</sup> Sputtering, <b>Amal Ben Hadj Mabrouk</b> , Univ. Grenoble Alpes, CEA, LETI, Grenoble; <i>M Veillerot</i> , Univ. Grenoble Alpes, CEA, LETI, Grenoble, France; <i>A Chateaubinois</i> , Soft Matter Science and Engineering Laboratory (SIMM), PSL Research University, France; <i>C Licitra</i> , Univ. Grenoble Alpes, CEA, LETI, Grenoble	
10:00am	<b>BREAK - Complimentary Coffee in Exhibit Hall</b>	<b>BREAK - Complimentary Coffee in Exhibit Hall</b>	
10:20am	<b>BREAK - Complimentary Coffee in Exhibit Hall</b>	<b>BREAK - Complimentary Coffee in Exhibit Hall</b>	
10:40am	<b>BREAK - Complimentary Coffee in Exhibit Hall</b>	<b>BREAK - Complimentary Coffee in Exhibit Hall</b>	
11:00am	<b>INVITED: MI+2D+AS+EM-ThM-10</b> Dzyaloshinskii-Moriya Interaction in Magnetic Multilayers, <b>Hans Nembach</b> , National Institute of Standards and Technology (NIST)	<b>AS-ThM-10</b> Probing the Surface Structure of Au-Pt Core-Shell Nanoparticles, <b>C Engelbrekt</b> , <b>Ich Tran</b> , <i>M Law</i> , University of California, Irvine	
11:20am	Invited talk continues.	<b>AS-ThM-11</b> Correlating Multiple Data Streams for Valence State Identification in Transition Metal Oxide during XPS Depth Profiling, <b>Zhenzhong Yang</b> , <i>C Wang, M Engelhard, Z Zhu, Y Du</i> , Pacific Northwest National Laboratory	
11:40am	<b>INVITED: MI+2D+AS+EM-ThM-12</b> Transport in Goniopolar and (pxn) Metals, <b>Joseph Heremans</b> , <i>B He, L Zheng, Y Wang, M Arquilla, N Cultrara, M Scudder, J Goldberger, W Windl</i> , The Ohio State University	<b>AS-ThM-12</b> Using Atom Probe Tomography for Three-dimensional Visualization of Sb Segregation in InAs/InAsSb Superlattices, <b>Nicole Kotulak</b> , <i>J Nolde, M Twigg, K Knipling</i> , U.S. Naval Research Laboratory; <i>D Lubyshev, J Fastenau, A Liu</i> , IQE Inc.; <i>E Aifer</i> , U.S. Naval Research Laboratory	
12:00pm	Invited talk continues.	<b>AS-ThM-13</b> Multi-technique Surface Analysis of Graphenes, <b>Kateryna Artyushkova</b> , Physical Electronics and University of New Mexico; <i>B Schmidt, J Mann, A Ellsworth, J Newman</i> , Physical Electronics	

# Thursday Morning, October 24, 2019

	<b>Fundamental Aspects of Material Degradation Focus Topic</b> <b>Room A212 - Session DM+BI+SS-ThM</b> <b>Material Stabilities and Technology for Degradation Protection</b> <b>Moderators:</b> Markus Valtiner, Vienna University of Technology, Austria, Gareth S. Parkinson, TU Wien, Austria	<b>Fundamental Discoveries in Heterogeneous Catalysis Focus Topic</b> <b>Room A213 - Session HC+2D+SS-ThM</b> <b>Nanoscale Surface Structure in Heterogeneously-Catalyzed Reactions</b> <b>Moderators:</b> Rebecca Fushimi, Idaho National Laboratory, Eric High, Tufts University
8:00am	<b>DM+BI+SS-ThM-1</b> Extremely Thin Protective Oxide Layer for Reflective Silver Thin Films, <i>Midori Kawamura, E Kudo, Y Sasaki, T Kiba, Y Abe, K Kim</i> , Kitami Institute of Technology, Japan; <i>H Murotani</i> , Tokai University, Japan	
8:20am	<b>DM+BI+SS-ThM-2</b> Influence of the Electric Double Layer on Degradation of Materials, <i>Dominik Dworschak, M Valtiner</i> , Vienna University of Technology, Austria	<b>HC+2D+SS-ThM-2</b> Low-temperature Investigation of Propylene on TiO <sub>2</sub> /Au(111), <i>M Gillum, M DePonte, J Wilke, E Maxwell, V Lam, D Schlosser, Ashleigh Baber</i> , James Madison University
8:40am	<b>INVITED: DM+BI+SS-ThM-3</b> Key Issues for the Stability of Protective Surface Oxides, <i>Philippe Marcus</i> , CNRS - Chimie ParisTech, France	<b>INVITED: HC+2D+SS-ThM-3</b> Structure and Reactivity of Supported Oxide and Metal Nanoparticles, <i>Geoff Thornton</i> , University College London, UK
9:00am	Invited talk continues.	Invited talk continues.
9:20am	<b>DM+BI+SS-ThM-5</b> Controlling and Observing Localized Dealloying Corrosion and Dissolution via Lateral Modification of Surfactant Inhibitor Layers, <i>S Neupane</i> , Hasselt University, Belgium; <i>Frank Uwe Renner</i> , IMEC vzw. Division IMOMEC, Belgium	<b>HC+2D+SS-ThM-5</b> Catalysis by Well-defined Oxide Nanostructures: From Atomic-scale Properties to Rational Design, <i>Fan Yang</i> , Dalian Institute of Chemical Physics, China
9:40am	<b>DM+BI+SS-ThM-6</b> <i>In Situ</i> Characterization of Interactions at Polymer/Metal Oxide Interfaces Under Aqueous Conditions by a Spectro-electrochemical Approach, <i>Sven Pletincx</i> , Vrije Universiteit Brussel, Belgium; <i>L Fockaert, A Mol</i> , Delft University of Technology, Netherlands; <i>H Terry, T Hauffman</i> , Vrije Universiteit Brussel, Belgium	<b>HC+2D+SS-ThM-6</b> Structural and Chemical Effects of Cesium on the Cu(111) and Cu <sub>x</sub> O/Cu(111) Surface, <i>Rebecca Hamlyn</i> <sup>1</sup> , Stony Brook University; <i>M Mahapatra</i> , Brookhaven National Laboratory; <i>I Orozco</i> , Stony Brook University; <i>M White, S Senanayake, J Rodriguez</i> , Brookhaven National Laboratory
10:00am	<b>BREAK - Complimentary Coffee in Exhibit Hall</b>	<b>BREAK - Complimentary Coffee in Exhibit Hall</b>
10:20am	<b>BREAK - Complimentary Coffee in Exhibit Hall</b>	<b>BREAK - Complimentary Coffee in Exhibit Hall</b>
10:40am	<b>BREAK - Complimentary Coffee in Exhibit Hall</b>	<b>BREAK - Complimentary Coffee in Exhibit Hall</b>
11:00am	<b>INVITED: DM+BI+SS-ThM-10</b> Design of Corrosion Resistant High Entropy Alloys, <i>Gerald Frankel, C Taylor, W Windl</i> , The Ohio State University; <i>J Scully</i> , University of Virginia; <i>J Locke</i> , The Ohio State University; <i>P Lu</i> , Questek Innovations	<b>INVITED: HC+2D+SS-ThM-10</b> Mythbusting: From Single Crystals in UHV to Catalytic Reactors, <i>Robert Madix</i> , Harvard University
11:20am	Invited talk continues.	Invited talk continues.
11:40am	<b>DM+BI+SS-ThM-12</b> Determination of Hydrogen in High Strength Steels using Scanning Kelvin Probe Force Microscopy, <i>Ines Traxler, G Schimo-Aichhorn</i> , CEST Competence Centre for Electrochemical Surface Technology, Austria; <i>A Muhr, G Luckeneder, H Duchaczek, K Stellinger</i> , voestalpine Stahl GmbH, Austria; <i>D Rudamilova, T Prosek</i> , University of Chemistry and Technology Prague, Czech Republic; <i>B Lutzer</i> , CEST Competence Centre for Electrochemical Surface Technology, Austria; <i>D Stifter, S Hild</i> , Johannes Kepler University Linz, Austria	<b>HC+2D+SS-ThM-12</b> Cooperativity Between Pd and AgO <sub>x</sub> Phases on Ag(111), <i>V Mehar, M Yu, Jason Weaver</i> , University of Florida
12:00pm	<b>DM+BI+SS-ThM-13</b> Reflection Mode Interferometry for studying interfacial processes, <i>Kai Schwenzfeier, P Bilotta, M Lengauer, C Merola, H Cheng, M Valtiner</i> , TU Wien, Austria	<b>HC+2D+SS-ThM-13</b> Migration Across Metal/Metal Oxide Interfaces: Enhancing the Reactivity of Ag Oxide with H <sub>2</sub> by the Presence of Pd/Pd Oxide, <i>Christopher O'Connor</i> <sup>1</sup> , <i>M van Spronsen, E Muramoto, T Egle, R Madix, C Friend</i> , Harvard University

# Thursday Morning, October 24, 2019

<b>Electronic Materials and Photonics Division</b> <b>Room A214 - Session EM+AP+MS+NS+TF-ThM</b> <b>Advanced Processes for Interconnects and Devices</b> <b>Moderators:</b> Andy Antonelli, Nanometrics, Bryan Wiggins, Intel Corporation		<b>Advanced Surface Engineering Division</b> <b>Room A215 - Session SE+PS-ThM</b> <b>Plasma-assisted Surface Modification and Deposition Processes</b> <b>Moderators:</b> Robert Franz, Montanuniversität Leoben, Jianliang Lin, Southwest Research Institute	
8:00am	<b>EM+AP+MS+NS+TF-ThM-1</b> High-density Plasma for Soft Etching of Noble Metals, <i>Gerhard Franz</i> , <i>V Sushkov</i> , Munich University of Applied Sciences, Germany; <i>W Oberhausen</i> , <i>R Meyer</i> , Technische Universität München, Germany		<b>SE+PS-ThM-1</b> Core/Shell Particles using a Plasma-based Reactors, <i>Santiago Vargas-Giraldo</i> , <i>D Galeano-Osorio</i> , <i>C Castano</i> , Virginia Commonwealth University
8:20am	<b>EM+AP+MS+NS+TF-ThM-2</b> Crystalline InP Growth and Device Fabrication Directly on Amorphous Dielectrics at Temperatures below 400°C for Future 3D Integrated Circuits, <i>Debarghya Sarkar</i> , <i>Y Xu</i> , <i>S Weng</i> , <i>R Kapadia</i> , University of Southern California		<b>SE+PS-ThM-2</b> Formation Mechanisms of Converted Layer During Erosion of Composite Al-Cr Arc Cathodes, <i>Mehran Golizadeh</i> , <i>F Mendez Martin</i> , <i>B Rashkova</i> , Montanuniversität Leoben, Austria; <i>S Kolozsvári</i> , Plansee Composite Materials GmbH, Lechbruck am See, Germany; <i>R Franz</i> , Montanuniversität Leoben, Austria
8:40am	<b>INVITED: EM+AP+MS+NS+TF-ThM-3</b> The Role and Requirements of Selective Deposition in Advanced Patterning, <i>Charles Wallace</i> , Intel Corporation		<b>SE+PS-ThM-3</b> Self-organization of Plasma in RF Magnetron Sputtering, <i>Matjaz Panjan</i> , Jozef Stefan Institute, Slovenia
9:00am	Invited talk continues.		<b>SE+PS-ThM-4</b> Study of High Power Pulsed Magnetron Sputtering Discharge with Positive Bias on the Target after the Main Pulse, <i>Ivan Shchelkanov</i> , <i>T Houlahan</i> , <i>J McLain</i> , <i>I Haehnlein</i> , <i>B Jurczyk</i> , <i>R Stubbers</i> , Starfire Industries LLC; <i>D Barlaz</i> , <i>D Ruzic</i> , University of Illinois at Urbana-Champaign
9:20am	<b>EM+AP+MS+NS+TF-ThM-5</b> Graphene-Template Assisted Selective Epitaxy (G-TASE) of Group IV Semiconductors, <i>M. Arslan Shehzad</i> , <i>A T. Mohabir</i> , <i>M Filler</i> , Georgia Institute of Technology		<b>INVITED: SE+PS-ThM-5</b> Innovative PVD Strategies for the Design of Novel TiO <sub>2</sub> -based Photoanode Utilized in Dye-sensitized Solar Cells, <i>Rony Snyders</i> , University of Mons, Belgium
9:40am	<b>EM+AP+MS+NS+TF-ThM-6</b> Resistivity and Surface Scattering Specularity at (0001) Ru/dielectric Interfaces, <i>S Ezzat</i> , University of Central Florida; <i>P Mani</i> , View Dynamic Glass, Inc.; <i>A Khaniya</i> , <i>W Kaden</i> , University of Central Florida; <i>D Gall</i> , Rensselaer Polytechnic Institute; <i>K Barmak</i> , Columbia University; <i>Kevin Coffey</i> , University of Central Florida		Invited talk continues.
10:00am	<b>BREAK - Complimentary Coffee in Exhibit Hall</b>		<b>BREAK - Complimentary Coffee in Exhibit Hall</b>
10:20am	<b>BREAK - Complimentary Coffee in Exhibit Hall</b>		<b>BREAK - Complimentary Coffee in Exhibit Hall</b>
10:40am	<b>BREAK - Complimentary Coffee in Exhibit Hall</b>		<b>BREAK - Complimentary Coffee in Exhibit Hall</b>
11:00am	<b>INVITED: EM+AP+MS+NS+TF-ThM-10</b> Electrochemical Atomic Layer Deposition and Etching of Metals for Atomically-Precise Fabrication of Semiconductor Interconnects, <i>Y Gong</i> , <i>K Venkatraman</i> , <i>Rohan Akolkar</i> , Case Western Reserve University		<b>SE+PS-ThM-10</b> Enhancing the Far Ultra-Violet Optical Properties of Aluminum Mirrors with a Single Step Approach to Oxide Removal and Fluorine Passivation, <i>David Boris</i> , U.S. Naval Research Laboratory; <i>A Kozen</i> , <i>S Rosenberg</i> , American Society for Engineering Education (residing at U.S. Naval Research Laboratory); <i>J del Hoyo</i> , <i>G Richardson</i> , <i>M Quijada</i> , NASA Goddard Spaceflight Center; <i>S Walton</i> , U.S. Naval Research Laboratory
11:20am	Invited talk continues.		<b>SE+PS-ThM-11</b> Improving the Crystallinity of Inorganic Coatings Synthesized by Atmospheric Plasma using a New Device for Heating the Substrate, <i>Antoine Remy</i> , <i>M Fall</i> , <i>F Reniers</i> , Université Libre de Bruxelles, Belgium
11:40am	<b>EM+AP+MS+NS+TF-ThM-12</b> Mechanical Properties of Patterned low- $\kappa$ Films Measured by Brillouin Light Scattering, <i>Jon Zizka</i> , <i>H Wijesinghe</i> , The Ohio State University; <i>S King</i> , <i>H Yoo</i> , Intel Corporation, USA; <i>R Sooryakumar</i> , The Ohio State University		<b>SE+PS-ThM-12</b> Improved Nitride Formation on Titanium Substrates by Femtosecond Laser Processing with Secondary Plasma, <i>Jeremy Mettler</i> , <i>D Barlaz</i> , University of Illinois at Urbana-Champaign; <i>B Jurczyk</i> , Starfire Industries LLC; <i>D Ruzic</i> , University of Illinois at Urbana-Champaign
12:00pm	<b>EM+AP+MS+NS+TF-ThM-13</b> Wafer-Scale Fabrication of Carbon-Based Electronic Devices, <i>Zhigang Xiao</i> , <i>J Kimbrough</i> , <i>J Cooper</i> , <i>K Hartage</i> , <i>Q Yuan</i> , Alabama A&M University		<b>SE+PS-ThM-13</b> Characterizing the Spatially Dependent Properties of Plasma Polymerized Acrylic Acid Films, <i>Karyn Jarvis</i> , <i>S McArthur</i> , Swinburne University of Technology, Australia

# Thursday Morning, October 24, 2019

<b>2D Materials</b> <b>Room A216 - Session 2D+EM+MI+NS+QS+SS-ThM</b> <b>Dopants, Defects, and Interfaces in 2D Materials</b> <b>Moderator:</b> Evan Reed, Stanford University		<b>Surface Science Division</b> <b>Room A220-221 - Session SS+AS+HC+TL-ThM</b> <b>Surface Science of Energy Conversion and Storage</b> <b>Moderators:</b> Steven L. Tait, Indiana University, Francisco Zaera, University of California, Riverside	
8:00am	<b>INVITED: 2D+EM+MI+NS+QS+SS-ThM-1</b> Interfacial Engineering of Chemically Reactive Two-Dimensional Materials, <i>Mark Hersam</i> , Northwestern University	<b>INVITED: SS+AS+HC+TL-ThM-1</b> Chemical and Electrochemical Stability of Perovskite Oxide Surfaces in Energy Conversion: Mechanisms and Improvements, <i>Bilge Yildiz</i> , Massachusetts Institute of Technology	
8:20am	Invited talk continues.	Invited talk continues.	
8:40am	<b>2D+EM+MI+NS+QS+SS-ThM-3</b> Effects of Mn Doping on the Surface Electronic Band Structure and Bulk Magnetic Properties of ZnS and CdS Quantum Dot Thin Films, <i>Thilini K. Ekanayaka<sup>1</sup></i> , <i>G Gurung</i> , University of Nebraska-Lincoln; <i>G Rimal</i> , Rutgers University; <i>S Horoz</i> , Siirt University, Turkey; <i>J Tang</i> , <i>T Chien</i> , University of Wyoming; <i>T Paudel</i> , <i>A Yost</i> , University of Nebraska-Lincoln	<b>SS+AS+HC+TL-ThM-3</b> Mechanism of Oxygen Reduction Reaction on Nitrogen-doped Carbon Catalysts, <i>Junji Nakamura</i> , University of Tsukuba, Japan	
9:00am	<b>2D+EM+MI+NS+QS+SS-ThM-4</b> Interaction of Molecular O <sub>2</sub> with Organolead Halide Nanorods by Single-Particle Fluorescence Microscopy, <i>Juvinch Vicente</i> , <i>J Chen</i> , Ohio University	<b>SS+AS+HC+TL-ThM-4</b> Copper Corrosion Inhibition Investigated on the Molecular Scale Using APXPS, <i>Bo-Hong Liu</i> , Lawrence Berkeley National Laboratory; <i>O Karslıođlu</i> , Lawrence Berkeley National Laboratory; <i>M Salmeron</i> , <i>S Nemšák</i> , Lawrence Berkeley National Laboratory; <i>H Bluhm</i> , Fritz Haber Institute of the Max Planck Society, Germany	
9:20am	<b>2D+EM+MI+NS+QS+SS-ThM-5</b> Complementary Growth of 2D Transition Metal Dichalcogenide Semiconductors on Metal Oxide Interfaces, <i>T Wickramasinghe</i> , <i>Gregory Jensen</i> , <i>R Thorat</i> , Nanoscale and Quantum Phenomena Institute; <i>S Aleithan</i> , Nanoscale and Quantum Phenomena Institute, Saudi Arabia; <i>S Khadka</i> , <i>E Stinoff</i> , Nanoscale and Quantum Phenomena Institute	<b>INVITED: SS+AS+HC+TL-ThM-5</b> Analysis and Deliberate Modification of Electrochemical Interfaces, <i>Esther Takeuchi</i> , <i>K Takeuchi</i> , <i>A Marschilok</i> , Stony Brook University	
9:40am	<b>2D+EM+MI+NS+QS+SS-ThM-6</b> Kagome-type Lattice Instability and Insulator-metal Transition in an Alkali-doped Mott Insulator on Si(111), <i>Tyler Smith</i> , <i>H Weitering</i> , University of Tennessee Knoxville	Invited talk continues.	
10:00am	<b>BREAK - Complimentary Coffee in Exhibit Hall</b>	<b>BREAK - Complimentary Coffee in Exhibit Hall</b>	
10:20am	<b>BREAK - Complimentary Coffee in Exhibit Hall</b>	<b>BREAK - Complimentary Coffee in Exhibit Hall</b>	
10:40am	<b>BREAK - Complimentary Coffee in Exhibit Hall</b>	<b>BREAK - Complimentary Coffee in Exhibit Hall</b>	
11:00am	<b>2D+EM+MI+NS+QS+SS-ThM-10</b> Chemical Migration and Dipole Formation at TMD/TI Interfaces, <i>Brenton Noesges</i> , <i>T Zhu</i> , The Ohio State University; <i>D O'Hara</i> , University of California, Riverside; <i>R Kawakami</i> , <i>L Brillson</i> , The Ohio State University	<b>SS+AS+HC+TL-ThM-10</b> An Investigation on Active Sites of La <sub>2</sub> O <sub>3</sub> Catalyst for OCM Reaction: A Combined Study of <i>in situ</i> XRD, XPS and Online MS, <i>Yong Yang</i> , <i>C Guan</i> , <i>E Vovk</i> , <i>Z Liu</i> , <i>X Zhou</i> , <i>J Liu</i> , <i>Y Pang</i> , ShanghaiTech University, China	
11:20am	<b>2D+EM+MI+NS+QS+SS-ThM-11</b> Atomically Resolved Electronic Properties of Defects in the in-plane Anisotropic Lattice of ReS <sub>2</sub> , <i>Adina Luican-Mayer</i> , University of Ottawa, Canada	<b>SS+AS+HC+TL-ThM-11</b> Interaction of Amino Acids on Au(111) as Studied with EC-STM: From Islands to Magic Fingers, <i>J Phillips</i> , <i>K Boyd</i> , <i>I Baljak</i> , <i>L Harville</i> , <i>Erin Iski</i> , University of Tulsa	
11:40am	<b>2D+EM+MI+NS+QS+SS-ThM-12</b> Charge Diminishing at the Si-SiO <sub>2</sub> System and its Influence on the Interface Properties, <i>Daniel Kropman</i> , <i>V Seeman</i> , Tartu University, Estonia; <i>A Medvids</i> , <i>P Onufrievs</i> , Riga Technical University, Latvia	<b>SS+AS+HC+TL-ThM-12</b> Deposition and Structure of MoO <sub>3</sub> Clusters on Anatase TiO <sub>2</sub> (101), <i>Nassar Doudin</i> , <i>Z Dohnálek</i> , Pacific Northwest National Laboratory	
12:00pm	<b>2D+EM+MI+NS+QS+SS-ThM-13</b> Size-independent "Squeezed" Shape of Metal Clusters Embedded Beneath Layered Materials, <i>A Lii-Rosales</i> , Ames Laboratory and Iowa State University; <i>S Julien</i> , <i>K Wan</i> , Northeastern University; <i>Y Han</i> , Ames Laboratory and Iowa State University; <i>K Lai</i> , Iowa State University; <i>M Tringides</i> , <i>J Evans</i> , <i>Patricia A. Thiel</i> , Ames Laboratory and Iowa State University	<b>SS+AS+HC+TL-ThM-13</b> Ionic Conducting Nanostructures Tailored on Porous Mixed Conduction Composite Electrodes for Enhancement of Oxygen Reduction Reaction, <i>Jong-Eun Hong</i> , <i>D Joh</i> , <i>S Kim</i> , <i>H Ishfaq</i> , Korea Institute of Energy Research, Republic of Korea; <i>C Jung</i> , <i>J Park</i> , DGIST, Republic of Korea; <i>S Lee</i> , <i>H Kim</i> , <i>T Lim</i> , <i>S Park</i> , <i>R Song</i> , Korea Institute of Energy Research, Republic of Korea; <i>K Lee</i> , DGIST, Republic of Korea	



# Thursday Morning, October 24, 2019

<p><b>Nanometer-scale Science and Technology Division</b>  <b>Room A222 - Session NS+2D+QS-ThM</b>  <b>Direct Atomic Fabrication by Electron and Particle Beams &amp; Flash Session</b>  <b>Moderators:</b> Canhui Wang, National Institute of Standards and Technology (NIST), Xiaolong Liu, Northwestern University</p>		<p><b>Manufacturing Science and Technology Group</b>  <b>Room A226 - Session MS+EM+QS-ThM</b>  <b>Science and Technology for Manufacturing: Neuromorphic and Quantum Computing (ALL INVITED SESSION)</b>  <b>Moderators:</b> Nathaniel C. Cady, SUNY Polytechnic Institute, Albany, Alain C. Diebold, SUNY College of Nanoscale Science and Engineering</p>	
8:00am	<p><b>NS+2D+QS-ThM-1</b> Multiprobe Scanning Tunneling Microscopy and Spectroscopy: Atomic-level Understanding of Quantum Transport in Functional Systems, <i>Marek Kolmer<sup>1</sup>, W Ko, A Li</i>, Oak Ridge National Laboratory</p>		
8:20am	<p><b>INVITED: NS+2D+QS-ThM-2</b> Light and Heavy Ions from New Non-classical Liquid Metal Ion Sources for Advanced Nanofabrication, <i>Paul Mazarov</i>, RAITH GmbH, Germany; <i>T Richter, L Bruchhaus, R Jede</i>, Raith GmbH; <i>Y Yu, J Sanabia</i>, Raith America; <i>L Bischoff</i>, Helmholtz Zentrum Dresden-Rossendorf, Germany; <i>J Gierak</i>, CNRS—Université Paris-Sud, France</p>		
8:40am	Invited talk continues.	<p><b>INVITED: MS+EM+QS-ThM-3</b> Materials and Fabrication Challenges for Neuromorphic and Quantum Computing Devices, <i>S Olson, C Hobbs, H Chong, J Nalaskowski, H Stamper, J Mucci, B Martinick, M Zhu, K Beckmann, I Wells, C Johnson, V Kaushik, T Murray, S Novak, S Bennett, M Rodgers, C Borst, N Cady, M Liehr, Satyavolu Papa Rao</i>, SUNY Polytechnic Institute</p>	
9:00am	<p><b>INVITED: NS+2D+QS-ThM-4</b> Visualizing the Interplay between Spatial and Magnetic Confinement in Graphene Quantum Dots, <i>Joseph Stroscio</i>, National Institute of Standards and Technology (NIST)</p>	Invited talk continues.	
9:20am	Invited talk continues.	<p><b>INVITED: MS+EM+QS-ThM-5</b> IBM Q: Quantum Computing in the 21st Century, <i>Robert Sutor</i>, IBM Research</p>	
9:40am	<p><b>NS+2D+QS-ThM-6</b> Using Controlled Manipulation of Molecules to Trace Potential Energy Surfaces of Adsorbed Molecules, <i>O Dagdeviren, C Zhou</i>, Yale University; <i>M Todorovic</i>, Aalto University, Finland; <i>Eric Altman, U Schwarz</i>, Yale University</p>	Invited talk continues.	
10:00am	<b>BREAK - Complimentary Coffee in Exhibit Hall</b>	<b>BREAK - Complimentary Coffee in Exhibit Hall</b>	
10:20am	<b>BREAK - Complimentary Coffee in Exhibit Hall</b>	<b>BREAK - Complimentary Coffee in Exhibit Hall</b>	
10:40am	<b>BREAK - Complimentary Coffee in Exhibit Hall</b>	<b>BREAK - Complimentary Coffee in Exhibit Hall</b>	
11:00am	<p><b>NS+2D+QS-ThM-10</b> Direct Writing of Functional Heterostructures in Atomically Precise Single Graphene Nanoribbons, <i>Chuanxu Ma</i>, Oak Ridge National Laboratory; <i>Z Xiao</i>, North Carolina State University; <i>J Huang, L Liang</i>, Oak Ridge National Laboratory; <i>W Lu</i>, North Carolina State University; <i>K Hong, B Sumpter</i>, Oak Ridge National Laboratory; <i>J Bernholc</i>, North Carolina State University; <i>A Li</i>, Oak Ridge National Laboratory</p>	<p><b>INVITED: MS+EM+QS-ThM-10</b> Quantum Information Science at AFRL, <i>Michael Hayduk</i>, Air Force Research Laboratory</p>	
11:20am	<p><b>NS+2D+QS-ThM-11</b> Effects of Helium and Neon Processing on 2D Material Properties, <i>Alex Belianinov</i>, Oak Ridge National Laboratory; <i>S Kim</i>, Pusan National University, South Korea; <i>V Iberi, S Jesse, O Ovchinnikova</i>, Oak Ridge National Laboratory</p>	Invited talk continues.	
11:40am	<p><b>NS+2D+QS-ThM-12</b> Operating Molecular Propeller in Quantum Regime with Directional Control, <i>Y Zhang, Tolulope Ajayi</i>, Ohio University; <i>J Calupitan</i>, Université de Toulouse, France; <i>R Tumbleson</i>, Ohio University; <i>G Erbland, C Kammerer</i>, CEMES-CNRS, France; <i>S Wang</i>, Ohio University; <i>L Curtiss, A Ngo</i>, Argonne National Laboratory; <i>G Rapenne</i>, NAIST, Japan; <i>S Hla</i>, Ohio University</p>	<p><b>INVITED: MS+EM+QS-ThM-12</b> Neuromorphic Computing: From Emerging Devices to Neuromorphic System-on-a-Chip, <i>Vishal Saxena</i>, University of Idaho</p>	
12:00pm		Invited talk continues.	

# Thursday Morning, October 24, 2019

<b>Atomic Scale Processing Focus Topic</b> <b>Room B130 - Session AP+PS+TF-ThM</b> <b>Thermal Atomic Layer Etching</b> <b>Moderators:</b> Craig Huffman, Micron, Eric A. Joseph, IBM Research Division, T.J. Watson Research Center		<b>Plasma Science and Technology Division</b> <b>Room B131 - Session PS-ThM</b> <b>Plasma Diagnostics and Sources II</b> <b>Moderators:</b> David Lishan, Plasma-Therm LLC, Geun Young Yeom, Sungkyunkwan University, Korea	
8:00am	<b>INVITED: AP+PS+TF-ThM-1</b> A Challenge for Selective Atomic Layer Etching of Non-volatile Materials Using Organometallic Complex, <i>Yoshihide Yamaguchi</i> , <i>S Fujisaki</i> , <i>K Shinoda</i> , Hitachi, Japan; <i>H Kobayashi</i> , <i>K Kawamura</i> , <i>M Izawa</i> , Hitachi High Technologies, Japan	8:00am	<b>PS-ThM-1</b> Measurement of Plasma Neutral Densities in a Very High Frequency Ar/NH <sub>3</sub> Plasma with a Line-of-sight Threshold Ionization Mass Spectrometry, <i>Jianping Zhao</i> , <i>P Ventzek</i> , <i>C Schlechte</i> , <i>M Burtner</i> , Tokyo Electron America, Inc.; <i>D Li</i> , <i>J Ekerdt</i> , The University of Texas at Austin; <i>T Iwao</i> , <i>K Ishibashi</i> , Tokyo Electron Technology Solutions Limited, Japan
8:20am	Invited talk continues.	8:20am	<b>PS-ThM-2</b> Radical Probe System for In-Situ Measurements of Hydrogen, Oxygen and Nitrogen Radical Densities, <i>Dren Qerimi</i> , <i>G Panici</i> , <i>A Jain</i> , University of Illinois at Urbana-Champaign; <i>J Wagner</i> , Colorado State University; <i>D Ruzic</i> , University of Illinois at Urbana-Champaign
8:40am	<b>AP+PS+TF-ThM-3</b> Characterization of Isotropic Thermal ALE of Oxide Films and Nanometer-Size Structures, <i>Andreas Fischer</i> , <i>A Routzahn</i> , <i>T Lill</i> , Lam Research Corporation	8:40am	<b>PS-ThM-3</b> Post Charge Separation Grid Ion Flux Evaluation in Inductive Coupled Plasma Source Downstream Asher, <i>Luke Zhang</i> , <i>S Ma</i> , Mattson Technology, Inc.
9:00am	<b>AP+PS+TF-ThM-4</b> Advanced Selective Chemical Dry Etch for Oxide and Si-based Material, <i>Li-Hung Chen</i> , <i>T Kato</i> , <i>K Nakahata</i> , <i>K Takeya</i> , Tokyo Electron Technology Solutions Limited, Japan	9:00am	<b>PS-ThM-4</b> Development of a Novel Langmuir Probe for the Investigation of Dusty Non-thermal Plasmas, <i>Austin Woodard</i> <sup>1</sup> , <i>L Mangolini</i> , <i>K Shojaei</i> , <i>C Berrospe</i> , University of California, Riverside
9:20am	<b>AP+PS+TF-ThM-5</b> Mechanisms of Thermal Atomic Layer Etching (ALE) of Metal by Deprotonation and Complex Formation of Hexafluoroacetylacetone (hfach), <i>Abdulrahman Basher</i> <sup>1</sup> , <i>I Hamada</i> , Osaka University, Japan; <i>M Krstic</i> , Karlsruhe Institute of Technology (KIT), Germany; <i>M Isobe</i> , <i>T Ito</i> , Osaka University, Japan; <i>K Fink</i> , Karlsruhe Institute of Technology (KIT), Germany; <i>K Karahashi</i> , <i>Y Morikawa</i> , Osaka University, Japan; <i>W Wenzel</i> , Karlsruhe Institute of Technology (KIT), Germany; <i>S Hamaguchi</i> , Osaka University, Japan	9:20am	<b>INVITED: PS-ThM-5</b> Historical Review of Microwave Plasma Diagnostics using Plasma Cutoff Phenomenon, <i>Shin-Jae You</i> , <i>S Kim</i> , Chungnam National University, Republic of Korea; <i>D Kim</i> , KIMM, Republic of Korea
9:40am	<b>AP+PS+TF-ThM-6</b> Thermal Atomic Layer Etching of Amorphous and Crystalline Al <sub>2</sub> O <sub>3</sub> Films, <i>Jessica A. Murdzek</i> , <i>S George</i> , University of Colorado at Boulder	9:40am	Invited talk continues.
10:00am	<b>BREAK - Complimentary Coffee in Exhibit Hall</b>	10:00am	<b>BREAK - Complimentary Coffee in Exhibit Hall</b>
10:20am	<b>BREAK - Complimentary Coffee in Exhibit Hall</b>	10:20am	<b>BREAK - Complimentary Coffee in Exhibit Hall</b>
10:40am	<b>BREAK - Complimentary Coffee in Exhibit Hall</b>	10:40am	<b>BREAK - Complimentary Coffee in Exhibit Hall</b>
11:00am	<b>AP+PS+TF-ThM-10</b> Thermal Atomic Layer Etching (ALE) of Germanium-Rich SiGe Films, <i>Aziz Abdulagatov</i> , <i>S George</i> , University of Colorado at Boulder	11:00am	<b>PS-ThM-10</b> Characterization of Inductive Coupled Plasma Source RF Power Pulsing for Advanced Surface Treatment Applications, <i>Shawming Ma</i> , <i>L Zhang</i> , <i>D Kohl</i> , Mattson Technology, Inc.
11:20am	<b>AP+PS+TF-ThM-11</b> Thermal Atomic Layer Etching of GaN and Ga <sub>2</sub> O <sub>3</sub> Using Sequential Fluorination and Ligand-Exchange Reactions, <i>Nicholas Johnson</i> , <i>Y Lee</i> , <i>S George</i> , University of Colorado at Boulder	11:20am	<b>PS-ThM-11</b> In-situ Measurement of Deposited Film Thickness and Electron Density by Double Curling Probe, <i>Daisuke Ogawa</i> , Chubu University, Japan; <i>Y Sakiyama</i> , Lam Research Corporation; <i>K Nakamura</i> , Chubu University, Japan; <i>H Sugai</i> , Nagoya Industrial Science Research Institute, Japan
11:40am	<b>INVITED: AP+PS+TF-ThM-12</b> Mechanistic Insights into Thermal Dry Atomic Layer Processing of Metals, <i>Andrew Teplyakov</i> , University of Delaware	11:40am	<b>PS-ThM-12</b> Study of Selective PECVD of Silicon on Silicon Nitride and Aluminum Oxide, <i>Ghewa Akiki</i> , <i>E Johnson</i> , <i>P Bulkin</i> , LPICM, CNRS, Ecole Polytechnique, Institut Polytechnique de Paris, France; <i>D Daineka</i> , LPICM, CNRS, Ecole Polytechnique, Institut Polytechnique de Paris
12:00pm	Invited talk continues.	12:00pm	

# Thursday Morning, October 24, 2019

Room B231-232		<b>Advanced Ion Microscopy and Ion Beam Nano-engineering Focus Topic</b> <b>Session HI+NS-ThM</b> <b>Novel Beam Induced Material Engineering and Nano-Patterning</b> <b>Moderators:</b> Olga S. Ovchinnikova, Oak Ridge National Laboratory, Shinichi Ogawa, National Institute of Advanced Industrial Science and Technology (AIST)
8:00am	<b>INVITED: HI+NS-ThM-1</b> Tuning out-of-plane Piezoelectricity in 2D Materials using Ion Beams, <i>Yunseok Kim</i> , Sungkyunkwan University, Republic of Korea	
8:20am	Invited talk continues.	
8:40am	<b>INVITED: HI+NS-ThM-3</b> Defect Engineering of Ferroelectric Thin Films – Leveraging Ion Beams for Improved Function, <i>Lane Martin</i> , University of California at Berkeley	
9:00am	Invited talk continues.	
9:20am	<b>HI+NS-ThM-5</b> Exploring Proximity Effects and Large Depth of Field in Helium Ion Beam Lithography: Large-area Dense Patterns and Tilted Surface Exposure, <i>Ranveig Flatabø</i> , University of Bergen, Norway; <i>A Agarwal</i> , Massachusetts Institute of Technology; <i>R Hobbs</i> , Trinity College Dublin; <i>M M. Greve</i> , University of Bergen; <i>B Holst</i> , University of Bergen, Norway; <i>K Berggren</i> , Massachusetts Institute of Technology	
9:40am	<b>HI+NS-ThM-6</b> Fabrication of Plasmonic Nanostructures by Helium-Ion Milling, <i>André Beyer</i> , <i>M Westphal</i> , Bielefeld University, Germany; <i>S Stephan</i> , Oldenburg University, Germany; <i>D Emmrich</i> , <i>H Vieker</i> , Bielefeld University, Germany; <i>K Chen</i> , Jinan University, Guangzhou, China; <i>G Razinskas</i> , <i>H Gross</i> , <i>B Hecht</i> , Würzburg University, Germany; <i>M Silles</i> , Oldenburg University, Germany; <i>A Götzhäuser</i> , Bielefeld University, Germany	
10:00am	<b>BREAK - Complimentary Coffee in Exhibit Hall</b>	
10:20am	<b>BREAK - Complimentary Coffee in Exhibit Hall</b>	
10:40am	<b>BREAK - Complimentary Coffee in Exhibit Hall</b>	
11:00am	<b>INVITED: HI+NS-ThM-10</b> Towards Atomically Precise Carbon Quantum Electronic Devices, <i>J Swett</i> , University of Oxford, UK; <i>O Dyck</i> , <i>S Jesse</i> , Oak Ridge National Laboratory; <i>Jan Mol</i> , Queen Mary University of London, UK	
11:20am	Invited talk continues.	
11:40am	<b>HI+NS-ThM-12</b> Fabrication of High-Q nanofiber Bragg Cavity Using a Helium Ion Microscope, <i>Hideaki Takashima</i> , Kyoto university, Japan; <i>A Fukuda</i> , <i>H Maruya</i> , <i>T Tashima</i> , Kyoto University, Japan; <i>A Schell</i> , Central European Institute of Technology, Czech Republic; <i>S Takeuchi</i> , Kyoto University, Japan	
12:00pm	<b>HI+NS-ThM-13</b> Time of Flight Secondary Ion Mass Spectrometry in the Helium Ion Microscope for Battery Materials and Other Nanoscale Problems, <i>N Klingner</i> , Helmholtz Zentrum Dresden-Rossendorf, Germany; <i>Gregor Hlawacek</i> , Helmholtz-Zentrum Dresden Rossendorf, Germany; <i>L Wheatcroft</i> , <i>B Inkson</i> , University of Sheffield, UK; <i>R Heller</i> , Helmholtz Zentrum Dresden-Rossendorf, Germany	

# Thursday Afternoon, October 24, 2019

<p><b>Chemical Analysis and Imaging Interfaces Focus Topic</b>  <b>Room A120-121 - Session CA+NS+SS+VT-ThA</b>  <b>Progress in Instrumentation and Methods for Spectro-microscopy of Interfaces</b>  <b>Moderators:</b> Jinghua Guo, Lawrence Berkeley National Laboratory, Andrei Kolmakov, National Institute of Standards and Technology (NIST)</p>		<p><b>Thin Films Division</b>  <b>Room A122-123 - Session TF+SS-ThA</b>  <b>Metal Halide Perovskites, Other Organic/Inorganic Hybrid Thin Films &amp; Flash Session</b>  <b>Moderators:</b> Mark Losego, Georgia Institute of Technology, Greg Szulczewski, The University of Alabama</p>	
2:20pm	<p><b>INVITED: CA+NS+SS+VT-ThA-1</b> Helium and Neon Ion Beams for the Imaging and Analysis of Interfaces, <b>John A. Notte</b>, <i>C Guillermier, F Khanom, B Lewis</i>, Carl Zeiss PCS, Inc.</p>	<p><b>INVITED: TF+SS-ThA-1</b> Tailoring Electrode-electrolyte Interfaces in Lithium-ion Batteries using Molecularly Engineered Functional Polymers, <b>Laisuo Su</b>, Carnegie Mellon University; <i>J Weaver</i>, National Institute of Standards and Technology (NIST); <i>M Groenenboom</i>, National Institute of Standards and Technology (NIST); <i>B Jayan</i>, Carnegie Mellon University</p>	
2:40pm	Invited talk continues.	Invited talk continues.	
3:00pm	<p><b>INVITED: CA+NS+SS+VT-ThA-3</b> Interfacial Studies using Ambient Pressure XPS, <b>Paul Dietrich</b>, <i>A Thissen</i>, SPECS Surface Nano Analysis GmbH, Germany</p>	<p><b>TF+SS-ThA-3</b> Chemoselective Adsorption of Alkyne-functionalized Cyclooctynes for the Formation of Si/organic Interfaces, <b>C Laenger, Julian Heep</b>, Justus-Liebig-University, Giessen, Germany; <i>P Nikodemiak, T Bohamud</i>, Philipps-University, Marburg, Germany; <i>P Kirsten</i>, Justus-Liebig-University, Giessen, Germany; <i>U Hoefler, U Koert</i>, Philipps-University, Marburg, Germany; <i>M Duerr</i>, Justus-Liebig-University, Giessen, Germany</p>	
3:20pm	Invited talk continues.	<p><b>TF+SS-ThA-4</b> Durability of Property Changes in Polyester Fabrics Infused with Inorganics via Vapor Phase Infiltration, <b>Kira Pyronneau</b>, <i>E McGuinness</i>, <i>M Losego</i>, Georgia Institute of Technology</p>	
3:40pm	<b>BREAK</b>	<b>BREAK</b>	
4:00pm	<p><b>INVITED: CA+NS+SS+VT-ThA-6</b> Operando Spectroscopy and Microscopy of the Electrode-Electrolyte Interface in Batteries, <b>Feng Wang</b>, Brookhaven National Laboratory</p>	<p><b>INVITED: TF+SS-ThA-6</b> Materials Synthesis and Device Fabrication for Novel Inorganic Perovskites, <b>Mingzhen Liu</b>, UESTC, China</p>	
4:20pm	Invited talk continues.	Invited talk continues.	
4:40pm	<p><b>CA+NS+SS+VT-ThA-8</b> Ultrasensitive Combined Tip- and Antenna-Enhanced Infrared Nanoscopy of Protein Complexes, <b>B O'Callahan</b>, Pacific Northwest National Laboratory; <i>M Hentschel</i>, University of Stuttgart, Germany; <i>M Raschke</i>, University of Colorado Boulder; <i>P El-Khoury</i>, Pacific Northwest National Laboratory; <b>Scott Lea</b>, Pacific Northwest National Laboratory</p>	<p><b>TF+SS-ThA-8</b> Carrier-Gas Assisted Vapor Deposition of Metal Halide Perovskite Thin Films, <b>Catherine Clark</b>, University of Minnesota; <i>E Aydil</i>, New York University; <i>R Holmes</i>, University of Minnesota</p>	
5:00pm	<p><b>CA+NS+SS+VT-ThA-9</b> Imaging and Processing in Liquid Gel Solutions with Focused Electron and X-ray Beams, <b>T Gupta</b>, National Institute of Standards and Technology (NIST); <i>P Zeller, M Amati, L Gregoratti</i>, Elettra - Sincrotrone Trieste, Trieste, Italy; <b>Andrei Kolmakov</b>, National Institute of Standards and Technology (NIST)</p>	<p><b>TF+SS-ThA-9</b> Synthesis and Optical Properties of Organo-halide 2D Perovskites, <b>Misook Min</b>, <i>A Kaul</i>, University of North Texas</p>	
5:20pm	<p><b>INVITED: CA+NS+SS+VT-ThA-10</b> In Situ TEM Visualization of Solution-based Nanofabrication Processes: Chemical Wet-etching and Capillary Forces, <b>Utukur Mirsaidov</b>, National University of Singapore, Singapore</p>	<p><b>TF+SS-ThA-10</b> Encapsulation of Perovskite Nanocrystal Solids using Metal Oxides - A Closer Look into Optical Properties, <b>Riya Bose</b>, <i>Y Zheng, T Guo, Y Garstein, A Malko</i>, University of Texas at Dallas</p>	
5:40pm	Invited talk continues.		

# Thursday Afternoon, October 24, 2019

Room A124-125		<b>Thin Films Division</b> <b>Session TF+AS+EL+PS+RA-ThA</b> <b>Characterization of Thin Film Processes and Properties</b> <b>Moderators:</b> Richard Vanfleet, Brigham Young University, Virginia Wheeler, U.S. Naval Research Laboratory
2:20pm	<b>INVITED: TF+AS+EL+PS+RA-ThA-1</b> Phase Separation in III-V Semiconductor Thin Films, <i>Mark Twigg</i> , <i>N Mahadik</i> , <i>N Kotulak</i> , <i>S Tomasulo</i> , <i>M Yakes</i> , U.S. Naval Research Laboratory	
2:40pm	Invited talk continues.	
3:00pm	<b>TF+AS+EL+PS+RA-ThA-3</b> In-Situ Spectroscopic Monitoring of Methylamine-Induced Hybrid Perovskite Phase Transitions, <i>Jonathan Meyers</i> <sup>1</sup> , <i>L Serafin</i> , <i>J Cahoon</i> , University of North Carolina at Chapel Hill	
3:20pm	<b>TF+AS+EL+PS+RA-ThA-4</b> Angle-Resolved HAXPES Analysis of Al <sub>x</sub> O <sub>y</sub> and Cu <sub>x</sub> O <sub>y</sub> Layers formed by Metal Salt Diffusion into a poly 2-vinylpyridine (P2vP) Polymer Layer, <i>Pierre Mani</i> , Universidad Autonoma de Ciudad Juarez, México; <i>M Snelgrove</i> , Dublin City University, Ireland; <i>P Rueff</i> , Synchrotron SOLEIL, France; <i>R Lundy</i> , Trinity College Dublin, Ireland; <i>J Bogan</i> , <i>R O'Connor</i> , Dublin City University, Ireland; <i>J Enríquez</i> , Universidad Autonoma de Ciudad Juarez, México; <i>M Morris</i> , Trinity College Dublin, Ireland; <i>G Hughes</i> , Dublin City University, Ireland	
3:40pm	<b>BREAK</b>	
4:00pm	<b>INVITED: TF+AS+EL+PS+RA-ThA-6</b> Obtaining Smooth Surfaces and Measuring Surface Roughness, <i>Steven M. George</i> , University of Colorado at Boulder	
4:20pm	Invited talk continues.	
4:40pm	<b>TF+AS+EL+PS+RA-ThA-8</b> Characterizing Ultra-thin Layer Growth and Area Selective Deposition using High Resolution Low Energy Ion Scattering (LEIS), <i>Thomas Grehl</i> , IONTOF GmbH, Germany; <i>P Brüner</i> , ION-TOF GmbH, Germany; <i>V Pesce</i> , <i>B Pelissier</i> , <i>R Gassilloud</i> , <i>C Vallée</i> , Laboratoire des Technologies de la Microélectronique (LTM), France	
5:00pm	<b>TF+AS+EL+PS+RA-ThA-9</b> Real-Time Monitoring of Aluminum Oxidation Through Wide Band Gap MgF <sub>2</sub> Layers for Protection of Space Mirrors, <i>B Johnson</i> , <i>T Avval</i> , <i>G Hodges</i> , <i>K Membreno</i> , <i>D Allred</i> , <i>Matthew Linford</i> , Brigham Young University	
5:20pm	<b>INVITED: TF+AS+EL+PS+RA-ThA-10</b> Visualization of Ultrafast Charge Motion in Thin Films via THz Emission Spectroscopy, <i>Aaron Lindenberg</i> , Stanford University	
5:40pm	Invited talk continues.	

# Thursday Afternoon, October 24, 2019

Room A210		
2:20pm	<b>INVITED: LS+AC+NS-ThA-1</b> Triplet Dynamics in Photovoltaic Materials Measured with Time Resolved X-Ray Spectroscopies, <i>R Costantini</i> , University of Trieste; <i>R Faber</i> , Technical University of Denmark; <i>A Cossaro, A Verdini, L Floreano</i> , CNR - Istituto Officine Materiali; <i>C Haettig</i> , Ruhr-University Bochum, Germany; <i>A Morgante</i> , University of Trieste, Italy; <i>S Coriani</i> , Technical University of Denmark; <i>Martina Dell'Angela</i> , CNR - Istituto Officine Materiali, Italy	<b>Frontiers of New Light Sources Applied to Materials, Interfaces, and Processing Focus Topic Session LS+AC+NS-ThA</b> <b>Photon Science for Imaging Materials from the Meso- to the Nanoscale</b> <b>Moderator:</b> Maya Kiskinova, Elettra-Sincrotrone Trieste, Italy
2:40pm	Invited talk continues.	
3:00pm	<b>INVITED: LS+AC+NS-ThA-3</b> Synchrotron X-Ray Tomography to Understand Structure and Physical Transformations in Solid State Batteries, <i>Kelsy Hatzell, M Dixit</i> , Vanderbilt University	
3:20pm	Invited talk continues.	
3:40pm	<b>BREAK</b>	
4:00pm	<b>LS+AC+HC+SS-ThA-6</b> Resolving X-ray Based Spectroscopies in the Sub-nanometer Regime: Enabling Atomic Scale Insights into CO Adsorption on Thin Film Surfaces, <i>Heath Kersell, B Eren, C Wu</i> , Lawrence Berkeley National Laboratory; <i>I Waluyo, A Hunt</i> , Brookhaven National Laboratory; <i>G Somorjai, M Salmeron</i> , Lawrence Berkeley National Laboratory	<b>Frontiers of New Light Sources Applied to Materials, Interfaces, and Processing Focus Topic Session LS+AC+HC+SS-ThA</b> <b>Emerging Methods with New Coherent Light Sources</b> <b>Moderator:</b> Germán Rafael Castro, Spanish CRG BM25-SpLine Beamline at the ESRF
4:20pm	<b>LS+AC+HC+SS-ThA-7</b> Imaging with XPS: Advanced Characterization for Advanced Materials and Devices, <i>Tatyana Bendikova, H Kaslasi, E Sanders, E Joselevich, D Cahen</i> , Weizmann Institute of Science, Israel	
4:40pm	<b>INVITED: LS+AC+HC+SS-ThA-8</b> Time-Resolved Photoemission with Free-Electron Lasers, <i>Kai Rossnagel</i> , CAU Kiel / DESY, Germany	
5:00pm	Invited talk continues.	
5:20pm	<b>INVITED: LS+AC+HC+SS-ThA-10</b> Ultrafast Magnetization Dynamics on the Nanoscale, <i>Bastian Pfau</i> , Max Born Institute, Germany	
5:40pm	Invited talk continues.	

# Thursday Afternoon, October 24, 2019

Room A211		<b>Applied Surface Science Division</b> <b>Session AS-ThA</b> <b>Role of Surfaces and Interfaces in Energy Material and Industrial Problems</b> <b>Moderators:</b> David M. Carr, Physical Electronics, Alan Spool, Western Digital Corporation
2:20pm	<b>INVITED: AS-ThA-1</b> Characterization of Glass and Durable Optical Surfaces and Their Modes of Failure, <i>Albert Fahey, D Baker, T Dimond, Corning Inc.</i>	
2:40pm	Invited talk continues.	
3:00pm	<b>AS-ThA-3</b> Determination of Liquid Laundry Additives Across Fabric Surfaces, <i>Michael Clark, Jr., A Peera, S Donovan, R Pulukkody, The Dow Chemical Company</i>	
3:20pm	<b>AS-ThA-4</b> Depth Profiling of Silicones with GCIB, Do They Behave like Organic or Inorganic Molecules?, <i>Michaeleen Pacholski, M Clark, Jr., P Vlasak, C McMillan, The Dow Chemical Company</i>	
3:40pm	<b>BREAK</b>	
4:00pm	<b>AS-ThA-6</b> Active Control of Interfacial Chemistry for Thin Film Solar Cells, <i>Alexandra Koziel, K Montiel, L Wilson, J Carter, I Martin, Case Western Reserve University</i>	
4:20pm	<b>INVITED: AS-ThA-7</b> Solar Energy From a Big-Picture Perspective to Nanoscale Insights via TOF-SIMS, <i>Steven Harvey, National Renewable Energy Laboratory</i>	
4:40pm	Invited talk continues.	
5:00pm	<b>AS-ThA-9</b> Investigation of Surface and Bulk Properties of Extended Surface PtNi and PtNiCo Catalysts, <i>Sarah Zaccarine, Colorado School of Mines; W McNeary, CU Boulder; S Shulda, S Mauger, K Hurst, National Renewable Energy Laboratory; A Weimer, CU Boulder; S Alia, B Pivovar, National Renewable Energy Laboratory; S Pylypenko, Colorado School of Mines</i>	
5:20pm	<b>INVITED: AS-ThA-10</b> Interfaces in Electrodeposited Li-Ion Battery Electrodes, <i>Paul Braun, University of Illinois at Urbana-Champaign</i>	
5:40pm	Invited talk continues.	

# Thursday Afternoon, October 24, 2019

Room A212		
2:20pm	<b>INVITED: DM1+BI+SS-ThA-1</b> Utilizing Experimental and MD Simulation Approaches in the Understanding and Design of Low Fouling Interfaces, <i>Paul Molino</i> , University of Wollongong, Australia	<b>Fundamental Aspects of Material Degradation</b> <b>Focus Topic</b> <b>Session DM1+BI+SS-ThA</b> <b>Low Fouling Interfaces and Environmental Degradation</b> <b>Moderator:</b> Axel Rosenhahn, Ruhr-University Bochum
2:40pm	Invited talk continues.	
3:00pm	<b>DM1+BI+SS-ThA-3</b> Study of Environmental Exposure Effects on Pristine and DC Magnetron Sputtering Metallic Coated 3D Printed Polymers, <i>D Mihut, Arash Afshar, P Chen</i> , Mercer University	
3:20pm	<b>DM1+BI+SS-ThA-4</b> Reaction Mechanism of Chloride-induced Depassivation of Oxide Films: a Density Functional Theory Study, <i>Q Pang, H DorMohammadi, K Oware Sarfo, P Murkute, Y Zhang, O Isgor, J Tucker, Líney Árnadóttir</i> , Oregon State University	
3:40pm	<b>BREAK</b>	
4:00pm	<b>INVITED: DM2+BI+SS-ThA-6</b> Stability Challenges in Electrocatalysis, <i>Serhiy Cherevko</i> , Forschungszentrum Jülich GmbH, Germany	<b>Fundamental Aspects of Material Degradation</b> <b>Focus Topic</b> <b>Session DM2+BI+SS-ThA</b> <b>Fundamentals of Catalyst Degradation: Dissolution, Oxidation and Sintering</b> <b>Moderator:</b> Gareth S. Parkinson, TU Wien, Austria
4:20pm	Invited talk continues.	
4:40pm	<b>DM2+BI+SS-ThA-8</b> Self-limited Growth of an Oxyhydroxide Phase at the Fe <sub>3</sub> O <sub>4</sub> (001) Surface in Liquid and Ambient Pressure Water, <i>Florian Kraushofer</i> , TU Wien, Austria; <i>F Mirabella</i> , TU Wien, Austria, Germany; <i>J Xu, J Pavelec, J Balajka, M Müllner, N Resch, Z Jakob, J Hulva, M Meier, M Schmid, U Diebold, G Parkinson</i> , TU Wien, Austria	
5:00pm	<b>DM2+BI+SS-ThA-9</b> The Impact of W on the Early Stages of Oxide Evolution for Ni-Cr Alloys, <i>Cameron Volders</i> , V Avincola, University of Virginia; <i>J Waluyo</i> , Brookhaven National Laboratory; <i>J Perepezko</i> , University of Wisconsin - Madison; <i>P Reinke</i> , University of Virginia	
5:20pm	<b>DM2+BI+SS-ThA-10</b> The Stability of Platinum in Non-aqueous Media, <i>J Ranninger, S Wachs, J Möller, K Mayrhofer, Balázs Berkes</i> , Forschungszentrum Jülich GmbH, Germany	
5:40pm	<b>DM2+BI+SS-ThA-11</b> Stabilizing Transparent Conductive Oxides as a Route to Long-Lived Thin Film Photovoltaics: A Case Study in CIGS, <i>N Kovach</i> , Colorado School of Mines; <i>R Matthews, E Pentzer</i> , Case Western Reserve University; <i>L Mansfield</i> , National Renewable Energy Laboratory; <i>T Peshek</i> , NASA Glenn Research Center; <i>Ina Martin</i> , Case Western Reserve University	



# Thursday Afternoon, October 24, 2019

Room A213		<p><b>Fundamental Discoveries in Heterogeneous Catalysis Focus Topic</b>  <b>Session HC+SS+TL-ThA</b>  <b>Reaction Pathways and Addressing Challenges for Energy Production in the 21st Century &amp; Heterogeneous Catalysis Graduate Student Award Presentation</b>  <b>Moderators:</b> Sanjaya Senanayake, Brookhaven National Laboratory, Arthur Utz, Tufts University</p>
2:20pm	<b>HC+SS+TL-ThA-1</b> High Resolution XPS to Identify C <sub>x</sub> H <sub>y</sub> Surface Species on a Cobalt Model Catalyst: New Experimental Evidence for the Importance of Alkylidynes as Growth Intermediates in Fischer-Tropsch Synthesis, <i>Kees-Jan Weststrate</i> , Syngaschem BV, Netherlands; <i>D Sharma, D Garcia Rodriguez, M Gleeson</i> , DIFFER, Eindhoven University, The Netherlands, Netherlands; <i>H Fredriksson, H Niemantsverdriet</i> , Syngaschem BV, Netherlands	
2:40pm	<b>HC+SS+TL-ThA-2</b> Beam Reflectivity Measurements of Carbon Dissolution on Nickel Single Crystal Catalysts, <i>Eric High, D Tinney, A Utz</i> , Tufts University	
3:00pm	<b>INVITED: HC+SS+TL-ThA-3</b> Fundamental Research Opportunities to Advance Energy Technologies, <i>Bruce Garrett</i> , Department of Energy	
3:20pm	Invited talk continues.	
3:40pm	<b>BREAK</b>	
4:00pm	<b>HC+SS+TL-ThA-6</b> Oxidation and Redox-Mediated Transformation of a Tb <sub>2</sub> O <sub>3</sub> Thin Film from the Cubic Fluorite to Bixbyite Structure, <i>Christopher Lee, J Weaver</i> , University of Florida	
4:20pm	<b>HC+SS+TL-ThA-7</b> Discrimination of Surface Storage and Mechanistic Pathways Using Dynamic Pulse Response Experiments, <i>Y Wang, M Kunz</i> , Idaho National Laboratory; <i>G Yablonsky</i> , Washington University in Saint Louis; <i>Rebecca Fushimi</i> , Idaho National Laboratory	
4:40pm	<b>INVITED: HC+SS+TL-ThA-8</b> Nuclearity Effects in Supported Zinc and Gallium Catalysts for Alkane Dehydrogenation, <i>Susannah Scott</i> , University of California at Santa Barbara	
5:00pm	Invited talk continues.	
5:20pm	<b>HC+SS+TL-ThA-10</b> Fundamental Insights into Hydrocarbon Conversion Mechanisms in Lewis and Brønsted Acid Zeolites using Temporal Analysis of Products, <i>Hari Thirumala<sup>1</sup>, J Rimer, L Grabow</i> , University of Houston	

<sup>1</sup> Morton S. Traum Award Finalist

# Thursday Afternoon, October 24, 2019

Room A215		
2:20pm	<b>INVITED: SE-ThA-1</b> Evaluating Electro-Mechanical Reliability using In-Situ Methods, <i>Megan J. Cordill, O Glushko</i> , Erich Schmid Institute of Materials Science, Austrian Academy of Sciences, Austria	<b>Advanced Surface Engineering Division</b> <b>Session SE-ThA</b> <b>New Challenges and Opportunities in Surface Engineering</b> <b>Moderators:</b> Jolanta Klemberg-Sapieha, Ecole Polytechnique de Montreal, Canada, Matjaz Panjan, Jozef Stefan Institute, Slovenia
2:40pm	Invited talk continues.	
3:00pm	<b>INVITED: SE-ThA-3</b> Surface Engineering for Bearing Applications: Present Status and (Near)-Future Needs, <i>Esteban Broitman</i> , SKF - RTD - Research & Technology Development Center, Netherlands	
3:20pm	Invited talk continues.	
3:40pm	<b>BREAK</b>	
4:00pm	<b>SE-ThA-6</b> <i>In situ</i> Scanning Electron Microscopy based Uniaxial Compression of sub-micrometer-size NbC(100) Single-crystalline Pillars, <i>A Aleman, K Tanaka, H Zaid, J Yang, Suneel Kodambaka</i> , University of California, Los Angeles	
4:20pm	<b>SE-ThA-7</b> Thermal Stability of MoNbTaVW High Entropy Alloys Thin Films Deposited by Cathodic Arc, <i>A Xia, Robert Franz</i> , Montanuniversität Leoben, Austria	
4:40pm	<b>SE-ThA-8</b> Erosion Resistant Coatings Inside Narrow Tubes to Protect Aircraft Engine Components, <i>A Kilicaslan, O Zabeida, E Bousser, M Martinu, Jolanta Klemberg-Sapieha</i> , Polytechnique Montreal, Canada	
5:00pm	<b>EL-ThA-9</b> Far-infrared Dielectric Functions of Hg <sub>1-x</sub> Cd <sub>x</sub> Se Thin Films Determined via Ellipsometry and Reflectivity, <i>Frank Peiris, J Lyons</i> , Kenyon College; <i>G Brill</i> , U.S. Army Research Laboratory	<b>Spectroscopic Ellipsometry Focus Topic</b> <b>Session EL-ThA</b> <b>Spectroscopic Ellipsometry Late New Session</b> <b>Moderator:</b> Tino Hofmann, University of North Carolina at Charlotte
5:20pm	<b>EL-ThA-10</b> Tunable Giant Circular Dichroism in Spatially-coherent Si-Au/Ag Nano-plasmonic Chiral Heterostructures, <i>Ufuk Kilic, M Hilfiker</i> , University of Nebraska-Lincoln; <i>R Feder</i> , The Fraunhofer Institute for Microstructure of Materials and Systems (IMWS), Germany; <i>R Korlacki, E Schubert, C Argyropoulos, M Schubert</i> , University of Nebraska-Lincoln	
5:40pm	<b>EL-ThA-11</b> Numerical Ellipsometry: Methods for Selecting Measurements and Techniques for Advanced Analysis Applied to $\beta$ -Gallium Oxide, <i>Frank Urban</i> , Florida International University; <i>D Barton</i> , retired; <i>M Schubert</i> , University of Nebraska-Lincoln	

# Thursday Afternoon, October 24, 2019

	<p><b>2D Materials</b>  <b>Room A216 - Session 2D+AS+BI+HC+MN+NS+PS+SS+TL-ThA</b>  <b>Surface Chemistry, Functionalization, Bio, Energy and Sensor Applications</b>  <b>Moderator:</b> Mark Edmonds, Monash University, Australia</p>	<p><b>Surface Science Division</b>  <b>Room A220-221 - Session SS+2D+AP+AS+OX+SE-ThA</b>  <b>Dynamics at Surfaces/Reactions and Imaging of Oxide Surfaces</b>  <b>Moderators:</b> Irene Groot, Leiden University, The Netherlands, William E. Kaden, University of Central Florida</p>
2:20pm	<p><b>2D+AS+BI+HC+MN+NS+PS+SS+TL-ThA-1</b> Molecular Layers on Nanoporous Gold Electrodes, <i>Elizabeth Landis</i>, College of the Holy Cross</p>	<p><b>SS+2D+AP+AS+OX+SE-ThA-1</b> Adsorption, Reaction, and Diffusion of Energetic Reagents on Morphologically Diverse Thin Films, <i>Rebecca Thompson</i><sup>1,2</sup>, <i>M Brann</i>, <i>S Sibener</i>, The University of Chicago</p>
2:40pm	<p><b>2D+AS+BI+HC+MN+NS+PS+SS+TL-ThA-2</b> Thermotropic Liquid Crystal (5CB) on Two-dimensional Materials, <i>Paul Brown</i>, American Society for Engineering Education; <i>S Fischer</i>, <i>J Kolacz</i>, <i>C Spillmann</i>, <i>D Gunlycke</i>, U.S. Naval Research Laboratory</p>	<p><b>SS+2D+AP+AS+OX+SE-ThA-2</b> Oxidation of Semiconductors and Semimetals by Supersonic Beams of O<sub>2</sub> with Scanning Tunneling Microscopy Visualization, <i>Ross EdelP</i>, <i>T Grabnic</i>, <i>B Wiggins</i>, <i>S Sibener</i>, The University of Chicago</p>
3:00pm	<p><b>2D+AS+BI+HC+MN+NS+PS+SS+TL-ThA-3</b> Is it Possible to Achieve Intramolecular Resolution with Ambient AFM?, <i>Vladimir Korolkov</i>, Oxford Instruments-Asylum Research; <i>S Chulkov</i>, <i>M Watkins</i>, University of Lincoln, UK; <i>P Beton</i>, The University of Nottingham, UK</p>	<p><b>INVITED: SS+2D+AP+AS+OX+SE-ThA-3</b> Studying Molecule-Surface Interactions using Rotational Orientation Control of Ground-State Molecular Beams, <i>Gil Alexandrowicz</i>, Swansea University, UK</p>
3:20pm	<p><b>2D+AS+BI+HC+MN+NS+PS+SS+TL-ThA-4</b> Tailoring Surface Properties via Functionalized Hydrofluorinated Graphene Compounds, <i>Jangyup Son</i>, University of Illinois at Urbana-Champaign; <i>N Buzov</i>, University of California at Santa Barbara; <i>S Chen</i>, University of Illinois at Urbana-Champaign; <i>D Sung</i>, Sejong University, Republic of Korea; <i>H Ryu</i>, Seoul National University, Republic of Korea; <i>J Kwon</i>, Yonsei University, Republic of Korea; <i>S Kim</i>, <i>J Xu</i>, University of Illinois at Urbana-Champaign; <i>S Hong</i>, Sejong University, Republic of Korea; <i>W King</i>, University of Illinois at Urbana-Champaign; <i>G Lee</i>, Seoul National University, Republic of Korea; <i>A van der Zande</i>, University of Illinois at Urbana-Champaign</p>	<p>Invited talk continues.</p>
3:40pm	<p><b>BREAK</b></p>	<p><b>BREAK</b></p>
4:00pm	<p><b>2D+AS+BI+HC+MN+NS+PS+SS+TL-ThA-6</b> Functionalization of MoS<sub>2</sub> with Halogens, <i>G Copetti</i>, IF-UFRGS, Brazil; <i>E Nunes</i>, IQ-UFRGS, Brazil; <i>G Soares</i>, IF-UFRGS, Brazil; <i>Cláudio Radtke</i>, IQ-UFRGS, Brazil</p>	<p><b>SS+2D+AP+AS+OX+SE-ThA-6</b> Diffusion of (100)-epitaxially Supported 3D fcc Nanoclusters: Complex Size-dependence on the Nanoscale, <i>King Chun Lai</i>, <i>J Evans</i>, Iowa State University</p>
4:20pm	<p><b>2D+AS+BI+HC+MN+NS+PS+SS+TL-ThA-7</b> Towards Higher Alcohol Synthesis from Syngas on 2D material-based catalysts: A First-Principles Study*, <i>Tao Jiang</i>, <i>D Le</i>, <i>T Rahman</i>, University of Central Florida</p>	<p><b>SS+2D+AP+AS+OX+SE-ThA-7</b> Oxide Surface Formation on Rh Nanoparticle during O<sub>2</sub> Exposures Observed by Atom Probe Microscopy, <i>Sten Lambeets</i>, Pacific Northwest National Laboratory; <i>T Visart de Bocarmé</i>, Université Libre de Bruxelles, Belgium; <i>N Kruse</i>, Washington State University; <i>D Perea</i>, Pacific Northwest National Laboratory</p>
4:40pm	<p><b>2D+AS+BI+HC+MN+NS+PS+SS+TL-ThA-8</b> Proton Conductivity Properties of Electrospun Chitosan Nanofibers, <i>Woo-Kyung Lee</i>, <i>J Pietron</i>, <i>D Kidwell</i>, <i>J Robinson</i>, <i>C McGann</i>, <i>S Mulvaney</i>, U.S. Naval Research Laboratory</p>	<p><b>INVITED: SS+2D+AP+AS+OX+SE-ThA-8</b> Noncontact AFM on Oxide Surfaces: Challenges and Opportunities, <i>Martin Setvin</i>, TU Wien, Austria</p>
5:00pm	<p><b>2D+AS+BI+HC+MN+NS+PS+SS+TL-ThA-9</b> Sensor for Breath and Skin Diagnostics, <i>Pelagia I Gouma</i>, The Ohio State University</p>	<p>Invited talk continues.</p>
5:20pm	<p><b>2D+AS+BI+HC+MN+NS+PS+SS+TL-ThA-10</b> Symmetry Controlled Adsorption of Diodobenzene on MoS<sub>2</sub>, <i>Zahra Hooshmand</i>, University of Central Florida; <i>P Evans</i>, <i>P Dowben</i>, University of Nebraska - Lincoln; <i>T Rahman</i>, University of Central Florida</p>	<p><b>SS+2D+AP+AS+OX+SE-ThA-10</b> Edge-Enhanced Oxygen Evolution Reactivity at Au-Supported, Ultrathin Fe<sub>2</sub>O<sub>3</sub> Electrocatalysts, <i>Xingyi Deng</i>, <i>D Kauffman</i>, <i>D Sorescu</i>, National Energy Technology Laboratory</p>
5:40pm	<p><b>2D+AS+BI+HC+MN+NS+PS+SS+TL-ThA-11</b> Mechanistic Understanding of the CO Hydrogenation Reaction on Defect Engineered 2D-TaS<sub>2</sub> and 2D-MoS<sub>2</sub> Catalysts, <i>Mihai Vaida</i>, University of Central Florida</p>	<p><b>SS+2D+AP+AS+OX+SE-ThA-11</b> Adsorption and Reaction of Methanol on the Magnetite Fe<sub>3</sub>O<sub>4</sub>(001) Surface, <i>Matthew Marcinkowski</i>, Pacific Northwest National Laboratory; <i>K Adamsen</i>, Aarhus University, Denmark; <i>N Doudin</i>, <i>Y Yang Wang</i>, <i>S Smith</i>, <i>B Kay</i>, <i>Z Dohnalek</i>, Pacific Northwest National Laboratory</p>

<sup>1</sup> Morton S. Traum Award Finalist

<sup>2</sup> National Student Award Finalist

# Thursday Afternoon, October 24, 2019

<b>Nanometer-scale Science and Technology Division</b> <b>Room A222 - Session NS-ThA</b> <b>SPM for Functional Characterization</b> <b>Moderators:</b> Volker Rose, Argonne National Laboratory, Renu Sharma, NIST Center for Nanoscale Science and Technology		<b>Plasma Science and Technology Division</b> <b>Room B130 - Session PS+2D+EM+SS+TF-ThA</b> <b>Plasma-Enhanced Atomic Layer Etching</b> <b>Moderators:</b> Steven Vitale, MIT Lincoln Laboratory, Mingmei Wang, TEL Technology Center, America, LLC	
2:20pm	<b>INVITED: NS-ThA-1</b> Interatomic Force Laws That Evade Dynamic Measurement, <i>John Sader</i> , University of Melbourne, Australia	<b>INVITED: PS+2D+EM+SS+TF-ThA-1</b> Atomic Layer Etch: Real World Utilization of an Idealized Solution, <i>Peter Biolsi</i> , TEL Technology Center, America, LLC	
2:40pm	Invited talk continues.	Invited talk continues.	
3:00pm	<b>INVITED: NS-ThA-3</b> Intermittent Contact Resonance Atomic Force Microscopy (icr-Afm) for Nanoscale Mechanical Property Characterization, <i>Gheorghe Stan</i> , National Institute of Standards and Technology	<b>PS+2D+EM+SS+TF-ThA-3</b> Mechanism of SiN Etching Rate Fluctuation in Atomic Layer Etching, <i>Akiko Hirata</i> , <i>M Fukasawa</i> , <i>K Kugimiya</i> , <i>K Nagaoka</i> , Sony Semiconductor Solutions Corporation, Japan; <i>K Karahashi</i> , <i>S Hamaguchi</i> , Osaka University, Japan	
3:20pm	Invited talk continues.	<b>PS+2D+EM+SS+TF-ThA-4</b> Effect of Polymerization on Ar+ Bombardment Modification of SiO <sub>2</sub> and Si <sub>3</sub> N <sub>4</sub> Substrates: Molecular Dynamics Simulation Study, <i>Hojin Kim</i> , <i>Y Shi</i> , <i>Y Tsai</i> , <i>D Zhang</i> , <i>Y Han</i> , TEL Technology Center, America, LLC; <i>K Taniguchi</i> , TEL Miyagi Limited, Japan; <i>S Morikita</i> , TEL Miyagi Limited; <i>M Wang</i> , <i>A Mosden</i> , <i>A Metz</i> , <i>P Biolsi</i> , TEL Technology Center, America, LLC	
3:40pm	<b>BREAK</b>	<b>BREAK</b>	
4:00pm	<b>NS-ThA-6</b> Novel Approaches Towards Cantilevers for Functional Multiparametric AFM Characterization, <i>Georg Ernest Fantner</i> , <i>N Hosseini</i> , <i>M Neuenschwander</i> , <i>B Ghadiani</i> , École Polytechnique Fédéral de Lausanne, Switzerland	<b>INVITED: PS+2D+EM+SS+TF-ThA-6</b> Advanced Cyclic Plasma Etch Approaches for Metal Patterning: Synergy and Surface Modification Effects, <i>Nathan Marchack</i> , IBM T.J. Watson Research Center; <i>K Hernandez</i> , University of Texas at Dallas; <i>J Innocent-Dolor</i> , <i>M Hopstaken</i> , <i>S Engelmann</i> , IBM T.J. Watson Research Center	
4:20pm	<b>NS-ThA-7</b> Fluid Handling using Scanning Probe Lithography for Nanocombinatorics, <i>V Saygin</i> , <i>N Alsharif</i> , <i>Keith A. Brown</i> , Boston University	Invited talk continues.	
4:40pm	<b>NS-ThA-8</b> Accuracy of Tip-sample Interaction Measurements Using Dynamic Atomic Force Microscopy Techniques, <i>O Dagdeviren</i> , <i>Udo D. Schwarz</i> , Yale University	<b>PS+2D+EM+SS+TF-ThA-8</b> Surface Modification and Stability of Plasma-assisted Atomic-layer Etching (ALE) of Si based Materials; Analysis by Molecular Dynamics (MD) Simulation, <i>Satoshi Hamaguchi</i> , <i>M Isobe</i> , <i>E Tinacba</i> , <i>S Shigeno</i> , <i>Y Okada</i> , <i>T Ito</i> , <i>K Karahashi</i> , Osaka University, Japan	
5:00pm	<b>NS-ThA-9</b> Utilizing AFM to Study the Effect of Malaria-derived EVs on the Mechanical and Morphological Properties of Red Blood Cells, <i>Irit Rosenhek-Goldian</i> , <i>E Dekel</i> , <i>Y Ohana</i> , <i>S Maihib</i> , <i>S Cohen</i> , <i>N Regev-Rudzikib</i> , Weizmann Institute of Science, Israel	<b>INVITED: PS+2D+EM+SS+TF-ThA-9</b> Innovative Future Etch Technology by Atomic-order Control, <i>Yoshihide Kihara</i> , <i>T Katsunuma</i> , <i>S Kumakura</i> , <i>T Hisamatsu</i> , <i>M Honda</i> , Tokyo Electron Miyagi Ltd., Japan	
5:20pm	<b>INVITED: NS-ThA-10</b> Silicon Oxide for RRAM Application: The SPM Analysis Approach, <i>Adnan Mehonic</i> , <i>M Buckwell</i> , <i>W Ng</i> , <i>A Kenyon</i> , University College London, UK	Invited talk continues.	
5:40pm	Invited talk continues.		

# Thursday Afternoon, October 24, 2019

<p><b>Plasma Science and Technology Division</b>  <b>Room B131 - Session PS+SS-ThA</b>  <b>Plasma Conversion and Enhanced Catalysis for Chemical Synthesis</b>  <b>Moderator:</b> R. Mohan Sankaran, Case Western Reserve University</p>		<p><b>Advanced Ion Microscopy and Ion Beam Nano-engineering Focus Topic</b>  <b>Room B231-232 - Session HI+NS-ThA</b>  <b>Emerging Ion Sources, Optics, and Applications &amp; Flash Session</b>  <b>Moderators:</b> Gregor Hlawacek, Helmholtz-Zentrum Dresden - Rossendorf, Shida Tan, Intel Corporation</p>	
2:20pm	<p><b>PS+SS-ThA-1</b> Rate Limiting Factors of Low Pressure Plasma-catalytic CO<sub>2</sub> Methanation Process, <i>Kazunori Koga, A Yamamoto, K Kamataki, N Itagaki, M Shiratani</i>, Kyushu University, Japan</p>	<p><b>INVITED: HI+NS-ThA-1</b> Cold Atom Ion Sources, <i>Jabez McClelland, J Gardner, W McGehee</i>, National Institute of Standards and Technology (NIST); <i>A Schwarzkopf, B Knuffman, A Steele</i>, zeroK NanoTech Corp.</p> <p>Invited talk continues.</p>	
2:40pm	<p><b>PS+SS-ThA-2</b> Radical Nitrating of Graphene Promoted by Surface Plasmon Resonance of Gold Nanoparticle Catalyst, <i>Takeshi Kitajima, T Nakano</i>, National Defense Academy, Japan</p>		
3:00pm	<p><b>INVITED: PS+SS-ThA-3</b> Plasma-assisted Catalysis: Exploring the Effects of Plasma Stimulation on Catalyst Performance, <i>Jason C. Hicks</i>, University of Notre Dame</p>	<p><b>HI+NS-ThA-3</b> Silicon Lithiation by Direct-writing with a Focused Li<sup>+</sup>-ion Beam, <i>W McGehee, Evgheni Strelcov, V Oleshko, C Soles, N Zhitenev, J McClelland</i>, National Institute of Standards and Technology (NIST)</p>	
3:20pm	Invited talk continues.	<p><b>HI+NS-ThA-4</b> A New FIB for Deterministic Single Ion Implantation, <i>Nathan Cassidy</i>, UK National Ion Beam Centre, University of Surrey, UK; <i>D Cox</i>, Advanced Technology Institute, University of Surrey, UK; <i>R Webb</i>, UK National Ion Beam Centre, University of Surrey, UK; <i>B Murdin</i>, Advanced Technology Institute, University of Surrey, UK; <i>P Blenkinsopp, I Brown</i>, Ionoptika Ltd., UK; <i>R Curry</i>, The Photon Science Institute, University of Manchester, UK</p>	
3:40pm	<b>BREAK</b>	<b>BREAK</b>	
4:00pm	<p><b>PS+SS-ThA-6</b> A Plasma-aerosol Droplet Reactor for the Synthesis of Ammonia from Nitrogen and Water, <i>Joseph Toth, D Lacks, J Renner, M Sankaran</i>, Case Western Reserve University</p>	<p><b>INVITED: HI+NS-ThA-6</b> Technology and Applications of a Plasma Ion Source with User-selectable Ion Species, <i>Gregory Schwind, S Kellogg, J Stiller, M Doud, C Rue, B Van Leer</i>, Thermo Fisher Scientific</p>	
4:20pm	<p><b>PS+SS-ThA-7</b> Plasma-assisted Nitrogen Fixation by Water: Development and Evaluation of Hybrid Membrane Based Plasma-Electrochemical Reactor, <i>R Sharma, Richard M.C.M. van de Sanden, H Patel, V Kyriakou, U Mushtaq</i>, Dutch Institute for Fundamental Energy, Netherlands; <i>A Pandiyan</i>, Dutch Institute for Fundamental Energy; <i>S Welzel, M Tsampas</i>, Dutch Institute for Fundamental Energy, Netherlands</p>	Invited talk continues.	
4:40pm	<p><b>INVITED: PS+SS-ThA-8</b> Plasma-Assisted Ammonia Synthesis in Hybrid Plasma-Catalysis DBD Reactors, <i>Z Chen, X Yang, Y Ju, S Sundaresan, Bruce E. Koel</i>, Princeton University</p>	<p><b>HI+NS-ThA-8</b> Neutral Helium Microscopy, <i>Bodil Holst</i>, University of Bergen, Norway</p>	
5:00pm	Invited talk continues.	<p><b>HI+NS-ThA-9</b> GaBiLi Liquid Metal Alloy Ion Sources for Advanced Nanofabrication, <i>P Mazarov</i>, RAITH GmbH, Germany; <i>T Richter, L Bruchhaus, W Pilz, R Jede</i>, Raith GmbH, Germany; <i>Yang Yu, R Schmid, J Sanabia</i>, Raith America, Inc.; <i>L Bischoff</i>, Helmholtz Zentrum Dresden-Rossendorf, Germany; <i>G Hlawacek</i>, Helmholtz-Zentrum Dresden Rossendorf, Germany</p>	
5:20pm	<p><b>PS+SS-ThA-10</b> Efforts towards Plasma-assisted Catalysis: Elucidating Gas-phase Energetics, Kinetics, and Surface Interactions, <i>Angela Hanna, E Fisher</i>, Colorado State University</p>	<p><b>HI+NS-ThA-10</b> Focused Ion Beams in Biology: How the Helium Ion Microscope and FIB/SEMs Help Reveal Nature's Tiniest Structures, <i>Annalena Wolff</i>, Central Analytical Research Facility, Institute for Future Environments, Queensland University of Technology (QUT), Brisbane QLD 4000, Australia; <i>N Klingner</i>, Helmholtz Zentrum Dresden-Rossendorf, Germany; <i>W Thompson</i>, HeelionicsLLC; <i>Y Zhou</i>, Queensland University of Technology (QUT), Australia; <i>J Lin</i>, Affiliated Stomatological Hospital of Xiamen Medical College, China; <i>Y Peng</i>, CSIRO Manufacturing, Australia; <i>J Ramshaw</i>, St. Vincent's Hospital, University of Melbourne, Australia; <i>Y Xiao</i>, The Australia-China Centre for Tissue Engineering and Regenerative Medicine (ACCTERM), Queensland University of Technology, Australia</p>	

## Atomic Scale Processing Focus Topic

### Room Union Station AB - Session AP-ThP

#### Atomic Scale Processing Poster Session

6:30pm

**AP-ThP-1** Atomic Resolution Characterization of Atomic Layer Etching Normally-off AlGaIn/GaN Heterostructure Device by Using Aberration-corrected STEM, *Chien-Nan Hsiao*, Taiwan Instrument Research Institute, National Applied Research Laboratories, Taiwan, Republic of China; *C Lin, C Chen, M Chan, W Chen, F Chen*, National Applied Research Laboratories, Taiwan, Republic of China

**AP-ThP-2** Programmable Radical-Assisted Sputtering Enabling Designed Deposition Processes with Atomic Layer Accuracy, *Hideo Isshiki, Y Tanaka*, The University of Electro-Communications, Japan; *S Saisho*, Shincon Co. LTD., Japan

## Applied Surface Science Division

### Room Union Station AB - Session AS-ThP

#### Applied Surface Science Poster Session

6:30pm

**AS-ThP-1** Hydrogen Generation Eases Safety and Infrastructure Requirements for Efficient and Productive Vacuum Deposition Processes, *David Wolff*, Nel Hydrogen

**AS-ThP-2** Progress in Understanding SIMS Spectra from Silicones, *Paul Vlasak, M Pacholski*, The Dow Chemical Company

**AS-ThP-3** Silicon Wet Etching Using NH<sub>4</sub>OH Solution For Texturing of Silicon Micro-Channels, *José Alexandre Diniz, A Silva*, UNICAMP, Brazil

**AS-ThP-4** Ionic Liquids: Advanced Oil Additives for Lubricating Case-Hardened Titanium Alloys (OD-Ti64), *Harry Meyer III, H Duan, W Li, C Kumara, Y Jin, H Luo, J Qu*, Oak Ridge National Laboratory

**AS-ThP-5** Controlling Surfaced-catalyzed Coupling of Aryl Halides for Preparation of Two-dimensional Covalent Networks, *Margaret Wolf, C Gerber, R Quardokus*, University of Connecticut

**AS-ThP-6** Characterization of Mineral Associated Organic Matter in Alkaline Soil, *Mark Engelhard, R Kukkadapu, T Varga, R Boiteau, L Kovarik, J Cliff, M Wirth, A Dohnalkova, C Smallwood, D Perea, J Moran, K Hofmocker*, Pacific Northwest National Laboratory

**AS-ThP-7** Atomic Structure Simulation of Nitrogen Supersaturated Austenitic Stainless Steel, *Honglong Che, M Lei*, Dalian University of Technology, China

**AS-ThP-8** Determination of the Number of Layers of a 2D Material by Angle-Resolved Photoelectron Spectroscopy, *P Tyagi*, University at Albany - SUNY; *Carl A. Ventrice, Jr.*, SUNY Polytechnic Institute

**AS-ThP-9** Effect in Core Level Binding Energy Spectra of Phthalocyanine (MePcs) Functionalized Carbon Nanotubes Studied by XPS and DFT, *Lázaro Huerta*, Instituto de Investigaciones en Materiales, México; *E Basiuk, V Basiuk*, Universidad Nacional Autónoma de México, México; *R Escamilla*, Universidad Nacional Autónoma de México, México; *M Flores*, Universidad de Guadalajara, México, Mexico

**AS-ThP-10** Probing the Electrical Double Layer by *in situ* X-ray Photoelectron Spectroscopy through a Carbon Nanotube-Strengthened Graphene Window, *P Wang, Yunfeng Li, L Wang, J Klos, Z Peng, N Kim*, University of Maryland, College Park; *H Bluhm*, Lawrence Berkeley National Laboratory; *K Gaskell, S Lee, B Eichhorn, Y Wang*, University of Maryland, College Park

**AS-ThP-11** Antibacterial Performance of Electrically Activated Conductive Water Filter Papers, *Dorina Mihut, A Afshar, L Lackey*, Mercer University

**AS-ThP-12** Biocompatible and Robust Non-wetting Surface Inspired by Three Natural Organisms: Lotus Leaf, Mussel, and Sandcastle Worm, *Kiduk Han*, POSTECH, Republic of Korea; *T Park*, POSTEC, Republic of Korea; *H Cha, K Yong*, POSTECH, Republic of Korea

**AS-ThP-13** In-situ ToF-SIMS Analysis of FIB Prepared Li Ion Battery Anodes, *Vincent Smentkowski, R Hart, H Cao*, GE-Research; *F Kollmer, J Zakel, H Arlinghaus*, IONTOF GmbH, Germany

**AS-ThP-14** Characterization of Surface-Immobilized Aptamers for Electrochemical Biosensing, *Ramya Vishnubhotla*, National Institute of Standards and Technology (NIST); *S Robinson, J Giddens*, University of Maryland, College Park; *S Semancik*, National Institute of Standards and Technology (NIST)

## Chemical Analysis and Imaging Interfaces Focus Topic

### Room Union Station AB - Session CA-ThP

#### Chemical Analysis and Imaging at Interfaces Poster Session

6:30pm

**CA-ThP-1** Probing Solid-liquid Interfaces with Tender X-rays, *Nicolò Comini, Z Novotny, B Tobler*, University of Zuerich, Switzerland; *D Aegerter, E Fabbri*, Paul Scherrer Institute, Switzerland; *U Maier*, Ferrovac GmbH, Switzerland; *L Artiglia, J Raabe, T Huthwelker*, Paul Scherrer Institute, Switzerland; *J Osterwalder*, University of Zuerich, Switzerland

**CA-ThP-2** Using AES, EDS, and FIB to Detect, Identify, and Image Buried Metallic Particles, *Ashley Ellsworth, D Paul, J Newman*, Physical Electronics

**CA-ThP-3** Secondary Ion Mass Spectrometry Designed for Ultra-sensitive Molecular Analysis of Solids and Liquids, *Stanislav Verkhoturov, D Verkhoturov, E Schweikert*, Texas A&M University

## Spectroscopic Ellipsometry Focus Topic

### Room Union Station AB - Session EL-ThP

#### Spectroscopic Ellipsometry Focus Topic Poster Session

**Moderator:** Tino Hofmann, University of North Carolina at Charlotte

6:30pm

**EL-ThP-1** Teaching Ellipsometry to Undergraduates, *John Woollam*, University of Nebraska-Lincoln

## Electronic Materials and Photonics Division

### Room Union Station AB - Session EM-ThP

#### Electronic Materials and Photonics Poster Session

6:30pm

**EM-ThP-1** Synthesis and Characterization of Fluorenone Derivatives as Organic Semiconductors for Organic Thin-Film Transistors, *Sung Yong Seo, J Jeong, K Lim, B Choi, Y Yun, M Son, G Kim*, Pukyong National University, Republic of Korea

**EM-ThP-2** Beryllium Oxide Band Alignment with Wide Bandgap Semiconductors, *Danghyi Koh, S Banerjee*, University of Texas at Austin; *J Brockman, M Kuhn, S King*, Intel Corporation

**EM-ThP-3** Thermal Conductivity of Nano-porous Low-k Dielectrics, *Hari Harikrishna, S Huxtable*, Virginia Tech; *S King*, Intel Corporation

**EM-ThP-4** Characterization of Textile Yarn Coated with Polypyrrole/Carbon Black Electronic Material, *R Villaneuva, Deepak Ganta, C Guzman*, TAMIU

**EM-ThP-5** Optical and Nonlinear Optical Properties of (1-x)Pb(Mg<sub>1/3</sub>Nb<sub>2/3</sub>)O<sub>3</sub>-xPbTiO<sub>3</sub> Thin Films Grown by Pulsed Laser Deposition, *Da-Ren Liu*, Taiwan Instrument Research Institute, Taiwan, Republic of Korea

**EM-ThP-6** Toward Selective Deposition of Boron Carbide Layers, *Raja Sekhar Bale, R Thapa, L Dorsett, S Wagner, D Bailey, A Caruso*, University of Missouri-Kansas City; *J Bielefeld, S King*, Intel Corporation; *M Paquette*, University of Missouri-Kansas City

**EM-ThP-7** The Effect of Processing Conditions on the Growth of Transition Metal Dichalcogenides by Molecular Beam Epitaxy, *Peter Litwin, S McDonnell*, University of Virginia

**EM-ThP-8** Co-sputtered and Rapid Thermal Annealed ZnS:Cu Thin Films for Photovoltaic Applications, *Y Jun*, EM Co., Inc., Republic of Korea; *Sakal Pech, M Yoo, G Cho, N Kim*, Chosun University, Republic of Korea

**EM-ThP-9** Biomimetic Electrospun Polyethylene Fabrics for Effective Radiative Cooling Under Sunlight, *Bokyung Park, S Han, S Han*, University of New Mexico

**EM-ThP-10** Suppression of the Spectral Weight of Topological Surface States on the Nanoscale via Local Symmetry Breaking via Local Symmetry Breaking, *Omur E. Dagdeviren, S Mandal, K Zou, C Zhou, G Simon, S Albright, X Zhu, S Ismail-Beigi, F Walker, C Ahn, U Schwarz, E Altman*, Yale University

**EM-ThP-11** Optical and Electrical Properties of Layer-by-layered and Mixed ZnS/CdS Structures with a Decrease in Cd-content by Co-sputtering Method, *S Pech*, Chosun University, Republic of Korea; *Y Jun*, EM Co., Inc., Republic of Korea; *Geum-Bae Cho, N Kim*, Chosun University, Republic of Korea

# Thursday Evening Poster Sessions, October 24, 2019

**EM-ThP-12** Design and Simulation of a Leaf-like Antenna on Thin Kapton Substrate for the 915MHz Frequency, *Felipe Frazatto, L Manera, L Perissinotto*, UNICAMP, Brazil

**EM-ThP-13** Atom Probe Tomography Analysis of the Composition of GaAsN<sub>Bi</sub>, *Jared W. Mitchell, R Goldman*, University of Michigan, Ann Arbor

**EM-ThP-14** Silicon Nanowire P-N Junction Photovoltaic Device, *Michael Small, S Collins, R Smith*, University of Maine

**EM-ThP-15** Effect of N<sub>2</sub>/H<sub>2</sub> Plasma on the Epitaxial Growth of InN by Hollow Cathode Plasma Assisted Atomic Layer Deposition, *Mustafa Alevli, N Gungor*, Marmara University, Turkey

**EM-ThP-16** Atomic Layer Deposition of Functional Films for Transparent and Flexible Organic Electronic Devices, *Yu Duan*, Jilin University, China

**EM-ThP-18** Incredibly Simple Synthesis of a Zinc Oxide / Graphene Hybrid Nano Material, *Daniel Little*, Ohio Dominican University; *J Pfund, A McLain, S Lantvit, S King*, University of Wisconsin - La Crosse

**EM-ThP-19** Metal Oxide-based Heterojunction Thin Films for Solar Cell Applications, *Zainuriah Hassan, M Mohamed Saheed, A Yusof*, Institute of Nano Optoelectronics Research and Technology (INOR), Universiti Sains Malaysia, 11800 USM, Penang, Malaysia

## Fundamental Discoveries in Heterogeneous Catalysis Focus Topic

Room Union Station AB - Session HC-ThP

## Fundamental Discoveries in Heterogeneous Catalysis Poster Session

6:30pm

**HC-ThP-1** The Role of Boron in Supported Platinum Dry Reforming Catalysts, *Carly Byron, S Bai, A Teplyakov*, University of Delaware

**HC-ThP-2** Spectroscopic Characterization of Ethylidyne formed from Acetylene on Pd(111), *Ravi Ranjan, M Trenary*, University of Illinois at Chicago

**HC-ThP-3** XPS, TOF-SIMS, and AES Analysis of Fresh and Aged Alumina-Supported Silver Catalysts, *John Newman, D Carr, D Paul, L Swartz*, Physical Electronics; *M Di Mare, W Suchanek*, Scientific Design Company, Inc.

**HC-ThP-4** Infrared Spectroscopy of Carbon Dioxide Hydrogenation over the Cu(111) and Pd/Cu(111) Single Atom Alloy Surfaces under Ambient Pressure Conditions, *Arephin Islam, M Trenary*, University of Illinois at Chicago

**HC-ThP-5** Morphology of an Oxide Formed on Au(111) at High Temperatures under Ambient Pressure Conditions, *Jordan Baker, H Kaleem, E Maxwell, A Baber*, James Madison University

**HC-ThP-6** Machine-Learning Enabled Search for The Next-Generation Catalyst for Hydrogen Evolution Reaction, *Sichen Wei, S Baek, K Reyes, F Yao*, University at Buffalo

**HC-ThP-7** Intermolecular Interactions of Small Alcohols on Au(111), *Eric Maxwell, J Baker, H Kaleem, A Baber*, James Madison University

## Advanced Ion Microscopy and Ion Beam Nano-engineering Focus Topic

Room Union Station AB - Session HI-ThP

## Advanced Ion Microscopy Poster Session

6:30pm

**HI-ThP-1** Fabrication of a Single Atom Ir/W(111) Tip by a Simple Sputtering Method, *Kwang-II Kim*, University of Science and Technology, Republic of Korea; *J Hwang*, Chungbuk National University, Republic of Korea; *T Ogawa*, Korea Research Institute of Standards and Science, Republic of Korea; *B Cho*, Korea Research Institute of Standards and Science (KRISS), Republic of Korea; *I Park*, Korea Research Institute of Standards and Science, Republic of Korea

**HI-ThP-2** Morphology Modification of Si Nanopillars under Ion Irradiation at Elevated Temperatures, *Xiaomo Xu, K Heinig*, Helmholtz Zentrum Dresden-Rossendorf, Germany; *W Möller*, Helmholtz-Zentrum Dresden-Rossendorf, Germany; *H Engelmann, N Klingner*, Helmholtz Zentrum Dresden-Rossendorf, Germany; *A Gharbi, R Tiron*, CEA-LETI, France; *J von Borany*, Helmholtz Zentrum Dresden-Rossendorf, Germany; *G Hlawacek*, Helmholtz-Zentrum Dresden-Rossendorf, Germany

## Frontiers of New Light Sources Applied to Materials, Interfaces, and Processing Focus Topic

Room Union Station AB - Session LS-ThP

## Frontiers of New Light Sources Applied to Materials, Interfaces, and Processing Poster Session

6:30pm

**LS-ThP-1** Bringing Synchrotron Capabilities to a Local X-ray Facility: the Lyncean Compact Light Source, *Benjamin Hornberger, J Kasahara, M Gifford*, Lyncean Technologies, Inc.

**LS-ThP-2** Observing Formation of Detonation Nanodiamond at Sub-Microsecond Timescales at the Advanced Photon Source, *Trevor Willey, J Hammons, M Bagge-Hansen, M Nielsen, L Lauderbach, R Hodgkin, W Shaw, W Bassett, E Stavrou, S Bastea, L Fried, L Leininger*, Lawrence Livermore National Laboratory

## Magnetic Interfaces and Nanostructures Division

Room Union Station AB - Session MI-ThP

## Magnetic Interfaces and Nanostructures Poster Session

6:30pm

**MI-ThP-1** Room Temperature Skyrmion in Alternative Layer Molecular Beam Epitaxial Grown B20 Fe-rich Fe<sub>1.2</sub>Ge Films, *Tao Liu, R Bennett, S Chen, A Ahmed, R Kawakami*, The Ohio State University

**MI-ThP-2** Investigation of Exchange Bias in L1<sub>0</sub>-MnGa/θ-MnN/MgO Bilayers, *Sneha Upadhyay*, Ohio University; *K Meng, F Yang*, The Ohio State University; *D Ingram, A Smith*, Ohio University

**MI-ThP-3** Investigating a Possible Kondo Resonance for Iron-induced Islands on Chromium Nitride (001), *K Alam, Y Ma, Shyam Chauhan, S Upadhyay, A Smith*, Ohio University

**MI-ThP-5** Characteristics of a Single Molecule Magnet on Graphene: A DFT Study, *Rainier Berkley, Z Hooshmand, T Rahman*, University of Central Florida

**MI-ThP-6** Molecular Conductivity Switching via Voltage Controlled Spin Crossover at a Ferroelectric Interface, *Aaron Mosey*, Indiana University-Purdue University Indianapolis; *G Hao*, University of Nebraska-Lincoln; *A N'Diaye*, Lawrence Berkeley National Laboratory; *A Dale*, Indiana University-Purdue University Indianapolis; *U Manna*, Illinois State University; *P Dowben*, University of Nebraska-Lincoln; *R Cheng*, Indiana University-Purdue University Indianapolis

## Manufacturing Science and Technology Group

Room Union Station AB - Session MS-ThP

## Manufacturing Science and Technology Poster Session

6:30pm

**MS-ThP-1** Evaluation of Mechanical Properties of Infill Structures Change during 3D Modeling, *Seita Ogawa, A Matsumuro*, Aichi Institute of Technology, Japan

**MS-ThP-2** Development of Innovative CNT/Extra Super Duralumin Composite Materials, *Chihiro Fujiwara*, Aichi Institute of Technology; *A Matsumuro*, Aichi Institute of Technology, Japan

**MS-ThP-3** Development of Composite Resin Materials with High Dispersion Cellulose Nanofibers, *Naoki Iwanaga, A Matsumuro*, Aichi Institute of Technology, Japan; *K Osawa*, Aichi Institute of Technology, Japan

**MS-ThP-4** Improvement of Laminated Interface Strength of Printed Objects by FDM 3D Printer, *Li Song*, Aichi Institute of Technology, Japan

**MS-ThP-5** Investigation of Multi-Level ReRAM in 65nm CMOS for Logic-in-Memory Applications, *Sarah Rafiq, K Beckmann, J Hazra, M Liehr*, SUNY Polytechnic Institute; *S Jha*, University of Central Florida; *N Cady*, SUNY Polytechnic Institute

**MS-ThP-6** III-V NanoWires for Junctionless Transistors Fabricated by Focused Ion Beam (FIB) System with Silicon Nitride Passivation, *Cássio Almeida*, University of Campinas, Brazil; *P Souza*, PUC-Rio, Brazil; *M Pires*, Federal University of Rio de Janeiro, Brazil; *J Diniz*, University of Campinas, Brazil

**MS-ThP-7** The Development of High Efficiency X-ray Tube with Carbon Nanotube Yarn based-cold Cathode, *Hyun Suk Kim, C Lee*, Wonkwang University, Korea

**MS-ThP-8** High Aspect Ratio Carbon Nanotube Optical Collimator, *Tyler Westover, R Davis, R Vanfleet*, Brigham Young University

# Thursday Evening Poster Sessions, October 24, 2019

**MS-ThP-9** Development of a Fabrication Process for Integrated Inductors on Flexible Substrate, *Wilson Freitas*, State University of Campinas, Brazil; *M Oliveira Piazzetta*, Brazilian Nanotechnology National Laboratory, Brazil; *L Manera*, UNICAMP, Brazil; *A Gobbi*, Brazilian Nanotechnology National Laboratory, Brazil

## Nanometer-scale Science and Technology Division

### Room Union Station AB - Session NS-ThP

#### Nanometer-scale Science and Technology Poster Session

6:30pm

**NS-ThP-1** Probing Intermolecular and Molecule-Substrate Interactions at Angstrom Scale by Ultrahigh Vacuum Tip-Enhanced Raman Spectroscopy, *Sayantana Mahapatra*, *J Schultz*, *N Jiang*, University of Illinois at Chicago

**NS-ThP-2** Cobalt Nanoparticles Supported on Multiwalled Carbon Nanotubes for Catalysts in Hydrogen Generation, *Brian Price*, Christopher Newport University

**NS-ThP-3** Advanced Hybrid Metrology for Measuring Pattern Fidelity for Nano Technology--Combining Massive metrology using Full Contour based Data Extraction and Analysis, *Allen H. Rasafar*, GLOBALFOUNDRIES Inc.

**NS-ThP-4** A Nanoscopic View of Photo-induced Charge Transfer in Organic Nano-crystalline Heterojunctions, *Qian Zhang*, *S Cohen*, *B Rybtchinski*, Weizmann Institute of Science, Israel

**NS-ThP-5** Ferroic-ionic Interaction in Hybrid Organic Inorganic Perovskites, *Yongtao Liu*<sup>1,2</sup>, *L Collins*, *A Ievlev*, *A Belianinov*, Oak Ridge National Laboratory; *M Ahmadi*, University of Tennessee Knoxville; *S Jesse*, *S Kalinin*, Oak Ridge National Laboratory; *B Hu*, University of Tennessee Knoxville; *O Ovchinnikova*, Oak Ridge National Laboratory

**NS-ThP-6** Processing of Nanoscale Lamellae in Bulk Al-Cu Eutectic Samples Through Selective Laser Melting, *Jonathan Skelton*, *J Floro*, *J Fitz-Gerald*, University of Virginia

**NS-ThP-7** Precision Nanometer-scale Scanning Probe Microscopy Data Recalculation for Diamond Tool Cutting Edge Structures, *J Su*, *Nian-Nan Chu*, *C Hsiao*, Taiwan Instrument Research Institute, National Applied Research Laboratories, Taiwan, Republic of China

## Advanced Surface Engineering Division

### Room Union Station AB - Session SE-ThP

#### Advanced Surface Engineering Poster Session

6:30pm

**SE-ThP-2** Plasma and Heat Treatment Response of Carborane Self-Assembled Monolayer on Copper, *Rupak Thapa*, *L Dorsett*, *S Malik*, *R Bale*, *S Wagner*, *D Bailey*, *A Caruso*, University of Missouri-Kansas City; *J Bielefeld*, *S King*, Intel Corporation; *M Paquette*, University of Missouri-Kansas City

## Thin Films Division

### Room Union Station AB - Session TF-ThP

#### Thin Films Poster Session

6:30pm

**TF-ThP-1** Oxygen Partial Pressure Dependence of Structural and Photoluminescence Properties in Eu<sup>3+</sup> doped Tantalum based Double-perovskite Thin Film, *Jung Hyun Jeong*, *J Oh*, *B Choi*, *J Kim*, *S Seo*, Pukyong National University, Republic of Korea; *K Jang*, Changwon National University, Republic of Korea

**TF-ThP-2** Influence of the Crystal Structure on Photoluminescence Properties of Dy<sup>3+</sup> and Pr<sup>3+</sup> Doped Rare-earth Oxyorthosilicates (R<sub>2</sub>SiO<sub>5</sub>) (R = La, Gd, Y) Thin Film Phosphors, *S Ogugua*, *H Swart*, University of the Free State, South Africa; *O. Martin Ntwaeaborwa*, University of the Witwatersrand, South Africa

**TF-ThP-3** Transparent Hybrid Thin-Films of Copper-Mesh and Conductive Polymers for ITO-Free Organic Light-Emitting Diodes, *K Lim*, *Y Kim*, Pukyong National University, Republic of Korea; *S Jeong*, Pusan National University, Republic of Korea; *Min Kyo Jeong*, *S Seo*, *J Jeong*, Pukyong National University, Republic of Korea

**TF-ThP-4** Fabrication of IrO<sub>2</sub>/Pt Composite Films by Pulsed-dc Magnetron Sputtering and Plasma-enhanced Atomic Layer Deposition, *Chao-Te Lee*, *Y Yu*, *W Cho*, Taiwan Instrument Research Institute, Taiwan; *W Chen*, Taiwan Instrument Research Institute, Taiwan, Republic of China; *H Chen*, Taiwan Instrument Research Institute, Taiwan

**TF-ThP-5** The Effect of Deposition Parameters on the Optical and Electrical Properties of MoO<sub>3</sub>/Ag/Mo/ MoO<sub>3</sub> Films by Reactive rf Magnetron Sputtering, *C Lee*, Taiwan Instrument Research Institute, Taiwan; *Wei-Chun Chen*, Taiwan Instrument Research Institute, Taiwan, Republic of China; *H Chen*, Taiwan Instrument Research Institute, Taiwan; *C Jaing*, Minghsin University of Science and Technology, Japan

**TF-ThP-6** Effect of Sintering Conditions on Characteristic of BaFe<sub>2</sub>(PO<sub>4</sub>)<sub>2</sub> and Ceramic Target Production for Thin Films, *Jung Hwan Kim*, *B Jung*, *J Jeong*, *S Seo*, Pukyong National University, Republic of Korea; *K Jang*, Changwon National University, Republic of Korea

**TF-ThP-7** Development of Thin Film of Ferric Hydroxide Dispersed in Polymer Matrix Doped with Ethylenediamine, *S Fernandes*, *Leandro Tiago Manera*, *H Ceragioli*, UNICAMP, Brazil

**TF-ThP-8** Dual-temperature Atomic Layer Deposition of HfO<sub>2</sub>/Al<sub>2</sub>O<sub>3</sub> on In<sub>0.53</sub>Ga<sub>0.47</sub>As, *Changmin Lee*, *S Choi*, *Y An*, *W Lee*, *W Oh*, *D Eom*, *J Lee*, *H Kim*, Sungkyunkwan University, Republic of Korea

**TF-ThP-9** Conformal CVD of Hf<sub>1-x</sub>V<sub>x</sub>B<sub>2</sub> from Two Precursors: Control of Composition x in Deep Trenches, *Kinsey Canova*, *G Girolami*, *J Abelson*, University of Illinois at Urbana-Champaign

**TF-ThP-10** Catalyst-enhanced Chemical Vapor Deposition of Titanium-doped MgB<sub>2</sub> Thin Films, *Xiaoqing Chu*, *Y Yang*, *C Caroff*, *G Girolami*, *J Abelson*, University of Illinois at Urbana-Champaign

**TF-ThP-11** Computational Simulation of Novel Pyroelectric Infrared Detectors and Their Integration with Silicon, *A Batra*, *George Taylor*, *J Sampson*, Alabama A&M University

**TF-ThP-12** Kinetically Stabilized Growth of InN by MEPA-MOCVD, *G. Brendan Cross*, *Z Ahmad*, Georgia State University; *D Seidlitz*, Technische Universität Berlin, Germany; *M Vernon*, *A Kozhanov*, Georgia State University

**TF-ThP-13** Structure Characterization of PECVD a-SiCN:H Thin Films: Toward Machine Learning Algorithms for Modeling of Complex Disordered Solids, *Sai Siva Kumar Pinnepalli*, *C Burkett*, University of Missouri-Kansas City; *J Hwang*, Ohio State University; *N Oyler*, *M Paquette*, University of Missouri-Kansas City

**TF-ThP-14** Growth of Hafnium Oxide and Zirconium Oxide for the Fabrication of Electronic Devices Using Plasma-Enhanced Atomic Layer Deposition, *Samuel Banks*, *K Bell*, *S Chance III*, *B Rodgers*, *Z Xiao*, Alabama A&M University

**TF-ThP-15** Nanoscale Multilayered Thin-Film Thermoelectric Materials and Devices, *Joevonte Kimbrough*, *A Glenn*, *A Henderson*, *S Budak*, *Z Xiao*, Alabama A&M University

**TF-ThP-16** Microstructural Evolution in Sputter-deposited 316L Stainless Steel / Si (100) Thin Films, *Christopher Bansah*, *C Solomon*, Youngstown State University

**TF-ThP-18** Characterization of Fluorine-doped SiO<sub>2</sub> Films Deposited by Magnetron Sputtering, *Bohwei Liao*, Taiwan Instrument Research Institute; *C Hsiao*, Taiwan Instrument Research Institute, Taiwan, Republic of China

**TF-ThP-19** MOCVD Growth and Characterization of Wide Bandgap ZnGeN<sub>2</sub> Thin Films, *Md Rezaul Karim*, The Ohio State University; *B Jayatunga*, Case Western Reserve University; *Z Feng*, *M Zhu*, *J Hwang*, The Ohio State University; *K Kash*, Case Western Reserve University; *H Zhao*, The Ohio State University

**TF-ThP-20** Low Temperature Charging Dynamics of Ionic Liquid and Its Gating Effect on FeSe<sub>0.5</sub>Te<sub>0.5</sub> Superconducting Films, *Cheng Zhang*, University of Tennessee Knoxville; *W Zhao*, *S Bi*, Huazhong University of Science and Technology, China; *C Rauleau*, *J Fowlkes*, Oak Ridge National Laboratory; *W Boldman*, University of Tennessee Knoxville; *G Gu*, *Q Li*, Brookhaven National Laboratory; *G Feng*, Huazhong University of Science and Technology; *P Rack*, University of Tennessee Knoxville

**TF-ThP-21** Design and Characterization of Nanomaterials using PREVAC's Research Platforms, *Lukasz Walczak*, PREVAC sp. z o.o., Poland

**TF-ThP-22** Deposition of the Porous Film on the Reactive Liquid Substrate via Metal-organic Precursors, *Haoming Yan*, *Q Peng*, University of Alabama

**TF-ThP-23** Self-Limited Surface Reaction between Trimethyl Aluminum and Formamidinium Lead Iodide Perovskite, *Qing Peng*, *X Yu*, *H Yan*, University of Alabama

**TF-ThP-24** The Evolution of Atomic Layer Processing as a Field: Atomic Layer Etching and its Connections with Atomic Layer Deposition, *Elsa Alvaro*, Northwestern University; *A Yanguas-Gil*, Argonne National Laboratory

<sup>1</sup> National Student Award Finalist

<sup>2</sup> NSTD Graduate Student Award Finalist



# Thursday Evening Poster Sessions, October 24, 2019

**TF-ThP-25** Electrical Properties of In<sub>2</sub>O<sub>3</sub> Thin-film Transistors under Vacuum and Inert Environments, *Keisuke Nakamura, K Sasaki, Y Shibata, K Oe, S Aikawa*, Kogakuin University, Japan

**TF-ThP-26** Toward Ultra-fast Switching Speed Electrochromic Supercapacitor, *Weimin Jiao, S Wei, C Chang, F Yao*, University at Buffalo

**TF-ThP-27** Growth and Structure of Cr-doped ZnO Thin Films, *Gabrielle Pasternak*, Washington and Jefferson College; *A Gardill*, Lawrence University; *S Chamberlin*, Washington and Jefferson College

**TF-ThP-28** Developing an Approach to Improve the Beta-phase in Ferroelectric PVDF-HFP Thin Films, *Ashley S. Dale, A Mosey, J Soruco, R Cheng*, Indiana University Purdue University Indianapolis

**TF-ThP-29** Ternary Thin Film Alloys for Varistor Application, *Ajit Dhamdhere, S Rathi, N Mukherjee, J Heo, S Lee, J Mack, B Nie*, Eugenius, Inc.

**TF-ThP-30** Plasma Study and Fretting Corrosion of Zr/ZrN/CNx Multilayers Deposited by HIPIMS on Ti6Al4V, *Martin Flores, L Flores, J Perez, M Flores, O Jimenez*, Universidad de Guadalajara, Mexico

**TF-ThP-31** Size Dependent Strengthening in High Strength Nanotwinned Al/Ti Multilayers, *Yifan Zhang, S Xue, Q Li, J Li, J Ding, T Niu, R Su, H Wang, X Zhang*, Purdue University

# Anticipated Schedule Friday, October 25, 2019

## Anticipated Schedule Friday Morning, October 25

8:20 AM	_____
8:40 AM	_____
9:00 AM	_____
9:20 AM	_____
9:40 AM	_____
10:00 AM	_____
10:20 AM	_____
10:40 AM	_____
11:00 AM	_____
11:20 AM	_____
11:40 AM	_____
12:00 PM	_____

## Anticipated Schedule Friday Lunch, October 25

When	_____
Where	_____
With	_____

# Friday Morning, October 25, 2019

Room A213		<b>Fundamental Discoveries in Heterogeneous Catalysis Focus Topic</b> <b>Session HC+SS-FrM</b> <b>Catalysis at Complex Interfaces</b> <b>Moderators:</b> Elizabeth Landis, College of the Holy Cros, Fan Yang, Dalian Institute of Chemical Physics, China
8:20am	<b>HC+SS-FrM-1</b> Pd Nanoparticles on Alumina Nanofibers by Electrospinning for Heterogeneous Catalysis, <i>Miguel Angel Rodriguez Olguin, M Enes da Silva, J Faria, A Susarrey Arce, H Gardeniers</i> , University of Twente, Netherlands	
8:40am	<b>HC+SS-FrM-2</b> Multi-Layered TiO <sub>2</sub> Nanofibrous Structures Decorated with Catalytic Nanoparticles for Photoelectrocatalytic Applications, <i>Cristian Deenen, C Eyövsge, A Susarrey-Arce, H Gardeniers</i> , University of Twente, Netherlands	
9:00am	<b>INVITED: HC+SS-FrM-3</b> Water Oxidation Reaction in Natural Photosynthesis, <i>Junko Yano</i> , Lawrence Berkeley National Laboratory	
9:20am	Invited talk continues.	
9:40am	<b>HC+SS-FrM-5</b> Synthesis and Characterization of Carbon-supported PdCu Nanoparticles for the Water Electrolysis in Acid Medium, <i>Jonder Morais, D Lima, M Castegnaro, M Alves</i> , Universidade Federal do Rio Grande do Sul, Brazil	
10:00am	<b>HC+SS-FrM-6</b> Nanoscale Spectromicroscopy and Chemical Activity of Bilayer Silicate Films on Pd(100) and Pd(111), <i>Samuel Tenney, C Eads</i> , Brookhaven National Laboratory; <i>L Mark</i> , University of Colorado at Boulder; <i>V Lee</i> , University of North Texas; <i>M Wang</i> , Brookhaven National Laboratory; <i>J Medlin</i> , University of Colorado at Boulder; <i>J Kelber</i> , University of North Texas; <i>D Stacchiola</i> , Brookhaven National Laboratory	
10:20am	<b>INVITED: HC+SS-FrM-7</b> Formation and Properties of Mirror Twin Grain Boundary Networks in Molybdenum Dichalcogenides, <i>Matthias Batzill</i> , University of South Florida	
10:40am	Invited talk continues.	
11:00am	<b>HC+SS-FrM-9</b> Selectable Catalytic Reduction of Carbon Dioxide to Formic Acid or Methanol over Defect Hexagonal Boron Nitride*, <i>K Chagoya, T Jiang, D Nash, D Le, Talat S. Rahman, R Blair</i> , University of Central Florida	

# Friday Morning, October 25, 2019

<b>Room A215</b>			
8:20am	<b>INVITED: SE+AS+SS-FrM-1</b> The Scaling of Tribological Effects from Nano- to Macro-scale, <i>Peter Lee</i> , Southwest Research Institute	<b>Advanced Surface Engineering Division</b> <b>Session SE+AS+SS-FrM</b> <b>Tribology: From Nano to Macro-scale</b> <b>Moderators:</b> Robert Franz, Montanuniversität Leoben, Andrey Voevodin, University of North Texas	
8:40am	Invited talk continues.		
9:00am	<b>SE+AS+SS-FrM-3</b> Nanotribology of Graphene in Organic Solvents, <i>Prathima Nalam</i> , <i>B Sattari Baboukani</i> , University at Buffalo, State University of New York; <i>Z Ye</i> , Miami University		
9:20am	<b>SE+AS+SS-FrM-4</b> Measuring Atomic-scale Surface Friction of a Molecular Vehicle on Au(111), <i>K Latt</i> , <i>Sanjoy Sarkar</i> , <i>K Kottur</i> , <i>M Raeis</i> , Ohio University; <i>A Ngo</i> , Argonne National Laboratory; <i>R Tumbleson</i> , <i>Y Zhang</i> , <i>E Masson</i> , <i>S Hla</i> , Ohio University		
9:40am	<b>INVITED: SE+AS+SS-FrM-5</b> The Use of the Nanocomposite Concept in Hard Coatings for Improving the Frictional Performance, <i>Albano Cavaleiro</i> , University of Coimbra, Portugal		
10:00am	Invited talk continues.		
10:20am	<b>SE+AS+SS-FrM-7</b> Development of Ultra-thick CrAlAgN Coatings by HiPIMS for Self-lubrication at Elevated Temperatures, <i>Jianliang Lin</i> , Southwest Research Institute; <i>X Zhang</i> , Southeast University, China		
10:40am	<b>2D-FrM-8</b> Mechanistic Insights into a Modified ALD Process to Achieve Crystalline MoS <sub>2</sub> Thin Films, <i>Nathaniel Richey</i> , <i>L Zeng</i> , <i>M Yasheng</i> , <i>J Shi</i> , <i>I Oh</i> , <i>S Bent</i> , Stanford University		<b>2D Materials</b> <b>Session 2D-FrM</b> <b>2D Late News Session</b> <b>Moderators:</b> Daniel Gunlycke, Naval Research Laboratory, Ivan Oleynik, University of South Florida
11:00am	<b>2D-FrM-9</b> The Electronic Properties of Quasi-One-Dimensional TiS <sub>3</sub> and ZrS <sub>3</sub> , <i>Simeon Gilbert</i> , University of Nebraska-Lincoln; <i>H Yi</i> , Synchrotron SOLEIL; <i>A Lipatov</i> , <i>T Komesu</i> , University of Nebraska-Lincoln; <i>A Yost</i> , Oklahoma State University; <i>A Sinitiskii</i> , University of Nebraska-Lincoln; <i>J Avila</i> , Synchrotron SOLEIL, France; <i>M Asensio</i> , Madrid Institute of Materials Science; <i>P Dowben</i> , University of Nebraska-Lincoln		
11:20am	<b>2D-FrM-10</b> Single Asperity Sliding Friction across the Superconducting Phase Transition, <i>Wen Wang</i> , <i>D Dietzel</i> , <i>A Schirmeisen</i> , Institute of Applied Physics, University of Giessen, Germany		
11:40am	<b>2D-FrM-11</b> Definition of CVD Graphene Micro Ribbons with Lithography and Oxygen Plasma Ashing, <i>Fernando Cesar Rufino</i> , <i>A Pascon</i> , UNICAMP, Brazil; <i>D Larrudé</i> , Mackenzie Presbyterian University, Brazil; <i>L Espindola</i> , <i>F Cioldin</i> , <i>J Diniz</i> , UNICAMP, Brazil		
12:00pm	<b>2D-FrM-12</b> Reactivity of Metal Contacts with Monolayer Tungsten Disulfide, <i>Ama Agyapong</i> , <i>K Cooley</i> , <i>S Mohney</i> , The Pennsylvania State University		

# Friday Morning, October 25, 2019

<b>Thin Films Division</b> <b>Room A216 - Session TF-FrM</b> <b>Theory and Characterization of Thin Film Properties</b> <b>Moderators:</b> Angel Yanguas-Gil, Argonne National Lab, Gerben van Straaten, Eindhoven University of Technology, The Netherlands		<b>Surface Science Division</b> <b>Room A220-221 - Session SS+HC+PS-FrM</b> <b>Planetary, Ambient, and Operando Environments</b> <b>Moderators:</b> Catherine Dukes, University of Virginia, Petra Reinke, University of Virginia	
8:20am	<b>INVITED: TF-FrM-1</b> Incorporation Mechanisms and Electronic Properties of Impurities in Wide-Band-Gap Semiconductors, <i>John (Jack) Lyons, S Erwin</i> , U.S. Naval Research Laboratory	<b>INVITED: SS+HC+PS-FrM-1</b> Seeing is Believing: Atomic-scale Imaging of Catalysts under Reaction Conditions, <i>Irene Groot</i> , Leiden University, The Netherlands, Netherlands	
8:40am	Invited talk continues.	Invited talk continues.	
9:00am	<b>TF-FrM-3</b> Review and Demonstration of Feature Scale Simulations, <i>Paul Moroz</i> , TEL Technology Center, America, LLC	<b>SS+HC+PS-FrM-3</b> Operando NAP-XPS and NAP-STM Investigation of CO Oxidation on CoO Nanoislands on Noble Metal Surfaces, <i>Jonathan Rodriguez-Fernández, Z Sun, E Rattigan</i> , Aarhus University, Denmark; <i>C Martín, E Carrasco</i> , IMDEA Nanoscience, Spain; <i>E Pellegrin, C Escudero</i> , ALBA Synchrotron Light Source, Spain; <i>D Ecija</i> , IMDEA Nanoscience, Spain; <i>J Lauritsen</i> , Aarhus University, Denmark	
9:20am	<b>TF-FrM-4</b> Process Optimization in Atomic Layer Deposition Using Machine Learning, <i>A Yanguas-Gil, S Letourneau, A Mane, Noah Paulson, A Lancaster, J Elam</i> , Argonne National Laboratory	<b>SS+HC+PS-FrM-4</b> Reaction of 2-Propanol on SnO <sub>2</sub> (110) Studied with Ambient-Pressure X-ray Photoelectron Spectroscopy, <i>J Diulus, R Addou, Gregory Herman</i> , Oregon State University	
9:40am	<b>TF-FrM-5</b> Electroless Deposition of Cobalt Metal on a Palladium Layer on an Amine-modified Surface, <i>A Ng, Anthony Muscat</i> , University of Arizona	<b>SS+HC+PS-FrM-5</b> Chemical Speciation and Structural Evolution of Rhodium and Silver Surfaces with High Oxygen Coverages, <i>Daniel Killelea, M Turano</i> , Loyola University Chicago; <i>R Farber, K Gibson, S Sibener</i> , The University of Chicago; <i>W Walkosz</i> , Lake Forest College; <i>R Rosenberg</i> , Argonne National Laboratory	
10:00am	<b>TF-FrM-6</b> The Origins of Condensation-Driven Degradation of Hydrophobic Thin Films, <i>Jingcheng Ma, N Miljkovic</i> , University of Illinois at Urbana-Champaign	<b>INVITED: SS+HC+PS-FrM-6</b> Molecular Processes on Icy Surfaces in the Interstellar Medium and the Outer Solar System, <i>Edith Fayolle, R Hodyss, P Johnson</i> , Jet Propulsion Laboratory, California Institute of Technology; <i>K Oberg</i> , Harvard University; <i>J Fillion, M Bertin</i> , Sorbonne Université	
10:20am	<b>TF-FrM-7</b> Structural and Electrical Properties of Sputtered HEA Thin Films of CrFeCoNiCu and their Oxidation Studies, <i>Jeyanthinath Mayandi</i> , SMN, Department of Physics, University of Oslo, Norway; <i>M Stange, E Sagvolden, M Sunding, Ø Dahl</i> , SINTEF Materials and Chemistry, Norway; <i>M Schrader</i> , SINTEF, Materials and Chemistry, Norway; <i>J Deuermeier, E Fortunato</i> , Universidade Nova de Lisboa, Portugal; <i>O Løvvik, S Diplas</i> , SINTEF Materials and Chemistry, Norway and University of Oslo, Norway; <i>P Carvalho</i> , SINTEF Materials and Chemistry, Norway and Universidade de Lisboa, Portugal; <i>T Finstad</i> , SMN, Department of Physics, University of Oslo, Norway	Invited talk continues.	
10:40am	<b>TF-FrM-8</b> Observation of Topological Hall and Curie Temperature above Room Temperature in Strain-engineered FeGe Thin Films, <i>Adam Hauser, S Budhathoki, K Law, S Ranjit, A Sapkota</i> , The University of Alabama; <i>A Thind, R Mishra</i> , Washington University in St. Louis; <i>D Heiman</i> , Northeastern University; <i>M Jamer</i> , United States Naval Academy; <i>A Borisevich</i> , Oak Ridge National Laboratory; <i>T Mewes</i> , The University of Alabama; <i>J Gallagher</i> , U.S. Naval Research Laboratory	<b>SS+HC+PS-FrM-8</b> Bilayer Silicates as Models for Space-weather-mediated Water-cycling Processes at the Interface of Airless Bodies, <i>B Dhar, William E. Kaden</i> , University of Central Florida	
11:00am	<b>TF-FrM-9</b> Infrared Absorption Oscillator Strength Factors in SiNx Thin Films, <i>Sara DiGregorio, S Habermehl</i> , Sandia National Laboratories	<b>SS+HC+PS-FrM-9</b> Unraveling the Evolution of the Solid-Electrolyte Interphase Layer at Li-Metal Anodes, <i>Venkateshkumar Prabhakaran, S Roy, G Johnson</i> , Pacific Northwest National Laboratory, Joint Center for Energy Storage Research; <i>M Engelhard, V Shutthanandan, A Martinez, S Thevuthasan</i> , Pacific Northwest National Laboratory; <i>K Mueller, V Murugesan</i> , Pacific Northwest National Laboratory, Joint Center for Energy Storage Research	
11:20am	<b>TF-FrM-10</b> Computer Aided Molecular Design of novel precursor materials for Atomic Layer Deposition, <i>Mina Shahmohammadi</i> , University of Illinois at Chicago; <i>R Mukherjee</i> , Vishwamitra Research Institute; <i>C Takoudis</i> , University of Illinois at Chicago; <i>U Diwekar</i> , Vishwamitra Research Institute		
11:40am	<b>TF-FrM-11</b> The Use of Molecular Oxygen for a Low Cost and Low Temperature ALD of Amorphous Titania, <i>Harshdeep S. Bhatia, C Takoudis</i> , University of Illinois at Chicago		
12:00pm	<b>TF-FrM-12</b> Ultra-High Purity Process Capability for High-Performance Atomic layer Deposition, <i>Noel O'Toole, G Rayner, Jr.</i> , Kurt J. Lesker Company; <i>N Strnad</i> , General Technical Services, LLC; <i>D Potrepka</i> , U.S. Army Research Laboratory		

# Friday Morning, October 25, 2019

<b>Nanometer-scale Science and Technology Division</b> <b>Room A222 - Session NS+AS-FrM</b> <b>Electron-Beam Promoted Nanoscience</b> <b>Moderators:</b> Omur E. Dagdeviren, Yale University, Qing Tu, Northwestern University		<b>Chemical Analysis and Imaging Interfaces Focus Topic</b> <b>Room A226 - Session CA+AS+NS+SE+SS-FrM</b> <b>Novel Applications and Approaches in Interfacial Analysis</b> <b>Moderators:</b> Paul Dietrich, SPECS Surface Nano Analysis GmbH, Germany, Jeong Young Park, Korea Advanced Institute of Science and Technology (KAIST), Republic of Korea	
8:20am	<b>INVITED: NS+AS-FrM-1</b> Vibrational Spectroscopy in the Electron Microscope, <i>Ondrej Krivanek, N Dellby, C Meyer, A Mittelberger, T Lovejoy</i> , Nion Co.	8:20am	<b>INVITED: CA+AS+NS+SE+SS-FrM-1</b> Chemical Reactions on Bimetal Surfaces with Operando Surface Techniques, <i>Jeong Young Park</i> , Korea Advanced Institute of Science and Technology (KAIST), Republic of Korea
8:40am	Invited talk continues.	8:40am	Invited talk continues.
9:00am	<b>INVITED: NS+AS-FrM-3</b> In-situ Electron Microscopy of Localized Surface Plasmon Initiated Reactions, <i>Canhui Wang, W Yang, A Bruma</i> , UMD/NIST; <i>R Sharma</i> , National Institute of Standards and Technology (NIST)	9:00am	<b>CA+AS+NS+SE+SS-FrM-3</b> Principal Component Analysis to Reveal Camouflaged Information in Spectromicroscopy of (complex) Oxides, <i>David Mueller, M Giesen</i> , Forschungszentrum Juelich GmbH, Germany; <i>D Stadler</i> , University of Cologne, Germany; <i>T Duchon, F Gunkel, V Feyer</i> , Forschungszentrum Juelich GmbH, Germany; <i>S Mathur</i> , University of Cologne, Germany; <i>C Schneider</i> , Forschungszentrum Juelich GmbH, Germany
9:20am	Invited talk continues.	9:20am	<b>INVITED: CA+AS+NS+SE+SS-FrM-4</b> In situ Electron Microscopy of Catalysts with Atomic Resolution under Atmospheric Pressure, <i>Xiaoqing Pan</i> , University of California Irvine
9:40am	<b>INVITED: NS+AS-FrM-5</b> Nanoscale Manipulation of Redox of Ag by Electron Beam, <i>Jianguo Wen, H Sheng</i> , Argonne National Laboratory; <i>J Wang</i> , Wuhan University, China	9:40am	Invited talk continues.
10:00am	Invited talk continues.	10:00am	<b>CA+AS+NS+SE+SS-FrM-6</b> Exposing Buried Interfaces in Thin Film Photovoltaics through Thermo-mechanical Cleaving, <i>Deborah McGott</i> , Colorado School of Mines; <i>C Perkins, W Metzger</i> , National Renewable Energy Laboratory; <i>C Wolden</i> , Colorado School of Mines; <i>M Reese</i> , National Renewable Energy Laboratory
10:20am	<b>INVITED: NS+AS-FrM-7</b> Dynamics of Material Surfaces and Interfaces – The Good, the Bad and the Electron Beam, <i>Jakob Birkedal Wagner</i> , DTU Nanolab, Technical University of Denmark, Denmark	10:20am	<b>CA+AS+NS+SE+SS-FrM-7</b> Switchable Dopants on Percolation Networks of 2D Materials for Chemiresistive Sensing Applications in Aqueous Environments, <i>Peter Kruse</i> , McMaster University, Canada
10:40am	Invited talk continues.	10:40am	<b>CA+AS+NS+SE+SS-FrM-8</b> Analysis Of Radioactive Materials In Liquid Using In Situ Sem And Tof-Sims, <i>Jennifer Yao, X Yu, Z Zhu, E Buck</i> , Pacific Northwest National Laboratory
11:00am	<b>NS+AS-FrM-9</b> Atomic-Scale Mechanism of Unidirectional Oxide Growth, <i>Xianhu Sun, W Zhu, D Wu</i> , SUNY Binghamton University; <i>Z Liu</i> , University of Pittsburgh; <i>X Chen, L Yuan</i> , SUNY Binghamton University; <i>G Wang</i> , University of Pittsburgh; <i>R Sharma</i> , National Institute of Standards and Technology (NIST); <i>G Zhou</i> , SUNY Binghamton University	11:00am	<b>CA+AS+NS+SE+SS-FrM-9</b> Interactions between Synthetic Bilgewater Emulsion and Biofilms, <i>Jiyoung Son</i> , Earth and Biological Sciences Directorate; <i>J Yao</i> , Earth & Biological Sciences Directorate; <i>X Yu</i> , Pacific Northwest National Laboratory
11:20am	<b>NS+AS-FrM-10</b> Application of Electron-beam-excited Localized Surface Plasmon Resonance to Provide Guidelines for Plasmonic Catalysts, <i>Wei-Chang Yang</i> <sup>1</sup> , <i>C Wang, L Fredin, H Lezec, R Sharma</i> , National Institute of Standards and Technology (NIST)	11:20am	<b>CA+AS+NS+SE+SS-FrM-10</b> Mechanistic Insights into the Study of $\gamma$ -Al <sub>2</sub> O <sub>3</sub> Surface and its Interface with Pt, <i>Kofi Oware Sarfo, A Clauser, M Santala, L Árnadóttir</i> , Oregon State University
11:40am		11:40am	<b>INVITED: CA+AS+NS+SE+SS-FrM-11</b> Artificial Intelligence--An Autonomous TEM for In-situ Studies, <i>Huolin Xin</i> , University of California Irvine
12:00pm		12:00pm	Invited talk continues.

# Friday Morning, October 25, 2019

<b>Room B130</b>		
8:20am	<b>INVITED: PS+2D+SE+TF-FrM-1</b> Plasma-based Synthesis of 2D Materials for Devices on Flexible Substrates, <i>N Glavin</i> , Air Force Research Laboratory; <b>Christopher Muratore</b> , Department of Chemical and Materials Engineering, University of Dayton	<b>Plasma Science and Technology Division</b> <b>Session PS+2D+SE+TF-FrM</b> <b>Plasma Deposition and Plasma-Enhanced Atomic Layer Deposition</b> <b>Moderators:</b> Scott Walton, Naval Research Laboratory, David Boris, U.S. Naval Research Laboratory
8:40am	Invited talk continues.	
9:00am	<b>PS+2D+SE+TF-FrM-3</b> Homogeneous Ternary Oxides of Aluminum with Silicon, Molybdenum, and Niobium by Plasma Enhanced ALD by Sequential Precursor Pulses, <b>Steven Vitale</b> , MIT Lincoln Laboratory	
9:20am	<b>PS+2D+SE+TF-FrM-4</b> Piezoelectric Response of ZnO Thin Films Grown by Plasma-Enhanced Atomic Layer Deposition, <b>Julian Pilz</b> , <i>T Abu Ali</i> , Graz University of Technology, Austria; <i>P Schöffner</i> , <i>B Stadlober</i> , Joanneum Research Forschungsgesellschaft mbH, Austria; <i>A Coclite</i> , Graz University of Technology, Austria	
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10:00am	<b>PS+2D+SE+TF-FrM-6</b> Plasma-enhanced Molecular Layer Deposition of Boron Carbide from Carboranes, <b>Michelle M. Paquette</b> , <i>R Thapa</i> , <i>L Dorsett</i> , <i>R Bale</i> , <i>S Malik</i> , <i>D Bailey</i> , <i>A Caruso</i> , University of Missouri-Kansas City; <i>J Bielefeld</i> , <i>S King</i> , Intel Corporation	
10:20am	<b>PS+2D+SE+TF-FrM-7</b> Gas Phase Kinetics Optimization Study for Scaling-up Atmospheric Pressure Plasma Enhanced Spatial ALD, <b>Yves Creyghton</b> , Holst Centre / TNO, The Netherlands, Netherlands	
10:40am	<b>INVITED: PS+2D+SE+TF-FrM-8</b> Taking Plasma ALD to the Next Level: From Fundamental Understanding to Selective 3D Processing, <i>T Faraz</i> , <i>K Arts</i> , Eindhoven University of Technology, The Netherlands, Netherlands; <i>L Martini</i> , <i>R Engeln</i> , <i>H Knoops</i> , Eindhoven University of Technology, The Netherlands; <b>Erwin Kessels</b> , Eindhoven University of Technology, The Netherlands, Netherlands	
11:00am	Invited talk continues.	
11:20am	<b>PS+2D+SE+TF-FrM-10</b> Computational Investigation of Plasma Enhanced ALD of SiO <sub>2</sub> , <i>C Qu</i> , University of Michigan; <i>P Agarwal</i> , <i>Y Sakiyama</i> , <i>A LaVoie</i> , Lam Research Corporation; <b>Mark J. Kushner</b> , University of Michigan	
11:40am	<b>PS+2D+SE+TF-FrM-11</b> Analyzing Self-limiting Surface Reaction Mechanisms of Metal Alkyl Precursors and Nitrogen Plasma Species: Real-time In-situ Ellipsometric Monitoring of III-nitride Plasma-ALD Processes, <b>Ali Okyay</b> , OkyayTech Inc., Turkey; <i>A Mohammad</i> , <i>D Shukla</i> , <i>S Ilhom</i> , University of Connecticut; <i>B Johs</i> , Film Sense LLC; <i>B Willis</i> , <i>N Biyikli</i> , University of Connecticut	
12:00pm	<b>PS+2D+SE+TF-FrM-12</b> Tribological Properties of Plasma Enhanced Atomic Layer Deposition TiMoN with Substrate Bias, <b>Mark Sowa</b> , Veeco ALD; <i>A Kozen</i> , University of Maryland; <i>N Strandwitz</i> , <i>T Babuska</i> , <i>B Krick</i> , Lehigh University	

**Bold page numbers indicate presenter**

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