Program Key

Conference Topics

2D 2D Materials
AC Actinides and Rare Earths Focus Topic
AP Atomic Scale Processing Focus Topic
AS Applied Surface Science Division
BI Biomaterial Interfaces Division
BP Biomaterials Plenary Session
CA Chemical Analysis and Imaging Interfaces Focus Topic
DM Fundamental Aspects of Material Degradation Focus Topic
EL Spectroscopic Ellipsometry Focus Topic
EM Electronic Materials and Photonics Division
EW Exhibitor Technology Spotlight Workshops
HC Fundamental Discoveries in Heterogeneous Catalysis Focus Topic
HI Advanced Ion Microscopy and Ion Beam Nano-engineering Focus Topic
LS Frontiers of New Light Sources Applied to Materials, Interfaces, and Processing Focus Topic
MI Magnetic Interfaces and Nanostructures Division
MN MEMS and NEMS Group
MS Manufacturing Science and Technology Group
NS Nanometer-scale Science and Technology Division
OX Complex Oxides: Fundamental Properties and Applications Focus Topic
PS Plasma Science and Technology Division
QS Materials and Processes for Quantum Information, Computing and Science Focus Topic
RA New Challenges to Reproducible Data and Analysis Focus Topic
SE Advanced Surface Engineering Division
SS Surface Science Division
TF Thin Films Division
TL Energy Transition Focus Topic
VT 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. SS**1**, SS**2**),
then a dash followed by the first two characters of the day of the week:
Monday, **Tu**esday, **We**dnesday, **Th**ursday, **Fr**iday,
then a single letter for **M**orning, **A**fternoon, **E**vening, **P**oster,
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 LS+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: CO2, 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)

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

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

	2D Materials **Room A216 - Session 2D+EM+MI+NS-MoM** **Properties of 2D Materials including Electronic, Magnetic, Mechanical, Optical, and Thermal Properties I** **Moderator:** Jeehwan Kim, Massachusetts Institute of Technology	**Actinides and Rare Earths Focus Topic** **Room A215 - Session AC+LS+MI-MoM** **Magnetism, Complexity, Superconductivity, and Electron Correlations in the Actinides and Rare Earths** **Moderators:** Krzysztof Gofryk, Idaho National Laboratory, Ladislav Havela, Charles University, Prague, Czech Republic
8:20am	**2D+EM+MI+NS-MoM-1** Extreme Fatigue Life of Graphene, ***Teng Cui***, *S Mukherjee, P Sudeep, G Colas, J Tam,* University of Toronto, Canada; *P Ajayan,* Rice University; *C Singh, Y Sun, T Filleter,* University of Toronto, Canada	**INVITED: AC+LS+MI-MoM-1** Possible Structural Quantum Phase Transition in UCr2Si2 Accessed Through Cr → Ru Chemical Substitution, ***Ryan Baumbach***, Florida State Universityy
8:40am	**2D+EM+MI+NS-MoM-2** Epitaxial Growth and Thermal Degradation of Monolayer MoS_2 on $SrTiO_3$ Single Crystal Substrates, ***Peiyu Chen***, *W Xu, Y Gao, P Holdway, J Warner, M Castell,* University of Oxford, UK	Invited talk continues.
9:00am	**2D+EM+MI+NS-MoM-3** 3D Printed and Injection Molded Polymer Matrix Composites with 2D Layered Materials, ***Sangram Mazumder***, University of North Texas; *J Catalan,* University of Texas at El Paso; *N Hnatchuk, I Chen,* University of North Texas; *P Perez,* University of Texas at El Paso; *W Brostow, A Kaul,* University of North Texas	**INVITED: AC+LS+MI-MoM-3** Dynamic Spin Transport in Antiferromagnetic Insulators: Angular Dependent Spin Pumping in $Y_3Fe_5O_{12}$/NiO/Pt Trilayers, ***Fengyuan Yang***, The Ohio State University
9:20am	**2D+EM+MI+NS-MoM-4** Semiconducting WS_2 and h-BN Inks for Printing Optically-active Nanodevices, ***Jay A. Desai***, University of Texas at El Paso; *S Mazumder, A Kaul,* University of North Texas	Invited talk continues.
9:40am	**2D+EM+MI+NS-MoM-5** Transparent PEDOT:PSS Based Electro-Chromic/Thermal Devices With Excellent Durability For Applications In Smart Electronics, ***Hossein Sojoudi***, *S Nemani,* University of Toledo	**INVITED: AC+LS+MI-MoM-5** Pressure Studies of Strongly Correlated Phases in Rare Earth Compounds, ***Rena Zieve***, University of California, Davis
10:00am	**2D+EM+MI+NS-MoM-6** Edge Dominated Graphene/h-BN Lateral Hybrid Nanostructures for Electronic and Spintronic Applications, ***Gour P. Das***, IIT Kharagpur India, India	Invited talk continues.
10:20am	**BREAK**	**BREAK**
10:40am	**INVITED: 2D+EM+MI+NS-MoM-8** Engineering Interfaces in the Atomically-Thin Limit, ***Deep Jariwala***, University of Pennsylvania	**AC+LS+MI-MoM-8** Fermi Surface Reconstructions and Transport Properties in Heavy-fermion Materials, ***Gertrud Zwicknagl***, Institut f. Mathemat. Physics, TU Braunschweig, Germany
11:00am	Invited talk continues.	**AC+LS+MI-MoM-9** Direct Measurement the 5 $f_{5/2}$ and 5 $f_{7/2}$ Unoccupied Density of States of UO_2, ***James G. Tobin***, University of Wisconsin-Oshkosh; *S Nowak,* SLAC National Accelerator Laboratory; *C Booth,* Lawrence Berkeley National Laboratory; *E Bauer,* Los Alamos National Laboratory; *S Yu,* Lawrence Livermore National Laboratory; *R Alonso-Mori, T Kroll, D Nordlund, T Weng, D Sokaras,* SLAC National Accelerator Laboratory
11:20am	**2D+EM+MI+NS-MoM-10** Ultrasoft Slip-mediated Bending in Few-layer Graphene, ***Jaehyung Yu***, *E Han, E Annevelink, J Son, E Ertekin, P Huang, A van der Zande,* University of Illinois at Urbana-Champaign	**AC+LS+MI-MoM-10** Optimizing the Magnetic Performance of Tetragonal $ReFe_{12-x}M_x$ Phases by First Principles Computational Simulations, ***Heike Christine Herper***, *O Vekilova, P Thunström, O Eriksson,* Uppsala University, Sweden
11:40am	**2D+EM+MI+NS-MoM-11** Experimental Study on Vanadium Oxides Films by Sputtering, ***Chuan Li***, National Yang Ming University, Taiwan, Republic of China; *J Hsieh,* Ming Chi University of Technology, Taiwan, Republic of China; *C Su,* National Yang Ming University, Taiwan, Republic of China	**AC+LS+MI-MoM-11** Optical Excitation Effect on Magnetodielectric and Photodielectric Properties of Rare Earth doped ZnO:Na Nanoparticles, *W Jadwisienczak,* ***Mohammed Bsatee***, *F Inbanathan,* Ohio University; *R Martínez,* University of Puerto Rico; *H Huhtinen,* University of Turku, Finland; *R Palai,* University of Puerto Rico

	Atomic Scale Processing Focus Topic **Room A214 - Session AP+2D+EM+PS+TF-MoM** **Area Selective Deposition and Selective-Area Patterning** **Moderators:** Satoshi Hamaguchi, Osaka University, Japan, Eric A. Joseph, IBM Research Division, T.J. Watson Research Center	**Applied Surface Science Division** **Room A211 - Session AS+BI+RA-MoM** **Quantitative Surface Analysis I/Reproducibility Issues in Quantitative XPS** **Moderators:** Donald Baer, Pacific Northwest National Laboratory, Mark Engelhard, EMSL, Environmental Molecular Sciences Laboratory
8:20am		**INVITED: AS+BI+RA-MoM-1** Improving Accuracy in Quantitation by XPS: Standards, Cross-sections, Satellite Structure, ***C. Richard Brundle,*** C.R.Brundle & Associates; *P Bagus,* University of North Texas; *B Crist,* XPS International LLC
8:40am	**AP+2D+EM+PS+TF-MoM-2** Surface Pre-functionalization of SiN_x and SiO_2 to Enhance Selectivity in Plasma–Assisted Atomic Layer Etching, ***Ryan Gasvoda,*** Colorado School of Mines; *Z Zhang, S Wang, E Hudson,* Lam Research Corporation; *S Agarwal,* Colorado School of Mines	Invited talk continues.
9:00am	**AP+2D+EM+PS+TF-MoM-3** Area-selective Atmospheric-pressure Spatial ALD of SiO_2 using Interleaved Back-etch steps Yielding Selectivity > 10 nm, *A Mameli,* Holst Centre / TNO, The Netherlands; *F Roozeboom,* ***Paul Poodt,*** Holst Centre / TNO, The Netherlands, Netherlands	**AS+BI+RA-MoM-3** A Rigorous Approach to the Calculation of the Uncertainties in XPS Analysis, *A Herrera-Gomez,* CINVESTAV-Unidad Queretaro, México; ***Orlando Cortazar-Martinez,*** CINVESTAV-Unidad Queretaro, Mexico
9:20am	**AP+2D+EM+PS+TF-MoM-4** Mechanisms of Precursor Blocking during Area-selective Atomic Layer Deposition using Inhibitors in ABC-type Cycles, *M Merkx,* Eindhoven University of Technology, The Netherlands; *D Hausmann,* Lam Research Corporation; *E Kessels,* Eindhoven University of Technology, The Netherlands, Netherlands; *T Sandoval,* Universidad Técnica Federico Santa María, Chile; ***Adrie Mackus***[1], Eindhoven University of Technology, The Netherlands, Nederland	**AS+BI+RA-MoM-4** Gross Errors in XPS Peak Fitting, ***Matthew Linford,*** *V Jain, G Major,* Brigham Young University
9:40am	**INVITED: AP+2D+EM+PS+TF-MoM-5** Area-Selective Deposition of TiO_2 using Isothermal Integrated Atomic Layer Deposition and Atomic Layer Etching in a Single Reaction Chamber, ***Gregory Parsons,*** *S Song, H Saare,* North Carolina State University	**AS+BI+RA-MoM-5** Improved Energy Referencing in XPS, ***Hagai Cohen,*** Weizmann Institute of Science, Israel
10:00am	Invited talk continues.	**AS+BI+RA-MoM-6** How to Avoid Errors in the Interpretation of XPS Data?, ***Andreas Thissen,*** *P Dietrich,* SPECS Surface Nano Analysis GmbH, Germany; *W Unger,* Bundesanstalt für Materialforschung und -prüfung - Berlin (Germany), Germany
10:20am	**BREAK**	**BREAK**
10:40am	**AP+2D+EM+PS+TF-MoM-8** Area-Selective Atomic Layer Deposition of Metal Oxides on an Inhibitor-Functionalized SiO_2 Surface, ***Wanxing Xu,*** Colorado School of Mines; *P Lemaire, K Sharma, D Hausmann,* Lam Research Corporation; *S Agarwal,* Colorado School of Mines	**AS+BI+RA-MoM-8** Misinterpretations in the Spectroscopic Analysis of Heterogeneous Materials and Defected Structures, ***Lisa Swartz,*** *K Artyushkova, J Mann, B Schmidt, J Newman,* Physical Electronics
11:00am	**AP+2D+EM+PS+TF-MoM-9** Area-selective Deposition Achieved in a Continuous Process using Competitive Adsorption, ***Taewon Suh,*** *Y Yang, K Lao, R DiStasio, Jr., J Engstrom,* Cornell University	**AS+BI+RA-MoM-9** Current Issues and Solutions for Reliable, Robust and Reproducible XPS Spectral Acquisition and Data Reporting, *J Counsell, C Blomfield,* Kratos Analytical Limited, UK; ***Christopher Moffitt,*** Kratos Analytical Limited; *N Gerrard, S Coultas,* Kratos Analytical Limited, UK
11:20am	**INVITED: AP+2D+EM+PS+TF-MoM-10** Surface Chemistry during Plasma-Assisted ALE: What Can We Learn from ALD?, ***Sumit Agarwal,*** Colorado School of Mines	**AS+BI+RA-MoM-10** Intensity Calibration and Sensitivity Factors for XPS Instruments with Monochromatic Ag Lα and Al Kα Sources, ***Alexander Shard,*** National Physical Laboratory, UK; *J Counsell, C Blomfield,* Kratos Analytical Limited, UK; *D Cant,* National Physical Laboratory, UK; *E Smith,* University of Nottingham, UK; *P Navabpour,* Teer Coatings Ltd, UK
11:40am	Invited talk continues.	**AS+BI+RA-MoM-11** Reporting XPS Measurements and How Can We Do Better to Minimize Reproducibility Problems, ***Karen Gaskell,*** University of Maryland, College Park

[1] **Paul Holloway Award Winner**

Monday Morning, October 21, 2019

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

[1] **Heterogeneous Catalysis Graduate Student Presentation Award Finalist**

[2] **Morton S. Traum Award Finalist**

	MEMS and NEMS Group **Room A210 - Session MN-MoM** **MEMS, BioMEMS, and MEMS for Energy: Processes, Materials, and Devices I** **Moderators:** B. Robert Ilic, National Institute for Science and Technology (NIST), Zenghui Wang, Case Western Reserve University	**Plasma Science and Technology Division** **Room B131 - Session PS1+SE-MoM** **Atmospheric-Pressure Plasmas** **Moderators:** Michael Gordon, University of California at Santa Barbara, François Reniers, Université Libre de Bruxelles
8:20am	**INVITED: MN-MoM-1** Piezoelectrics Meets Photonics – Acousto-Optic Microsystems, ***Gianluca Piazza,*** Carnegie Mellon University	**INVITED: PS1+SE-MoM-1** On the Versatility of Atmospheric Non-equilibrium Plasmas: Material Synthesis, Packaging Sanitation and Oncological Applications, ***Matteo Gherardi,*** *V Colombo, F Barletta, A Bisag, C Bucci, F Capelli, R Laurita,* Alma Mater Studiorum-University of Bologna, Italy*; E Mezzofanti,* AlmaPlasma srl*; T Gallingani,* Alma Mater Studiorum-University of Bologna, Italy, Italia*; G Girolimetti, S Coluccelli, L Amato, G Gasparre,* S.Orsola-Malpighi Hospital, Bologna, Italy*; M Perrone,* S. Orsola-Malpighi Hospital, Bologna, Italy*; A Porcelli,* Alma Mater Studiorum- University of Bologna, Italy*; P De Iaco,* S. Orsola-Malpighi Hospital, Bologna, Italy
8:40am	Invited talk continues.	Invited talk continues.
9:00am	**MN-MoM-3** On-chip Silicon Photonics Radiation Sensors, ***Nikolai Klimov****, Z Ahmed, R Fitzgerald, L Cumberland, I Pazos, R Tosh,* National Institute of Standards and Technology (NIST)	**PS1+SE-MoM-3** Spectroscopic Characterization of a Multi-pins Plasma System*, M Gulan, R Muddiman,* ***Vladimir Milosavljevic****,* Technological University Dublin, Ireland
9:20am	**MN-MoM-4** Synthesis and Characterization of Nanoscale 3 dimensional Plasmonic Architectures, ***Grace Pakeltis****, E Mutunga,* University of Tennessee Knoxville*; Z Hu, D Masiello,* University of Washington*; J Idrobo,* Oak Ridge National Laboratory*; H Plank,* Graz University of Technology, Austria*; J Fowlkes,* Oak Ridge National Laboratory*; P Rack,* University of Tennessee Knoxville	**PS1+SE-MoM-4** Breaching Debye Law by Coupling of Y2O3 Vapor Carrying Focused Atmospheric ICP Beam Penetrating Showernead's Holes with Opposite CCP Discharge during Chemical Corrosion Barrier Coating in Open Air*,* ***Yuri Glukhoy****,* Nanocoating Plasma Systems Inc
9:40am	**MN-MoM-5** 2D Raman Imaging and Characterization of Surface Acoustic Waves on GaAs Substrates, ***Brian Douglas Rummel****, G Heileman,* University of New Mexico*; M Henry,* Sandia National Laboratories*; S Han,* University of New Mexico	**PS1+SE-MoM-5** Streamers Effects in Cold Atmospheric Plasma Applications: Coatings, Gas Conversion, Surface Chemistries*, A Ozkan, J Mertens,* ***François Reniers****,* Université Libre de Bruxelles, Belgium
10:00am	**MN-MoM-6** Impacts of Stress and Dissipation in van der Waals Interfaces on 2D Material Nanoelectromechanical Systems, ***SunPhil Kim****, A van der Zande,* University of Illinois at Urbana-Champaign	**PS1+SE-MoM-6** Improved Water Intrusion Resistance on Adhesive Bonded Metals using Atmospheric CVD SiO_2 Barrier Coatings, ***Zachary Jeckell****, D Patel, T Choi, M Schmid, L Bónová, D Barlaz, D Ruzic,* University of Illinois at Urbana-Champaign*; I Shchelkanov, B Jurczyk,* Starfire Industries LLC
10:20am	**BREAK**	**BREAK**
10:40am	**INVITED: MN-MoM-8** Nanomechanical Sensing for the Life Sciences, ***Montserrat Calleja****,* IMN-CSIC, Spain	**PS1+SE-MoM-8** OES Imaging and Double Langmuir Probe Studies of Flow-through, Supersonic Microplasma Jet Sources*, K Mackie,* ***Michael Gordon****,* University of California at Santa Barbara
11:00am	Invited talk continues.	**PS1+SE-MoM-9** Time-resolved Optical Emission Spectroscopy of an Atmospheric Pressure Plasma Jet – Surface Interaction, ***Michael Johnson****, D Boris, T Petrova, S Walton,* U.S. Naval Research Laboratory
11:20am	**MN-MoM-10** Neutral Mass Spectrometry of Metallic Nanoparticles with Optomechanical Resonators, ***Marc Sansa****, M Defoort, M Hermouet, L Banniard, A Fafin, M Gely,* Université Grenoble Alpes, CEA, LETI, France*; I Favero,* Centre de Nanosciences et de Nanotechnologies, CNRS, Université Paris-Sud, Université Paris-Saclay, France*; G Jourdan,* Université Grenoble Alpes, CEA, LETI, France*; A Brenac,* Université Grenoble Alpes, CEA, CNRS, Grenoble INP, INAC-Spintec, France*; S Hentz,* Université Grenoble Alpes, CEA, LETI, France	**INVITED: PS1+SE-MoM-10** Atmospheric-Pressure Plasmas As Ionization Sources For Atomic, Molecular, And Biological Mass Spectrometry, ***Jacob Shelley****, S Badal, C Walton, G MacLean,* Rensselaer Polytechnic Institute*; I Ayodeji,* University of South Florida*; G Chan,* Lawrence Berkeley National Laboratory*; T Evans-Nguyen,* University of South Florida
11:40am	**MN-MoM-11** Mass Calibration of Nanomechanical Resonators from Electrical Measurements for Mass Spectrometry Applications, ***Bogdan Vysotskyi****,* CEA/LETI-University Grenoble Alpes, France*; S Lai,* CEA/IRIG-University Grenoble Alpes, France*; M Defoort, M Sansa,* CEA/LETI-University Grenoble Alpes, France*; K Clement,* CEA/IRIG-University Grenoble Alpes, France*; M Gely,* CEA/LETI-University Grenoble Alpes, France*; C Masselon,* CEA/IRIG-University Grenoble Alpes, France*; S Hentz,* CEA/LETI-University Grenoble Alpes, France	Invited talk continues.

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

Monday Morning, October 21, 2019

	Thin Films Division **Room A122-123 - Session TF+EM+MI+MN+OX+PS-MoM** **Functional Thin Films: Ferroelectric, Multiferroics, and Magnetic Materials** **Moderators:** Christophe Vallee, LTM - MINATEC - CEA/LETI, France, Jessica Kachian, Intel Corporation	**Thin Films Division** **Room A124-125 - Session TF-MoM** **Thin Films for Electrochemistry and Energy Storage** **Moderators:** Parag Banerjee, University of Central Florida, Jason Avila, U.S. Naval Research Laboratory
8:20am	**INVITED: TF+EM+MI+MN+OX+PS-MoM-1** A Room-Temperature Magnetoelectric Multiferroic made by Thin Film Alchemy, *D Schlom,* ***Megan Holtz,*** Cornell University	**INVITED: TF-MoM-1** Enabling Energy Dense Lithium Batteries Using Thin Film Technology, ***Wyatt Tenhaeff,*** University of Rochester
8:40am	Invited talk continues.	Invited talk continues.
9:00am	**TF+EM+MI+MN+OX+PS-MoM-3** Magnetic Losses in FeGa/NiFe/Al_2O_3 Laminates for Strain-Mediated Multiferroic Micro-Antenna Applications, ***Kevin Fitzell,*** *A Acosta, C Rementer, D Schneider, Z Yao,* University of California, Los Angeles; *C Dong,* Northeastern University; *M Jamer, D Gopman, J Borchers, B Kirby,* National Institute of Standards and Technology (NIST); *N Sun,* Northeastern University; *Y Wang, G Carman, J Chang,* University of California, Los Angeles	**TF-MoM-3** Molecular Layer Deposition of Organic Li-containing Thin Film for Li Ion Solid-state Batteries, ***Haotian Wang,*** University of Maryland, College Park
9:20am	**TF+EM+MI+MN+OX+PS-MoM-4** Multiferroic Gd-substituted HfO_2Thin Films, ***John Hayden,*** *F Scurti, J Schwartz, J Maria,* Pennsylvania State University	**TF-MoM-4** Organic/Inorganic Solid Electrolytes and Electrode Coatings for 3D Lithium-ion Microbatteries, ***Ryan Sheil[1],*** *J Lau,* University of California, Los Angeles; *K Jungjohann,* Sandia National Laboratories; *J Yoo,* Los Alamos National Laboratory; *B Dunn, J Chang,* University of California, Los Angeles
9:40am	**TF+EM+MI+MN+OX+PS-MoM-5** Epitaxial Growth of Antiferromagnetic NiO Films by Off-axis Sputtering for Spintronic Devices, *A Churikova, G Beach,* Massachusetts Institute of Technology; ***Larry Scipioni,*** *A Shepard, J Greer, T Newhouse-Illige,* PVD Products, Inc.	**TF-MoM-5** Structural Rearrangement in $Li_xV_2O_5$ Thin Films, a Cathode Material for All-solid-state Batteries, ***Angelique Jarry,*** University of Maryland, College Park; *N Pronin, M Walker,* The Ohio State University; *J Ballard,* University of Maryland; *D Stewart,* University of Maryland, College Park; *L Brillson,* The Ohio State University; *G Rubloff,* University of Maryland, College Park
10:00am	**TF+EM+MI+MN+OX+PS-MoM-6** Structural and Magnetic Properties of CoPd Alloys for Non-Volatile Memory Applications, *S Gupta, J Abugri, B Clark,* University of Alabama; *P Komninou,* Aristotle University of Thessaloniki; ***Sujan Budhathoki,*** *A Hauser, P Visscher,* University of Alabama	**TF-MoM-6** Atomic Layer Deposition and Performance of Sodium and Potassium Electrolytes for Conformal Solid State Batteries, ***Blake Nuwayhid,*** *A Jarry, G Rubloff, K Gregorczyk,* University of Maryland, College Park
10:20am	**BREAK**	**BREAK**
10:40am	**INVITED: TF+EM+MI+MN+OX+PS-MoM-8** Size Effects of the Electromechanical Response in Ferroic Thin Films: Phase Transitions to the Rescue, ***Nazanin Bassiri-Gharb,*** Georgia Institute of Technology	**INVITED: TF-MoM-8** ALD as Tool for Bottom-up Synthesis of Catalyst Powders, ***Frank Rosowski,*** BASF Se, Germany
11:00am	Invited talk continues.	Invited talk continues.
11:20am	**TF+EM+MI+MN+OX+PS-MoM-10** Ferroelectrics Meet Ionics in the Land of van der Waals, *S Neumayer,* Center for Nanophase Materials Sciences, Oak Ridge National Laboratory; *J Brehm,* Vanderbilt University; *M McGuire,* Oak Ridge National Laboratory; *M Susner,* Air Force Research Laboratory; *E Eliseev,* National Academy of Sciences of Ukraine; *S Jesse, S Kalinin,* Center for Nanophase Materials Sciences, Oak Ridge National Laboratory; *A Morozovska,* National Academy of Sciences of Ukraine; *S Pantelides,* Vanderbilt University; *N Balke,* ***Petro Maksymovych,*** Center for Nanophase Materials Sciences, Oak Ridge National Laboratory	**TF-MoM-10** Strategies for the Stabilization of Metal Anodes for Li and Na Metal Batteries, ***Yang Zhao[2],*** *X Sun,* University of Western Ontario, Canada
11:40am	**TF+EM+MI+MN+OX+PS-MoM-11** Adsorption-controlled Epitaxial Growth of the Hyperferroelectric Candidate LiZnSb on GaSb (111), *D Du, P Strohbeen,* University of Wisconsin - Madison; *H Paik,* Cornell University; *C Zhang, P Voyles,* ***Jason Kawasaki,*** University of Wisconsin - Madison	**TF-MoM-11** Competition Between Incorporation and Desorption of Nitrogen in Plasma-Enhanced Atomic Layer Deposition of Cobalt and Cobalt Nitride Catalysts, ***Gerben van Straaten,*** Eindhoven University of Technology, The Netherlands, Netherlands; *H Fredriksson,* Syngaschem BV, Netherlands; *R Deckers,* Eindhoven University of Technology, Netherlands; *M Vos,* Eindhoven University of Technology, The Netherlands, Netherlands; *K Weststrate,* Syngaschem BV, Netherlands; *E Kessels,* Eindhoven University of Technology, The Netherlands, Netherlands; *A Creatore,* Eindhoven University of Technology, Netherlands

[1] **TFD James Harper Award Finalist**

[2] **Late-Abstract Energy Transition Symposium Theme Award**

Vacuum Technology Division
Room A213 - Session VT-MoM
Pumping, Outgassing, leaks, and Vacuum Pressure Measurement
Moderators: Scott Heinbuch, MKS Granville-Phillips Division, Longmont, Giulia Lanza, SLAC National Accelerator Laboratory

8:20am	**VT-MoM-1** Operational Experiences of Compact Non-Evaporable Getter Pumps in CHESS-U and CBETA, ***Yulin Li,*** *Y Lushtak, L Ying,* Cornell University	
8:40am	**VT-MoM-2** Al_2O_3 Coated Stainless Steel Vacuum Chamber and Parts, ***Martin Wüest,*** *Y Kuzminykh, G Mata Osoro, W Fuchs, J Gabathuler, L Ospelt,* INFICON Ltd., Liechtenstein	
9:00am	**VT-MoM-3** Comparative Outgassing Study of Identical Vacuum Chambers, ***James Fedchak,*** National Institute of Sandards and Technology (NIST)	
9:20am	**VT-MoM-4** The NIST VAcuum LEaks System (VALES): a new system for the primary and comparison calibration of small gas flows., ***Julia Scherschligt****, J Fedchak, R Vest,* National Institute of Sandards and Technology (NIST)	
9:40am	**VT-MoM-5** Creating a Controlled Gas Environment for Lifetime Testing of EUV Optics, ***Timo Huijser,*** *M van Putten, M van der Lans,* TNO, Netherlands	
10:00am	**VT-MoM-6** Sampling System Design to Predict Mixture Composition at a Quadrupole Mass Spectrometer Ion Source, ***Robert Ellefson,*** REVac Consulting	
10:20am	**BREAK**	
10:40am	**INVITED: VT-MoM-8** Quantum Pressure Standard in the range 200 Pa to 20 kPa using Superconducting Microwave Cavity, ***Laurent Pitre,*** LNE Cnam-LCM, France*; P Gambette,* LNE-Cnam LCM, France*; R Gavioso, D Ripa,* INRiM, Italy*; M Plimmer,* LNE-Cnam LCM, France	
11:00am	Invited talk continues.	
11:20am	**VT-MoM-10** Progress Toward Primary Pressure Measurements based on Refractive Index, ***Kevin Douglass,*** *J Ricker, J Hendricks,* National Institute of Standards and Technology (NIST)	
11:40am	**VT-MoM-11** Application of Porous Conductance Element for High Vacuum Gauge Calibration, ***Martin-Viktor Johansson,*** Aix Marseille University, France*; M Wüest,* INFICON Ltd., Liechtenstein*; P Perrier,* Aix Marseille University, France*; I Graur,* Aix-Marseille University, France	

	2D Materials **Room A226 - Session 2D+AP+EM+MI+MN+NS+PS+TF-MoA** **Nanostructures including Heterostructures and Patterning of 2D Materials** **Moderator:** Deep Jariwala, University of Pennsylvania	**2D Materials** **Room A216 - Session 2D+AP+EM+MI+NS+PS+TF-MoA** **2D Materials Growth and Fabrication** **Moderator:** Sarah Haigh, University of Manchester, UK
1:40pm	**INVITED: 2D+AP+EM+MI+MN+NS+PS+TF-MoA-1** Tailoring and Patterning 2D Material Interfaces Through Chemical Functionalization, ***Arend van der Zande,*** University of Illinois at Urbana-Champaign	**2D+AP+EM+MI+NS+PS+TF-MoA-1** Two-dimensional Non-layered Indium Sulfide for Electronic and Optical Applications, ***Jian Zhen Ou,*** *A Jannat, K Xu,* RMIT University, Australia
2:00pm	Invited talk continues.	**2D+AP+EM+MI+NS+PS+TF-MoA-2** Synthesis of High Quality Monolayer Transition Metal Dichalcogenides using Direct Liquid Injection, ***Kathleen M. McCreary,*** *E Cobas, A Hanbicki, M Rosenberger, H Chuang, B Jonker,* U.S. Naval Research Laboratory
2:20pm	**2D+AP+EM+MI+MN+NS+PS+TF-MoA-3** Dual-Route Hydrogenation of the Graphene/Ni Interface, ***Rosanna Larciprete,*** CNR-Institute for Complex Systems, Roma, Italy*; D Lizzit,* Elettra - Sincrotrone Trieste, Trieste, Italy*; M Trioni,* CNR-Institute of Molecular Science and Technologies, Milano, Italy*; P Lacovig, L Bignardi, S Lizzit,* Elettra - Sincrotrone Trieste, Trieste, Italy*; R Martinazzo,* Università degli Studi di Milano, Milano, Italy	**INVITED: 2D+AP+EM+MI+NS+PS+TF-MoA-3** Understanding and Controlling the Growth of 2D Materials with Non-Equilibrium Methods and in situ Diagnostics, ***David Geohegan,*** *Y Lin, Y Yu,* Oak Ridge National Laboratory*; C Liu, G Duscher,* University of Tennessee Knoxville*; A Strasser,* University of Texas at Dallas*; A Puretzky,* Oak Ridge National Laboratory*; K Wang,* Intel Corporation, USA*; M Yoon, C Rouleau,* Oak Ridge National Laboratory*; S Canulescu,* DTU Nanolab, Technical University of Denmark*; P Rack,* University of Tennessee Knoxville*; L Liang, W Zhang, H Cai, Y Gu, G Eres, K Xiao,* Oak Ridge National Laboratory
2:40pm	**2D+AP+EM+MI+MN+NS+PS+TF-MoA-4** Assembly of Arrays of Predefined Monolayer Features into vdW Heterostructure by a Continuous Exfoliate-align-Release Process, ***Vu Nguyen,*** *H Taylor,* University of California at Berkeley	Invited talk continues.
3:00pm	**2D+AP+EM+MI+MN+NS+PS+TF-MoA-5** van der Waals Heterojunction Photothermoelectric Effect in MoS_2/Graphene Monolayers, ***Yunqiu Kelly Luo,*** The Ohio State University*; T Zhou,* University at Buffalo, State University of New York*; M Newburger,* The Ohio State Univesity*; R Bailey-Crandell, I Lyalin,* The Ohio State University*; M Neupane,* U.S. Army Research Laboratory*; A Matos-Abiague,* Wayne State University*; I Zutic,* University at Buffalo, State University of New York*; R Kawakami,* The Ohio State University	**2D+AP+EM+MI+NS+PS+TF-MoA-5** Area-Selective Atomic Layer Deposition of 2D WS_2 Nanolayers, ***Shashank Balasubramanyam***[1], Eindhoven University of Technology, The Netherlands, Noord Brabant*; M Merkx,* Eindhoven University of Technology, The Netherlands*; E Kessels,* Eindhoven University of Technology, The Netherlands, Netherlands*; A Mackus,* Eindhoven University of Technology, The Netherlands, Nederland*; A Bol,* Eindhoven University of Technology, The Netherlands, Netherlands
3:20pm	**2D+AP+EM+MI+MN+NS+PS+TF-MoA-6** Formation of Edge-bonded MoS_2-graphene Nanoribbons by On-surface Synthesis, ***Mark Haastrup,*** *M Mammen, J Rodríguez-Fernández, J Lauritsen,* Aarhus University, Denmark	**2D+AP+EM+MI+NS+PS+TF-MoA-6** Growth Behavior of Hexagonal Boron Nitride on Cu-Ni Binary Alloys, ***Karthik Sridhara,*** Texas A&M University*; J Wollmershauser,* U.S. Naval Research Laboratory*; L Nyakiti,* Texas A&M University*; B Feigelson,* U.S. Naval Research Laboratory
3:40pm	**BREAK**	**BREAK**
4:00pm	**2D+AP+EM+MI+MN+NS+PS+TF-MoA-8** The Effects of Metal-modification and Two Dimensional (2D) Lamellar Structure on Catalytic Performance of MFI Zeolite for Ethylene Conversion into Liquid Aromatics, ***Laleh Emdadi,*** *L Mahoney, D Tran, I Lee,* US Army Research Laboratory	**2D+AP+EM+MI+NS+PS+TF-MoA-8** Chemical Deposition of Vanadium Disulfide on Silicon for Optoelectronic Applications, ***Mathias Fraccaroli,*** *R Gassilloud, S Cadot,* CEA-LETI, France*; B Pelissier,* LTM, Univ. Grenoble Alpes, CNRS, France*; C Vallée,* LTM, Univ. Grenoble Alpes, CEA-LETI, France*; A Sylvestre,* G2Elab, Univ. Grenoble Alpes, France
4:20pm	**2D+AP+EM+MI+MN+NS+PS+TF-MoA-9** Structural Stability of Graphene Nanoflakes:From the View Point of Aromaticity, *M Ushirozako, H Matsuyama, A Akaishi,* ***Jun Nakamura,*** The University of Electro-Communications (UEC-Tokyo), Japan	**2D+AP+EM+MI+NS+PS+TF-MoA-9** Controlled Growth of Transition Metal Dichalcogenide Monolayers for Applications in Nanoelectronic and Nanophotonic Devices, *A George, C Neumann, D Kaiser, R Mupparapu,* Friedrich Schiller University Jena, Germany*; U Hübner,* Leibniz Institute of Photonic Technology, Jena, Germany*; Z Tang, A Winter, I Staude,* ***Andrey Turchanin,*** Friedrich Schiller University Jena, Germany
4:40pm	**INVITED: 2D+AP+EM+MI+MN+NS+PS+TF-MoA-10** Wafer-scale 2D-3D Mixed Heterostructures Enabled by Remote Epitaxy through Graphene, ***Jeehwan Kim,*** Massachusetts Institute of Technology	**2D+AP+EM+MI+NS+PS+TF-MoA-10** Atomic Layer Deposition of BN as a Novel Capping Barrier for B_2O_3, ***Aparna Pilli,*** *J Jones, J Kelber,* University of North Texas*; A LaVoie, F Pasquale,* Lam Research Corporation
5:00pm	Invited talk continues.	**2D+AP+EM+MI+NS+PS+TF-MoA-11** Atomic Layer Deposition of SiO_2 on Group VIII Metals: Towards Formation of a 2D Dielectric, *T Suh, R Yalisove,* ***James Engstrom,*** Cornell University

[1] **TFD James Harper Award Finalist**

Monday Afternoon, October 21, 2019

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

	Electronic Materials and Photonics Division **Room A214 - Session EM+PS+TF-MoA** **New Devices and Materials for Logic and Memory** **Moderators:** Rehan Kapadia, University of Southern California, Nicholas Strandwitz, Lehigh University	**MEMS and NEMS Group** **Room A210 - Session MN-MoA** **Microfabricated Systems for Gas Chromatography and Nanomechanical Mass Sensing** **Moderators:** Robert Davis, Brigham Young University, Christian Zorman, Case Western Reserve University
1:40pm	**EM+PS+TF-MoA-1** Short-term Plasticity to Long-term Plasticity Transition Mimicked by High Mobility InP FETs with TiO_2 Trapping Layer, ***Jun Tao***, *R Kapadia,* University of Southern California	**INVITED: MN-MoA-1** Micromachined Silicon Micro-pillar Arrays for Liquid and Gas Chromatography, ***Gert Desmet***, Vrije Universiteit Brussel, Belgium
2:00pm	**EM+PS+TF-MoA-2** Magnetic Domain Wall Devices for Artificial Neural Network, ***Saima Siddiqui***, *S Dutta, A Tang, L Liu, M Baldo, C Ross,* MIT	Invited talk continues.
2:20pm	**INVITED: EM+PS+TF-MoA-3** Ferroelectric Devices for Non-von Neumann Computing, *Z Wang,* ***Asif Khan***, Georgia Institute of Technology	**INVITED: MN-MoA-3** An Integrated Passive µPreconcentrator with Progressively-Heated µInjector for µGC, *R Hower, C Zhan, M Akbar, N Nuñovero, J Wang, J Potkay,* ***Edward Zellers***, University of Michigan
2:40pm	Invited talk continues.	Invited talk continues.
3:00pm	**EM+PS+TF-MoA-5** Ultrafast Measurement of Nanoseconds Polarization Switching in Ferroelectric Hafnium Zirconium Oxide, ***Mengwei Si***, *P Ye,* Purdue University	**MN-MoA-5** Developments and Challenges in Full-range Microchip Gas Chromatography, ***Abhijit Ghosh***, Honeywell UOP, Des Plaines, IL, USA.*; M Lee,* Brigham Young University
3:20pm	**EM+PS+TF-MoA-6** Interfacial Charge Engineering in Ferroelectric-Gated Mott Transistors, *X Chen, Y Hao, L Zhang,* ***Xia Hong***, University of Nebraska-Lincoln	**MN-MoA-6** Fabrication of Thermally Isolated micro-Column for Gas Chromatography, ***James Harkness***, *H Davis, A Davis, R Davis, B Jensen, R Vanfleet,* Brigham Young University
3:40pm	**BREAK**	**BREAK**
4:00pm	**EM+PS+TF-MoA-8** The Interface of Transition Metal Dichalcogenides and Ferroelectric Oxides, ***Maria Gabriela Sales***, *S Jaszewski, S Fields, R Christopher, N Shukla, J Ihlefeld, S McDonnell,* University of Virginia	**MN-MoA-8** Control of Surface Geometry and Chemistry to enable integration of Microfabricated Structures into High Performance Microscale Gas Chromatography Systems, ***Henry Davis***, *D McKenna, J Harkness, D Kane, R Vanfleet, R Davis,* Brigham Young University
4:20pm	**EM+PS+TF-MoA-9** Electronic and Thermal Properties of 2D Materials, ***Connor McClellan***, *E Yalon, K Smithe, C English, S Vaziri, C Bailey, A Sood, M Chen, E Pop,* Stanford University	**INVITED: MN-MoA-9** Constructive Utilization of Nonlinear Dynamics in MEMS/NEMS, ***Hanna Cho***, The Ohio State University
4:40pm	**INVITED: EM+PS+TF-MoA-10** Electronics in Flatland, ***Sanjay Banerjee***, University of Texas at Austin	Invited talk continues.
5:00pm	Invited talk continues.	**MN-MoA-11** Frequency Stabilization in a MEMS Oscillator Via Tunable Internal Resonance, ***Jun Yu***, *H Cho,* The Ohio State University

Monday Afternoon, October 21, 2019

	Plasma Science and Technology Division **Room B130 - Session PS+AS+EM+SS+TF-MoA** **Plasma-Surface Interactions** **Moderators:** Sebastian Engelmann, IBM T.J. Watson Research Center, Sumit Agarwal, Colorado School of Mines	**Plasma Science and Technology Division** **Room B131 - Session PS1-MoA** **Plasma-Liquid Interactions, Medicine, and Agriculture** **Moderators:** Kazunori Koga, Kyushu University, Japan, Deborah O'Connell, University of York, UK
1:40pm	**PS+AS+EM+SS+TF-MoA-1** Cleaning Chamber Walls after ITO Plasma Etching Process, ***Salma Younesy,*** *C Petit-Etienne,* LTM/CNRS, France*; S Barnola,* CEA-LETI, France*; P Gouraud,* ST Microelectronics, France*; G Cunge,* LTM/CNRS, France	**INVITED: PS1-MoA-1** Peroxynitric acid ($HOONO_2$) Chemistry in Plasma-treated Water for Effective and Safety Disinfection, ***Katsuhisa Kitano,*** Osaka University, Japan*; S Ikawa, Y Nakashima,* Osaka Research Institute of Industrial Science and Technology, Japan*; T Yokoyama,* Osaka University, Japan*; A Tani,* Kobe University, Japan
2:00pm	**PS+AS+EM+SS+TF-MoA-2** Plasma Resistance of Sintered Yttrium Oxyfluoride (YOF) with Various Y, O, and F Composition Ratios, ***Tetsuya Goto,*** *Y Shiba, A Teramoto,* Tohoku University, Japan*; Y Kishi,* Nippon Yttrium Co., Ltd, Japan*; S Sugawa,* Tohoku University, Japan	Invited talk continues.
2:20pm	**INVITED: PS+AS+EM+SS+TF-MoA-3** Understanding Atomic Layer Etching: Thermodynamics, Kinetics and Surface Chemistry, ***Jane P. Chang***[1], University of California, Los Angeles	**PS1-MoA-3** Impact of Solution Properties on Plasma Formation in DC Plasma Electrolysis, ***Hernan E. Delgado***[2]*, D Bartels, P Rumbach, D Go,* University of Notre Dame
2:40pm	Invited talk continues.	**INVITED: PS1-MoA-4** Plasma Reactive Species Formation in Liquids, ***Sylwia Ptasinska,*** University of Notre Dame
3:00pm	**PS+AS+EM+SS+TF-MoA-5** Comparison of Silicon Surface Chemistry between Photo-Assisted Etching and Ion-Assisted Etching, ***Emilia Hirsch,*** *L Du, V Donnelly, D Economou,* University of Houston	Invited talk continues.
3:20pm	**PS+AS+EM+SS+TF-MoA-6** Chemical Reaction Probabilities in the Etching of Si by Fluorine Atoms Produced in a Mixture of NF_3/SF_6 Plasma, ***Priyanka Arora***[2]*, T Nguyen,* University of Houston*; S Nam,* Samsung Electronic Company, Republic of Korea*; V Donnelly,* University of Houston	**PS1-MoA-6** In-flight Synthesis and Online Characterization of Silver Nanoparticles from Aerosol Droplets Reacting in a Non-thermal Plasma, ***Tommaso Gallingani,*** Alma Mater Studiorum-University of Bologna, Italy, Italia*; N Abuyazid,* Case Western Reserve University*; M Gherardi, V Colombo,* Alma Mater Studiorum-University of Bologna, Italy*; C Hogan,* University of Minnesota, Minneapolis*; M Sankaran,* Case Western Reserve University
3:40pm	**BREAK**	**BREAK**
4:00pm	**INVITED: PS+AS+EM+SS+TF-MoA-8** John Thornton Memorial Award Lecture: Low Temperature Plasma-Materials Interactions: Foundations of Nanofabrication And Emerging Novel Applications At Atmospheric Pressure, ***Gottlieb S. Oehrlein***[3], University of Maryland, College Park	**INVITED: PS1-MoA-8** Plasma-assisted Fabrication and Functionalization of Materials for Applications at the Nano-biointerface, ***Cristina Satriano,*** University of Catania, Italy
4:20pm	Invited talk continues.	Invited talk continues.
4:40pm	**PS+AS+EM+SS+TF-MoA-10** Determining Surface Recombination Probabilities during Plasma-enhanced ALD using Lateral High Aspect Ratio Structures, ***Karsten Arts,*** Eindhoven University of Technology, The Netherlands, Netherlands*; M Utriainen,* VTT Technical Research Centre of Finland, Finland*; R Puurunen,* Aalto University School of Chemical Engineering, Finland*; E Kessels,* Eindhoven University of Technology, The Netherlands, Netherlands*; H Knoops,* Eindhoven University of Technology, The Netherlands	**INVITED: PS1-MoA-10** Cold Plasma Jets, Liquids and Biomaterials for Bone Cancer Therapy, ***Cristina Canal,*** Universitat Politècnica de Catalunya, Spain
5:00pm	**PS+AS+EM+SS+TF-MoA-11** Study of Plasma-Photoresist Interactions for Atomic Layer Etching Processes, ***Adam Pranda***[2]*, K Lin, G Oehrlein,* University of Maryland, College Park	Invited talk continues.

[1] **PSTD Plasma Prize Winner**

[2] **Coburn & Winters Student Award Finalist**

[3] **John A. Thornton Memorial Award Winner**

Monday Afternoon, October 21, 2019

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

	Surface Science Division **Room A220-221 - Session SS+HC-MoA** **CO2, CO, Water, and Small Molecule Chemistry at Surfaces** **Moderators:** Donna Chen, University of South Carolina, Omur E. Dagdeviren, Yale University	**Thin Films Division** **Room A124-125 - Session TF+2D+AP+EL+SS-MoA** **ALD and CVD: Nucleation, Surface Reactions, Mechanisms, and Kinetics** **Moderators:** Adrie Mackus, Eindhoven University, Netherlands, Qing Peng, University of Alabama
1:40pm	**INVITED: SS+HC-MoA-1** Calculations of the Electrochemical Reduction of CO2 and the Competing Hydrogen Evolution Reaction, ***Hannes Jónsson,*** University of Iceland, Iceland	**INVITED: TF+2D+AP+EL+SS-MoA-1** ALD on Particles: What is Different from Wafers?, ***Ruud van Ommen,*** Delft University of Technology, Netherlands
2:00pm	Invited talk continues.	Invited talk continues.
2:20pm	**SS+HC-MoA-3** CO_2 Adsorption on the O-Cu(100) Surface Studied by STM and DFT, *S Tjung, Q Zhang, J Repicky, S Yuk,* The Ohio State University; *X Nie,* Dalian University of Technology; ***Seth Shields,*** The Ohio State University; *N Santagata,* University of Memphis; *A Asthagiri, J Gupta,* The Ohio State University	**TF+2D+AP+EL+SS-MoA-3** Insights into Particle ALD Peculiarities from In- and Ex-Situ Characterization, ***Benjamin Greenberg,*** American Society for Engineering Education; *J Wollmershauser, B Feygelson,* U.S. Naval Research Laboratory
2:40pm	**SS+HC-MoA-4** Employing Carbon Monoxide and Carbon Dioxide Plasmas to Improve the Gas Sensing Performance of Tin(IV) Oxide, ***Kimberly Hiyoto,*** *E Fisher,* Colorado State University	**TF+2D+AP+EL+SS-MoA-4** Impact of Medium Energy Ions on HfO2 Nucleation Mechanisms on Si, SiO2,TiN Substrates in PEALD Processes Investigated by In situ Ellipsometry, Optical Emission Spectroscopy, AFM and XPS Analyses, ***Marceline Bonvalot,*** *S belahcen, A Bsiesy, C Vallée,* LTM, Univ. Grenoble Alpes, CEA-LETI, France
3:00pm	**INVITED: SS+HC-MoA-5** The Role of Steps in the Dissociation of CO_2 on Cu, ***Johan Gustafson,*** *B Hagman,* Lund University, Sweden; *A Posada-Borbón, A Schaefer,* Chalmers University of Technology, Sweden; *M Shipilin,* Stockholm University, Sweden; *C Zhang,* Lund University, Sweden; *L Merte,* Malmö University, Sweden; *A Hellman,* Chalmers University of Technology, Sweden; *E Lundgren,* Lund University, Sweden; *H Grönbeck,* Chalmers University of Technology, Sweden	**TF+2D+AP+EL+SS-MoA-5** Controlling the Nucleation of CVD Cobalt Films on SiO_2 : Combining an Amido-based Nucleation Promotor with an Amine-based Growth Inhibitor to Afford Atomically-smooth Surfaces, ***Zhejun Zhang,*** *G Girolami, J Abelson,* University of Illinois at Urbana-Champaign
3:20pm	Invited talk continues.	**TF+2D+AP+EL+SS-MoA-6** Plasma-assisted Atomic Layer Epitaxy of Indium Aluminum Nitride Studied Using *in situ* Grazing Incidence Small-angle X-ray Scattering, ***Jeffrey M. Woodward,*** ASEE (residing at US Naval Research Laboratory); *S Rosenberg,* American Society for Engineering Education (residing at US Naval Research Laboratory); *S Johnson, N Nepal,* U.S. Naval Research Laboratory; *Z Robinson,* SUNY Brockport; *K Ludwig,* Boston University; *C Eddy,* U.S. Naval Research Laboratory
3:40pm	**BREAK**	**BREAK**
4:00pm	**SS+HC-MoA-8** Surface Temperature Dependence of Methane Dissociation on Ni(997), ***Daniel Tinney,*** *E High, L Joseph, A Utz,* Tufts University	**INVITED: TF+2D+AP+EL+SS-MoA-8** Real-time Monitoring of the Surface Chemistry of Atomic Layer Deposition by Ambient Pressure X-ray Photoelectron Spectroscopy, ***Joachim Schnadt,*** *P Shayesteh,* Lund University, Sweden; *R Tsyshevskiy,* University of Maryland; *G Jean-Jacques, F Bournel,* Sorbonne Université, France; *R Timm,* Lund University, Sweden; *A Head,* Brookhaven National Laboratory; *G D'Acunto, F Rehman, S Chaudhary,* Lund University, Sweden; *R Sánchez-de-Armas,* Uppsala University, Sweden; *F Rochet,* Sorbonne Université, France; *B Brena,* Uppsala University, Sweden; *A Mikkelsen, S Urpelainen, A Troian, S Yngman, J Knudsen,* Lund University, Sweden
4:20pm	**SS+HC-MoA-9** Promotion and Inhibition of Methane Dissociation by Carbon on Ni Single Crystal Surfaces, ***Arthur Utz,*** *E High, D Tinney,* Tufts University	Invited talk continues.
4:40pm	**SS+HC-MoA-10** Two-Dimensional Polymorphism as a Result of Non-Equilibrium Self-Assembly, ***Angela Silski[1],*** *J Petersen,* University of Notre Dame; *R Brown,* Clarkson University; *S Kandel,* University of Notre Dame	**TF+2D+AP+EL+SS-MoA-10** Kinetics during TMA-H_2O ALD: The Possible Role of Cooperative Surface Reactions, ***Brent Sperling,*** *B Kalanyan, J Maslar,* National Institute of Standards and Technology (NIST)
5:00pm		**TF+2D+AP+EL+SS-MoA-11** Atomic Layer Deposition of Metal Sulfides: Growth and Surface Chemistry, ***Xinwei Wang,*** Shenzhen Graduate School, Peking University, China

[1] **Morton S. Traum Award Finalist**

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

Vacuum Technology Division
Room A213 - Session VT-MoA
Gas Dynamics, Surface Science for Accelerators, and Ultra-Clean Vacuum Systems
Moderators: Jason Carter, Argonne National Laboratory, James Fedchak, National Institute of Standards and Technology

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

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 _____

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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

	2D Materials **Room A216 - Session 2D+AS+MI+NS-TuM** **2D Materials Characterization including Microscopy and Spectroscopy** **Moderator:** David Geohegan, Oak Ridge National Laboratory	**2D Materials** **Room A226 - Session 2D+EM+MI+MN+NS+QS-TuM** **Novel Quantum Phenomena** **Moderator:** Arend van der Zande, University of Illinois at Urbana Champaign
8:00am	**2D+AS+MI+NS-TuM-1** Near-field Infrared Spectroscopy of Single Layer $MnPS_3$, ***Sabine Neal,*** University of Tennessee Knoxville; *H Kim,* Rutgers University; *K Smith, A Haglund, D Mandrus,* University of Tennessee Knoxville; *H Bechtel,* Advanced Light Source, Lawrence Berkeley National Laboratory; *L Carr,* National Synchrtoron Light Source II, Brookhaven National Lab; *K Haule, D Vanderbilt,* Rutgers University; *J Musfeldt,* University of Tennessee Knoxville	**INVITED: 2D+EM+MI+MN+NS+QS-TuM-1** Charge Density-Wave States in Single-Layer Transition-Metal Dichalcogenides, ***Phil King,*** University of St Andrews, UK
8:20am	**2D+AS+MI+NS-TuM-2** Multi-parameter Analysis of Genesis and Evolution of Secondary Electrons produced in the Low Energy Regime, ***Alessandra Bellissimo,*** ETH Zürich, Switzerland; *G Pierantozzi,* CNR - Istituto Officine Materiali, Italy; *A Ruocco, G Stefani,* Università degli Studi Roma Tre, Italy; *O Ridzel, V Astašauskas, W Werner,* Technische Universität Wien, Austria; *M Taborelli,* CERN, Switzerland; *G Bertolini, U Ramsperger,* ETH Zürich, Switzerland; *O Gürlü,* ETH Zürich, Switzerland, Turkey; *D Pescia,* ETH Zürich, Switzerland	Invited talk continues.
8:40am	**INVITED: 2D+AS+MI+NS-TuM-3** Probing Point Defects, Folds and Interfaces in 2D Material Heterostructures using Scanning Transmission Electron Microscopy, ***Sarah Haigh,*** University of Manchester, UK	**2D+EM+MI+MN+NS+QS-TuM-3** Sublattice Symmetry Breaking and Kondo-effect Enhancement in Strained Graphene, *D Zhai,* Ohio University; *K Ingersent,* University of Florida; *S Ulloa,* ***Nancy Sandler,*** Ohio University
9:00am	Invited talk continues.	**2D+EM+MI+MN+NS+QS-TuM-4** Indirect Transition and Opposite Circular Polarization of Interlayer Exciton in a MoSe2 WSe2 van der Waals Heterostructure, ***Hsun-Jen Chuang,*** *A Hanbicki, M Rosenberger, C Hellberg, S Sivaram, K McCreary, I Mazin, B Jonker,* U.S. Naval Research Laboratory
9:20am	**2D+AS+MI+NS-TuM-5** Low-Energy Electron Induced Disordering and Decomposition of Self-assembled Monolayers on Au(111), ***Jodi Grzeskowiak***[1], University at Albany - SUNY; *C Ventrice, Jr.,* SUNY Polytechnic Institute	**2D+EM+MI+MN+NS+QS-TuM-5** Integrating 2D Magnet 1T-$MnSe_2$ with Topological Insulator Bi_2Se_3, ***Tiancong Zhu,*** The Ohio State University; *D O'Hara,* University of California, Riverside; *J Repicky, S Yu, M Zhu, B Noesges, T Liu, M Brenner, L Brillson, J Hwang, F Yang, J Gupta, R Kawakami,* The Ohio State University
9:40am	**2D+AS+MI+NS-TuM-6** Continuous Silicene, Silicene Ribbons and Surface Reconstructions on h-$MoSi_2$, ***Anna Costine,*** *C Volders,* University of Virginia; *M Fu,* Oak Ridge National Laboratory; *P Reinke,* University of Virginia	**2D+EM+MI+MN+NS+QS-TuM-6** Effect of Exchange-correlation Functional and Structural Constraints on the Transition Temperature of Two- Dimensional Ferroelectrics, ***Shiva P. Poudel,*** *J Villanova, B Miller, A Pandit, S Barraza-Lopez,* University of Arkansas, Fayetteville
10:00am	**BREAK - Complimentary Coffee in Exhibit Hall**	**BREAK - Complimentary Coffee in Exhibit Hall**
10:20am	**BREAK - Complimentary Coffee in Exhibit Hall**	**BREAK - Complimentary Coffee in Exhibit Hall**
10:40am	**BREAK - Complimentary Coffee in Exhibit Hall**	**BREAK - Complimentary Coffee in Exhibit Hall**
11:00am	**2D+AS+MI+NS-TuM-10** Epitaxial Growth and Characterization of Single-Orientation Single-Layer Transition Metal Dichalcogenides on Au(111), *L Bignardi,* University of Trieste, Italy; ***Daniel Lizzit,*** Elettra - Sincrotrone Trieste, Trieste, Italy; *B Harsh, E Travaglia,* Department of Physics, University of Trieste, Italy; *C Sanders,* iNANO, Aarhus University, Denmark, UK; *M Dendzik,* Aarhus University, Denmark, Germany; *P Lacovig,* Elettra-Sincrotrone Trieste, Italy; *M Michiardi,* iNANO, Aarhus University, Denmark, Canada; *M Bianchi,* Aarhus University, Denmark; *R Larciprete,* CNR-Institute for Complex Systems, Roma, Italy; *J Flege, J Falta,* University of Bremen, Germany; *P Das,* Abdus Salam International Centre for Theoretical Physics, Trieste, Italy; *J Fujii, I Vobornik,* IOM-CNR, Laboratorio TASC, Trieste, Italy; *M Ewert, L Buß,* University of Bremen, Germany; *A Baraldi,* University of Trieste, Italy; *P Hofmann,* Aarhus University, Denmark; *S Lizzit,* Elettra - Sincrotrone Trieste, Trieste, Italy	**2D+EM+MI+MN+NS+QS-TuM-10** Sign-change Pairing Symmetry in Single Layer FeSe/$SrTiO_3$ Film, ***Huimin Zhang,*** West Virginia University; *Z Ge, M Weinert,* University of Wisconsin; *L Li,* West Virginia University
11:20am	**2D+AS+MI+NS-TuM-11** Surface Reactivity of MoS_2 by ambient pressure X-ray Photoelectron Spectroscopy, ***Rafik Addou,*** *D Dardzinsky, G Herman,* Oregon State University	**2D+EM+MI+MN+NS+QS-TuM-11** High Temperature Superconductivity in Epitaxial Single Layer $FeTe_{1-x}Se_x$/STO(001), ***Qiang Zou,*** *Z Ge, C Yan, H Zhang, L Li,* West Virginia University
11:40am	**2D+AS+MI+NS-TuM-12** Surface Characterization of 2D Materials and their 3D Analogues using XPS, ***Jonathan Counsell,*** *S Coultas, C Blomfield, N Gerrard,* Kratos Analytical Limited, UK; *C Moffitt,* Kratos Analytical Limited; *A Roberts,* Kratos Analytical Limited, UK	**INVITED: 2D+EM+MI+MN+NS+QS-TuM-12** The Observation of Majorana Zero Mode and Conductance Plateau in an Iron-based Superconductor, ***Hong-Jun Gao,*** Institute of Physics, Chinese Academy of Sciences, China
12:00pm	**2D+AS+MI+NS-TuM-13** Characterization of Catalytic Active Sites on the Surface of MoS2 2-D Materials, ***Miguel Jose Yacaman,*** University of Texas at San Antonio; *T Zepeda, S Fuentes Moyado,* CNyN UNAM Ensenada, Mexico	Invited talk continues.

[1] **ASSD Student Award Finalist**

Tuesday Morning, October 22, 2019

	Actinides and Rare Earths Focus Topic **Room A215 - Session AC+AS+LS-TuM** **Chemistry and Physics of the Actinides and Rare Earths** **Moderators:** Melissa Denecke, University of Manchester, UK, James G. Tobin, University of Wisconsin-Oshkosh	**Applied Surface Science Division** **Room A211 - Session AS+BI+RA-TuM** **Quantitative Surface Analysis III/Other Surface Analysis Methods** **Moderators:** Karen Gaskell, University of Maryland, College Park, Alexander Shard, National Physical Laboratory
8:00am	**INVITED: AC+AS+LS-TuM-1** Study of the Early Actinide Oxides and Fluorides – Systematics of the Electronic Structure, ***Thomas Gouder***, *R Eloirdi, R Caciuffo,* European Commission - Joint Research Centre, Germany	**INVITED: AS+BI+RA-TuM-1** Oxygen Energy Filtering and Relative Sensitivity Factor Considerations for Making U and Pu Measurements by LG-SIMS, ***Todd Williamson***, Los Alamos National Laboratory
8:20am	Invited talk continues.	Invited talk continues.
8:40am	**INVITED: AC+AS+LS-TuM-3** Broadening of the XPS Spectra of U Oxides, ***Paul S. Bagus***, University of North Texas; *C Nelin,* Consultant	**AS+BI+RA-TuM-3** Utilizing Large Geometry Secondary Ion Mass Spectrometry for Age-Dating of Individual Uranium Particles, ***Christopher Szakal***, *D Simons, J Fassett,* National Institute of Standards and Technology (NIST); *A Fahey,* Corning Inc.
9:00am	Invited talk continues.	**AS+BI+RA-TuM-4** Peak Shape Analysis in TOF SIMS: Best Practices and Limiting Precision in Accounting for Detector Saturation, ***Lev Gelb***, *A Walker,* University of Texas at Dallas
9:20am	**INVITED: AC+AS+LS-TuM-5** Multiscale Characterization of Lanthanide and Actinide Nanoparticles Embedded in Porous Materials, ***Stefan Minasian***, *S Alayoglu, S Aloni,* Lawrence Berkeley National Laboratory; *J Arnold,* University of California at Berkeley; *E Batista,* Los Alamos National Laboratory; *A Braun, C Booth, A Herve,* Lawrence Berkeley National Laboratory; *Y Liu,* University of California at Berkeley; *L Moreau,* Lawrence Berkeley National Laboratory; *T Lohrey, J Long, M Straub, S Robin, D Russo,* University of California at Berkeley; *D Shuh,* Lawrence Berkeley National Laboratory; *J Su, P Yang, X Zhang,* Los Alamos National Laboratory	**AS+BI+RA-TuM-5** Electronic Structure and Band Gaps of Industrially Relevant Materials Investigated by Photoelectron Spectroscopy and REELS (Reflection Electron Energy Loss Spectroscopy), ***Paul Mack***, *T Nunney,* Thermo Fisher Scientific, UK; *H Meyer III,* Oak Ridge National Laboratory
9:40am	Invited talk continues.	**AS+BI+RA-TuM-6** Practical References for Low Energy Ion Scattering by Ca and F, *S Průsa, T Šikola,* Brno University of Technology, Czech Republic; ***Hidde Brongersma***, IONTOF Technologies GmbH, Germany/Eindhoven University of Technology, Eindhoven, The Netherlands, Germany
10:00am	**BREAK - Complimentary Coffee in Exhibit Hall**	**BREAK - Complimentary Coffee in Exhibit Hall**
10:20am	**BREAK - Complimentary Coffee in Exhibit Hall**	**BREAK - Complimentary Coffee in Exhibit Hall**
10:40am	**BREAK - Complimentary Coffee in Exhibit Hall**	**BREAK - Complimentary Coffee in Exhibit Hall**
11:00am	**AC+AS+LS-TuM-10** Multiple Forms of Uranium Hydrides and their Electronic Properties, ***Ladislav Havela***, *V Buturlim, E Chitrova, O Koloskova, P Minarik, M Cieslar, M Dopita, L Horak, M Divis, I Turek,* Charles University, Prague, Czech Republic; *D Legut,* VSB-Technical University of Ostrava, Czech Republic; *T Gouder,* European Commission - Joint Research Centre, Germany	**AS+BI+RA-TuM-10** Extreme-Ultraviolet-Assisted Atom Probe Tomography, ***Norman Sanford***, *L Miaja Avila,* National Institute of Standards and Technology (NIST); *P Blanchard,* National Institute of Sandards and Technology (NIST); *D Diercks, B Gorman,* Colorado School of Mines; *A Chiaramonti,* National Institute of Sandards and Technology (NIST)
11:20am	**AC+AS+LS-TuM-11** Hafnium L-Edge X-ray Absorption Near Edge Structure Spectra Reveals Crystal Field Splitting, ***David Shuh***, *D Caulder,* Lawrence Berkeley National Laboratory; *L Davis,* Pacific Northwest National Laboratory; *M Mara,* University of California at Berkeley; *C Booth,* Lawrence Berkeley National Laboratory; *J Darab, J Icenhower, D Strachan,* Pacific Northwest National Laboratory	**AS+BI+RA-TuM-11** A Multi-Technique Approach for Complete Thin Film Characterisation, ***Sarah Coultas***, *J Counsell, N Gerrard, C Blomfield,* Kratos Analytical Limited, UK; *C Moffitt,* Kratos Analytical Limited; *T Conard,* IMEC, Belgium
11:40am	**AC+AS+LS-TuM-12** Electrical Resistivity in Uranium-based Thin Films, ***Evgeniya Tereshina-Chitrova***, *L Havela, M Paukov, M Dopita, L Horak, M Cieslar,* Charles University, Prague, Czech Republic; *Z Soban,* Institute of Physics, Academy of Sciences of the Czech Republic, Czech Republic; *T Gouder, F Huber, A Seibert,* Joint Research Center, European Commission, Germany	**AS+BI+RA-TuM-12** Polymeric Barrier Coatings for Silicone Elastomer against Diffusion of Isocyanate in Vacuum Casting Processes, ***Martin Wortmann***, *R Petkau,* Bielefeld University of Applied Sciences, Germany; *N Frese,* Bielefeld University, Germany; *E Moritzer,* Paderborn University, Germany; *A Gölzhäuser,* Bielefeld University, Germany; *B Hüsgen,* Bielefeld University of Applied Sciences, Germany
12:00pm		**AS+BI+RA-TuM-13** pARXPS Study of GeSbTe Surface Oxidation, ***Ludovic Goffart***, ST Microelectronics/LTM/CEA-LETI, France; *C Vallée,* Laboratoire des Technologies de la Microélectronique (LTM), France; *B Pelissier,* LTM, Univ. Grenoble Alpes, CEA-LETI, France; *J Reynard, D Benoit,* ST Microelectronics, France; *G Navarro,* CEA-LETI, France

Tuesday Morning, October 22, 2019

	Biomaterial Interfaces Division **Room A120-121 - Session BI+AS-TuM** **Characterization of Biological and Biomaterial Surfaces** **Moderators:** Karyn Jarvis, Swinburne University of Technology, Sally McArthur, Swinburne University of Technology, Australia	**Electronic Materials and Photonics Division** **Room A214 - Session EM+2D+AP+NS+PS-TuM** **New Devices and Materials for Electronics and Photonics** **Moderators:** Sean W. King, Intel Corporation, Michelle M. Paquette, University of Missouri-Kansas City
8:00am	**BI+AS-TuM-1** Characterizing Protein Fiber Structures in Solution with Vibrational Sum-Frequency Scattering Spectroscopy, ***David G. Castner***, *P Johansson,* University of Washington	**INVITED: EM+2D+AP+NS+PS-TuM-1** Performance Modeling and Design for Spintronic Logic and Memory Devices, ***Azad Naeemi***, Georgia Institute of Technology
8:20am	**BI+AS-TuM-2** Near-Ambient Pressure XPS Surface Characterisation of Bacteria and Biofilms - Model Systems and Sample Preparation, ***Marit Kjaervik***, Bundesanstalt für Materialforschung und -prüfung, Germany; *P Dietrich, A Thissen,* SPECS Surface Nano Analysis GmbH, Germany; *K Schwibbert, W Unger,* Bundesanstalt für Materialforschung und -prüfung, Germany	Invited talk continues.
8:40am	**BI+AS-TuM-3** ToF-SIMS Imaging of Plant seed Interactions with Plant-growth Promoting Bacteria, ***Yuchen Zhang***, *X Yu,* Pacific Northwest National Laboratory	**EM+2D+AP+NS+PS-TuM-3** High Yield, Low Variability HfO_2 1T1R Cells Fabricated in 65nm CMOS, ***Jubin Hazra***, *M Liehr, K Beckmann, N Cady,* SUNY Polytechnic Institute
9:00am	**BI+AS-TuM-4** 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, ***Matthias Lorenz***, *S King, N Borodinov, C Steed, J Chae, A Ievlev, O Ovchinnikova,* Oak Ridge National Laboratory	**EM+2D+AP+NS+PS-TuM-4** Heat Transfer Proximity Effects in Resistive Memory Crossbar Arrays, ***Marius Orlowski***, *M Al-Mamun,* Virginia Tech
9:20am	**BI+AS-TuM-5** *In situ* Observation of Triacylglycerol (C39:0) and Acylceramide (C17) Colocalization in Lipid Droplets of Apoptotic Cells using ToF-SIMS, ***Shohini Sen-Britain***, *N Li, G Atilla-Gokcumen, J Gardella Jr.,* State University of New York, Buffalo	**EM+2D+AP+NS+PS-TuM-5** High Performance Memristive Action in Methylammonium Bismuth Iodide([MA]3Bi2I9) Films, *P Cheng,* Vanderbilt University; *G Luo,* Washington University in St. Louis; *Z Gao,* University of Central Florida; *A Thind, R Mishra,* Washington University in St. Louis; ***Parag Banerjee***, University of Central Florida
9:40am	**BI+AS-TuM-6** Customizing Decellularized Biopolymer Matrices to Serve as Cell-instructive Microenvironments: A ToF-SIMS Study, ***Mirko Nitschke***, *V Magno, R Zimmermann, N Dennison,* Leibniz Institute of Polymer Research Dresden, Germany; *C Werner,* Leibniz Institute of Polymer Research Dresden, Germany, Deutschland, Germany	**EM+2D+AP+NS+PS-TuM-6** Mechanism of Chalcogen Passivation of GaAs Surfaces, ***Takayuki Suga***, *S Goto,* UEC-Tokyo, Japan; *A Ohtake,* NIMS, Japan; *J Nakamura,* UEC-Tokyo, Japan
10:00am	**BREAK - Complimentary Coffee in Exhibit Hall**	**BREAK - Complimentary Coffee in Exhibit Hall**
10:20am	**BREAK - Complimentary Coffee in Exhibit Hall**	**BREAK - Complimentary Coffee in Exhibit Hall**
10:40am	**BREAK - Complimentary Coffee in Exhibit Hall**	**BREAK - Complimentary Coffee in Exhibit Hall**
11:00am	**INVITED: BI+AS-TuM-10** Hierarchical Changes in Protein Structure: from Surface Influence to Cell Control, ***Sapun Parekh***, University of Texas at Austin	**INVITED: EM+2D+AP+NS+PS-TuM-10** Combining 2D and 1D Atomic Scale Tailored Nanowire Surfaces for Novel Electronics and Photonics, ***Anders Mikkelsen***, Lund University, Sweden
11:20am	Invited talk continues.	Invited talk continues.
11:40am	**BI+AS-TuM-12** The Role of Cr-N phases Prepared by Plasma Processes on 316L Stainless Steel and the Potential Use in Biocompatible Systems, ***Diana Galeano-Osorio***, *S Vargas-Giraldo, C Castano,* Virginia Commonwealth University	**EM+2D+AP+NS+PS-TuM-12** Nanoflower Decorated GaN and AlGaN/GaN based Catalyst-free CO Sensors, ***Monu Mishra***, *G Gupta,* National Physical Laboratory, India
12:00pm	**BI+AS-TuM-13** Direct Interspecies Electron Transfer (DIET) in Syntrophic Microbes, ***Cuiyun Yang***, *X Yu,* Pacific Northwest National Laboratory	**EM+2D+AP+NS+PS-TuM-13** Surface Transfer Doping of Diamond by Complex Metal Oxides for Power Electronics: A Combined Experimental and Simulation Study, ***Vihar Georgiev***, *D Moran, J McGhee,* University of Glasgow, UK

Tuesday Morning, October 22, 2019

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

Tuesday Morning, October 22, 2019

	Plasma Science and Technology Division Room B131 - Session PS+EM-TuM Advanced FEOL **Moderators:** Keren Kanarik, Lam Research Corporation, Alok Ranjan, TEL Technology Center, America, LLC	Plasma Science and Technology Division Room B130 - Session PS-TuM Plasma Diagnostics and Sources I **Moderators:** Tetsuya Tatsumi, Sony Semiconductor Solutions Corporation, Geun Young Yeom, Sungkyunkwan University, Korea
8:00am	**INVITED: PS+EM-TuM-1** Investigation on Plasma Etch Technology Enabling Si/SiGe MOSFET Process Integration, ***Yohei Ishii,*** Hitachi High Technologies America Inc.*; Y Lee, W Wu,* Taiwan Semiconductor Research Institute, Taiwan, Republic of China*; R Sugano,* Hitachi, Ltd., Japan*; K Maeda,* Hitachi High Technologies America Inc.*; H Ishimura,* Hitachi High-Technologies Taiwan Corp., Taiwan, Republic of China*; M Miura,* Hitachi High Technologies, Japan	**PS-TuM-1** Optimizing Power Delivery in a Pulsed Inductively Coupled Plasma Using Set-Point Impedance Match and Frequency Tuning, ***Chenhui Qu,*** University of Michigan*; J Brandon, C Smith, S Shannon,* North Carolina State University*; D Coumou, S White,* MKS Instruments*; M Kushner,* University of Michigan
8:20am	Invited talk continues.	**PS-TuM-2** Compact Surface Wave Plasma Source, *G Panici,* ***David Ruzic,*** *D Qerimi, D Barlaz,* University of Illinois at Urbana-Champaign*; B Jurczyk,* Starfire Industries LLC
8:40am	**PS+EM-TuM-3** Etching of Sub-10 nm Half-pitch High Chi Block Copolymers for Directed Self-Assembly (DSA) Application, ***Maria Gabriela Gusmão Cacho,*** *P Pimenta-Barros, K Benotmane, A Gharbi, M Argoud,* CEA-LETI, France*; C Navarro,* Arkema France, France*; K Sakavuyi,* Brewer Science Inc.*; R Tiron, N Possémé, S Barnola,* CEA-LETI, France	**INVITED: PS-TuM-3** Overview of Linear Plasma Sources as Applied to Ribbon ion and Plasma Beam Processing of Scanned Substrates, ***Peter Kurunczi,*** Applied Materials, Varian Semiconductor Equipment
9:00am	**PS+EM-TuM-4** Mechanism of Highly Selective SiCN Etchings Using NF_3/Ar-based Gases, ***Miyako Matsui,*** Hitachi Ltd., Japan*; K Kuwahara,* Hitachi High-Technologies Corp., Japan	Invited talk continues.
9:20am	**PS+EM-TuM-5** Impact of Plasma Process on Source/Drain Epitaxy Film, ***Yun Han,*** *B Messer, M Sapel, H Kim, Y Shi, M Wang, Y Trickett, K Maekawa,* TEL Technology Center, America, LLC*; K Taniguchi, S Morikita,* Tokyo Electron Miyagi Ltd., Japan*; A Metz, P Biolsi,* TEL Technology Center, America, LLC	**PS-TuM-5** Online Diagnostics of Non-Thermal Plasma Nanoparticle-Laden Systems by Ion Mobility Spectrometry, ***Xiaoshuang Chen,*** *S Ghosh, D Buckley,* University of Minnesota, Minneapolis*; M Sankaran,* Case Western Reserve University*; T Seto,* Kanazawa University, Japan*; U Kortshagen, C Hogan,* University of Minnesota, Minneapolis
9:40am	**PS+EM-TuM-6** CCP Dry Clean Process Development Using Quadrupole Mass Spectrometer and Optical Emission Spectroscopy, ***Harutyun Melikyan,*** *A Martinez, S Pandey, M Koltonski, G Sandhu,* Micron Technology	**PS-TuM-6** Experiment-Model Comparisons in Capacitively Coupled Plasmas at Moderate Pressures for Argon, Helium and Nitrogen, ***David J. Peterson,*** North Carolina State University*; T Koh, T Chua, W Tian, K Bera, S Rauf, P Kraus,* Applied Materials, Inc.*; S Shannon,* North Carolina State University
10:00am	**BREAK - Complimentary Coffee in Exhibit Hall**	**BREAK - Complimentary Coffee in Exhibit Hall**
10:20am	**BREAK - Complimentary Coffee in Exhibit Hall**	**BREAK - Complimentary Coffee in Exhibit Hall**
10:40am	**BREAK - Complimentary Coffee in Exhibit Hall**	**BREAK - Complimentary Coffee in Exhibit Hall**
11:00am	**PS+EM-TuM-10** Surface Reaction of Atomic Hydrogen with SiGe Surface Compared with Si Through Ab-initio Calculations, ***Ryoko Sugano,*** Hitachi, Ltd., Japan*; Y Ishii, K Maeda,* Hitachi High Technologies America Inc.*; M Miura, K Kuwahara,* Hitachi High Technologies, Japan	**PS-TuM-10** Optical and Mass Spectrometric Measurements of O_2 and NF_3 Dissociation in a Low Frequency, High Density, Remote Plasma, ***Hanyang Li,*** *Y Zhou, V Donnelly,* University of Houston*; J Chiu, X Chen,* MKS Plasma & Reactive Gas Solutions
11:20am	**PS+EM-TuM-11** Nanopantography with Reusable Membrane-based Electrostatic Lens Arrays, ***Ryan Sawadichai,*** *Y Chen, P Basu, V Donnelly, P Ruchhoeft, D Economou,* University of Houston	**PS-TuM-11** A Combined Experimental and Modeling Study of Reactive Vapor-nanoparticle-plasma Interactions in a Dusty Atmospheric-pressure Plasma, ***Nabiel Abuyazid,*** Case Western Reserve University*; X Chen,* University of Minnesota, Minneapolis*; D Mariotti, P Maguire,* University of Ulster, UK*; C Hogan,* University of Minnesota, Minneapolis*; M Sankaran,* Case Western Reserve University

Tuesday Morning, October 22, 2019

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

Tuesday Morning, October 22, 2019

	Thin Films Division **Room A124-125 - Session TF+AP-TuM** **ALD and CVD: Precursors and Process Development** **Moderators:** Paul Poodt, Holst Centre / TNO, Erwin Kessels, Eindhoven University of Technology, the Netherlands	**Thin Films Division** **Room A122-123 - Session TF+EM+MI-TuM** **Thin Films for Microelectronics, Photonics, and Optoelectronic Applications** **Moderators:** John F. Conley, Jr., Oregon State University, Halil Akyildiz, Uludag University, Turkey
8:00am	**INVITED: TF+AP-TuM-1** Mechanism-Based Precursor Design for CVD of Metal Oxides and Sulfides, ***Lisa McElwee-White,*** University of Florida	**INVITED: TF+EM+MI-TuM-1** Monolithic Integration of III-Vs on Si for Electronic and Photonic Applications, *P Staudinger, S Mauthe, N Vico Trivino, M Sousa, C Convertino, Y Baumgartner, P Tiwari, H Schmid,* ***Kirsten Moselund,*** IBM Research Zurich, Switzerland
8:20am	Invited talk continues.	Invited talk continues.
8:40am	**TF+AP-TuM-3** Improved Control of Atomic Scale Processing: Characterization and Optimization of Precursor Mass Delivery Utilizing a Novel Thermal Sensor, ***Daniel Alvarez,*** *J Spiegelman, C Ramos, Z Shamsi,* RASIRC	**TF+EM+MI-TuM-3** A Scheme for Better Future Technology by developing AlGaN based Highly Responsive Photosensing Devices, ***Neha Aggarwal,*** *S Krishna, L Goswami, G Gupta,* CSIR-National Physical Laboratory, India
9:00am	**TF+AP-TuM-4** Effect of Co-Reactant on the Atomic Layer Deposition of Copper Oxide, ***Jason Avila,*** *N Nepal, V Wheeler,* U.S. Naval Research Laboratory	**TF+EM+MI-TuM-4** Correlating the Optical Property Evolution in the Au-Ni Binary Thin Films: From Metastable Solid Solution to Phase Separated Alloy, ***Robyn Collette,*** *Y Wu, P Rack,* University of Tennessee Knoxville
9:20am	**TF+AP-TuM-5** Electron Enhanced Atomic Layer Deposition (EE-ALD) of Cobalt Films and Development of New Hollow Cathode Plasma Electron Source, ***Zachary Sobell,*** CU Boulder; *A Cavanagh, S George,* University of Colorado at Boulder	**TF+EM+MI-TuM-5** Integration of Electro-optically Active $BaTiO_3$ and $Ba_xSr_{1-x}TiO_3$ with Buffered Si (001) by Chemical Methods, ***John G. Ekerdt,*** *B Edmondson, E Lin,* University of Texas at Austin; *S Kwon,* University of Texas at Dallas; *A Demkov,* University of Texas at Austin; *M Kim,* University of Texas at Dallas
9:40am	**TF+AP-TuM-6** Surface Science Studies of GaN Substrates Subjected to Plasma-Assisted Atomic Level Processes, ***Samantha G. Rosenberg,*** American Society for Engineering Education (residing at U.S. Naval Research Laboratory); *D Pennachio, E Young, Y Chang, H Inbar,* University of California at Santa Barbara; *J Woodward,* U.S. Naval Research Laboratory; *Z Robinson,* SUNY Brockport; *J Grzeskowiak,* University at Albany - SUNY; *C Ventrice, Jr.,* SUNY Polytechnic Institute; *C Palmstrøm,* University of California at Santa Barbara; *C Eddy, Jr.,* U.S. Naval Research Laboratory	**TF+EM+MI-TuM-6** Nonlinear Optical Properties of TiO_2-based ALD Thin Films, ***Theodosia Gougousi,*** *R Kuis, I Basaldua, P Burkins, J Kropp, A Johnson,* University of Maryland, Baltimore County
10:00am	**BREAK - Complimentary Coffee in Exhibit Hall**	**BREAK - Complimentary Coffee in Exhibit Hall**
10:20am	**BREAK - Complimentary Coffee in Exhibit Hall**	**BREAK - Complimentary Coffee in Exhibit Hall**
10:40am	**BREAK - Complimentary Coffee in Exhibit Hall**	**BREAK - Complimentary Coffee in Exhibit Hall**
11:00am	**TF+AP-TuM-10** Reaction Pathways in Photolytic CVD of Platinum on Organic Thin Films, ***Bryan G. Salazar,*** University of Texas at Dallas; *H Liu, L McElwee-White,* University of Florida; *A Walker,* University of Texas at Dallas	**TF+EM+MI-TuM-10** Atomic Layer Deposition on Hexagonal Ge and SiGe Nanowires for Surface Passivation, ***Willem-Jan Berghuis,*** Department of Applied Physics, Eindhoven University of Technology, Postbus 513, 5600 MB Eindhoven, The Netherlands; *E Kessels,* Eindhoven University of Technology, The Netherlands, Netherlands; *J Haverkort, E Bakkers, A Dijkstra, E Fadaly, M Verheijen,* Eindhoven University of Technology, The Netherlands
11:20am	**TF+AP-TuM-11** Process Development and Mechanism Analysis of Low Temperature ALD TiN with $TiCl_4$/Monomethylhydrazine, ***Taiki Kato,*** *Z Ni, M Matsukuma, H Nakamura, Y Ideno, Y Serizawa,* Tokyo Electron Technology Solutions Limited, Japan	**TF+EM+MI-TuM-11** Oxidation Studies of Silicon Germanium (SiGe) using In-Situ Steam Generated (ISSG) and Plasma Enhanced Atomic Layer Deposited (PEALD) Oxides, ***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,* IBM Research Division, Albany, NY
11:40am	**TF+AP-TuM-12** Atomic Layer Deposition of Aluminum, Hafnium and Zirconium Oxyfluoride Films with Tunable Stoichiometry, ***Neha Mahuli,*** *J Wallas, S George,* University of Colorado at Boulder	**TF+EM+MI-TuM-12** Precision Defect Engineering of Metal/Insulator/Metal (MIM) Diodes using Localized ALD Transition Metal Impurities in Al_2O_3 Tunnel Barriers, ***Konner Holden***[1], *Y Qi, J Conley, Jr.,* Oregon State University
12:00pm	**TF+AP-TuM-13** ALD on Thermally and Chemically Treated Fused Silica and Glass Surfaces, ***Tahereh Gholian Avval,*** *G Hodges, V Carver, M Linford,* Brigham Young University	**TF+EM+MI-TuM-13** Improvement in the Electrical Characteristics of a-ZTO based TFTs *via* Microwave Assisted Annealing of Channel Layer, ***Sunil Uprety,*** *M Khanal, H Lee, S Sarwar,* Auburn University; *A Subramanian,* Stony Brook University; *E Hassani, T Oh, X Zhang,* Auburn University; *C Nam,* Brookhaven National Laboratory; *M Park,* Auburn University

[1] **TFD James Harper Award Finalist**

Tuesday Morning, October 22, 2019

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

Exhibitor Technology Spotlight Workshops
Room Hall A - Session EW-TuL
Exhibitor Technology Spotlight Workshop II
Moderator: Christopher Moffitt, Kratos Analytical Inc

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

	2D Materials **Room A216 - Session 2D+EM+MI+NS-TuA** **Properties of 2D Materials including Electronic, Magnetic, Mechanical, Optical, and Thermal Properties II** **Moderator:** Roland Wiesendanger, University of Hamburg, Germany	**Actinides and Rare Earths Focus Topic** **Room A215 - Session AC+AS+LS-TuA** **Forensics, Science and Processing for Nuclear Energy** **Moderators:** Paul S. Bagus, University of North Texas, Tomasz Durakiewicz, National Science Foundation, David Geeson, AWE
2:20pm	**2D+EM+MI+NS-TuA-1** Boundary Conditions for a Continuum Model of Lateral Interfaces in Transition Metal Dichalcogenides, ***Kaelyn Ferris,*** Ohio University	**INVITED: AC+AS+LS-TuA-1** Helium Implantation Studies in Metals and Ceramics for Nuclear Energy Applications, Microstructure and Properties, ***Peter Hosemann,*** *M Balooch, S Stevenson, A Scott,* University of California, Berkeley*; Y Yang,* Lawrence Berkeley Lab, University of California, Berkeley
2:40pm	**2D+EM+MI+NS-TuA-2** Resolving the Structural and Electronic Properties of Graphene/Ge(110), ***Luca Camilli,*** Technical University of Denmark, Denmark*; M Galbiati,* Technical University of Denmark*; L Persichetti, M De Seta,* Università degli Studi Roma Tre, Italy*; F Fabbri,* Italian Institute of Technology, Italy*; A Scaparro,* Università degli Studi Roma Tre, Italy*; A Notargiacomo,* Centro Nazionale di Ricerca, Italy*; V Miseikis, C Coletti,* Italian Institute of Technology, Italy*; L Di Gaspare,* Università degli Studi Roma Tre, Italy	Invited talk continues.
3:00pm	**2D+EM+MI+NS-TuA-3** Array of Strain Induced Quantum Dots in Graphene, ***Md Tareq Mahmud****, N Sandler,* Ohio University	**INVITED: AC+AS+LS-TuA-3** Origin of Element Selectivity during Solvent Extraction of Rare Earths: Studies of Model Interfaces using Synchrotron Radiation, *M Miller, Y Liang, H Li, M Chu, S Yoo,* Northwestern University*; W Bu,* University of Chicago*; M Olvera de la Cruz,* ***Pulak Dutta,*** Northwestern University
3:20pm	**2D+EM+MI+NS-TuA-4** Ultrafast Spin and Charge Dynamics in Monolayer WSe_2-Graphene Heterostructure Devices, ***Michael Newburger****, K Luo,* The Ohio State University*; K McCreary,* U.S. Naval Research Laboratory*; I Martin, E McCormick,* The Ohio State University*; B Jonker,* U.S. Naval Research Laboratory*; R Kawakami,* The Ohio State University	Invited talk continues.
3:40pm	**BREAK**	**BREAK**
4:00pm	**BREAK**	**BREAK**
4:20pm	**2D+EM+MI+NS-TuA-7** Spatially Selective Enhancement of Photoluminescence in MoS by Exciton-Mediated Adsorption and Defect Passivation, ***Saujan V. Sivaram****, A Hanbicki, M Rosenberger, G Jernigan, H Chuang, K McCreary, B Jonker,* U.S. Naval Research Laboratory	**INVITED: AC+AS+LS-TuA-7** Analysis of Aged of Uranium Particles via X-ray Xpectromicroscopy, ***Andrew Duffin****, J Ward,* Pacific Northwest National Laboratory
4:40pm	**2D+EM+MI+NS-TuA-8** Strained Graphene in the Quantum Hall Regime: Valley Splitting and Extra Conducting Channels, ***Daiara Faria,*** Ohio University / Universidade do Estado do Rio de Janeiro*; C León,* Brigham Young University*; L Lima,* Universidade Rural do Rio de Janeiro, Brazil*; A Latgé,* Universidade Federal Fluminense, Brazil*; N Sandler,* Ohio University	Invited talk continues.
5:00pm	**INVITED: 2D+EM+MI+NS-TuA-9** Unraveling the Novel Quantum Phenomena in Two-dimensional Materials using Transport and Photoemission Spectroscopy, ***Jyoti Katoch,*** Carnegie Mellon University	**INVITED: AC+AS+LS-TuA-9** Heat Transfer and Phase Stability of Early Actinides and Actinide Compounds, ***Dominik Legut****, L Kývala, U Wdowik, G Jaglo, P Piekarz,* Technical University of Ostrava, Ostrava, Czechia*; L Havela,* Charles University, Prague, Czechia
5:20pm	Invited talk continues.	Invited talk continues.
5:40pm	**2D+EM+MI+NS-TuA-11** Electronic Properties and Charge Density Wave Transition in Single-layer VSe_2, ***Kien Nguyen-Cong****, P Neto, M Batzill, I Oleynik,* University of South Florida	**AC+AS+LS-TuA-11** Reactivity of Potential TRISO Fuel Barrier Layers (SiC and ZrN) with H_2O Probed with Ambient Pressure Photoelectron Spectroscopy, ***Jeff Terry****, M Warren,* Illinois Institute of Technology*; R Addou, G Herman,* Oregon State University
6:00pm	**2D+EM+MI+NS-TuA-12** Tunable Band Gap and Thermal Conductivity Measurements of Monolayer $MoSe_2$ by S Incorporation, ***Shyama Rath****, V Singh,* University of Delhi, India	

	Atomic Scale Processing Focus Topic **Room B130 - Session AP+EL+MS+PS+SS+TF-TuA** **Advancing Metrology and Characterization to enable Atomic Layer Processing** **Moderators:** Eric A. Joseph, IBM Research Division, T.J. Watson Research Center, Jessica Kachian, Intel Corporation	**Applied Surface Science Division** **Room A211 - Session AS+BI+CA+LS-TuA** **Beyond Traditional Surface Analysis** **Moderators:** Michaeleen Pacholski, The Dow Chemical Company, Xiao-Ying Yu, Pacific Northwest National Laboratory
2:20pm	**INVITED: AP+EL+MS+PS+SS+TF-TuA-1** In Situ Ellipsometry Characterization Of Atomic Layer Processes: A Review, ***James Hilfiker,*** *G Pribil, J VanDerslice,* J.A. Woollam Co., Inc.	**INVITED: AS+BI+CA+LS-TuA-1** Nanotechnology as a Driver for Going Beyond Traditional Surface Analysis, ***Olivier Renault,*** CEA-LETI, France
2:40pm	Invited talk continues.	Invited talk continues.
3:00pm	**INVITED: AP+EL+MS+PS+SS+TF-TuA-3** Elucidating the Mechanisms for Atomic Layer Growth through In Situ Studies, ***Jeffrey Elam,*** Argonne National Laboratory	**AS+BI+CA+LS-TuA-3** Core Levels Sub-shell Photo-ionization Cross-sections of Au, Ag, Cu in the Hard X-ray Photon Energy Range of 7-26 keV, ***Germán Rafael Castro,*** *J Rubio Zuazo,* Spanich CRG BM25-SpLine Beamline at the ESRF, France
3:20pm	Invited talk continues.	**AS+BI+CA+LS-TuA-4** Interfacial Photochemistry of Pyruvic Acid in Atmospheric Chemistry, ***Yanjie Shen,*** *Y Fu,* Pacific Northwest National Laboratory; *X Yao,* Ocean University of China; *Z Zhu,* Pacific Northwest National Laboratory; *X Yu,* Earth and Biological Sciences Directorate
3:40pm	**BREAK**	**BREAK**
4:00pm	**BREAK**	**BREAK**
4:20pm	**INVITED: AP+EL+MS+PS+SS+TF-TuA-7** Surface, Interface, or Film: A Discussion of the Metrology of ALD Materials in Semiconductor Applications, ***G. Andrew Antonelli,*** *N Keller,* Nanometrics	**INVITED: AS+BI+CA+LS-TuA-7** Nanoscale Tomographic Mapping the Liquid-Solid Interface with Cryo-APT, ***Daniel Perea,*** *D Schreiber, J Evans, J Ryan,* Pacific Northwest National Laboratory
4:40pm	Invited talk continues.	Invited talk continues.
5:00pm	**AP+EL+MS+PS+SS+TF-TuA-9** In Line and Ex Situ Metrology and Characterization to Enable Area Selective Deposition, ***Christophe Vallee,*** *M Bonvalot, B Pelissier, J Tortai, S David, S belahcen, V Pesce, M Jaffal, A Bsiesy,* LTM, Univ. Grenoble Alpes, CEA-LETI, France; *R Gassilloud, N Posseme,* CEA-LETI, France; *T Grehl, P Bruner,* IONTOF GmbH, Germany; *A Uedono,* University of Tsukuba, Japan	**AS+BI+CA+LS-TuA-9** Characterization of Electronic Materials using Low Energy Inverse Photoemission Spectroscopy, ***Benjamin Schmidt,*** *J Newman, J Mann, K Artyushkova, L Swartz,* Physical Electronics; *M Terashima, T Miyayama,* ULVAC-PHI Inc., Japan
5:20pm	**INVITED: AP+EL+MS+PS+SS+TF-TuA-10** Recent Progress in Thin Film Conformality Analysis with Microscopic Lateral High-aspect-ratio Test Structures, ***Riikka Puurunen,*** Aalto University, Finland	**AS+BI+CA+LS-TuA-10** Deconvolution of Atom Probe Tomography on Nanomaterials for Renewable Energy, ***Margaret Fitzgerald,*** *M Dzara, D Diercks,* Colorado School of Mines; *N Leick, S Christensen,* National Renewable Energy Laboratory; *T Gennett, S Pylypenko,* Colorado School of Mines
5:40pm	Invited talk continues.	**AS+BI+CA+LS-TuA-11** Mass Spectrometric Investigation of Ion Solvation in Liquids, a Comparison of *in situ* Liquid SIMS to Regular ESI-MS, ***Yanyan Zhang,*** Institute of Chemistry, Chinese Academy of Sciences, China; *D Baer, Z Zhu,* Pacific Northwest National Laboratory
6:00pm	**AP+EL+MS+PS+SS+TF-TuA-12** *In operando*XPS Study on Atomic Layer Etching of Fe and Co Using $Cl_2$and Acetylacetone or Hexafluoroacetylacetone, ***Zijian Wang,*** *O Melton, D Angel, B Yuan, R Opila,* University of Delaware	**AS+BI+CA+LS-TuA-12** Characterizing the Thickness and Physical Properties of Nearly Ideal Zirconium Oxide Surfaces Using Ellipsometry, ESCA, Profilometry and FIB, ***Edward Gillman,*** Naval Nuclear Laboratory

	Biomaterial Interfaces Division **Room A120-121 - Session BI+AS-TuA** **Biomolecules and Biophysics and Interfaces & Flash Session** **Moderators:** Markus Valtiner, Vienna University of Technology, Austria, Tobias Weidner, Aarhus University, Denmark	**Electronic Materials and Photonics Division** **Room A214 - Session EM+OX+TF-TuA** **Nikolaus Dietz Memorial Session: Wide and Ultra-wide Band Gap Materials and Devices** **Moderators:** Seth King, University of Wisconsin - La Crosse, David Aspnes, North Carolina State University
2:20pm	**BI+AS-TuA-1** Electrochemical Surface Reactivity of Catechol Derivatives: Competitive Adsorption and Ion Effects, ***Laila Moreno Ostertag***, *L Mears, D Dworschak, M Valtiner,* Vienna University of Technology, Austria	**INVITED: EM+OX+TF-TuA-1** Nitride-Based Semiconducting Materials: A Long Pathway to Advanced Nuclear Detection Capabilities, ***Vincent Woods***, *L Hubbard,* Pacific Northwest National Laboratory*; Z Sitar,* North Carolina State University*; A Kozhanov,* Georgia State University
2:40pm	**BI+AS-TuA-2** Direct Observation of Lysozyme Interaction with a Curved Lipid Membrane Surface by Sum Frequency Scattering Vibrational Spectroscopy, ***Thaddeus Golbek***, Aarhus University, Denmark, Denmark*; H Okur, S Kulik, J Dedic, S Roke,* École Polytechnique Fédérale de Lausanne (EPFL), Switzerland*; T Weidner,* Aarhus University, Denmark	Invited talk continues.
3:00pm	**INVITED: BI+AS-TuA-3** Iron Speciation at Aqueous Surfaces, ***Heather Allen***, Ohio State University	**EM+OX+TF-TuA-3** New Mg-based Ternary Nitrides for Wide Band Gap Device Applications, *K York, R Makin III,* ***Steven Durbin***, Western Michigan University*; R Reeves,* University of Canterbury, New Zealand*; N Senabulya, R Clarke,* University of Michigan
3:20pm	Invited talk continues.	**EM+OX+TF-TuA-4** Low Temperature Growth of InN by Atomic Layer Epitaxy, ***Charles R. Eddy, Jr.***, U.S. Naval Research Laboratory*; S Rosenberg, J Woodward,* American Society for Engineering Education (residing at U.S. Naval Research Laboratory)*; K Ludwig,* Boston University*; N Nepal,* U.S. Naval Research Laboratory
3:40pm	**BREAK**	**BREAK**
4:00pm	**BREAK**	**BREAK**
4:20pm	**BI+AS-TuA-7** Identifying the Molecular Mechanisms that Mediate Cell Membrane Repair by Sum Frequency Generation Spectroscopy*, T Golbek,* Oregon State University*; S Roeters, T Weidner,* Aarhus University, Denmark*; C Johnson,* ***Joe Baio***, Oregon State University	**EM+OX+TF-TuA-7** Stochiometry- and Orientation-Dependent Native Point Defects of MOCVD-Grown $ZnGeN_2$ Films, ***Micah Haseman***, *D Ramdin, R Karim,* The Ohio State University*; D Jayatunga,* Case Western Reserve University*; H Zhao,* The Ohio State University*; K Kash,* Case Western Reserve University*; L Brillson,* The Ohio State University
4:40pm	**BI+AS-TuA-8** Fishing Manganese out from Cellulose: Impact of Coupling Desferrioxamine B to Stainless Steel Beads on the Circular Economy of Paper and Pulp Industry, ***Jeff Wilkesman***, Mannheim University of Applied Sciences, Germany*; K Mörtter, I Sommer, P Kunz,* Mannheim University of Applied Sciences, Deutschland	**EM+OX+TF-TuA-8** 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, ***Necmi Biyikli***, *S Ilhom, A Mohammad, D Shukla,* University of Connecticut
5:00pm	**BI+AS-TuA-9** The Hybrid Nano-biointerfaces Between Gold, Graphene Oxide and Angiogenin for Wound Repair, ***Diego La Mendola***, University of Pisa, Italy*; L Cucci, G Villaggio, C Satriano,* University of Catania, Italy	**INVITED: EM+OX+TF-TuA-9** Wide Bandgap Dilute Magnetic Semiconductors for Room Temperature Spintronic Applications, *V Saravade, A Ghods,* Missouri University of Science and Technology, Rolla, MO, USA*; N Ben Sedrine,* Universidade de Aveiro, Portugal*; C Zhou,* ***Ian Ferguson***, Missouri University of Science and Technology
5:20pm	**BI+AS-TuA-10** Improved Antibacterial Sandwich system for Urological Purposes, ***Sara Bröskamp***, *G Franz,* Munich University of Applied Sciences, Germany*; D Jocham,* University Hospital of Schleswig-Holstein, Germany	Invited talk continues.
5:40pm	**BI+AS-TuA-11** Quantitative Characterization of Piezoelectric Property in Biological System via Piezoresponse Force Microscopy, ***Jinha Kwon***, *D Kim, H Cho,* The Ohio State University	**EM+OX+TF-TuA-11** Processing and Characterization of Schottky and Ohmic contacts on (100) β-Ga_2O_3, ***Luke Lyle***, *K Jiang, E Favela, D Moody, T Lin, P Chung,* Carnegie Mellon University*; K Das,* North Carolina State University*; Z Galazka, A Popp, G Wagner,* Leibniz-Institut für Kristallzüchtung, Germany*; L Porter,* Carnegie Mellon University
6:00pm		**EM+OX+TF-TuA-12** III-Nitrides: Enabling Applications with Wide to Ultra-Wide Bandgap Materials and Devices, ***Erica Douglas***, *A Baca, B Klein, A Allerman, A Armstrong, A Colon, C Stephenson, R Kaplar,* Sandia National Laboratories

Tuesday Afternoon, October 22, 2019

	MEMS and NEMS Group **Room A210 - Session MN+QS-TuA** **Devices for Quantum Information and Quantum Nanomechanics** **Moderators:** Sebastian Hentz, CEA-LETI, France, Matthew Jordan, Sandia National Laboratories	**Nanometer-scale Science and Technology Division** **Room A222 - Session NS-TuA** **Recent Advances in Nanoscale Probing and Fabrication** **Moderator:** Jay Mody, GLOBALFOUNDRIES Inc.
2:20pm	**INVITED: MN+QS-TuA-1** Fabrication Challenges in Quantum Optomechanics, ***Simon Groeblacher,*** Delft University of Technology, The Netherlands, Netherlands	
2:40pm	Invited talk continues.	
3:00pm	**INVITED: MN+QS-TuA-3** Floquet Dynamics and Time Symmetry Breaking in Arrays of Driven Nanoresonators, ***Mark Dykman,*** Michigan State University	
3:20pm	Invited talk continues.	
3:40pm	**BREAK**	**BREAK**
4:00pm	**BREAK**	**BREAK**
4:20pm	**INVITED: MN+QS-TuA-7** Engineering Quantum Signal Transduction in Atomic Layer 2D Devices, ***Philip Feng,*** Case Western Reserve University	**NS-TuA-7** Electrical, Photovoltaic, and Nano-Optical Characterization of TMD Lateral Heterostructures, ***Marudachalam Shanmugasundaram,*** HORIBA Scientific*; A Elias, M Terrones,* The Pennsylvania State University*; H Terrones,* Rensselaer Polytechnic Institute
4:40pm	Invited talk continues.	**NS-TuA-8** Development of Near-Field Electrospinning for 3D Nanofabrication for tissue engineering applications, ***Alex Nagle,*** University of Wollongong, Australia
5:00pm	**INVITED: MN+QS-TuA-9** Superconducting Resonators as Diagnostics for Qubit Fabrication, ***Rupert Lewis,*** Sandia National Laboratories	**NS-TuA-9** The Fundamentals of Silica Nanoparticle-based Hydrophilic Antifouling Coating, ***Dan Yang,*** University of wollongong, Australia*; P Molino,* University of Wollongong, Australia*; M Higgins,* University of Wollongong
5:20pm	Invited talk continues.	**NS-TuA-10** The Effects of Atomic-Scale Strain Relaxation on the Electronic Properties of Monolayer MoS_2, ***Daniel Trainer,*** *Y Zhang,* Argonne National Laboratory*; F Bobba,* University of Salerno, Italy*; X Xi,* Temple University*; S Hla,* Argonne National Laboratory*; M Iavarone,* Temple University
5:40pm	**INVITED: MN+QS-TuA-11** Surface Ion Trap Device Fabrication for Experiments in Quantum Information Science, ***Matthew Blain,*** Sandia National Laboratories	**NS-TuA-11** Understanding Tip-induced Nanoscale Wear for Tomographic Atomic Force Microscopy, ***Umberto Celano,*** IMEC, Belgium*; X Hu,* University of California-Merced*; L Wouters, K Paredis, T Hatschel, P van der Heide,* IMEC, Belgium*; A Martini,* University of California-Merced
6:00pm	Invited talk continues.	**NS-TuA-12** Probing the Viscoelastic Properties of Polymer Composites with AFM-based Dynamic Mechanical Analysis, ***Bede Pittenger,*** *S Osechinskiy, J Thornton, S Loire, T Mueller,* Bruker Corporation

Tuesday Afternoon, October 22, 2019

	Complex Oxides: Fundamental Properties and Applications Focus Topic **Room A220-221 - Session OX+EM+HC+MI+NS+SS+TF-TuA** **Complex Oxides: Catalysis, Dielectric Properties and Memory Applications** **Moderators:** Alexander Demkov, University of Texas at Austin, Jeffry Kelber, University of North Texas	**Plasma Science and Technology Division** **Room B131 - Session PS+EM-TuA** **Advanced BEOL/Interconnect Etching and Advanced Memory and Patterning** **Moderators:** Hisataka Hayashi, Toshiba, Japan, Kenji Maeda, Hitachi High Technologies America Inc.
2:20pm	**INVITED: OX+EM+HC+MI+NS+SS+TF-TuA-1** Novel Multiferroic and Ferroelectric Ferrite Thin Films, ***Peter A. Dowben***, *C Binek, X Xu,* University of Nebraska-Lincoln	**INVITED: PS+EM-TuA-1** BEOL Etch Challenges and Solutions for Advanced Process Nodes, ***Angélique Raley***, *K Lutker-Lee, X Sun, Y Lu, Q Lou, N Joy, M Edley,* TEL Technology Center, America, LLC; *K Taniguchi, M Honda,* TEL Miyagi Limited, Japan; *P Biolsi,* TEL Technology Center, America, LLC
2:40pm	Invited talk continues.	Invited talk continues.
3:00pm	**INVITED: OX+EM+HC+MI+NS+SS+TF-TuA-3** Potential Applications and Challenges for Complex Oxides in Advanced Memory and Computing Applications, ***Sebastian Engelmann***, *T Ando, V Narayanan,* IBM T.J. Watson Research Center	**PS+EM-TuA-3** Enabling Fully Aligned Via for Advanced BEOL Nodes Scaling -Etch and Film Co-optimization, ***Xinghua Sun***, *A Raley,* TEL Technology Center, America, LLC; *J Lee, J Arnold,* IBM Research Division, Albany, NY; *K Taniguchi,* TEL Miyagi Limited, Japan; *M Edley, K Lutker-Lee,* TEL Technology Center, America, LLC; *D O'Meara,* Tokyo Electron America, Inc.; *K Tapily, Y Lu, P Biolsi,* TEL Technology Center, America, LLC
3:20pm	Invited talk continues.	**PS+EM-TuA-4** Non-selective Silicon Oxide and Nitride Etch in Oxygen/Nitrogen-containing Fluorocarbon Plasmas, ***Yu-Hao Tsai***, *D Zhang, Y Han, J Baillargeon, Y Shi, H Kim, M Wang,* TEL Technology Center, America, LLC; *T Yokoyama, M Iwata, Y Kihara, M Honda, W Sakamoto,* Tokyo Electron Miyagi Ltd., Japan; *A Mosden, A Metz, P Biolsi,* TEL Technology Center, America, LLC
3:40pm	**BREAK**	**BREAK**
4:00pm	**BREAK**	**BREAK**
4:20pm	**INVITED: OX+EM+HC+MI+NS+SS+TF-TuA-7** Epitaxial Design of Complex Oxides for Catalysis and Electrocatalysis, ***Yingge Du***, Pacific Northwest National Laboratory	**INVITED: PS+EM-TuA-7** Challenges in High-aspect-ratio Hole Etching for 3D Flash Memory, ***Mitsuhiro Omura***, *J Hashimoto, T Adachi, Y Kondo, M Ishikawa, J Abe, I Sakai, H Hayashi,* Toshiba Memory Corporation, Japan
4:40pm	Invited talk continues.	Invited talk continues.
5:00pm	**OX+EM+HC+MI+NS+SS+TF-TuA-9** Manipulate the Electronic Structures of Complex (Ni, Co) Oxides by Hole Doping for Oxygen Evolution Reaction, ***Kelvin Zhang***, Xiamen University, China	**PS+EM-TuA-9** Plasma Processing of Phase Change Materials, ***Ernest Chen***, *N Altieri,* University of California, Los Angeles; *C Neumann, S Fong, H Wong,* Stanford University; *M Shen, T Lill,* Lam Research Corporation; *J Chang,* University of California, Los Angeles
5:20pm	**OX+EM+HC+MI+NS+SS+TF-TuA-10** Vanadia/Tungsten Oxide on Anatase TiO2(101): a Model Catalyst Study by STM and XPS, ***Tao Xu***, *J Lauritsen, K Adamsen,* Aarhus University, Denmark; *S Wendt,* iNANO, Aarhus University, Denmark	**INVITED: PS+EM-TuA-10** Meeting the Challenges in Patterning Phase Change Material for Next Generation Memory Devices, ***Meihua Shen***, *L Thorsten, J Hoang, S Chiou, D Qian, A Routzahn, J Chen, A Dulkin, J Sims, A McKerrow, R Dylewicz,* Lam Research Corporation
5:40pm	**OX+EM+HC+MI+NS+SS+TF-TuA-11** Observation of Memory Effect and Fractal Surface in $SrRuO_3$ Epitaxial Thin Films, ***Ratnakar Palai***, University of Puerto Rico; *H Huhtinen,* University of Turku, Finland	Invited talk continues.
6:00pm	**OX+EM+HC+MI+NS+SS+TF-TuA-12** *In situ* Auger Electron Spectroscopy of Complex Oxide Thin Film Surfaces Grown by Pulsed Laser Deposition, ***Thomas Orvis***, *M Surendran, Y Liu, A Cunniff, J Ravichandran,* University of Southern California	**PS+EM-TuA-12** Utilizing Photosensitive Polymers to Estimate UV Radiation Exposures in Different Plasma Chamber Configurations, ***Luxherta Buzi***, *M Sagianis, S Engelmann,* IBM T.J. Watson Research Center

Tuesday Afternoon, October 22, 2019

	Materials and Processes for Quantum Information, Computing and Science Focus Topic **Room B231-232 - Session QS+2D+EM+MN+NS-TuA** **Materials for Quantum Sciences** **Moderators:** Matthew R. Rosenberger, U.S. Naval Research Laboratory, Robert Walko, The Ohio State University	**Thin Films Division** **Room A124-125 - Session TF+PS-TuA** **Epitaxial Thin Films** **Moderator:** Robert Grubbs, Sandia National Laboratories
2:20pm	**QS+2D+EM+MN+NS-TuA-1** Electrically Detected Electron Nuclear Double Resonance Study of Defects in 4H-SiC Bipolar Junction Transistors, ***Ryan Waskiewicz***, *B Manning, D McCrory, P Lenahan,* Pennsylvania State University	**TF+PS-TuA-1** In-situ Epitaxy of Ultrathin Ni Ferrite Films Studied by Surface Sensitive Time-resolved High Energy X-ray Diffraction, ***Joachim Wollschläger***, *M Hoppe, T Pohlmann,* University Osnabrück, Germany; *F Bertram,* DESY, Hamburg, Germany
2:40pm	**QS+2D+EM+MN+NS-TuA-2** Scanning Tunneling Microscopy Studies of Er Adatoms on GaAs (110), ***Rebekah Smith***, *A Benjamin, J Gupta,* The Ohio State University	**TF+PS-TuA-2** Van der Waals Layer Promoted Heteroepitaxy in Sputter-deposited Transition-metal Carbide and Sulfide Thin Films, ***Koichi Tanaka***[1], *P Arias, M Liao, Y Wang, H Zaid, A Aleman,* University of California, Los Angeles; *K Hojo,* Nagoya University, Japan; *A Deshpande, M Goorsky, S Kodambaka,* University of California, Los Angeles
3:00pm	**INVITED: QS+2D+EM+MN+NS-TuA-3** Defect-based Quantum Systems in Hexagonal Boron Nitride, ***Trong Toan Tran***, University of Technology Sydney, Australia	**INVITED: TF+PS-TuA-3** Molecular Beam Epitaxy Applied to Tensile-Strained Quantum Dots for Quantum Optics and Band-Structure Engineering, ***Paul Simmonds***, Boise State University
3:20pm	Invited talk continues.	Invited talk continues.
3:40pm	**BREAK**	**BREAK**
4:00pm	**BREAK**	**BREAK**
4:20pm	**QS+2D+EM+MN+NS-TuA-7** Specific Placement of V_{Si} in 4H-SiC for Quantum Technologies using Li^+ Implantation, *S Pavunny,* ***Rachael L. Myers-Ward***, *D Gaskill,* U.S. Naval Research Laboratory; *E Bielejec,* Sandia National Laboratories; *H Banks, A Yeats,* U.S. Naval Research Laboratory; *M DeJarld,* Raytheon; *S Carter,* U.S. Naval Research Laboratory	
4:40pm	**QS+2D+EM+MN+NS-TuA-8** Silicon Vacancy Point Defect in High-quality Nanobeam Photonic Crystal Cavities in 4H Silicon Carbide, ***Mena Gadalla***, *X Zhang, A Greenspon,* Harvard University; *D Bracher,* Harvard GSAS; *R Defo, E Hu,* Harvard University	
5:00pm	**QS+2D+EM+MN+NS-TuA-9** Tailoring the Heterogeneities in 2D Materials by Controlled Synthesis and Processing, ***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,* Oak Ridge National Laboratory	**TF+PS-TuA-9** Low-temperature Homoepitaxial Growth of N-type Superlattices for Ultrastable, Ultrafast X-Ray and Charged Particle Detectors, ***April Jewell***, Jet Propulsion Laboratory, California Institute of Technology; *M Hoenk,* Jet Propulsion Laboratory; *Q Looker, M Sanchez, B Tierney,* Sandia National Laboratories; *A Carver,* Jet Propulsion Laboratory; *S Nikzad,* Jet Propulsion Laboratory, California Institute of Technology
5:20pm	**QS+2D+EM+MN+NS-TuA-10** Epitaxial Al Films for Plasmonic and Quantum Computing Applications, ***Ka Ming Law***, *S Budhathoki, S Ranjit, F Martin, A Hauser,* The University of Alabama	**TF+PS-TuA-10** Epitaxial Growth of Ultrathin Molybedenum Nitrides on Ru(0001) and Ag(100), ***Asim Khaniya***, *M Sajid, A Kara, W Kaden,* University of Central Florida
5:40pm	**QS+2D+EM+MN+NS-TuA-11** Minimizing Coulomb Oscillation Linewidth on Silicon Quantum Dots, ***Yanxue Hong***, *A Ramanayaka, M Stewart, Jr., X Wang, R Kashid, P Namboodiri, R Silver, J Pomeroy,* National Institute of Standards and Technology (NIST)	**TF+PS-TuA-11** Using Time and Temperature of the Purge Step to Control Crystallinity, Phase Assemblage, and Epitaxy in Atomic Layer Deposited (ALD) Thin Films, ***Mark Losego***, *B Piercy, R Petrie,* Georgia Institute of Technology
6:00pm	**QS+2D+EM+MN+NS-TuA-12** Micro-magnetic Simulations of Correlated Switching in Touching Nano-magnetic Elements, ***Tejumade Durowade***, *V Metlushko,* University of Illinois at Chicago	**TF+PS-TuA-12** The Role of Template Layers in Heteroepitaxial ALD Growth of Crystalline La_2O_3 on GaN(0001), ***Pei-Yu Chen***, *T Hadamek,* University of Texas at Austin; *S Kwon,* University of Texas at Dallas; *F Al-Quaiti, A Posadas,* University of Texas at Austin; *M Kim,* University of Texas at Dallas; *A Demkov, J Ekerdt,* University of Texas at Austin

[1] **National Student Award Finalist**

Tuesday Afternoon, October 22, 2019

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

Vacuum Technology Division
Room A213 - Session VT-TuA
Advanced Applications of Vacuum Technology
Moderators: Julia Scherschligt, NIST, Alan Van Drie, TAE Technologies

2:20pm	**INVITED: VT-TuA-1** Single Atom and Single Electron Transistors for Quantum Technologies, ***Richard Silver***, *X Wang, R Kashid, J Wyrick, P Namboodiri, K Liu, M Stewart, G Bryant,* National Institute of Standards and Technology (NIST)	
2:40pm	Invited talk continues.	
3:00pm	**VT-TuA-3** Turbomolecular Pump for Achieving Ultra-high Vacuum in a High-power Proton Accelerator Vacuum System, ***Junichiro Kamiya***, *M Kinsho,* Japan Atomic Energy Agency, Japan*; N Ogiwara,* KEK, Japan*; M Sakurai, T Mabuchi,* Osaka Vacuum, Ltd., Japan*; K Wada,* Tokyo Electronics Co., Ltd., Japan	
3:20pm	**VT-TuA-4** US Contributions to ITER Vacuum Auxiliary System, ***Charles Smith***, Us Iter	
3:40pm	**BREAK**	
4:00pm	**BREAK**	
4:20pm	**INVITED: VT-TuA-7** Importance of Advanced Vacuum Technology to the Present Thin Film Photovoltaics Industry, ***Timothy Gessert***, Gessert Consulting, LLC	
4:40pm	Invited talk continues.	
5:00pm	**INVITED: VT-TuA-9** Enabling Hydrogen as an Energy Carrier through Analytical Electron Microscopy, ***David Cullen***, *K More,* Oak Ridge National Laboratory	
5:20pm	Invited talk continues.	
5:40pm	**INVITED: VT-TuA-11** Defect Manipulation to Control Energy Processes in Electronic Materials, ***Leonard Brillson***, 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 Chinkezian, H Phirke, 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_2 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 $MoTe_2$, ***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_2/WS_2 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, ***Thuvarakhan 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 Faase***, *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 $La_{2/3}Sr_{1/3}VO_3$ 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_2O_3 Nanoflake for Enhancement Mode MESFETs and Logic Applications, ***Janghyuk Kim***, *J Kim,* Korea University, Republic of Korea

OX-TuP-3 Structure and Reactitvity 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_2 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 Barboun, 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

PS-TuP-10 Effects of Bias on Quasi-Atomic Layer Etching of Silicon Dioxide by Cyclic Ar/C_4F_8/O_2 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 Krogstad, 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_x(x=4~7)F_8 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_x Fixation by Atmospheric Pressure N_2/O_2 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 Teplyakov,* 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 Teplyakov,* University of Delaware

SS-TuP-3 Platinum Deposition onto OH-terminated Si (100) and Boron-impregnated Si (100) Substrates, ***Sana Rani,*** *C Byron, A Teplyakov,* 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 Teplyakov,* 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 Strzhemechny,* 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_2O 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 Sanjeewa, 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

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

Wednesday Morning, October 23, 2019

	New Challenges to Reproducible Data and Analysis Focus Topic **Room A124-125 - Session RA+AS+CA+PS+TF-WeM** **Reproducibility in Science and Engineering, including materials and energy systems** **Moderators:** Karen Gaskell, University of Maryland, College Park, Svitlana Pylypenko, Colorado School of Mines	**Magnetic Interfaces and Nanostructures Division** **Room A210 - Session MI+2D-WeM** **Emerging Multifunctional Magnetic Materials I and Magnetocaloric Materials** **Moderators:** Greg Szulczewski, The University of Alabama, Igor Barsukov, UC Riverside
8:00am	**INVITED: RA+AS+CA+PS+TF-WeM-1** Reproducibility and Replicability in Science and Engineering: a Report by the National Academies, *T Winters,* National Academies of Sciences, Engineering, and Medicine*;* ***Dianne Chong,*** Boeing Research and Technology (Retired)	**MI+2D-WeM-1** Spin-dependent Electron Reflection at Materials with Strong Spin-orbit Interaction, ***Markus Donath,*** *C Angrick, A Reimann, C Datzer, A Blob,* Muenster University, Germany*; J Braun,* LMU München,, Germany*; H Ebert,* LMU München, Germany
8:20am	Invited talk continues.	**MI+2D-WeM-2** Competitive and Cooperative Electronic States in $Ba(Fe_{1-x}T_x)_2As_2$, *Q Zou, M Fu, Z Wu, L Li, A Li, D Parker, A Safat,* ***Zheng Gai,*** Oak Ridge National Laboratory
8:40am	**INVITED: RA+AS+CA+PS+TF-WeM-3** Directly Assessing Reproducibility in Materials Chemistry Research Using Literature Meta-analysis, ***David Sholl,*** Georgia Institute of Technology	**INVITED: MI+2D-WeM-3** Microscopic Origin of High Temperature Magnetism in Multiferroic Superlattices $(LuFeO_3)_m/(LuFe_2O_4)_1$, ***Janice Musfeldt,*** *S Fan, K Smith,* University of Tennessee Knoxville*; H Das, A Rebola,* Cornell University*; B Holinsworth,* University of Tennessee Knoxville*; J Mundy,* University of California at Berkeley*; C Brooks, M Holtz,* Cornell University*; R Ramesh,* University of California at Berkeley*; D Muller, D Schlom, C Fennie,* Cornell University*; S McGill,* National High Magnetic Field Laboratory
9:00am	Invited talk continues.	Invited talk continues.
9:20am	**INVITED: RA+AS+CA+PS+TF-WeM-5** Reproducibility in Fundamental and Applied Science, ***George Crabtree,*** Argonne National Laboratory, University of Illinois at Chicago	**INVITED: MI+2D-WeM-5** Hidden Local Spin-polarized Electronic States investigated by Spin- and Angle-resolved Photoelectron Spectroscopy, ***Taichi Okuda,*** Hiroshima University, Japan
9:40am	Invited talk continues.	Invited talk continues.
10:00am	**BREAK - Complimentary Coffee in Exhibit Hall**	**BREAK - Complimentary Coffee in Exhibit Hall**
10:20am	**BREAK - Complimentary Coffee in Exhibit Hall**	**BREAK - Complimentary Coffee in Exhibit Hall**
10:40am	**BREAK - Complimentary Coffee in Exhibit Hall**	**BREAK - Complimentary Coffee in Exhibit Hall**
11:00am	**RA+AS+CA+PS+TF-WeM-10** Representativeness of a TEM image for Revealing New Phenomenon in Energy Storage Materials, ***Chongmin Wang,*** Pacific Norththwest National Laboratory*; D Baer,* Pacific Northwest National Laboratory	**INVITED: MI+2D-WeM-10** Compositional Tuning of Magnetic Exchange Interactions and Interpretation of the Pressure Dependence of the Magnetic Curie Temperature in High Entropy Alloys., ***Michael Mchenry,*** Carnegie Mellon University
11:20am	**RA+AS+CA+PS+TF-WeM-11** Reproducibility Issues when Developing Catalysts for Fuel Cell Applications, *M Dzara, S Zaccarine,* Colorado School of Mines*; K Artyushkova,* Physical Electronics and University of New Mexico*;* ***Svitlana Pylypenko,*** Colorado School of Mines	Invited talk continues.
11:40am	**INVITED: RA+AS+CA+PS+TF-WeM-12** Challenges in Multimodal Spectroscopic Analysis of Energy Storage Materials, ***Vijayakumar Murugesan,*** Pacific Norththwest National Laboratory*; K Mueller,* Joint Center for Energy Storage Research (JCESR)	**MI+2D-WeM-12** Epitaxy of Novel $Co_{1.5}Ti_{0.5}FeGe$ Heusler Alloy Thin Films, ***Shambhu KC[1],*** *R Mahat, T Evans, S Budhathoki, G Mankey, A Gupta, P LeClair,* The University of Alabama
12:00pm	Invited talk continues.	**MI+2D-WeM-13** Spin Transport in NiO Measured with Ferromagnetic Resonance, *G Mankey, T Evans, S KC,* ***Arjun Sapkota,*** *T Mewes,* The University of Alabama

[1] **Falicov Student Award Finalist**

	Spectroscopic Ellipsometry Focus Topic **Room A212 - Session EL+AS+EM+TF-WeM** **Optical Characterization of Thin Films and Nanostructures** **Moderators:** Eva Bittrich, Leibniz Institute of Polymer Research Dresden, Tino Hofmann, University of North Carolina at Charlotte	**Fundamental Discoveries in Heterogeneous Catalysis Focus Topic** **Room A213 - Session HC+2D+SS-WeM** **Exotic Nanostructured Surfaces for Heterogeneously-Catalyzed Reactions** **Moderators:** Ashleigh Baber, James Madison University, Erin Iski, University of Tulsa
8:00am	**EL+AS+EM+TF-WeM-1** Enhanced Strong Near Band Edge Emission from Lanththanide Doped Sputter Deposited ZnO, *C Heng,* Beijing Institutute of Technology, China*; W Xiang, T Wang,* Beijing Institutete of Technology, China*; W Su,* Beijing Instititute of Technology, China*; P Yin,* Beihang University, China*;* ***Terje G Finstad,*** University of Oslo, Norway	
8:20am	**EL+AS+EM+TF-WeM-2** Ellipsometry Study of PLD based Temperature Controlled Thin Film Depositions of CdSe on ITO Substrates, ***Flavia Inbanathan,*** Ohio University*; M Ebdah,* King Saud University, Kingdom of Saudi Arabia*; P Kumar,* Gurukula Kangri Vishwavidyalaya, India*; K Dasari,* Texas State University*; R Katiyar,* University of Puerto Rico*; W Jadwisienczak,* Ohio University	**HC+2D+SS-WeM-2** Selective Alkane Chemistry on IrO_2(110) Surfaces, ***Aravind Asthagiri,*** *M Kim,* The Ohio State University*; J Weaver,* University of Florida
8:40am	**INVITED: EL+AS+EM+TF-WeM-3** The Application of Mueller Matrix Spectroscopic Ellipsometry to Scatterometry Measurement of Feature Dimension and Shape for Integrated Circuit Structures, ***Alain C. Diebold,*** SUNY Polytechnic Institute	**INVITED: HC+2D+SS-WeM-3** Design of Nanostructured Catalysts for Better Performance, ***Francisco Zaera,*** University of California, Riverside
9:00am	Invited talk continues.	Invited talk continues.
9:20am	**EL+AS+EM+TF-WeM-5** Optical Constants and Thickness of Ultrathin Thermally Evaporated Iron Films, ***Nick Allen,*** *D Shah, R Vanfleet, M Linford, R Davis,* Brigham Young University	**HC+2D+SS-WeM-5** Characterization of a Pd/Ag(111) Single Atom Alloy Surface Using CO as a Probing Molecule for H_2 Dissociation, ***Mark Muir,*** *M Trenary,* University of Illinois at Chicago
9:40am	**EL+AS+EM+TF-WeM-6** Birefringent Photonic Crystals for Polarization-discriminatingInfrared Focal Plane Arrays, ***Marc Lata,*** *Y Li, S Park, M McLamb, T Hofmann,* University of North Carolina at Charlotte	**HC+2D+SS-WeM-6** Propyne Hydrogenation over a Pd/Cu(111) Single Atom Alloy Catalyst Studied with Infrared Spectroscopy, ***Mohammed Abdel-Rahman,*** *M Trenary,* University of Illinois at Chicago
10:00am	**BREAK - Complimentary Coffee in Exhibit Hall**	**BREAK - Complimentary Coffee in Exhibit Hall**
10:20am	**BREAK - Complimentary Coffee in Exhibit Hall**	**BREAK - Complimentary Coffee in Exhibit Hall**
10:40am	**BREAK - Complimentary Coffee in Exhibit Hall**	**BREAK - Complimentary Coffee in Exhibit Hall**
11:00am	**EL+AS+EM+TF-WeM-10** Relevance of hidden Valleys in the Dequenching of Room-temperature-emitting Ge Layers, *T Sakamoto, Y Yasutake,* University of Tokyo, Japan*; J Kanasaki,* Osaka City University, Japan*;* ***Susumu Fukatsu,*** University of Tokyo, Japan	**INVITED: HC+2D+SS-WeM-10** "Single-Atom" Catalysis: How Structure Influences Reactivity, ***Gareth S. Parkinson,*** TU Wien, Austria
11:20am	**INVITED: EL+AS+EM+TF-WeM-11** Spectroscopic Ellipsometry on Organic Thin Films - From in-situ Bio-sensing to Active Layers for Organic Solar Cells, ***Eva Bittrich,*** *P Uhlmann, K Eichhorn,* Leibniz Institute of Polymer Research Dresden, Germany*; M Schubert,* University of Nebraska-Lincoln, Linköping University, Sweden, Leibniz Institute of Polymer Research Dresden, Germany*; M Levichkova, K Walzer,* Heliatek GmbH, Germany	Invited talk continues.
11:40am	Invited talk continues.	**HC+2D+SS-WeM-12** Oxidation Reactions on Rh(111), ***Marie Turano,*** *G Hildebrandt,* Loyola University Chicago*; R Farber,* The University of Chicago*; D Killelea,* Loyola University Chicago
12:00pm	**EL+AS+EM+TF-WeM-13** Optical Dielectric Function of Si(bzimpy)2 – A Hexacoordinate Silicon Pincer Complex Determined by Spectroscopic Ellipsometry, ***Yanzeng Li,*** *M Kocherga, S Park, M Lata, M McLamb, G Boreman, T Schmedake, T Hofmann,* University of North Carolina at Charlotte	**HC+2D+SS-WeM-13** Adsorption and Motion of Atomic Oxygen on the Surface and Subsurface of Ag(111) and Ag(110), *S Isbill, C Mize, L Crosby,* ***Sharani Roy,*** University of Tennessee Knoxville

	Electronic Materials and Photonics Division **Room A214 - Session EM+2D+AS+MI+MN+NS+TF-WeM** **Nanostructures and Nanocharacterization of Electronic and Photonic Devices** **Moderators:** Sang M. Han, University of New Mexico, Jason Kawasaki, University of Wisconsin - Madison	**2D Materials** **Room A216 - Session 2D+AS+MI+NS-WeM** **2D Materials Characterization by Scanning Probe Microscopy and Spectroscopy** **Moderator:** Ivan Oleynik, University of South Florida
8:00am	**EM+2D+AS+MI+MN+NS+TF-WeM-1** Photonic Thermal Conduction in Semiconductor Nanowires, *E Tervo, M Gustafson, Z Zhang, B Cola,* ***Michael A. Filler,*** Georgia Institute of Technology	**2D+AS+MI+NS-WeM-1** Plasmon Induced Excitation of Doublet Emission at the Single Molecule Level, ***Alberto Martin-Jimenez,*** *K Lauwaet,* IMDEA Nanoscience, Spain*; P Merino, J Martinez,* ICMM-CSIC, Spain*; R Miranda, R Otero,* IMDEA Nanoscience, Spain
8:20am	**EM+2D+AS+MI+MN+NS+TF-WeM-2** Electric Field-Induced Defect Migration and Dielectric Breakdown in ZnO Nanowires, ***Hantian Gao,*** *M Haseman,* Department of Physics, The Ohio State University*; H von Wenckstern, M Grundmann,* Universität Leipzig, Felix-Bloch-Institut für Festkörperphysik*; L Brillson,* The Ohio State University	**2D+AS+MI+NS-WeM-2** Silicene like Domains on $IrSi_3$ Crystallites, ***Nuri Oncel,*** *D Cakir, F Fatima, D Nicholls,* University of North Dakota
8:40am	**EM+2D+AS+MI+MN+NS+TF-WeM-3** Characterization of SiGe/Si Multilayer FIN Structures using X-Ray Diffraction Reciprocal Space Maps, ***Roopa Gowda,*** *M Korde,* SUNY Polytechnic Institute*; M Wormington,* Jordan Valley Semiconductors Inc.*; A Diebold,* SUNY Polytechnic Institute	**INVITED: 2D+AS+MI+NS-WeM-3** Interfacial and Topological Superconductivity in 2D Layers Studied by Spin-Resolved Scanning Tunneling Spectroscopy, ***Roland Wiesendanger,*** University of Hamburg, Germany
9:00am	**EM+2D+AS+MI+MN+NS+TF-WeM-4** Nanoscale Depth and Lithiation Dependence of V_2O_5 Band Structure by Cathodoluminescence Spectroscopy, ***Mitchell Walker,*** *N Pronin,* The Ohio State University*; A Jarry, J Ballard, G Rubloff,* University of Maryland, College Park*; L Brillson,* The Ohio State University	Invited talk continues.
9:20am	**INVITED: EM+2D+AS+MI+MN+NS+TF-WeM-5** Electron Microscopy of Quantum Materials: From Learning Physics to Atomic Manipulation, ***Sergei Kalinin,*** Oak Ridge National Laboratory	**2D+AS+MI+NS-WeM-5** Geometric Imaging of Borophene Polymorphs, ***Xiaolong Liu,*** Northwestern University*; L Wang,* Rice University*; S Li, M Rahn,* Northwestern University*; B Yakobson,* Rice University*; M Hersam,* Northwestern University
9:40am	Invited talk continues.	**2D+AS+MI+NS-WeM-6** Atomic Manipulation of Defects in the Layered Semiconductor 2H-$MoTe_2$, ***Sara Mueller,*** *S Deng,* The Ohio State University*; B St. Laurent,* University of New Hampshire*; Y Wang, W Windl,* The Ohio State University*; S Hollen,* University of New Hampshire*; J Gupta,* The Ohio State University
10:00am	**BREAK - Complimentary Coffee in Exhibit Hall**	**BREAK - Complimentary Coffee in Exhibit Hall**
10:20am	**BREAK - Complimentary Coffee in Exhibit Hall**	**BREAK - Complimentary Coffee in Exhibit Hall**
10:40am	**BREAK - Complimentary Coffee in Exhibit Hall**	**BREAK - Complimentary Coffee in Exhibit Hall**
11:00am	**EM+2D+AS+MI+MN+NS+TF-WeM-10** Hot Electron Emission from Waveguide Integrated Graphene, ***Ragib Ahsan,*** *F Rezaeifar, H Chae, R Kapadia,* University of Southern California	**2D+AS+MI+NS-WeM-10** Scanning Tunneling Microscopy and Spectroscopy of a Heterotriangulene-based 2D Polymer, ***Zachery Enderson,*** *H Murali, R Dasari, T Parker, S Marder, H Li, Q Dai, S Thomas, J Brédas, P First,* Georgia Institute of Technology
11:20am	**EM+2D+AS+MI+MN+NS+TF-WeM-11** Imaging Candidate Nanoelectronic Materials with Photoemission Electron Microscopy (PEEM), ***Sujitra Pookpanratana,*** *S Robey,* National Institute of Standards and Technology (NIST)*; T Ohta,* Sandia National Laboratories	**2D+AS+MI+NS-WeM-11** Scanning Tunneling Microscopy Investigations of Molecules Adsrobed on Semiconducting Graphene Nanoribbons, ***Sineth Premarathna,*** *K Latt, S Hla,* Ohio University
11:40am	**EM+2D+AS+MI+MN+NS+TF-WeM-12** Comparison of Features for Au and Ir Adsorbed on the Ge (110) Surface, ***Shirley Chiang,*** University of California, Davis*; R Xie, H Xing,* Donghua University, China*; T Rahman,* University of Central Florida*; C Fong,* University of California, Davis	**2D+AS+MI+NS-WeM-12** Molecular Flexure and Atom Trapping with Sexiphenyl Molecules by Scanning Tunneling Microscope Manipulation, *Y Zhang,* ***Shaoze Wang,*** *K Braun, S Hla,* Ohio University
12:00pm	**EM+2D+AS+MI+MN+NS+TF-WeM-13** Reference Materials for Localization Microscopy, *C Copeland, R Dixson, L Elliott, B Ilic,* National Institute for Science and Technology (NIST)*; D Kozak, K Liao,* FDA, National Institute for Science and Technology (NIST)*; J Liddle,* NIST Center for Nanoscale Science and Technology*; A Madison,* National Institute for Science and Technology (NIST)*; J Myung,* FDA*; A Pintar,* ***Samuel Stavis,*** National Institute for Science and Technology (NIST)	**2D+AS+MI+NS-WeM-13** Localized Strain Effects in Spin-Polarized Density of States for 2D-MnGaN – a Room Temperature Ferromagnetic Monolayer, *Y Ma,* Ohio University*; K Meng,* The Ohio State University*; D Hunt, M Barral, V Ferrari,* CAC-CNEA, Argentina*; F Yang,* The Ohio State University*;* ***Arthur Smith,*** Ohio University

Wednesday Morning, October 23, 2019

	Complex Oxides: Fundamental Properties and Applications Focus Topic **Room A220-221 - Session OX+EM+MI+SS-WeM** **Electronic and Magnetic Properties of Complex Oxide Surfaces and Interfaces** **Moderators:** Yingge Du, Pacific Northwest National Laboratory, Vincent Smentkowski, GE Global Research Center	**Nanometer-scale Science and Technology Division** **Room A222 - Session NS-WeM** **Optics and Scattering on the Nanoscale** **Moderators:** Alex Belianinov, Oak Ridge National Laboratory, Nancy Burnham, Worcester Polytechnic Institute
8:00am	**OX+EM+MI+SS-WeM-1** Charge Transfer in Lanthanum Ferrite-Strontium Nickelate Superlattices, ***Le Wang,*** *Z Yang, M Bowden,* Pacific Northwest National Laboratory*; J Freeland,* Argonne National Laboratory*; Y Du, S Chambers,* Pacific Northwest National Laboratory	**INVITED: NS-WeM-1** Semiconductor Nanowires for Optoelectronics Applications, ***Chennupati Jagadish***[1]*,* Australian National University, Australia
8:20am	**OX+EM+MI+SS-WeM-2** Self-healing Growth of $LaNiO_3$ on Mixed-terminated $(LaAlO_3)_{0.3}$-$(Sr_2AlTaO_6)_{0.7}$, ***Friederike Wrobel,*** *H Hong, S Cook, T Andersen, D Hong, C Liu, A Bhattacharya, D Fong,* Argonne National Laboratory	Invited talk continues.
8:40am	**INVITED: OX+EM+MI+SS-WeM-3** Optoelectronics with Oxides and Oxide Heterostructures, ***Alexander Demkov,*** University of Texas at Austin	**NS-WeM-3** Photonic-Plasmonic Fiber Probe for Nanoscale Chemical Imaging, *B Birmingham, K Minn, B Ko, H Lee,* ***Zhenrong Zhang,*** Baylor University
9:00am	Invited talk continues.	**NS-WeM-4** Nanoscale Infrared Confinement Using Surface Phonon Polaritons, ***Vanessa Breslin,*** *A Grafton,* National Research Council Postdoctoral Fellow*; D Ratchford, A Giles, K Fears, C So, S Katzer, C Ellis, J Tischler,* U.S. Naval Research Laboratory*; J Caldwell,* Vanderbilt University*; A Dunkelberger, J Owrutsky,* U.S. Naval Research Laboratory
9:20am	**INVITED: OX+EM+MI+SS-WeM-5** Medard W. Welch Award Lecture: Defect-Mediated Coupling of Built-in Potentials at Buried Interfaces Involving Epitaxial Complex Oxides, ***Scott. A Chambers***[2]*,* Pacific Northwest National Laboratory	**INVITED: NS-WeM-5** Actuating and Probing a Single-molecule Switch at Femtosecond Timescales, *D Peller, L Kastner, T Buchner, C Roelcke, F Albrecht, R Huber,* ***Jascha Repp,*** University of Regensburg, Germany
9:40am	Invited talk continues.	Invited talk continues.
10:00am	**BREAK - Complimentary Coffee in Exhibit Hall**	**BREAK - Complimentary Coffee in Exhibit Hall**
10:20am	**BREAK - Complimentary Coffee in Exhibit Hall**	**BREAK - Complimentary Coffee in Exhibit Hall**
10:40am	**BREAK - Complimentary Coffee in Exhibit Hall**	**BREAK - Complimentary Coffee in Exhibit Hall**
11:00am	**OX+EM+MI+SS-WeM-10** Spin Transport Studies on Epitaxial Ultrathin $SrIrO_3$ Films Grown using Pulsed Laser Deposition (PLD), ***M S Ramachandra Rao,*** Indian Institute of Technology, India*; K Sethupathi, T Suraj, S Suresh,* Indian Institute of Technology Madras, India	**INVITED: NS-WeM-10** Nanoscale Structural Imaging through Bragg Diffraction Microscopy, ***Martin Holt,*** Argonne National Laboratory
11:20am	**OX+EM+MI+SS-WeM-11** Structural and Dielectric Characterization of Epitaxial Entropy-Stabilized Oxide Thin Films, ***George Kotsonis,*** *J Maria,* Pennsylvania State University	Invited talk continues.
11:40am	**OX+EM+MI+SS-WeM-12** Oxygen Vacancy-Mediated Epitaxy: $TiO_2(111)/Al_2O_3(0001)$ and Ferromagnetic $Cr_2O_3(0001)/TiO_2(111)$, *C Ladewig, F Anwar,* ***Jeffry Kelber,*** University of North Texas*; S Shah, P Dowben,* University of Nebraska-Lincoln	**NS-WeM-12** First Launch of XTIP - The World's First User Program for the Combination of Scanning Tunneling Microscopy with Synchrotron Radiation, ***Volker Rose,*** *N Shirato, D Rosenmann, M Fisher, S Hla,* Argonne National Laboratory
12:00pm	**OX+EM+MI+SS-WeM-13** Incorporation of Ti into Epitaxial Films of Magnetite, ***Tiffany Kaspar,*** *S Spurgeon, D Schreiber, S Taylor, M Bowden, S Chambers,* Pacific Northwest National Laboratory	**NS-WeM-13** Application of Scanning Tunneling Microscopy and Tip-Enhanced Raman Spectroscopy to the Study of Intermolecular and Molecule-Substrate Interactions, ***Jeremy Schultz***[3]*, N Jiang,* University of Illinois at Chicago

[1] **NSTD Recognition Award**

[2] **Medard W. Welch Award Winner**

[3] **NSTD Graduate Student Award Finalist**

Wednesday Morning, October 23, 2019

	2D Materials Room A226 - Session 2D+EM+MI+MN+NS+QS-WeM Novel 2D Materials **Moderator:** Phil King, University of St Andrews	Atomic Scale Processing Focus Topic Room B130 - Session AP+BI+PS+TF-WeM Surface Reaction Analysis and Emerging Applications of Atomic Scale Processing **Moderator:** Eric A. Joseph, IBM Research Division, T.J. Watson Research Center
8:00am	**INVITED: 2D+EM+MI+MN+NS+QS-WeM-1** A Safari Through Thousands of Layered Materials Guided by Data Science Techniques, ***Evan Reed***, *G Cheon,* Stanford University	**INVITED: AP+BI+PS+TF-WeM-1** Open Spaces in Al_2O_3 Film Deposited on Widegap Semiconductors Probed by Monoenergetic Positron Beams, ***Akira Uedono***, University of Tsukuba, Japan; *T Nabatame,* NIMS, Japan; *W Egger, T Koschine,* Universität der Bundeswehr München, Germany; *C Hugenschmidt, M Dickmann,* Technische Universität München, Germany; *M Sumiya,* NIMS, Japan; *S Ishibashi,* AIST, Japan
8:20am	Invited talk continues.	Invited talk continues.
8:40am	**2D+EM+MI+MN+NS+QS-WeM-3** 2D Ferroelectric Semiconductor α-In_2Se_3 for Non-Volatile Memory Applications, *M Si,* ***Peide Ye***, Purdue University	**AP+BI+PS+TF-WeM-3** Surface Reaction Analyses of Atomic-layer Etching by Controlled Beam Experiments, ***Kazuhiro Karahashi***, *T Ito, S Hamaguchi,* Osaka University, Japan
9:00am	**2D+EM+MI+MN+NS+QS-WeM-4** *Ab initio* Informed Theory of Axis-dependent Conduction Polarity in Goniopolar Materials, ***Yaxian Wang***, *B He, M Arguilla, N Cultrara, M Scudder, J Goldberger, J Heremans, W Windl,* The Ohio State University	**AP+BI+PS+TF-WeM-4** Surface Reaction Analysis of Fluorine-based Reactive Ion Etching (RIE) and Atomic Layer Etching (ALE) by Molecular Dynamics (MD) Simulation, ***Erin Joy Tinacba***, *M Isobe, K Karahashi, S Hamaguchi,* Osaka University, Japan
9:20am	**2D+EM+MI+MN+NS+QS-WeM-5** In-Plane Mechanical Properties and Strain Engineering of 2D Hybrid Organic-Inorganic Perovskites, ***Qing Tu***, *I Spanopoulos, S Hao, C Wolverton, M Kanatzidis, G Shekhawat, V Dravid,* Northwestern University	**AP+BI+PS+TF-WeM-5** Analysis of Metal Surface during Atomic Layer Etching with Gas Cluster Ion Beam and Organic Acid, ***Noriaki Toyoda***, *K Uematsu,* University of Hyogo, Japan
9:40am	**2D+EM+MI+MN+NS+QS-WeM-6** Collective Electronic States of Epitaxial Monolayer 1T-$NbSe_2$, ***Zhuozhi Ge***, University of Wisconsin; *H Zhang, L Liu, C Yan,* West Virginia University; *M Weinert,* University of Wisconsin; *L Li,* West Virginia University	**AP+BI+PS+TF-WeM-6** In-situ Characterization of Growth Kinetics of Piezoelectric Films Grown by Atomic Layer Deposition Utilizing an Ultra-high Purity Process Environment, ***Nicholas Strnad***, General Technical Services, LLC; *D Potrepka,* U.S. Army Research Laboratory; *N O'Toole, B Rayner,* Kurt J. Lesker Company; *J Pulskamp,* U.S. Army Research Laboratory
10:00am	**BREAK - Complimentary Coffee in Exhibit Hall**	**BREAK - Complimentary Coffee in Exhibit Hall**
10:20am	**BREAK - Complimentary Coffee in Exhibit Hall**	**BREAK - Complimentary Coffee in Exhibit Hall**
10:40am	**BREAK - Complimentary Coffee in Exhibit Hall**	**BREAK - Complimentary Coffee in Exhibit Hall**
11:00am	**2D+EM+MI+MN+NS+QS-WeM-10** Magnetic Interfaces of MnSe2 Monolayer, ***Tomas Rojas***, *S Ulloa,* Ohio University	**INVITED: AP+BI+PS+TF-WeM-10** Nanoscale Surface Modification of Medical Devices using Accelerated Neutral Atom Beam Technology, ***Dmitry Shashkov***, *J Khoury, B Phok,* Exogenesis Corp.
11:20am	**2D+EM+MI+MN+NS+QS-WeM-11** Orbital Design of Topological Insulators from Two-dimensional Semiconductors, ***Shixuan Du***, Institute of Physics, Chinese Academy of Sciences, China	Invited talk continues.
11:40am	**INVITED: 2D+EM+MI+MN+NS+QS-WeM-12** Rotationally Controlled van der Waals Heterostructures of 2D Materials, ***Emanuel Tutuc***, *K Kim, G Burg, H Movva,* The University of Texas at Austin	**AP+BI+PS+TF-WeM-12** Chemically Enhanced Patterning of Nickel for Next Generation EUV Mask, ***Xia (Gary) Sang***, *E Chen,* University of California, Los Angeles; *T Tronic, C Choi,* Intel Corporation; *J Chang,* University of California, Los Angeles
12:00pm	Invited talk continues.	**AP+BI+PS+TF-WeM-13** Surface Reactions of Low Energy Electrons and Ions with Organometallic Precursors and their Relevance to Charged Particle Deposition Processes, ***Rachel Thorman***, Johns Hopkins University; *E Bilgilisoy,* FAU Erlangen-Nürnberg, Germany; *S Matsuda, L McElwee-White,* University of Florida; *D Fairbrother,* Johns Hopkins University

	Room B131	
8:00am	**INVITED: PS+EM-WeM-1** Plasma Processes for High Efficiency Multi-Junction Solar Cells Fabrication, ***Maxime Darnon***, *M Volatier, P Albert, M de Lafontaine, P St-Pierre, G Hamon,* LN2, CNRS / Université de Sherbrooke, 3IT, Canada*; C Petit-Etienne, G Gay, E Pargon,* LTM, CNRS / Université Grenoble Alpes, France*; V Aimez, S Fafard, A Jaouad,* LN2, CNRS / Université de Sherbrooke, 3IT, Canada	**Plasma Science and Technology Division** **Session PS+EM-WeM** **Plasma Processing of Materials for Energy** **Moderators:** Ankur Agarwal, KLA-Tencor, Saravanapriyan Sriraman, Lam Research Corp
8:20am	Invited talk continues.	
8:40am	**PS+EM-WeM-3** Combinatorial Synthesis of Ternary Oxides by Reactive Sputtering for CdTe Solar Cells, ***Yegor Samoilenko***, *G Yeung, C Wolden,* Colorado School of Mines	
9:00am	**PS+EM-WeM-4** Potential Applications of TiN-based Plasmonic Nanoparticles: From Plasmon-induced Chemistry to Photothermal Absorption, *A Alvarez Barragan, C Berrospe Rodriguez,* ***Lorenzo Mangolini***, University of California, Riverside	
9:20am	**PS+EM-WeM-5** Plasma-induced Strain in MoS_2 Films for the Electrochemical Hydrogen Evolution Reaction, *T Liu, X Liu,* ***Souvik Bhattacharya***, Case Western Reserve University*; Z Ye, R He,* Texas Tech University*; X Gao, R Akolkar, R Sankaran,* Case Western Reserve University	
9:40am	**PS+EM-WeM-6** Comparison of Pulsed and Continuous Wave Argon Plasmas for the Synthesis of Vertical Graphene Nanosheets, ***Zoe Mann***, *E Fisher,* Colorado State University	
10:00am	**BREAK - Complimentary Coffee in Exhibit Hall**	
10:20am	**BREAK - Complimentary Coffee in Exhibit Hall**	
10:40am	**BREAK - Complimentary Coffee in Exhibit Hall**	
11:00am	**INVITED: TF2-WeM-10** Peter Mark Memorial Award Lecture: Molecular Beam Epitaxial Growth of Novel Plasmonic Materials: Heavily-doped Semiconductors and Topological Insulators, ***Stephanie Law***[1], University of Delaware	**Thin Films Division** **Session TF2-WeM** **Thin Film Late News Session** **Moderator:** Virginia Wheeler, U.S. Naval Research Laboratory
11:20am	Invited talk continues.	
11:40am	**TF2-WeM-12** Impact of Interface Quality on the Strength of Volume Plasmon Polaritons in Hyperbolic Metamaterials, ***Patrick Sohr***, *D Wei,* University of Delaware*; S Tomasulo, M Yakes,* U.S. Naval Research Laboratory*; S Law,* University of Delaware	
12:00pm	**TF2-WeM-13** Transparent Microelectrode Arrays made by Ion Beam Assisted Deposition for Neuronal Cell *in vitro* Recordings, ***Tomi Ryynänen***, Tampere University, Finland*; R Mzezewa, E Meriläinen, T Hyvärinen, J Lekkala, S Narkilahti, P Kallio,* Tampere University	

[1] **Peter Mark Memorial Award Winner**

Room B231-232

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
Moderators: Mena Gadalla, Harvard University, Kai Xiao, Oak Ridge National Laboratory

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

Wednesday Afternoon, October 23, 2019

	2D Materials **Room A216 - Session 2D+EM+MN+NS-WeA** **2D Device Physics and Applications** **Moderator:** Jyoti Katoch, Carnegie Mellon University	**Applied Surface Science Division** **Room A211 - Session AS+CA+LS-WeA** **Operando Characterization Techniques for In situ Surface Analysis of Energy Devices** **Moderator:** Svitlana Pylypenko, Colorado School of Mines
2:20pm	**INVITED: 2D+EM+MN+NS-WeA-1** Monolayer Electronics and Optoelectronics - Advances, Opportunities and Challenges, ***Ali Javey,*** University of California at Berkeley	**INVITED: AS+CA+LS-WeA-1** Probing the Electronic Structure of Electrocatalysts and the Formation of Reaction Intermediates, ***Kelsey Stoerzinger,*** Oregon State University
2:40pm	Invited talk continues.	Invited talk continues.
3:00pm	**2D+EM+MN+NS-WeA-3** Investigation on Graphene Band-gap Engineering for Graphene Transistors Applications, ***Benfdila Arezki,*** University M. Mammeri Tizi-Ouzou, Algeria	**AS+CA+LS-WeA-3** Surface Characterization of Battery Electrode/Electrolyte Materials Using XPS and ToF-SIMS, ***Elisa Harrison,*** *S Peczonczyk, S Simko,* Ford Motor Company*; K Wujcik,* Blue Current*; A Sharafi, A Drews,* Ford Motor Company
3:20pm	**2D+EM+MN+NS-WeA-4** Fully Inkjet Printed, High Photo-responsive, 2D WSe_2-Graphene Based Flexible Photodetector, *R Hossain, A Kaul,* ***Avra Bandyopadhyay,*** University of North Texas	**AS+CA+LS-WeA-4** In Operando Molecular Imaging of Microbes as an Electrode, ***Xiao-Ying Yu,*** Pacific Northwest National Laboratory
3:40pm	**BREAK**	**BREAK**
4:00pm	**BREAK**	**BREAK**
4:20pm	**2D+EM+MN+NS-WeA-7** Chemical Vapor Sensing with Transition Metal Dichalcogenides via Photoluminescence Modulation, ***Aubrey T. Hanbicki,*** *P Campbell, S Sivaram,* U.S. Naval Research Laboratory*; A Kusterbeck,* Nova Research, Inc.*; V Nguyen, A McGill, K McCreary, B Jonker, E Cobas, K Perkins,* U.S. Naval Research Laboratory*; A Friedman,* Laboratory for Physical Sciences	**INVITED: AS+CA+LS-WeA-7** Operando-XPS Investigation of Low-Volatile Liquids and Their Interfaces using Lab-Based Instruments, ***Sefik Suzer,*** Bilkent University, Turkey
4:40pm	**2D+EM+MN+NS-WeA-8** Effective and Robust Graphene Immunoligical Sensors Functionalized through Non-covalent Ninding of Antibody-Conjugated Tripodal Compound, *A Hugo,* CEA-LETI, France*; C Sun,* Northwestern University*; M Kumar,* CEA-LETI, France*; R Othmen, J Renard, V Bouchiat,* CNRS-Institut Néel, France*; J Mann,* Northwestern University*; J Parpia, H Craighead,* Cornell University*; P Mailley,* CEA-LETI, France*; W Dichtel,* Northwestern University*;* ***Thomas ALAVA,*** CEA-LETI, France	Invited talk continues.
5:00pm	**INVITED: 2D+EM+MN+NS-WeA-9** Electronic Properties of Ultra-Thin Na_3Bi: A Platform for a Topological Transistor, ***Mark Edmonds,*** Monash University, Australia	**AS+CA+LS-WeA-9** Decoupling Surface and Interface Evolution in Polymer Electrolyte Membrane Systems Through In Situ X-Ray Photoelectron Spectroscopy, ***Michael Dzara[1,2],*** Colorado School of Mines*; K Artyushkova,* Physical Electronics*; H Eskandari, K Karan,* University of Calgary, Canada*; K Neyerlin,* National Renewable Energy Laboratory*; S Pylypenko,* Colorado School of Mines
5:20pm	Invited talk continues.	**AS+CA+LS-WeA-10** Low Temperature Scanning Tunneling Microscopy and Spectroscopy of Semiconductor Nanowire Device Surfaces, ***Yen-Po Liu,*** *Y Liu, S Mousavi, L Sodergren, F Lindelöw, S Lehmann, K Dick Thelander, E Lind, R Timm, A Mikkelsen,* Lund University, Sweden
5:40pm	**2D+EM+MN+NS-WeA-11** Transparent Conductive Oxides in Contact with 2-D Materials, ***Ravindra Mehta,*** *A Bandyopadhyay, A Kaul,* University of North Texas	**AS+CA+LS-WeA-11** Work-function Estimation and In situ Measurement of Photoemission Spectroscopy of $CuFeO_2$ under Near Ambient Condition, ***Soumya Banerjee,*** *P Sapkota,* University of Notre Dame*; A Cabrera,* Pontificia Universidad Católica de Chile, Chile*; S Ptasinska,* University of Notre Dame
6:00pm	**2D+EM+MN+NS-WeA-12** Negative Fermi-level Pinning Effect Induced by Graphene Interlayer in Metal/Graphene/Semiconductor Junction, *H Yoon, W Song,* Ulsan National Institute of Science and Technology (UNIST), Republic of Korea*; S Jung,* SK Hynix, Republic of Korea*; J Kim,* Ulsan National Institute of Science and Technology (UNIST)*; K Mo, G Choi, H Jeong, J Lee,* ***Kibog Park,*** Ulsan National Institute of Science and Technology (UNIST), Republic of Korea	**AS+CA+LS-WeA-12** In-situ X-ray Photoelectron Spectroscopic Study of III-V Semiconductor/H_2O Interfaces under Light Illumination, ***Pitambar Sapkota,*** *S Ptasinska,* University of Notre Dame

[1] **ASSD Student Award Finalist**

[2] **National Student Award Finalist**

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

Wednesday Afternoon, October 23, 2019

	Electronic Materials and Photonics Division **Room A214 - Session EM+2D+NS+TF-WeA** **THEME Session: Electronics and Photonics for a Low-Carbon Future** **Moderators:** Michael A. Filler, Georgia Institute of Technology, Stephen McDonnell, University of Virginia	**Fundamental Discoveries in Heterogeneous Catalysis Focus Topic** **Room A213 - Session HC+OX+SS-WeA** **Metal-Support Interactions Driving Heterogeneously-Catalyzed Reactions** **Moderators:** Aravind Asthagiri, The Ohio State University, Jason Weaver, University of Florida
2:20pm	**INVITED: EM+2D+NS+TF-WeA-1** Uncovering the Materials Paradigm for Solar Absorbers through In situ Imaging and Characterization, ***Mariana Bertoni,*** Arizona State University	**HC+OX+SS-WeA-1** Yittria-stabilized Zirconia (YSZ) Supports for Low Temperature Ammonia Synthesis, *Z Zhang, S Livingston,* Colorado School of Mines*; L Fitzgerald,* University College Dublin*; D Way,* ***Colin Wolden,*** Colorado School of Mines
2:40pm	Invited talk continues.	**HC+OX+SS-WeA-2** Operando PTRF-XAFS Technique for 3D Structure Determination of Active Metal Sites on a Model Catalyst Surface under Working Conditions, ***Satoru Takakusagi,*** *L Bang, D Kido, Y Sato, K Asakura,* Hokkaido University, Japan
3:00pm	**INVITED: EM+2D+NS+TF-WeA-3** Atomic Layer Deposition's Potential in Sustainability, ***Karen Buechler,*** ALD NanoSolutions	**INVITED: HC+OX+SS-WeA-3** Understanding and Tuning Catalytic Materials Using Nanocrystal Precursors, ***Matteo Cargnello,*** Stanford University
3:20pm	Invited talk continues.	Invited talk continues.
3:40pm	**BREAK**	**BREAK**
4:00pm	**BREAK**	**BREAK**
4:20pm	**EM+2D+NS+TF-WeA-7** Challenges in Materials and Processing to Implementation of Energy Efficient SiC Technology, ***Mei-Chien Lu,*** Monte Rosa Technology	**HC+OX+SS-WeA-7** CO_2 Hydrogenation on Supported Zirconium Oxide Clusters, ***Yilin Ma***[1], Stony Brook University*; M White,* Brookhaven National Laboratory
4:40pm	**EM+2D+NS+TF-WeA-8** High Efficiency of Hot Electron Transfer at a Metal-Insulator-Semiconductor to Electrolyte Interface, ***Hyun Uk Chae,*** *R Ahsan, Q Lin, R Kapadia,* University of Southern California	**HC+OX+SS-WeA-8** Tuning Surface Hydrophobicity to Enhance Reaction Rate of the Lewis Acid Zeolite Nano Sn Beta for Alcohol Ring Opening of Epoxides, ***Nicholas Brunelli,*** *A Spanos, A Parulkar, N Deshpande,* The Ohio State University
5:00pm	**INVITED: EM+2D+NS+TF-WeA-9** Integrated Photocathodes for Solar Driven Conversion of Carbon Dioxide to value-added Products, ***Joel Ager,*** Lawrence Berkeley Lab, University of California, Berkeley	**INVITED: HC+OX+SS-WeA-9** Understanding Metal-Metal and Metal-Support Interactions in Bimetallic Catalysts, ***Donna Chen,*** Univeristy of South Carolina*; S Farzandh, D Shakya, A Brandt, T Maddumapatabandi,* University of South Carolina
5:20pm	Invited talk continues.	Invited talk continues.
5:40pm	**EM+2D+NS+TF-WeA-11** Modeling of Optical Scattering in White Beetle Scales, ***Seung Ho Lee,*** *S Han, S Han,* University of New Mexico	
6:00pm	**EM+2D+NS+TF-WeA-12** Boosting the Performance of WO_3/n-Si for Photo-electrochemical Water Splitting: From the Role of Si to Interface Engineering, ***Yihui Zhao,*** Electrochemical Materials and Interfaces (EMI), Dutch Institute for Fundamental Energy Research (DIFFER), The Netherlands*; A Bieberle-Hütter,* Electrochemical Materials and Interfaces (EMI), Dutch Institute for Fundamental Energy Research (DIFFER),The Netherlands, The Netherlands*; G Brocks,* 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*; H Genuit,* Dutch Institute for Fundamental Energy Research (DIFFER), The Netherlands*; R Lavrijsen,* Physics of Nanostructures and Center for NanoMaterials (cNM), Department of Applied Physics, Eindhoven University of Technology, The Netherlands	

[1] **Heterogeneous Catalysis Graduate Student Presentation Award Finalist**

	Advanced Ion Microscopy and Ion Beam Nano-engineering Focus Topic **Room B231-232 - Session HI+AS+CA-WeA** **Advanced Ion Microscopy and Surface Analysis Applications** **Moderators:** Richard Livengood, Intel Corporation, Armin Gölzhäuser, University of Bielefeld, Germany	**Magnetic Interfaces and Nanostructures Division** **Room A210 - Session MI+2D-WeA** **Emerging Multifunctional Magnetic Materials II** **Moderators:** Valeria Lauter, Oak Ridge National Laboratory, Axel Hoffmann, Technical University of Berlin
2:20pm	**INVITED: HI+AS+CA-WeA-1** Analytical Capabilities on FIB Instruments using SIMS: Applications, Current Developments and Prospects, ***Tom Wirtz,*** Luxembourg Institute of Science and Technology, Luxembourg; *J Audinot,* Luxembourg Institute of Science and Technology, Luxembourg, Luxembourg; *J Lovric, O De Castro,* Luxembourg Institute of Science and Technology, Luxembourg	**INVITED: MI+2D-WeA-1** Field and Current Control of the Electrical Conductivity of an Artificial Two-Dimensional Honeycomb Lattice, ***Deepak Singh,*** University of Missouri
2:40pm	Invited talk continues.	Invited talk continues.
3:00pm	**HI+AS+CA-WeA-3** Correlated Materials Characterization via Multimodal Chemical Imaging using HIM-SIMS, *A Belianinov,* Oak Ridge National Laboratory; *S Kim,* Pusan National University, South Korea; *A Trofimov,* ***Olga S. Ovchinnikova,*** Oak Ridge National Laboratory	**INVITED: MI+2D-WeA-3** Emergence and Dynamics of Magnetic Order in Metamagnetic Nanostructures, ***Vojtech Uhlir,*** CEITEC BUT, Brno University of Technology, Czech Republic
3:20pm	**HI+AS+CA-WeA-4** Compositional Characterization of Biogenic Nanoparticles using the ORION NanoFab with SIMS, ***Christelle Guillermier,*** *F Khanom,* Carl Zeiss PCS, Inc.; *D Medina,* Northeastern University; *J Audinot,* Luxembourg Institute of Science and Technology, Luxembourg	Invited talk continues.
3:40pm	**BREAK**	**BREAK**
4:00pm	**BREAK**	**BREAK**
4:20pm	**INVITED: HI+AS+CA-WeA-7** Effects of Ion Irradiation on Two-Dimensional Targets: What is Different from Bulk Materials, ***Arkady V. Krasheninnikov,*** Helmholtz-Zentrum Dresden-Rossendorf, Germany	**MI+2D-WeA-7** Time Dependence in $La_{0.7}Sr_{0.3}MnO_3$ Thin Films with Magnetic Competition, ***Mikel B. Holcomb,*** *R Trappen, N Mottaghi, S Yousefi, G Cabrera, G Bhandari, M Seehra,* West Virginia University
4:40pm	Invited talk continues.	**INVITED: MI+2D-WeA-8** Optically Induced Magnetization through Spin States at Perovskite/Ferromagnetic Interface Revealed by Neutron Magnetoreflectivity Studies, ***Bin Hu,*** University of Tennessee Knoxville
5:00pm	**HI+AS+CA-WeA-9** Effects of He Ion Irradiation on Gold Nanoclusters: a Molecular Dynamics Study, ***Sadegh Ghaderzadeh,*** *M Ghorbani-Asl, S Kretschmer, G Hlawacek,* Helmholtz-Zentrum Dresden Rossendorf, Germany; *A Krasheninnikov,* Helmholtz-Zentrum Dresden-Rossendorf, Germany	Invited talk continues.
5:20pm	**HI+AS+CA-WeA-10** Low Damage Imaging of Polymers with the Helium Ion Microscope, ***Doug Wei,*** Carl Zeiss, RMS, Inc.; *J Notte,* Carl Zeiss PCS, Inc.; *A Stratulat,* Carl Zeiss Microscopy, Ltd., UK	**MI+2D-WeA-10** Effect of Interlayer and Underlayers on the Microstructure and Magnetic Softness in FeGa-based Ferromagnetic Composites, ***Adrian Acosta,*** *K Fitzell,* University of California, Los Angeles; *C Dong,* Northeastern University; *M Zurbuchen, N Sun, J Chang,* University of California, Los Angeles
5:40pm	**HI+AS+CA-WeA-11** Imaging of Biological Cells with Helium-Ion Microscopy, ***Natalie Frese,*** *A Beyer, C Kaltschmidt, B Kaltschmidt,* Bielefeld University, Germany; *A Thomas,* Institute for Metallic Materials Dresden, Germany; *W Parak,* University of Hamburg, Germany; *A Gölzhäuser,* Bielefeld University, Germany	**MI+2D-WeA-11** Tunable Spin-polarized Edge Effects in Transition Metal Dichalcogenides on FM and AFM Substrates, *N Cortes,* Universidad Tecnica Federico Santa Maria, Chile; ***Oscar Avalos-Ovando,*** Ohio University; *L Rosales, P Orellana,* Universidad Tecnica Federico Santa Maria, Chile; *S Ulloa,* Ohio University
6:00pm	**HI+AS+CA-WeA-12** Channeling in the Helium Ion Microscope, ***Hussein Hijazi,*** *L Feldman, R Thorpe, M Li, T Gustafsson,* Rutgers University; *D Barbacci, A Schultz,* Ionwerks	**MI+2D-WeA-12** Magnetocaloric Properties of Thin Film $La_{0.7}Sr_{0.3}MnO_3$: Magnetic Field Dependence and Effects of Superparamagnetism, ***Navid Mottaghi***[1], *M Seehra, C Huang, S Kumari, S Yousefi Sarraf, G Cabrera, G Bhandari, R Trappen, M Holcomb,* West Virginia University

[1] **Falicov Student Award Finalist**

Wednesday Afternoon, October 23, 2019

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

[1] **NSTD Recognition Award**

[2] **NSTD Graduate Student Award Finalist**

Wednesday Afternoon, October 23, 2019

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

Wednesday Afternoon, October 23, 2019

	Advanced Surface Engineering Division **Room A215 - Session SE+AS+TF-WeA** **Nanostructured Thin Films and Coatings** **Moderators:** Mehran Golizadeh, Montanuniversität Leoben, Austria, Suneel Kodambaka, University of California Los Angeles	**Surface Science Division** **Room A220-221 - Session SS+AS+HC+OX-WeA** **Reactions at Alloy Surfaces and Single Atom Catalysis** **Moderators:** Erin Iski, University of Tulsa, Bruce E. Koel, Princeton University
2:20pm	**SE+AS+TF-WeA-1** Structural and Optical Properties of Pulsed-Laser Deposited β-Ga_2O_3 Thin Films, ***Mallesham Bandi***, *V Zade, R Chintalapalle,* University of Texas at El Paso	**INVITED: SS+AS+HC+OX-WeA-1** Correlating Structure and Function for Nanoparticle Catalysts, ***Graeme Henkelman***, University of Texas at Austin
2:40pm	**SE+AS+TF-WeA-2** Structural, Electrical, and Optical Properties of Mo-Ga Alloy Thin Films, ***Nivedita Lalitha Raveendran***, *R Chintalapalle,* University of Texas at El Paso	Invited talk continues.
3:00pm	**SE+AS+TF-WeA-3** Metallic Glass: From Coating to First-Ever Nanotube Arrays, ***Jinn P. Chu***, National Taiwan University of Science and Technology, Taiwan, Republic of China	**SS+AS+HC+OX-WeA-3** Surface Reactivity of PtAg and PdAg: From Single-Atom Alloys to Supported Nanoparticles, ***Dipna Patel***[2], Tufts University; *C O'Connor, R Madix, C Friend,* Harvard University; *E Sykes,* Tufts University
3:20pm	**SE+AS+TF-WeA-4** Tin Oxide Nanoaggregate Fragmentation and Restructuring during Supersonic Impaction based Thin Film Deposition Processes, ***Souvik Ghosh***, *X Chen, C Li, B Olson, C Hogan,* University of Minnesota, Minneapolis	**SS+AS+HC+OX-WeA-4** Single-site Catalysts by Metal-ligand Complexation at Surfaces: From Model Systems in Vacuum to High-pressure Catalysis on Oxide Supports, ***Steven L. Tait***, Indiana University
3:40pm	**BREAK**	**BREAK**
4:00pm	**BREAK**	**BREAK**
4:20pm	**INVITED: SE+AS+TF-WeA-7** From Gas-ion to Metal-ion-controlled Irradiation: A Paradigm Shift in the Thin Film Growth by Magnetron Sputtering, ***Grzegorz Greczynski***, Linköping University, Sweden; *I Petrov, J Greene,* University of Illinois at Urbana-Champaign; *L Hultman,* Linköping University, Sweden	**INVITED: SS+AS+HC+OX-WeA-7** Controlling the Local Coordination and Reactivity of Oxide-supported Atomically Dispersed Pt-group Species, ***Phillip Christopher***, University of California at Santa Barbara
4:40pm	Invited talk continues.	Invited talk continues.
5:00pm	**SE+AS+TF-WeA-9** Atomic Layer Deposition of Silver Thin Film on Polydimethylsiloxane (PDMS), ***Sarah Hashemi Astaneh***, *C Sukotjo, C Takoudis,* University of Illinois at Chicago	**SS+AS+HC+OX-WeA-9** Coordination Defines Reactivity of a Model Single-atom Catalyst: $Ir_1/Fe_3O_4(001)$, ***Zdenek Jakub***[1], *J Hulva, M Meier, U Diebold, G Parkinson,* TU Wien, Austria
5:20pm	**SE+AS+TF-WeA-10** Fabrication of 2D Photonic Crystals using Block Copolymer Lithography on Flexible Substrates and Fibers for Wearable Technology, ***Wade Ingram***, *R Spontak, J Jur,* North Carolina State University	**SS+AS+HC+OX-WeA-10** Capturing the Early Stages of Oxidation on Low-Index Ni and Ni-Cr Surfaces, ***William H. Blades***, *P Reinke,* University of Virginia
5:40pm	**SE+AS+TF-WeA-11** Use of an Einzel Lens to Enhance Electrohydrodynamic Printing Technology, ***Matthew Strohmayer***[3], *A Dhall, P Ramesh, N Tokranova, C Ventrice, Jr.,* SUNY Polytechnic Institute	**SS+AS+HC+OX-WeA-11** Evolution of Steady-state Material Properties during Catalysis: Oxidative Coupling of Methanol over Nanoporous $Ag_{0.03}Au_{0.97}$, ***Matthijs van Spronsen***, Lawrence Berkeley National Laboratory; *B Zugic,* Harvard University; *M Salmeron,* Lawrence Berkeley National Laboratory; *C Friend,* Harvard University
6:00pm		**SS+AS+HC+OX-WeA-12** Reduction and Oxidation of Transition Metal Oxides: From Tailoring the Surface and Interface Properties to the New Crystalline Phases Formation, ***Dominik Wrana***, Jagiellonian University, Poland; *C Rodenbücher,* Forschungszentrum Jülich GmbH, Germany; *K Cieślik, B Jany,* Jagiellonian University, Poland; *K Szot,* Forschungszentrum Jülich GmbH, Germany; *F Krok,* Jagiellonian University, Poland

[1] **Morton S. Traum Award Finalist**
[2] **National Student Award Finalist**
[3] **ASSD Student Award Finalist**

Thin Films Division
Room A122-123 - Session TF+EM-WeA
Emerging Thin Film Materials: Ultra-wide Bandgap and Phase Change Materials
Moderators: Cary Pint, Vanderbilt University, Brent Sperling, National Institute of Standards and Technology (NIST), Jin-Seong Park, Hanyang University, Korea

2:20pm	**TF+EM-WeA-1** MOCVD Growth and Characterization of $ZnGeN_2$-GaN Alloy Films, ***Benthara Hewage Dinushi Jayatunga***, *K Kash,* Case Western Reserve University*; K Reza, H Zhao,* The Ohio State University*; O Ohanaka, R Lalk,* Case Western Reserve University*; M Zhu, J Hwang,* The Ohio State University	
2:40pm	**TF+EM-WeA-2** Device Quality β-Ga2O3 and Related Alloys by MOCVD, ***Andrei Osinsky***, *F Alema,* Agnitron Technology, Inc.*; Y Zhang, A Mauze, J Speck,* University of California, Santa Barbara*; P Mukhopadhyay, W Schoenfeld,* University of Central Florida	
3:00pm	**INVITED: TF+EM-WeA-3** Development of the β-$(Al_xGa_{1-x})_2O_3$/β-Ga_2O_3 (010) Heterostructures by Plasma-assisted Molecular Beam Epitaxy, ***James Speck***, University of California at Santa Barbara	
3:20pm	Invited talk continues.	
3:40pm	**BREAK**	
4:00pm	**BREAK**	
4:20pm	**INVITED: TF+EM-WeA-7** Phase-Change Memory: A Quest from Material Engineering Towards the Device Performances, ***Guillaume Bourgeois***, *G Navarro, M Cyrille, J Garrione, C Sabbione, M Bernard, E Nolot, E Nowak,* CEA-LETI, France	
4:40pm	Invited talk continues.	
5:00pm	**TF+EM-WeA-9** Neuromorphic Materials and Architectures for Dynamic Learning and Edge Processing Applications, ***Angel Yanguas-Gil***, Argonne National Laboratory	
5:20pm	**TF+EM-WeA-10** Atomic Layer Deposited VO_2 Thin Films Towards Modulated Infrared Optoelectronic Devices, ***Virginia Wheeler***, *C Ellis, M Currie, J Avila, M Meeker, A Giles,* U.S. Naval Research Laboratory*; J Caldwell,* Vanderbilt University*; J Tischler,* U.S. Naval Research Laboratory	
5:40pm	**TF+EM-WeA-11** Deposition Process for Vanadium Dioxide Thin Films for RF Applications, ***Mark Lust***, *S Chen, N Ghalichechian,* The Ohio State University	
6:00pm	**TF+EM-WeA-12** Low Power, Microwave Solid State Oscillators Based on Phase Change Materials, ***Yang Liu***, *Z Du, B Zhao, H Wang, J Ravichandran,* University of Southern California	

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

	Chemical Analysis and Imaging Interfaces Focus Topic **Room A120-121 - Session CA+2D+AS+BI+NS-ThM** **Chemical Analysis and Imaging of Liquid/Vapor/Solid Interfaces II** **Moderators:** Utkur Mirsaidov, National University of Singapore, Xiao-Ying Yu, Pacific Northwest National Laboratory	**Thin Films Division** **Room A122-123 - Session TF+EM+NS+SS-ThM** **Thin Films for Energy Harvesting and Conversion** **Moderators:** Siamak Nejati, University of Nebraska-Lincoln, Xinwei Wang, Shenzhen Graduate School, Peking University
8:00am	**INVITED: CA+2D+AS+BI+NS-ThM-1** From Surfaces to Solid-Gas and Solid-liquid Interfaces: Ambient Pressure XPS and Beyond, ***Miquel B. Salmeron,*** Lawrence Berkeley Lab, University of California, Berkeley	**INVITED: TF+EM+NS+SS-ThM-1** Redesigning Batteries into Efficient Energy Harvesters and Sensors for Wearable Applications, ***Cary Pint,*** Vanderbilt University
8:20am	Invited talk continues.	Invited talk continues.
8:40am	**CA+2D+AS+BI+NS-ThM-3** Probing Solid-liquid Interfaces with Tender X-rays, ***Zbynek Novotny,*** *N Comini, B Tobler,* University of Zuerich, Switzerland; *D Aegerter, E Fabbri,* Paul Sherrer Institute, Switzerland; *U Maier,* Ferrovac GmbH, Switzerland; *L Artiglia, J Raabe, T Huthwelker,* Paul Sherrer Institute, Switzerland; *J Osterwalder,* University of Zuerich, Switzerland	**TF+EM+NS+SS-ThM-3** Engineering Effective Back Contact Barrier by interfacial $MoSe_2$ defect states for CZTSe: nanolayer Ge solar cells., ***Sanghyun Lee,*** Indiana State University
9:00am	**CA+2D+AS+BI+NS-ThM-4** X-ray Photoelectron Spectroscopy Insight into X-ray Induced Radiolysis at Heterogenous Liquid Electrolyte Interface, ***Christopher Arble,*** National Institute of Standards and Technology (NIST); *H Guo,* Southeast University, China; *E Strelcov, B Hoskins,* National Institute of Standards and Technology (NIST); *M Amati, P Zeller, L Gregoratti,* Elettra-Sincrotrone Trieste, Italy; *A Kolmakov,* National Institute of Standards and Technology (NIST)	**TF+EM+NS+SS-ThM-4** Development of Low-Cost, Crack-Tolerant Metallization Using Screen Printing for Increased Durability of Silicon Solar Cell Modules, *O Abudayyeh,* Osazda Energy; *A Chavez,* University of New Mexico; *J Chavez,* Osazda Energy; ***Sang M. Han,*** University of New Mexico; *F Zimbardi, B Rounsaville, V Upadhyaya, A Rohatgi,* Georgia Institute of Technology; *B McDanold, T Silverman,* National Renewable Energy Laboratory
9:20am	**INVITED: CA+2D+AS+BI+NS-ThM-5** Theoretical Investigation of Reactivity at Complex Solid-Liquid Interfaces, ***Roger Rousseau,*** Pacific Northwest National Laboratory	**TF+EM+NS+SS-ThM-5** Fabrication of Optical Test Structures for Enhanced Absorption in Thin Multi-junction Solar Cells, ***Erin Cleveland,*** *N Kotulak, S Tomasulo, P Jenkins,* U.S. Naval Research Laboratory; *A Mellor, P Pearce,* Imperial College London, UK; *N Ekins-Daukes,* University of New South Wales, Australia; *M Yakes,* U.S. Naval Research Laboratory
9:40am	Invited talk continues.	**TF+EM+NS+SS-ThM-6** Phosphorus as a *p*-Dopant in Pyrite FeS_2, a Potential Low-cost earth-abundant Thin Film Solar Absorber, ***Bryan Voigt***[1], *W Moore, D Ray, M Manno,* University of Minnesota, Minneapolis; *J Jeremiason,* Gustavus Adolphus College; *L Gagliardi, E Aydil, C Leighton,* University of Minnesota, Minneapolis
10:00am	**BREAK - Complimentary Coffee in Exhibit Hall**	**BREAK - Complimentary Coffee in Exhibit Hall**
10:20am	**BREAK - Complimentary Coffee in Exhibit Hall**	**BREAK - Complimentary Coffee in Exhibit Hall**
10:40am	**BREAK - Complimentary Coffee in Exhibit Hall**	**BREAK - Complimentary Coffee in Exhibit Hall**
11:00am	**CA+2D+AS+BI+NS-ThM-10** In-situ/Operando Soft X-ray Spectroscopy for Interfacial Characterization of Energy Materials and Devices, *Y Liu, X Feng,* ***Jinghua Guo,*** Lawrence Berkeley National Laboratory	**TF+EM+NS+SS-ThM-10** Relaxor-ferroelectric Thin Films for Energy Harvesting from Low-grade Waste-heat, ***Amrit Sharma,*** *B Xiao, S Pradhan, M Bahoura,* Norfolk State University
11:20am	**CA+2D+AS+BI+NS-ThM-11** The Importance of Amino Acid Adsorption on Polymer Surfaces in *P. Aeruginosa* Biofilm Formation, ***Olutoba Sanni,*** University of Nottingham, UK	**TF+EM+NS+SS-ThM-11** Thermal Treatment Effects on the Thermoelectric Devices from Sn/Sn+SnO_2 Thin Films, ***Satilmis Budak,*** *E McGhee, Z Xiao, E Barnes, R Norwood,* Alabama A&M University
11:40am		**TF+EM+NS+SS-ThM-12** Thermoelectric Properties of Efficient Thermoelectric Devices from Sb/Sb+SnO_2 Thin Films, ***Eshirdanya McGhee,*** *S Budak, Z Xiao, N Caver, B McNeal,* Alabama A&M University
12:00pm		**TF+EM+NS+SS-ThM-13** 3D Printed Triboelectric Nanogenerator, *I Fattah, E Utterback,* ***Naga Srinivas Korivi,*** *V Rangari,* Tuskegee University

[1] **TFD James Harper Award Finalist**

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

	Magnetic Interfaces and Nanostructures Division **Room A210 - Session MI+2D+AS+EM-ThM** **Novel Magnetic Materials and Device Concept for Energy efficient Information Processing and Storage** **Moderators:** Mikel B. Holcomb, West Virginia University, Markus Donath, Muenster University, Germany	**Applied Surface Science Division** **Room A211 - Session AS-ThM** **Advances in Depth Profiling, Imaging and Time-resolved Analysis** **Moderators:** Jeffrey Fenton, Medtronic, Inc., Carl A. Ventrice, Jr., SUNY Polytechnic Institute
8:00am	**INVITED: MI+2D+AS+EM-ThM-1** Using Novel Magnonic Device Concepts for Efficient Information Processing, ***Burkard Hillebrands,*** Technical University Kaiserslautern, Germany	**INVITED: AS-ThM-1** What Really Lies Beneath the AVS Surface? Depth Profiling Can Help Provide the Answer, ***Fred Stevie,*** *C Zhou, R Garcia,* North Carolina State University
8:20am	Invited talk continues.	Invited talk continues.
8:40am	**MI+2D+AS+EM-ThM-3** Spin-Polarized Scanning Tunneling Microscopy of <10 nm Skyrmions in SrIrO3/SrRuO3 Bilayers, ***Joseph Corbett,*** *J Rowland, A Ahmed, J Repicky,* The Ohio State University; *K Meng,* The Ohio State Univesity; *F Yang, M Randeria, J Gupta,* The Ohio State University	**AS-ThM-3** TOF-SIMS Tandem MS Imaging of (Sub-)Monolayer Coatings for Device Processing, ***David M. Carr,*** *G Fisher,* Physical Electronics
9:00am	**INVITED: MI+2D+AS+EM-ThM-4** Relieving YIG from its Substrate Constraints - YIG Resonators on Various Crystalline Substrate Materials, ***Georg Schmidt,*** Martin-Luther-Universität Halle-Wittenberg, Germany	**AS-ThM-4** TOF-SIMS at the Edge, ***Alan Spool,*** *D Bilich,* Western Digital Corporation
9:20am	Invited talk continues.	**AS-ThM-5** Variation of SIMS Secondary Ion Yield of Si and Mg Dopants in GaN Grown by MOCVD, ***M. K. Indika Senevirathna,*** Clark Atlanta University; *A Kozhanov, M Vernon, G Cross,* Georgia State University; *G Cooke,* Hiden Analytical Ltd, UK; *M Williams,* Clark Atlanta University
9:40am	**MI+2D+AS+EM-ThM-6** Magnetic Textures in Chiral Magnet MnGe Observed with SP-STM, ***Jacob Repicky,*** *J Corbett, T Liu, R Bennett, A Ahmed,* The Ohio State University; *J Guerrero-Sanchez,* National Autonomous University of Mexico; *R Kawakami, J Gupta,* The Ohio State University	**AS-ThM-6** Impact of the Molecular Weight on the Depth Profiling of Polymer Thin Films using Low Energy Cs^+ Sputtering, ***Amal Ben Hadj Mabrouk,*** Univ. Grenoble Alpes, CEA, LETI, Grenoble; *M Veillerot,* Univ. Grenoble Alpes, CEA, LETI, Grenoble, France; *A Chateauminois,* Soft Matter Science and Engineering Laboratory (SIMM), PSL Research University, France; *C Licitra,* Univ. Grenoble Alpes, CEA, LETI, Grenoble
10:00am	**BREAK - Complimentary Coffee in Exhibit Hall**	**BREAK - Complimentary Coffee in Exhibit Hall**
10:20am	**BREAK - Complimentary Coffee in Exhibit Hall**	**BREAK - Complimentary Coffee in Exhibit Hall**
10:40am	**BREAK - Complimentary Coffee in Exhibit Hall**	**BREAK - Complimentary Coffee in Exhibit Hall**
11:00am	**INVITED: MI+2D+AS+EM-ThM-10** Dzyaloshinskii-Moriya Interaction in Magnetic Multilayers, ***Hans Nembach,*** National Institute of Sandards and Technology (NIST)	**AS-ThM-10** Probing the Surface Structure of Au-Pt Core-Shell Nanoparticles, *C Engelbrekt,* ***Ich Tran,*** *M Law,* University of California, Irvine
11:20am	Invited talk continues.	**AS-ThM-11** Correlating Multiple Data Streams for Valence State Identification in Transition Metal Oxide during XPS Depth Profiling, ***Zhenzhong Yang,*** *C Wang, M Engelhard, Z Zhu, Y Du,* Pacific Northwest National Laboratory
11:40am	**INVITED: MI+2D+AS+EM-ThM-12** Transport in Goniopolar and (pxn) Metals, ***Joseph Heremans,*** *B He, L Zheng, Y Wang, M Arguilla, N Cultrara, M Scudder, J Goldberger, W Windl,* The Ohio State University	**AS-ThM-12** Using Atom Probe Tomography for Three-dimensional Visualization of Sb Segregation in InAs/InAsSb Superlattices, ***Nicole Kotulak,*** *J Nolde, M Twigg, K Knipling,* U.S. Naval Research Laboratory; *D Lubyshev, J Fastenau, A Liu,* IQE Inc.; *E Aifer,* U.S. Naval Research Laboratory
12:00pm	Invited talk continues.	**AS-ThM-13** Multi-technique Surface Analysis of Graphenes, ***Kateryna Artyushkova,*** Physical Electronics and University of New Mexico; *B Schmidt, J Mann, A Ellsworth, J Newman,* Physical Electronics

Thursday Morning, October 24, 2019

	Fundamental Aspects of Material Degradation Focus Topic **Room A212 - Session DM+BI+SS-ThM** **Material Stabilities and Technology for Degradation Protection** **Moderators:** Markus Valtiner, Vienna University of Technology, Austria, Gareth S. Parkinson, TU Wien, Austria	**Fundamental Discoveries in Heterogeneous Catalysis Focus Topic** **Room A213 - Session HC+2D+SS-ThM** **Nanoscale Surface Structure in Heterogeneously-Catalyzed Reactions** **Moderators:** Rebecca Fushimi, Idaho National Laboratory, Eric High, Tufts University
8:00am	**DM+BI+SS-ThM-1** Extremely Thin Protective Oxide Layer for Reflective Silver Thin Films, ***Midori Kawamura***, *E Kudo, Y Sasaki, T Kiba, Y Abe, K Kim,* Kitami Institute of Technology, Japan*; H Murotani,* Tokai University, Japan	
8:20am	**DM+BI+SS-ThM-2** Influence of the Electric Double Layer on Degradation of Materials, ***Dominik Dworschak***, *M Valtiner,* Vienna University of Technology, Austria	**HC+2D+SS-ThM-2** Low-temperature Investigation of Propylene on TiO_2/Au(111), *M Gillum, M DePonte, J Wilke, E Maxwell, V Lam, D Schlosser,* ***Ashleigh Baber***, James Madison University
8:40am	**INVITED: DM+BI+SS-ThM-3** Key Issues for the Stability of Protective Surface Oxides, ***Philippe Marcus***, CNRS - Chimie ParisTech, France	**INVITED: HC+2D+SS-ThM-3** Structure and Reactivity of Supported Oxide and Metal Nanoparticles, ***Geoff Thornton***, University College London, UK
9:00am	Invited talk continues.	Invited talk continues.
9:20am	**DM+BI+SS-ThM-5** Controlling and Observing Localized Dealloying Corrosion and Dissolution via Lateral Modification of Surfactant Inhibitor Layers, *S Neupane,* Hasselt University, Belgium*;* ***Frank Uwe Renner***, IMEC vzw. Division IMOMEC, Belgium	**HC+2D+SS-ThM-5** Catalysis by Well-defined Oxide Nanostructures: From Atomic-scale Properties to Rational Design, ***Fan Yang***, Dalian Institute of Chemical Physics, China
9:40am	**DM+BI+SS-ThM-6** *In Situ* Characterization of Interactions at Polymer/Metal Oxide Interfaces Under Aqueous Conditions by a Spectro-electrochemical Approach, ***Sven Pletincx***, Vrije Universiteit Brussel, Belgium*; L Fockaert, A Mol,* Delft University of Technology, Netherlands*; H Terryn, T Hauffman,* Vrije Universiteit Brussel, Belgium	**HC+2D+SS-ThM-6** Structural and Chemical Effects of Cesium on the Cu(111) and Cu_xO/Cu(111) Surface, ***Rebecca Hamlyn***[1], Stony Brook University*; M Mahapatra,* Brookhaven National Laboratory*; I Orozco,* Stony Brook University*; M White, S Senanayake, J Rodriguez,* Brookhaven National Laboratory
10:00am	**BREAK - Complimentary Coffee in Exhibit Hall**	**BREAK - Complimentary Coffee in Exhibit Hall**
10:20am	**BREAK - Complimentary Coffee in Exhibit Hall**	**BREAK - Complimentary Coffee in Exhibit Hall**
10:40am	**BREAK - Complimentary Coffee in Exhibit Hall**	**BREAK - Complimentary Coffee in Exhibit Hall**
11:00am	**INVITED: DM+BI+SS-ThM-10** Design of Corrosion Resistant High Entropy Alloys, ***Gerald Frankel***, *C Taylor, W Windl,* The Ohio State University*; J Scully,* University of Virginia*; J Locke,* The Ohio State University*; P Lu,* Questek Innovations	**INVITED: HC+2D+SS-ThM-10** Mythbusting: From Single Crystals in UHV to Catalytic Reactors, ***Robert Madix***, Harvard University
11:20am	Invited talk continues.	Invited talk continues.
11:40am	**DM+BI+SS-ThM-12** Determination of Hydrogen in High Strength Steels using Scanning Kelvin Probe Force Microscopy, ***Ines Traxler***, *G Schimo-Aichhorn,* CEST Competence Centre for Electrochemical Surface Technology, Austria*; A Muhr, G Luckeneder, H Duchaczek, K Stellnberger,* voestalpine Stahl GmbH, Austria*; D Rudomilova, T Prosek,* University of Chemistry and Technology Prague, Czech Republic*; B Lutzer,* CEST Competence Centre for Electrochemical Surface Technology, Austria*; D Stifter, S Hild,* Johannes Kepler University Linz, Austria	**HC+2D+SS-ThM-12** Cooperativity Between Pd and AgO_x Phases on Ag(111), *V Mehar, M Yu,* ***Jason Weaver***, University of Florida
12:00pm	**DM+BI+SS-ThM-13** Reflection Mode Interferometry for studying interfacial processes, ***Kai Schwenzfeier***, *P Bilotto, M Lengauer, C Merola, H Cheng, M Valtiner,* TU Wien, Austria	**HC+2D+SS-ThM-13** Migration Across Metal/Metal Oxide Interfaces: Enhancing the Reactivity of Ag Oxide with H_2 by the Presence of Pd/Pd Oxide, ***Christopher O'Connor***[1], *M van Spronsen, E Muramoto, T Egle, R Madix, C Friend,* Harvard University

[1] **Heterogeneous Catalysis Graduate Student Presentation Award Finalist**

Thursday Morning, October 24, 2019

	Electronic Materials and Photonics Division **Room A214 - Session EM+AP+MS+NS+TF-ThM** **Advanced Processes for Interconnects and Devices** **Moderators:** Andy Antonelli, Nanometrics, Bryan Wiggins, Intel Corporation	**Advanced Surface Engineering Division** **Room A215 - Session SE+PS-ThM** **Plasma-assisted Surface Modification and Deposition Processes** **Moderators:** Robert Franz, Montanuniversität Leoben, Jianliang Lin, Southwest Research Institute
8:00am	**EM+AP+MS+NS+TF-ThM-1** High-density Plasma for Soft Etching of Noble Metals, ***Gerhard Franz***, *V Sushkov,* Munich University of Applied Sciences, Germany; *W Oberhausen, R Meyer,* Technische Universität München, Germany	**SE+PS-ThM-1** Core/Shell Particles using a Plasma-based Reactors, ***Santiago Vargas-Giraldo***, *D Galeano-Osorio, C Castano,* Virginia Commonwealth University
8:20am	**EM+AP+MS+NS+TF-ThM-2** Crystalline InP Growth and Device Fabrication Directly on Amorphous Dielectrics at Temperatures below 400ºC for Future 3D Integrated Circuits, ***Debarghya Sarkar***, *Y Xu, S Weng, R Kapadia,* University of Southern California	**SE+PS-ThM-2** Formation Mechanisms of Converted Layer During Erosion of Composite Al-Cr Arc Cathodes, ***Mehran Golizadeh***, *F Mendez Martin, B Rashkova,* Montanuniversität Leoben, Austria; *S Kolozsvári,* Plansee Composite Materials GmbH, Lechbruck am See, Germany; *R Franz,* Montanuniversität Leoben, Austria
8:40am	**INVITED: EM+AP+MS+NS+TF-ThM-3** The Role and Requirements of Selective Deposition in Advanced Patterning, ***Charles Wallace***, Intel Corporation	**SE+PS-ThM-3** Self-organization of Plasma in RF Magnetron Sputtering, ***Matjaz Panjan***, Jozef Stefan Institute, Slovenia
9:00am	Invited talk continues.	**SE+PS-ThM-4** Study of High Power Pulsed Magnetron Sputtering Discharge with Positive Bias on the Target after the Main Pulse, ***Ivan Shchelkanov***, *T Houlahan, J McLain, I Haehnlein, B Jurczyk, R Stubbers,* Starfire Industries LLC; *D Barlaz, D Ruzic,* University of Illinois at Urbana-Champaign
9:20am	**EM+AP+MS+NS+TF-ThM-5** Graphene-Template Assisted Selective Epitaxy (G-TASE) of Group IV Semiconductors, ***M. Arslan Shehzad***, *A T. Mohabir, M Filler,* Georgia Institute of Technology	**INVITED: SE+PS-ThM-5** Innovative PVD Strategies for the Design of Novel TiO_2-based Photoanode Utilized in Dye-sensitized Solar Cells, ***Rony Snyders***, University of Mons, Belgium
9:40am	**EM+AP+MS+NS+TF-ThM-6** Resistivity and Surface Scattering Specularity at (0001) Ru/dielectric Interfaces, *S Ezzat,* University of Central Florida; *P Mani,* View Dynamic Glass, Inc.; *A Khaniya, W Kaden,* University of Central Florida; *D Gall,* Rensselaer Polytechnic Institute; *K Barmak,* Columbia University; ***Kevin Coffey***, University of Central Florida	Invited talk continues.
10:00am	**BREAK - Complimentary Coffee in Exhibit Hall**	**BREAK - Complimentary Coffee in Exhibit Hall**
10:20am	**BREAK - Complimentary Coffee in Exhibit Hall**	**BREAK - Complimentary Coffee in Exhibit Hall**
10:40am	**BREAK - Complimentary Coffee in Exhibit Hall**	**BREAK - Complimentary Coffee in Exhibit Hall**
11:00am	**INVITED: EM+AP+MS+NS+TF-ThM-10** Electrochemical Atomic Layer Deposition and Etching of Metals for Atomically-Precise Fabrication of Semiconductor Interconnects, *Y Gong, K Venkatraman,* ***Rohan Akolkar***, Case Western Reserve University	**SE+PS-ThM-10** Enhancing the Far Ultra-Violet Optical Properties of Aluminum Mirrors with a Single Step Approach to Oxide Removal and Fluorine Passivation, ***David Boris***, U.S. Naval Research Laboratory; *A Kozen, S Rosenberg,* American Society for Engineering Education (residing at U.S. Naval Research Laboratory); *J del Hoyo, G Richardson, M Quijada,* NASA Goddard Spaceflight Center; *S Walton,* U.S. Naval Research Laboratory
11:20am	Invited talk continues.	**SE+PS-ThM-11** Improving the Crystallinity of Inorganic Coatings Synthesized by Atmospheric Plasma using a New Device for Heating the Substrate, ***Antoine Remy***, *M Fall, F Reniers,* Université Libre de Bruxelles, Belgium
11:40am	**EM+AP+MS+NS+TF-ThM-12** Mechanical Properties of Patterned low-κ Films Measured by Brillouin Light Scattering, ***Jon Zizka***, *H Wijesinghe,* The Ohio State University; *S King, H Yoo,* Intel Corporation, USA; *R Sooryakumar,* The Ohio State University	**SE+PS-ThM-12** Improved Nitride Formation on Titanium Substrates by Femtosecond Laser Processing with Secondary Plasma, ***Jeremy Mettler***, *D Barlaz,* University of Illinois at Urbana-Champaign; *B Jurczyk,* Starfire Industries LLC; *D Ruzic,* University of Illinois at Urbana-Champaign
12:00pm	**EM+AP+MS+NS+TF-ThM-13** Wafer-Scale Fabrication of Carbon-Based Electronic Devices, ***Zhigang Xiao***, *J Kimbrough, J Cooper, K Hartage, Q Yuan,* Alabama A&M University	**SE+PS-ThM-13** Characterizing the Spatially Dependent Properties of Plasma Polymerized Acrylic Acid Films, ***Karyn Jarvis***, *S McArthur,* Swinburne University of Technology, Australia

Thursday Morning, October 24, 2019

	2D Materials **Room A216 - Session 2D+EM+MI+NS+QS+SS-ThM** **Dopants, Defects, and Interfaces in 2D Materials** **Moderator:** Evan Reed, Stanford University	**Surface Science Division** **Room A220-221 - Session SS+AS+HC+TL-ThM** **Surface Science of Energy Conversion and Storage** **Moderators:** Steven L. Tait, Indiana University, Francisco Zaera, University of California, Riverside
8:00am	**INVITED: 2D+EM+MI+NS+QS+SS-ThM-1** Interfacial Engineering of Chemically Reactive Two-Dimensional Materials, ***Mark Hersam***, Northwestern University	**INVITED: SS+AS+HC+TL-ThM-1** Chemical and Electrochemical Stability of Perovskite Oxide Surfaces in Energy Conversion: Mechanisms and Improvements, ***Bilge Yildiz***, Massachusetts Institute of Technology
8:20am	Invited talk continues.	Invited talk continues.
8:40am	**2D+EM+MI+NS+QS+SS-ThM-3** Effects of Mn Doping on the Surface Electronic Band Structure and Bulk Magnetic Properties of ZnS and CdS Quantum Dot Thin Films, ***Thilini K. Ekanayaka***[1], *G Gurung,* University of Nebraska-Lincoln; *G Rimal,* Rutgers University; *S Horoz,* Siirt University, Turkey; *J Tang, T Chien,* University of Wyoming; *T Paudel, A Yost,* University of Nebraska-Lincoln	**SS+AS+HC+TL-ThM-3** Mechanism of Oxygen Reduction Reaction on Nitrogen-doped Carbon Catalysts, ***Junji Nakamura***, University of Tsukuba, Japan
9:00am	**2D+EM+MI+NS+QS+SS-ThM-4** Interaction of Molecular O_2 with Organolead Halide Nanorods by Single-Particle Fluorescence Microscopy, ***Juvinch Vicente***, *J Chen,* Ohio University	**SS+AS+HC+TL-ThM-4** Copper Corrosion Inhibition Investigated on the Molecular Scale Using APXPS, ***Bo-Hong Liu***, Lawrence Berkeley National Laboratory; *O Karslıoğlu,* Lawrence Berkeley Nationa lLaboratory; *M Salmeron, S Nemšák,* Lawrence Berkeley National Laboratory; *H Bluhm,* Fritz Haber Institute of the Max Planck Society, Germany
9:20am	**2D+EM+MI+NS+QS+SS-ThM-5** Complementary Growth of 2D Transition Metal Dichalcogenide Semiconductors on Metal Oxide Interfaces, *T Wickramasinghe,* ***Gregory Jensen***, *R Thorat,* Nanoscale and Quantum Phenomena Institute; *S Aleithan,* Nanoscale and Quantum Phenomena Institute, Saudi Arabia; *S Khadka, E Stinaff,* Nanoscale and Quantum Phenomena Institute	**INVITED: SS+AS+HC+TL-ThM-5** Analysis and Deliberate Modification of Electrochemical Interfaces, ***Esther Takeuchi***, *K Takeuchi, A Marschilok,* Stony Brook University
9:40am	**2D+EM+MI+NS+QS+SS-ThM-6** Kagome-type Lattice Instability and Insulator-metal Transition in an Alkali-doped Mott Insulator on Si(111), ***Tyler Smith***, *H Weitering,* University of Tennessee Knoxville	Invited talk continues.
10:00am	**BREAK - Complimentary Coffee in Exhibit Hall**	**BREAK - Complimentary Coffee in Exhibit Hall**
10:20am	**BREAK - Complimentary Coffee in Exhibit Hall**	**BREAK - Complimentary Coffee in Exhibit Hall**
10:40am	**BREAK - Complimentary Coffee in Exhibit Hall**	**BREAK - Complimentary Coffee in Exhibit Hall**
11:00am	**2D+EM+MI+NS+QS+SS-ThM-10** Chemical Migration and Dipole Formation at TMD/TI Interfaces, ***Brenton Noesges***, *T Zhu,* The Ohio State University; *D O'Hara,* University of California, Riverside; *R Kawakami, L Brillson,* The Ohio State University	**SS+AS+HC+TL-ThM-10** An Investigation on Active Sites of La_2O_3 Catalyst for OCM Reaction: A Combined Study of *in situ* XRD, XPS and Online MS, ***Yong Yang***, *C Guan, E Vovk, Z Liu, X Zhou, J Liu, Y Pang,* ShanghaiTech University, China
11:20am	**2D+EM+MI+NS+QS+SS-ThM-11** Atomically Resolved Electronic Properties of Defects in the in-plane Anisotropic Lattice of ReS_2, ***Adina Luican-Mayer***, University of Ottawa, Canada	**SS+AS+HC+TL-ThM-11** Interaction of Amino Acids on Au(111) as Studied with EC-STM: From Islands to Magic Fingers, *J Phillips, K Boyd, I Baljak, L Harville,* ***Erin Iski***, University of Tulsa
11:40am	**2D+EM+MI+NS+QS+SS-ThM-12** Charge Diminishing at the Si-SiO_2 System and its Influence on the Interface Properties, ***Daniel Kropman***, *V Seeman,* Tartu University, Estonia; *A Medvids, P Onufrievs,* Riga Technical University, Latvia	**SS+AS+HC+TL-ThM-12** Deposition and Structure of MoO_3 Clusters on Anatase TiO_2 (101), ***Nassar Doudin***, *Z Dohnálek,* Pacific Northwest National Laboratory
12:00pm	**2D+EM+MI+NS+QS+SS-ThM-13** Size-independent "Squeezed" Shape of Metal Clusters Embedded Beneath Layered Materials, *A Lii-Rosales,* Ames Laboratory and Iowa State University; *S Julien, K Wan,* Northeastern University; *Y Han,* Ames Laboratory and Iowa State University; *K Lai,* Iowa State University; *M Tringides, J Evans,* ***Patricia A. Thiel***, Ames Laboratory and Iowa State University	**SS+AS+HC+TL-ThM-13** Ionic Conducting Nanostructures Tailored on Porous Mixed Conduction Composite Electrodes for Enhancement of Oxygen Reduction Reaction, ***Jong-Eun Hong***, *D Joh, S Kim, H Ishfaq,* Korea Institute of Energy Research, Republic of Korea; *C Jung, J Park,* DGIST, Republic of Korea; *S Lee, H Kim, T Lim, S Park, R Song,* Korea Institute of Energy Research, Republic of Korea; *K Lee,* DGIST, Republic of Korea

[1] **National Student Award Finalist**

Thursday Morning, October 24, 2019

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

[1] **NSTD Early Career Award Finalist**

Thursday Morning, October 24, 2019

	Atomic Scale Processing Focus Topic **Room B130 - Session AP+PS+TF-ThM** **Thermal Atomic Layer Etching** **Moderators:** Craig Huffman, Micron, Eric A. Joseph, IBM Research Division, T.J. Watson Research Center	**Plasma Science and Technology Division** **Room B131 - Session PS-ThM** **Plasma Diagnostics and Sources II** **Moderators:** David Lishan, Plasma-Therm LLC, Geun Young Yeom, Sungkyunkwan University, Korea
8:00am	**INVITED: AP+PS+TF-ThM-1** A Challenge for Selective Atomic Layer Etching of Non-volatile Materials Using Organometalic Complex, ***Yoshihide Yamaguchi***, *S Fujisaki, K Shinoda,* Hitachi, Japan; *H Kobayashi, K Kawamura, M Izawa,* Hitachi High Technologies, Japan	**PS-ThM-1** Measurement of Plasma Neutral Densities in a Very High Frequency Ar/NH_3 Plasma with a Line-of-sight Threshold Ionization Mass Spectrometry, ***Jianping Zhao***, *P Ventzek, C Schlechte, M Burtner,* Tokyo Electron America, Inc.; *D Li, J Ekerdt,* The University of Texas at Austin; *T Iwao, K Ishibashi,* Tokyo Electron Technology Solutions Limited, Japan
8:20am	Invited talk continues.	**PS-ThM-2** Radical Probe System for In-Situ Measurements of Hydrogen, Oxygen and Nitrogen Radical Densities, ***Dren Qerimi***, *G Panici, A Jain,* University of Illinois at Urbana-Champaign; *J Wagner,* Colorado State University; *D Ruzic,* University of Illinois at Urbana-Champaign
8:40am	**AP+PS+TF-ThM-3** Characterization of Isotropic Thermal ALE of Oxide Films and Nanometer-Size Structures, ***Andreas Fischer***, *A Routzahn, T Lill,* Lam Research Corporation	**PS-ThM-3** Post Charge Separation Grid Ion Flux Evaluation in Inductive Coupled Plasma Source Downstream Asher, ***Luke Zhang***, *S Ma,* Mattson Technology, Inc.
9:00am	**AP+PS+TF-ThM-4** Advanced Selective Chemical Dry Etch for Oxide and Si-based Material, ***Li-Hung Chen***, *T Kato, K Nakahata, K Takeya,* Tokyo Electron Technology Solutions Limited, Japan	**PS-ThM-4** Development of a Novel Langmuir Probe for the Investigation of Dusty Non-thermal Plasmas, ***Austin Woodard***[1], *L Mangolini, K Shojaei, C Berrospe,* University of California, Riverside
9:20am	**AP+PS+TF-ThM-5** Mechanisms of Thermal Atomic Layer Etching (ALE) of Metal by Deprotonation and Complex Formation of Hexafluoroacetylacetone (hfacH), ***Abdulrahman Basher***[1], *I Hamada,* Osaka University, Japan; *M Krstic,* Karlsruhe Institute of Technology (KIT), Germany; *M Isobe, T Ito,* Osaka University, Japan; *K Fink,* Karlsruhe Institute of Technology (KIT), Germany; *K Karahashi, Y Morikawa,* Osaka University, Japan; *W Wenzel,* Karlsruhe Institute of Technology (KIT), Germany; *S Hamaguchi,* Osaka University, Japan	**INVITED: PS-ThM-5** Historical Review of Microwave Plasma Diagnostics using Plasma Cutoff Phenomenon, ***Shin-Jae You***, *S Kim,* Chungnam National University, Republic of Korea; *D Kim,* KIMM, Republic of Korea
9:40am	**AP+PS+TF-ThM-6** Thermal Atomic Layer Etching of Amorphous and Crystalline Al_2O_3 Films, ***Jessica A. Murdzek***, *S George,* University of Colorado at Boulder	Invited talk continues.
10:00am	**BREAK - Complimentary Coffee in Exhibit Hall**	**BREAK - Complimentary Coffee in Exhibit Hall**
10:20am	**BREAK - Complimentary Coffee in Exhibit Hall**	**BREAK - Complimentary Coffee in Exhibit Hall**
10:40am	**BREAK - Complimentary Coffee in Exhibit Hall**	**BREAK - Complimentary Coffee in Exhibit Hall**
11:00am	**AP+PS+TF-ThM-10** Thermal Atomic Layer Etching (ALE) of Germanium-Rich SiGe Films, ***Aziz Abdulagatov***, *S George,* University of Colorado at Boulder	**PS-ThM-10** Characterization of Inductive Coupled Plasma Source RF Power Pulsing for Advanced Surface Treatment Applications, ***Shawming Ma***, *L Zhang, D Kohl,* Mattson Technology, Inc.
11:20am	**AP+PS+TF-ThM-11** Thermal Atomic Layer Etching of GaN and Ga_2O_3 Using Sequential Fluorination and Ligand-Exchange Reactions, ***Nicholas Johnson***, *Y Lee, S George,* University of Colorado at Boulder	**PS-ThM-11** In-situ Measurement of Deposited Tilm Thickness and Electron Density by Double Curling Probe, ***Daisuke Ogawa***, Chubu University, Japan; *Y Sakiyama,* Lam Research Corporation; *K Nakamura,* Chubu University, Japan; *H Sugai,* Nagoya Industrial Science Research Institute, Japan
11:40am	**INVITED: AP+PS+TF-ThM-12** Mechanistic Insights into Thermal Dry Atomic Layer Processing of Metals, ***Andrew Teplyakov***, University of Delaware	**PS-ThM-12** Study of Selective PECVD of Silicon on Silicon Nitride and Aluminum Oxide, ***Ghewa Akiki***, *E Johnson, P Bulkin,* LPICM, CNRS, Ecole Polytechnique, Institut Polytechnique de Paris, France; *D Daineka,* LPICM, CNRS, Ecole Polytechnique, Institut Polytechnique de Paris
12:00pm	Invited talk continues.	

[1] **Coburn & Winters Student Award Finalist**

Room B231-232

Advanced Ion Microscopy and Ion Beam Nano-engineering Focus Topic
Session HI+NS-ThM
Novel Beam Induced Material Engineering and Nano-Patterning
Moderators: Olga S. Ovchinnikova, Oak Ridge National Laboratory, Shinichi Ogawa, National Institute of Advanced Industrial Science and Technology (AIST)

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

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

Room A124-125

Thin Films Division
Session TF+AS+EL+PS+RA-ThA
Characterization of Thin Film Processes and Properties
Moderators: Richard Vanfleet, Brigham Young University, Virginia Wheeler, U.S. Naval Research Laboratory

2:20pm	**INVITED: TF+AS+EL+PS+RA-ThA-1** Phase Separation in III-V Semiconductor Thin Films, ***Mark Twigg***, *N Mahadik, N Kotulak, S Tomasulo, M Yakes,* U.S. Naval Research Laboratory
2:40pm	Invited talk continues.
3:00pm	**TF+AS+EL+PS+RA-ThA-3** In-Situ Spectroscopic Monitoring of Methylamine-Induced Hybrid Perovskite Phase Transitions, ***Jonathan Meyers***[1], *L Serafin, J Cahoon,* University of North Carolina at Chapel Hill
3:20pm	**TF+AS+EL+PS+RA-ThA-4** Angle-Resolved HAXPES Analysis of Al_xO_y and Cu_xO_y Layers formed by Metal Salt Diffusion into a poly 2-vinylpyridine (P2vP) Polymer Layer, ***Pierre Mani***, Universidad Autonoma de Ciudad Juarez, México; *M Snelgrove,* Dublin City University, Ireland; *P Rueff,* Synchrotron SOLEIL, France; *R Lundy,* Trinity College Dublin, Ireland; *J Bogan, R O´Connor,* Dublin City University, Ireland; *J Enríquez,* Universidad Autonoma de Ciudad Juarez, México; *M Morris,* Trinity College Dublin, Ireland; *G Hughes,* Dublin City University, Ireland
3:40pm	**BREAK**
4:00pm	**INVITED: TF+AS+EL+PS+RA-ThA-6** Obtaining Smooth Surfaces and Measuring Surface Roughness, ***Steven M. George***, University of Colorado at Boulder
4:20pm	Invited talk continues.
4:40pm	**TF+AS+EL+PS+RA-ThA-8** Characterizing Ultra-thin Layer Growth and Area Selective Deposition using High Resolution Low Energy Ion Scattering (LEIS), ***Thomas Grehl***, IONTOF GmbH, Germany; *P Brüner,* ION-TOF GmbH, Germany; *V Pesce, B Pelissier, R Gassilloud, C Vallée,* Laboratoire des Technologies de la Microélectronique (LTM), France
5:00pm	**TF+AS+EL+PS+RA-ThA-9** Real-Time Monitoring of Aluminum Oxidation Through Wide Band Gap MgF_2 Layers for Protection of Space Mirrors, *B Johnson, T Avval, G Hodges, K Membreno, D Allred,* ***Matthew Linford***, Brigham Young University
5:20pm	**INVITED: TF+AS+EL+PS+RA-ThA-10** Visualization of Ultrafast Charge Motion in Thin Films via THz Emission Spectroscopy, ***Aaron Lindenberg***, Stanford University
5:40pm	Invited talk continues.

[1] **National Student Award Finalist**

Room A210

2:20pm **INVITED: LS+AC+NS-ThA-1** Triplet Dynamics in Photovoltaic Materials Measured with Time Resolved X-Ray Spectroscopies, *R Costantini,* University of Trieste*; R Faber,* Technical University of Denmark*; A Cossaro, A Verdini, L Floreano,* CNR - Istituto Officine Materiali*; C Haettig,* Ruhr-University Bochum, Germany*; A Morgante,* University of Trieste, Italy*; S Coriani,* Technical University of Denmark*;* ***Martina Dell'Angela,*** CNR - Istituto Officine Materiali, Italy

2:40pm Invited talk continues.

3:00pm **INVITED: LS+AC+NS-ThA-3** Synchrotron X-Ray Tomography to Understand Structure and Physical Transformations in Solid State Batteries, ***Kelsy Hatzell,*** *M Dixit,* Vanderbilt University

3:20pm Invited talk continues.

Frontiers of New Light Sources Applied to Materials, Interfaces, and Processing Focus Topic Session LS+AC+NS-ThA
Photon Science for Imaging Materials from the Meso- to the Nanoscale
Moderator: Maya Kiskinova, Elettra-Sincrotrone Trieste, Italy

3:40pm **BREAK**

4:00pm **LS+AC+HC+SS-ThA-6** Resolving X-ray Based Spectroscopies in the Sub-nanometer Regime: Enabling Atomic Scale Insights into CO Adsorption on Thin Film Surfaces, ***Heath Kersell,*** *B Eren, C Wu,* Lawrence Berkeley National Laboratory*; I Waluyo, A Hunt,* Brookhaven National Laboratory*; G Somorjai, M Salmeron,* Lawrence Berkeley National Laboratory

4:20pm **LS+AC+HC+SS-ThA-7** Imaging with XPS: Advanced Characterization for Advanced Materials and Devices, ***Tatyana Bendikov,*** *H Kaslasi, E Sanders, E Joselevich, D Cahen,* Weizmann Institute of Science, Israel

4:40pm **INVITED: LS+AC+HC+SS-ThA-8** Time-Resolved Photoemission with Free-Electron Lasers, ***Kai Rossnagel,*** CAU Kiel / DESY, Germany

5:00pm Invited talk continues.

5:20pm **INVITED: LS+AC+HC+SS-ThA-10** Ultrafast Magnetization Dynamics on the Nanoscale, ***Bastian Pfau,*** Max Born Institute, Germany

5:40pm Invited talk continues.

Frontiers of New Light Sources Applied to Materials, Interfaces, and Processing Focus Topic Session LS+AC+HC+SS-ThA
Emerging Methods with New Coherent Light Sources
Moderator: Germán Rafael Castro, Spanich CRG BM25-SpLine Beamline at the ESRF

Room A211

Applied Surface Science Division
Session AS-ThA
Role of Surfaces and Interfaces in Energy Material and Industrial Problems
Moderators: David M. Carr, Physical Electronics, Alan Spool, Western Digital Corporation

2:20pm	**INVITED: AS-ThA-1** Characterization of Glass and Durable Optical Surfaces and Their Modes of Failure, ***Albert Fahey,*** *D Baker, T Dimond,* Corning Inc.
2:40pm	Invited talk continues.
3:00pm	**AS-ThA-3** Determination of Liquid Laundry Additives Across Fabric Surfaces, ***Michael Clark, Jr.,*** *A Peera, S Donovan, R Pulukkody,* The Dow Chemical Company
3:20pm	**AS-ThA-4** Depth Profiling of Silicones with GCIB, Do They Behave like Organic or Inorganic Molecules?, ***Michaeleen Pacholski,*** *M Clark, Jr., P Vlasak, C McMillan,* The Dow Chemical Company
3:40pm	**BREAK**
4:00pm	**AS-ThA-6** Active Control of Interfacial Chemistry for Thin Film Solar Cells, ***Alexandra Koziel,*** *K Montiel, L Wilson, J Carter, I Martin,* Case Western Reserve University
4:20pm	**INVITED: AS-ThA-7** Solar Energy From a Big-Picture Perspective to Nanoscale Insights via TOF-SIMS, ***Steven Harvey,*** National Renewable Energy Laboratory
4:40pm	Invited talk continues.
5:00pm	**AS-ThA-9** Investigation of Surface and Bulk Properties of Extended Surface PtNi and PtNiCo Catalysts, ***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
5:20pm	**INVITED: AS-ThA-10** Interfaces in Electrodeposited Li-Ion Battery Electrodes, ***Paul Braun,*** University of Illinois at Urbana-Champaign
5:40pm	Invited talk continues.

	Room A212	
2:20pm	**INVITED: DM1+BI+SS-ThA-1** Utilizing Experimental and MD Simulation Approaches in the Understanding and Design of Low Fouling Interfaces, ***Paul Molino,*** University of Wollongong, Australia	**Fundamental Aspects of Material Degradation Focus Topic** **Session DM1+BI+SS-ThA** **Low Fouling Interfaces and Environmental Degradation** **Moderator:** Axel Rosenhahn, Ruhr-University Bochum
2:40pm	Invited talk continues.	
3:00pm	**DM1+BI+SS-ThA-3** Study of Environmental Exposure Effects on Pristine and DC Magnetron Sputtering Metallic Coated 3D Printed Polymers, *D Mihut,* ***Arash Afshar,*** *P Chen,* Mercer University	
3:20pm	**DM1+BI+SS-ThA-4** Reaction Mechanism of Chloride-induced Depassivation of Oxide Films: a Density Functional Theory Study, *Q Pang, H DorMohammadi, K Oware Sarfo, P Murkute, Y Zhang, O Isgor, J Tucker,* ***Líney Árnadóttir,*** Oregon State University	
3:40pm	**BREAK**	
4:00pm	**INVITED: DM2+BI+SS-ThA-6** Stability Challenges in Electrocatalysis, ***Serhiy Cherevko,*** Forschungszentrum Jülich GmbH, Germany	**Fundamental Aspects of Material Degradation Focus Topic** **Session DM2+BI+SS-ThA** **Fundamentals of Catalyst Degradation: Dissolution, Oxidation and Sintering** **Moderator:** Gareth S. Parkinson, TU Wien, Austria
4:20pm	Invited talk continues.	
4:40pm	**DM2+BI+SS-ThA-8** Self-limited Growth of an Oxyhydroxide Phase at the Fe_3O_4(001) Surface in Liquid and Ambient Pressure Water, ***Florian Kraushofer,*** TU Wien, Austria*; F Mirabella,* TU Wien, Austria, Germany*; J Xu, J Pavelec, J Balajka, M Müllner, N Resch, Z Jakub, J Hulva, M Meier, M Schmid, U Diebold, G Parkinson,* TU Wien, Austria	
5:00pm	**DM2+BI+SS-ThA-9** The Impact of W on the Early Stages of Oxide Evolution for Ni-Cr Alloys, ***Cameron Volders,*** *V Avincola,* University of Virginia*; I Waluyo,* Brookhaven National Laboratory*; J Perepezko,* University of Wisconsin - Madison*; P Reinke,* University of Virginia	
5:20pm	**DM2+BI+SS-ThA-10** The Stability of Platinum in Non-aqueous Media, *J Ranninger, S Wachs, J Möller, K Mayrhofer,* ***Balázs Berkes,*** Forschungszentrum Jülich GmbH, Germany	
5:40pm	**DM2+BI+SS-ThA-11** Stabilizing Transparent Conductive Oxides as a Route to Long-Lived Thin Film Photovoltaics: A Case Study in CIGS, *N Kovach,* Colorado School of Mines*; R Matthews, E Pentzer,* Case Western Reserve University*; L Mansfield,* National Renewable Energy Laboratory*; T Peshek,* NASA Glenn Research Center*;* ***Ina Martin,*** Case Western Reserve University	

Room A213

Fundamental Discoveries in Heterogeneous Catalysis Focus Topic
Session HC+SS+TL-ThA
Reaction Pathways and Addressing Challenges for Energy Production in the 21st Century & Heterogeneous Catalysis Graduate Student Award Presentation
Moderators: Sanjaya Senanayake, Brookhaven National Laboratory, Arthur Utz, Tufts University

2:20pm	**HC+SS+TL-ThA-1** High Resolution XPS to Identify C_xH_y Surface Species on a Cobalt Model Catalyst: New Experimental Evidence for the Importance of Alkylidynes as Growth Intermediates in Fischer-Trospch Synthesis, ***Kees-Jan Weststrate***, Syngaschem BV, Netherlands; *D Sharma, D Garcia Rodriguez, M Gleeson,* DIFFER, Eindhoven University, The Netherlands, Netherlands; *H Fredriksson, H Niemantsverdriet,* Syngaschem BV, Netherlands
2:40pm	**HC+SS+TL-ThA-2** Beam Reflectivity Measurements of Carbon Dissolution on Nickel Single Crystal Catalysts, ***Eric High***, *D Tinney, A Utz,* Tufts University
3:00pm	**INVITED: HC+SS+TL-ThA-3** Fundamental Research Opportunities to Advance Energy Technologies, ***Bruce Garrett***, Department of Energy
3:20pm	Invited talk continues.
3:40pm	**BREAK**
4:00pm	**HC+SS+TL-ThA-6** Oxidation and Redox-Mediated Transformation of a Tb2O3 Thin Film from the Cubic Fluorite to Bixbyite Structure, ***Christopher Lee***, *J Weaver,* University of Florida
4:20pm	**HC+SS+TL-ThA-7** Discrimination of Surface Storage and Mechanistic Pathways Using Dynamic Pulse Response Experiments, *Y Wang, M Kunz,* Idaho National Laboratory; *G Yablonsky,* Washington University in Saint Louis; ***Rebecca Fushimi***, Idaho National Laboratory
4:40pm	**INVITED: HC+SS+TL-ThA-8** Nuclearity Effects in Supported Zinc and Gallium Catalysts for Alkane Dehydrogenation, ***Susannah Scott***, University of California at Santa Barbara
5:00pm	Invited talk continues.
5:20pm	**HC+SS+TL-ThA-10** Fundamental Insights into Hydrocarbon Conversion Mechanisms in Lewis and Brønsted Acid Zeolites using Temporal Analysis of Products, ***Hari Thirumalai***[1], *J Rimer, L Grabow,* University of Houston

[1] **Morton S. Traum Award Finalist**

Room A215

Advanced Surface Engineering Division
Session SE-ThA
New Challenges and Opportunities in Surface Engineering
Moderators: Jolanta Klemberg-Sapieha, Ecole Polytechnique de Montreal, Canada, Matjaz Panjan, Jozef Stefan Institute, Slovenia

2:20pm **INVITED: SE-ThA-1** Evaluating Electro-Mechanical Reliability using In-Situ Methods, ***Megan J. Cordill,*** *O Glushko,* Erich Schmid Institute of Materials Science, Austrian Academy of Sciences, Austria

2:40pm Invited talk continues.

3:00pm **INVITED: SE-ThA-3** Surface Engineering for Bearing Applications: Present Status and (Near)-Future Needs, ***Esteban Broitman,*** SKF - RTD - Research & Technology Development Center, Netherlands

3:20pm Invited talk continues.

3:40pm **BREAK**

4:00pm **SE-ThA-6** *In situ* Scanning Electron Microscopy based Uniaxial Compression of sub-micrometer-size NbC(100) Single-crystalline Pillars, *A Aleman, K Tanaka, H Zaid, J Yang,* ***Suneel Kodambaka,*** University of California, Los Angeles

4:20pm **SE-ThA-7** Thermal Stability of MoNbTaVW High Entropy Alloys Thin Films Deposited by Cathodic Arc, *A Xia,* ***Robert Franz,*** Montanuniversität Leoben, Austria

4:40pm **SE-ThA-8** Erosion Resistant Coatings Inside Narrow Tubes to Protect Aircraft Engine Components, *A Kilicaslan, O Zabeida, E Bousser, M Martinu,* ***Jolanta Klemberg-Sapieha,*** Polytechnique Montreal, Canada

Spectroscopic Ellipsometry Focus Topic
Session EL-ThA
Spectroscopic Ellipsometry Late New Session
Moderator: Tino Hofmann, University of North Carolina at Charlotte

5:00pm **EL-ThA-9** Far-infrared Dielectric Functions of $Hg_{1-x}Cd_xSe$ Thin Films Determined via Ellipsometry and Reflectivity, ***Frank Peiris,*** *J Lyons,* Kenyon College; *G Brill,* U.S. Army Research Laboratory

5:20pm **EL-ThA-10** Tunable Giant Circular Dichroism in Spatially-coherent Si-Au/Ag Nano-plasmonic Chiral Heterostructures, ***Ufuk Kilic,*** *M Hilfiker,* University of Nebraska-Lincoln; *R Feder,* The Fraunhofer Institute for Microstructure of Materials and Systems (IMWS), Germany; *R Korlacki, E Schubert, C Argyropoulos, M Schubert,* University of Nebraska-Lincoln

5:40pm **EL-ThA-11** Numerical Ellipsometry: Methods for Selecting Measurements and Techniques for Advanced Analysis Applied to β -Gallium Oxide, ***Frank Urban,*** Florida International University; *D Barton,* retired; *M Schubert,* University of Nebraska-Lincoln

Thursday Afternoon, October 24, 2019

	2D Materials **Room A216 - Session 2D+AS+BI+HC+MN+NS+PS+SS+TL-ThA** **Surface Chemistry, Functionalization, Bio, Energy and Sensor Applications** **Moderator:** Mark Edmonds, Monash University, Australia	**Surface Science Division** **Room A220-221 - Session SS+2D+AP+AS+OX+SE-ThA** **Dynamics at Surfaces/Reactions and Imaging of Oxide Surfaces** **Moderators:** Irene Groot, Leiden University, The Netherlands, William E. Kaden, University of Central Florida
2:20pm	**2D+AS+BI+HC+MN+NS+PS+SS+TL-ThA-1** Molecular Layers on Nanoporous Gold Electrodes, ***Elizabeth Landis,*** College of the Holy Cross	**SS+2D+AP+AS+OX+SE-ThA-1** Adsorption, Reaction, and Diffusion of Energetic Reagents on Morphologically Diverse Thin Films, ***Rebecca Thompson***[12], *M Brann, S Sibener,* The University of Chicago
2:40pm	**2D+AS+BI+HC+MN+NS+PS+SS+TL-ThA-2** Thermotropic Liquid Crystal (5CB) on Two-dimensional Materials, ***Paul Brown,*** American Society for Engineering Education*; S Fischer, J Kołacz, C Spillmann, D Gunlycke,* U.S. Naval Research Laboratory	**SS+2D+AP+AS+OX+SE-ThA-2** Oxidation of Semiconductors and Semimetals by Supersonic Beams of O_2 with Scanning Tunneling Microscopy Visualization, ***Ross Edel***[2], *T Grabnic, B Wiggins, S Sibener,* The University of Chicago
3:00pm	**2D+AS+BI+HC+MN+NS+PS+SS+TL-ThA-3** Is it Possible to Achieve Intra-molecular Resolution with Ambient AFM?, ***Vladimir Korolkov,*** Oxford Instruments-Asylum Research*; S Chulkov, M Watkins,* University of Lincoln, UK*; P Beton,* The University of Nottingham, UK	**INVITED: SS+2D+AP+AS+OX+SE-ThA-3** Studying Molecule-Surface Interactions using Rotational Orientation Control of Ground-State Molecular Beams, ***Gil Alexandrowicz,*** Swansea University, UK
3:20pm	**2D+AS+BI+HC+MN+NS+PS+SS+TL-ThA-4** Tailoring Surface Properties via Functionalized Hydrofluorinated Graphene Compounds, ***Jangyup Son,*** University of Illinois at Urbana-Champaign*; N Buzov,* University of California at Santa Barbara*; S Chen,* University of Illinois at Urbana-Champaign*; D Sung,* Sejong University, Republic of Korea*; H Ryu,* Seoul National University, Republic of Korea*; J Kwon,* Yonsei University, Republic of Korea*; S Kim, J Xu,* University of Illinois at Urbana-Champaign*; S Hong,* Sejong University, Republic of Korea*; W King,* University of Illinois at Urbana-Champaign*; G Lee,* Seoul National University, Republic of Korea*; A van der Zande,* University of Illinois at Urbana-Champaign	Invited talk continues.
3:40pm	**BREAK**	**BREAK**
4:00pm	**2D+AS+BI+HC+MN+NS+PS+SS+TL-ThA-6** Functionalization of MoS_2 with Halogens, *G Copetti,* IF-UFRGS, Brazil*; E Nunes,* IQ-UFRGS, Brazil*; G Soares,* IF-UFRGS, Brazil*;* ***Cláudio Radtke,*** IQ-UFRGS, Brazil	**SS+2D+AP+AS+OX+SE-ThA-6** Diffusion of (100)-epitaxially Supported 3D fcc Nanoclusters: Complex Size-dependence on the Nanoscale, ***King Chun Lai,*** *J Evans,* Iowa State University
4:20pm	**2D+AS+BI+HC+MN+NS+PS+SS+TL-ThA-7** Towards Higher Alcohol Synthesis from Syngas on 2D material-based catalysts: A First-Principles Study*, ***Tao Jiang,*** *D Le, T Rahman,* University of Central Florida	**SS+2D+AP+AS+OX+SE-ThA-7** Oxide Surface Formation on Rh Nanoparticle during O_2 Exposures Observed by Atom Probe Microscopy, ***Sten Lambeets,*** Pacific Northwest National Laboratory*; T Visart de Bocarmé,* Université Libre de Bruxelles, Belgium*; N Kruse,* Washington State University*; D Perea,* Pacific Northwest National Laboratory
4:40pm	**2D+AS+BI+HC+MN+NS+PS+SS+TL-ThA-8** Proton Conductivity Properties of Electrospun Chitosan Nanofibers, ***Woo-Kyung Lee,*** *J Pietron, D Kidwell, J Robinson, C McGann, S Mulvaney,* U.S. Naval Research Laboratory	**INVITED: SS+2D+AP+AS+OX+SE-ThA-8** Noncontact AFM on Oxide Surfaces: Challenges and Opportunities, ***Martin Setvin,*** TU Wien, Austria
5:00pm	**2D+AS+BI+HC+MN+NS+PS+SS+TL-ThA-9** Sensor for Breath and Skin Diagnostics, ***Pelagia I Gouma,*** The Ohio State University	Invited talk continues.
5:20pm	**2D+AS+BI+HC+MN+NS+PS+SS+TL-ThA-10** Symmetry Controlled Ddsorption of Diodobenzene on MoS_2, ***Zahra Hooshmand,*** University of Central Florida*; P Evans, P Dowben,* University of Nebraska - Lincoln*; T Rahman,* University of Central Florida	**SS+2D+AP+AS+OX+SE-ThA-10** Edge-Enhanced Oxygen Evolution Reactivity at Au-Supported, Ultrathin Fe2O3 Electrocatalysts, ***Xingyi Deng,*** *D Kauffman, D Sorescu,* National Energy Technology Laboratory
5:40pm	**2D+AS+BI+HC+MN+NS+PS+SS+TL-ThA-11** Mechanistic Understanding of the CO Hydrogenation Reaction on Defect Engineered 2D-TaS_2 and 2D-MoS_2 Catalysts, ***Mihai Vaida,*** University of Central Florida	**SS+2D+AP+AS+OX+SE-ThA-11** Adsorption and Reaction of Methanol on the Magnetite Fe_3O_4(001) Surface, ***Matthew Marcinkowski,*** Pacific Northwest National Laboratory*; K Adamsen,* Aarhus University, Denmark*; N Doudin, Y Yang Wang, S Smith, B Kay, Z Dohnalek,* Pacific Northwest National Laboratory

[1] **Morton S. Traum Award Finalist**

[2] **National Student Award Finalist**

	Nanometer-scale Science and Technology Division **Room A222 - Session NS-ThA** **SPM for Functional Characterization** **Moderators:** Volker Rose, Argonne National Laboratory, Renu Sharma, NIST Center for Nanoscale Science and Technology	**Plasma Science and Technology Division** **Room B130 - Session PS+2D+EM+SS+TF-ThA** **Plasma-Enhanced Atomic Layer Etching** **Moderators:** Steven Vitale, MIT Lincoln Laboratory, Mingmei Wang, TEL Technology Center, America, LLC
2:20pm	**INVITED: NS-ThA-1** Interatomic Force Laws That Evade Dynamic Measurement, ***John Sader,*** University of Melbourne, Australia	**INVITED: PS+2D+EM+SS+TF-ThA-1** Atomic Layer Etch: Real World Utilization of an Idealized Solution, ***Peter Biolsi,*** TEL Technology Center, America, LLC
2:40pm	Invited talk continues.	Invited talk continues.
3:00pm	**INVITED: NS-ThA-3** Intermittent Contact Resonance Atomic Force Microscopy (icr-Afm) for Nanoscale Mechanical Property Characterization, ***Gheorghe Stan,*** National Institute of Standards and Technology	**PS+2D+EM+SS+TF-ThA-3** Mechanism of SiN Etching Rate Fluctuation in Atomic Layer Etching, ***Akiko Hirata,*** *M Fukasawa, K Kugimiya, K Nagaoka,* Sony Semiconductor Solutions Corporation, Japan*; K Karahashi, S Hamaguchi,* Osaka University, Japan
3:20pm	Invited talk continues.	**PS+2D+EM+SS+TF-ThA-4** Effect of Polymerization on Ar+ Bombardment Modification of SiO_2 and Si_3N_4 Substrates: Molecular Dynamics Simulation Study, ***Hojin Kim,*** *Y Shi, Y Tsai, D Zhang, Y Han,* TEL Technology Center, America, LLC*; K Taniguchi,* TEL Miyagi Limited, Japan*; S Morikita,* TEL Miyagi Limited*; M Wang, A Mosden, A Metz, P Biolsi,* TEL Technology Center, America, LLC
3:40pm	**BREAK**	**BREAK**
4:00pm	**NS-ThA-6** Novel Approaches Towards Cantilevers for Functional Multiparametric AFM Characterization, ***Georg Ernest Fantner,*** *N Hosseini, M Neuenschwander, B Ghadiani,* École Polytechnique Fédéral de Lausanne, Switzerland	**INVITED: PS+2D+EM+SS+TF-ThA-6** Advanced Cyclic Plasma Etch Approaches for Metal Patterning: Synergy and Surface Modification Effects, ***Nathan Marchack,*** IBM T.J. Watson Research Center*; K Hernandez,* University of Texas at Dallas*; J Innocent-Dolor, M Hopstaken, S Engelmann,* IBM T.J. Watson Research Center
4:20pm	**NS-ThA-7** Fluid Handling using Scanning Probe Lithography for Nanocombinatorics, *V Saygin, N Alsharif,* ***Keith A. Brown,*** Boston University	Invited talk continues.
4:40pm	**NS-ThA-8** Accuracy of Tip-sample Interaction Measurements Using Dynamic Atomic Force Microscopy Techniques, *O Dagdeviren,* ***Udo D. Schwarz,*** Yale University	**PS+2D+EM+SS+TF-ThA-8** Surface Modification and Stability of Plasma-assisted Atomic-layer Etching (ALE) of Si based Materials; Analysis by Molecular Dynamics (MD) Simulation, ***Satoshi Hamaguchi,*** *M Isobe, E Tinacba, S Shigeno, Y Okada, T Ito, K Karahashi,* Osaka University, Japan
5:00pm	**NS-ThA-9** Utilizing AFM to Study the Effect *of* Malaria-derived EVs on the Mechanical and Morphological Properties of Red Blood Cells, ***Irit Rosenhek-Goldian,*** *E Dekel, Y Ohana, S Maihib, S Cohen, N Regev-Rudzkib,* Weizmann Institute of Science, Israel	**INVITED: PS+2D+EM+SS+TF-ThA-9** Innovative Future Etch Technology by Atomic-order Control, ***Yoshihide Kihara,*** *T Katsunuma, S Kumakura, T Hisamatsu, M Honda,* Tokyo Electron Miyagi Ltd., Japan
5:20pm	**INVITED: NS-ThA-10** Silicon Oxide for RRAM Application: The SPM Analysis Approach, ***Adnan Mehonic,*** *M Buckwell, W Ng, A Kenyon,* University College London, UK	Invited talk continues.
5:40pm	Invited talk continues.	

	Plasma Science and Technology Division **Room B131 - Session PS+SS-ThA** **Plasma Conversion and Enhanced Catalysis for Chemical Synthesis** **Moderator:** R. Mohan Sankaran, Case Western Reserve University	**Advanced Ion Microscopy and Ion Beam Nano-engineering Focus Topic** **Room B231-232 - Session HI+NS-ThA** **Emerging Ion Sources, Optics, and Applications & Flash Session** **Moderators:** Gregor Hlawacek, Helmholtz-Zentrum Dresden - Rossendorf, Shida Tan, Intel Corporation
2:20pm	**PS+SS-ThA-1** Rate Limiting Factors of Low Pressure Plasma-catalytic CO_2 Methanation Process, ***Kazunori Koga***, *A Yamamoto, K Kamataki, N Itagaki, M Shiratani,* Kyushu University, Japan	**INVITED: HI+NS-ThA-1** Cold Atom Ion Sources, ***Jabez McClelland***, *J Gardner, W McGehee,* National Institute of Standards and Technology (NIST); *A Schwarzkopf, B Knuffman, A Steele,* zeroK NanoTech Corp.
2:40pm	**PS+SS-ThA-2** Radical Nitriding of Graphene Promoted by Surface Plasmon Resonance of Gold Nanoparticle Catalyst, ***Takeshi Kitajima***, *T Nakano,* National Defense Academy, Japan	Invited talk continues.
3:00pm	**INVITED: PS+SS-ThA-3** Plasma-assisted Catalysis: Exploring the Effects of Plasma Stimulation on Catalyst Performance, ***Jason C. Hicks***, University of Notre Dame	**HI+NS-ThA-3** Silicon Lithiation by Direct-writing with a Focused Li^+-ion Beam, *W McGehee,* ***Evgheni Strelcov***, *V Oleshko, C Soles, N Zhitenev, J McClelland,* National Institute of Standards and Technology (NIST)
3:20pm	Invited talk continues.	**HI+NS-ThA-4** A New FIB for Deterministic Single Ion Implantation, ***Nathan Cassidy***, UK National Ion Beam Centre, University of Surrey, UK; *D Cox,* Advanced Technology Institute, University of Surrey, UK; *R Webb,* UK National Ion Beam Centre, University of Surrey, UK; *B Murdin,* Advanced Technology Institute, University of Surrey, UK; *P Blenkinsopp, I Brown,* Ionoptika Ltd., UK; *R Curry,* The Photon Science Institute, University of Manchester, UK
3:40pm	**BREAK**	**BREAK**
4:00pm	**PS+SS-ThA-6** A Plasma-aerosol Droplet Reactor for the Synthesis of Ammonia from Nitrogen and Water, ***Joseph Toth***, *D Lacks, J Renner, M Sankaran,* Case Western Reserve University	**INVITED: HI+NS-ThA-6** Technology and Applications of a Plasma Ion Source with User-selectable Ion Species, ***Gregory Schwind***, *S Kellogg, J Stiller, M Doud, C Rue, B Van Leer,* Thermo Fisher Scientific
4:20pm	**PS+SS-ThA-7** Plasma-assisted Nitrogen Fixation by Water: Development and Evaluation of Hybrid Membrane Based Plasma-Electrochemical Reactor, *R Sharma,* ***Richard M.C.M. van de Sanden***, *H Patel, V Kyriakou, U Mushtaq,* Dutch Institute for Fundamental Energy, Netherlands; *A Pandiyan,* Dutch Institute for Fundamental Energy; *S Welzel, M Tsampas,* Dutch Institute for Fundamental Energy, Netherlands	Invited talk continues.
4:40pm	**INVITED: PS+SS-ThA-8** Plasma-Assisted Ammonia Synthesis in Hybrid Plasma-Catalysis DBD Reactors, *Z Chen, X Yang, Y Ju, S Sundaresan,* ***Bruce E. Koel***, Princeton University	**HI+NS-ThA-8** Neutral Helium Microscopy, ***Bodil Holst***, University of Bergen, Norway
5:00pm	Invited talk continues.	**HI+NS-ThA-9** GaBiLi Liquid Metal Alloy Ion Sources for Advanced Nanofabrication, *P Mazarov,* RAITH GmbH, Germany; *T Richter, L Bruchhaus, W Pilz, R Jede,* Raith GmbH, Germany; ***Yang Yu***, *R Schmid, J Sanabia,* Raith America, Inc.; *L Bischoff,* Helmholtz Zentrum Dresden-Rossendorf, Germany; *G Hlawacek,* Helmholtz-Zentrum Dresden Rossendorf, Germany
5:20pm	**PS+SS-ThA-10** Efforts towards Plasma-assisted Catalysis: Elucidating Gas-phase Energetics, Kinetics, and Surface Interactions, ***Angela Hanna***, *E Fisher,* Colorado State University	**HI+NS-ThA-10** Focused Ion Beams in Biology: How the Helium Ion Microscope and FIB/SEMs Help Reveal Nature's Tiniest Structures, ***Annalena Wolff***, Central Analytical Research Facility, Institute for Future Environments, Queensland University of Technology (QUT), Brisbane QLD 4000, Australia; *N Klingner,* Helmholtz Zentrum Dresden-Rossendorf, Germany; *W Thompson,* HeelionicsLLC; *Y Zhou,* Queensland University of Technology (QUT), Australia; *J Lin,* Affiliated Stomatological Hospital of Xiamen Medical College, China; *Y Peng,* CSIRO Manufacturing, Australia; *J Ramshaw,* St. Vincent's Hospital, University of Melbourne, Australia; *Y Xiao,* The Australia-China Centre for Tissue Engineering and Regenerative Medicine (ACCTERM), Queensland University of Technology, Australia

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 AlGaN/GaN Hetrostructure 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,* Shincron 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 NH4OH 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 Hofmockel,* 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 Autonoma 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 Sandards 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 Sherrer Institute, Switzerland; *U Maier,* Ferrovac GmbH, Switzerland; *L Artiglia, J Raabe, T Huthwelker,* Paul Sherrer 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, ***Donghyi 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($Mg_{1/3}Nb_{2/3}$)O_3-x$PbTiO_3$ 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 ofTopological Surface States on the Nanoscale via Local Symmetry BreakingviaLocal 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

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

EM-ThP-13 Atom Probe Tomography Analysis of the Composition of GaAsNBi, ***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_2/H_2 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, ***Jordon 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-Il 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 Hodgin, 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 $Fe_{1.2}Ge$ Films, ***Tao Liu***, *R Bennett, S Chen, A Ahmed, R Kawakami,* The Ohio State University

MI-ThP-2 Investigation of Exchange Bias in $L1_0$- 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, Japn, 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

MS-ThP-9 Development of a Fabrication Process for Integrated inductors on Flexible Substrate, ***Wilson Freitas,*** State University of Campinas, Brasil; *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, ***Sayantan 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***[12], *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^{3+} 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^{3+} and Pr^{3+} Doped Rare-earth Oxyorthosilicates (R_2SiO_5) (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_2/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, 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_3/Ag/Mo/ MoO_3 Films by Reactive rf Magnetron Sputtering, *C Lee,* Taiwan Instrument Research Institute, Taiwan; ***Wei-Chun Chen,*** Taiwan Instrument Research Institute, Taiwan, 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 $BaFe_2(PO_4)_2$ 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_2/Al_2O_3 on $In_{0.53}Ga_{0.47}As$, ***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 $Hf_{1-x}V_xB_2$ 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_2 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_2 Films Deposited by Magnetron Sputtering, ***Bohuei 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 $ZnGeN_2$ 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 $FeSe_{0.5}Te_{0.5}$ Superconducting Films, ***Cheng Zhang,*** University of Tennessee Knoxville; *W Zhao, S Bi,* Huazhong University of Science and Technology, China; *C Rouleau, 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

[1] **National Student Award Finalist**
[2] **NSTD Graduate Student Award Finalist**

TF-ThP-25 Electrical Properties of In_2O_3 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,* Eugenus, Inc.

TF-ThP-30 Plasma Study and Fretting Corrosion of Zr/ZrN/CNx Multilayers Deposited by HIPIMS on Ti6Al4V, ***Martín 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 _____

Room A213

Fundamental Discoveries in Heterogeneous Catalysis Focus Topic
Session HC+SS-FrM
Catalysis at Complex Interfaces
Moderators: Elizabeth Landis, College of the Holy Cros, Fan Yang, Dalian Institute of Chemical Physics, China

8:20am **HC+SS-FrM-1** Pd Nanoparticles on Alumina Nanofibers by Electrospinning for Heterogeneous Catalysis, ***Miguel Angel Rodriguez Olguin***, *M Enes da Silva, J Faria, A Susarrey Arce, H Gardeniers,* University of Twente, Netherlands

8:40am **HC+SS-FrM-2** Multi-Layered TiO_2 Nanofibrous Structures Decorated with Catalytic Nanoparticles for Photoelectrocatalytic Applications, ***Cristian Deenen***, *C Eyövge, A Susarrey-Arce, H Gardeniers,* University of Twente, Netherlands

9:00am **INVITED: HC+SS-FrM-3** Water Oxidation Reaction in Natural Photosynthesis, ***Junko Yano***, Lawrence Berkeley National Laboratory

9:20am Invited talk continues.

9:40am **HC+SS-FrM-5** Synthesis and Characterization of Carbon-supported PdCu Nanoparticles for the Water Electrolysis in Acid Medium, ***Jonder Morais***, *D Lima, M Castegnaro, M Alves,* Universidade Federal do Rio Grande do Sul, Brazil

10:00am **HC+SS-FrM-6** Nanoscale Spectromicroscopy and Chemical Activity of Bilayer Silicate Films on Pd(100) and Pd(111), ***Samuel Tenney***, *C Eads,* Brookhaven National Laboratory; *L Mark,* University of Colorado at Boulder; *V Lee,* University of North Texas; *M Wang,* Brookhaven National Laboratory; *J Medlin,* University of Colorado at Boulder; *J Kelber,* University of North Texas; *D Stacchiola,* Brookhaven National Laboratory

10:20am **INVITED: HC+SS-FrM-7** Formation and Properties of Mirror Twin Grain Boundary Networks in Molybdenum Dichalcogenides, ***Matthias Batzill***, University of South Florida

10:40am Invited talk continues.

11:00am **HC+SS-FrM-9** Selectable Catalytic Reduction of Carbon Dioxide to Formic Acid or Methanol over Defect Hexagonal Boron Nitride*, *K Chagoya, T Jiang, D Nash, D Le,* ***Talat S. Rahman***, *R Blair,* University of Central Florida

	Room A215	
8:20am	**INVITED: SE+AS+SS-FrM-1** The Scaling of Tribological Effects from Nano- to Macro-scale, ***Peter Lee,*** Southwest Research Institute	**Advanced Surface Engineering Division** **Session SE+AS+SS-FrM** **Tribology: From Nano to Macro-scale** **Moderators:** Robert Franz, Montanuniversität Leoben, Andrey Voevodin, University of North Texas
8:40am	Invited talk continues.	
9:00am	**SE+AS+SS-FrM-3** Nanotribology of Graphene in Organic Solvents, ***Prathima Nalam,*** *B Sattari Baboukani,* University at Buffalo, State University of New York*; Z Ye,* Miami University	
9:20am	**SE+AS+SS-FrM-4** Measuring Atomicscale Surface Friction of a Molecular Vehicle on Au(111), *K Latt,* ***Sanjoy Sarkar,*** *K Kottur, M Raeis,* Ohio University*; A Ngo,* Argonne National Laboratory*; R Tumbleson, Y Zhang, E Masson, S Hla,* Ohio University	
9:40am	**INVITED: SE+AS+SS-FrM-5** The Use of the Nanocomposite Concept in Hard Coatings for Improving the Frictional Performance, ***Albano Cavaleiro,*** University of Coimbra, Portugal	
10:00am	Invited talk continues.	
10:20am	**SE+AS+SS-FrM-7** Development of Ultra-thick CrAlAgN Coatings by HiPIMS for Self-lubrication at Elevated Temperatures, ***Jianliang Lin,*** Southwest Research Institute*; X Zhang,* Southeast University, China	
10:40am	**2D-FrM-8** Mechanistic Insights into a Modified ALD Process to Achieve Crystalline MoS_2 Thin Films, ***Nathaniel Richey,*** *L Zeng, M Yasheng, J Shi, I Oh, S Bent,* Stanford University	**2D Materials** **Session 2D-FrM** **2D Late News Session** **Moderators:** Daniel Gunlycke, Naval Research Laboratory, Ivan Oleynik, University of South Florida
11:00am	**2D-FrM-9** The Electronic Properties of Quasi-One-Dimensional TiS_3 and ZrS_3, ***Simeon Gilbert,*** University of Nebraska-Lincoln*; H Yi,* Synchrotron SOLEIL*; A Lipatov, T Komesu,* University of Nebraska-Lincoln*; A Yost,* Oklahoma State University*; A Sinitskii,* University of Nebraska-Lincoln*; J Avila,* Synchrotron SOLEIL, France*; M Asensio,* Madrid Institute of Materials Science*; P Dowben,* University of Nebraska-Lincoln	
11:20am	**2D-FrM-10** Single Asperity Sliding Friction across the Superconducting Phase Transition, ***Wen Wang,*** *D Dietzel, A Schirmeisen,* Institute of Applied Physics, University of Giessen, Germany	
11:40am	**2D-FrM-11** Definition of CVD Graphene Micro Ribbons with Lithography and Oxygen Plasma Ashing, ***Fernando Cesar Rufino,*** *A Pascon,* UNICAMP, Brazil*; D Larrudé,* Mackenzie Presbyterian University, Brazil*; L Espindola, F Cioldin, J Diniz,* UNICAMP, Brazil	
12:00pm	**2D-FrM-12** Reactivity of Metal Contacts with Monolayer Tungsten Disulfide, ***Ama Agyapong,*** *K Cooley, S Mohney,* The Pennsylvania State University	

	Thin Films Division **Room A216 - Session TF-FrM** **Theory and Characterization of Thin Film Properties** **Moderators:** Angel Yanguas-Gil, Argonne National Lab, Gerben van Straaten, Eindhoven University of Technology, The Netherlands	**Surface Science Division** **Room A220-221 - Session SS+HC+PS-FrM** **Planetary, Ambient, and Operando Environments** **Moderators:** Catherine Dukes, University of Virginia, Petra Reinke, University of Virginia
8:20am	**INVITED: TF-FrM-1** Incorporation Mechanisms and Electronic Properties of Impurities in Wide-Band-Gap Semiconductors, ***John (Jack) Lyons***, *S Erwin,* U.S. Naval Research Laboratory	**INVITED: SS+HC+PS-FrM-1** Seeing is Believing: Atomic-scale Imaging of Catalysts under Reaction Conditions, ***Irene Groot***, Leiden University, The Netherlands, Netherlands
8:40am	Invited talk continues.	Invited talk continues.
9:00am	**TF-FrM-3** Review and Demonstration of Feature Scale Simulations, ***Paul Moroz***, TEL Technology Center, America, LLC	**SS+HC+PS-FrM-3** *Operando* NAP-XPS and NAP-STM Investigation of CO Oxidation on CoO Nanoislands on Noble Metal Surfaces, ***Jonathan Rodríguez-Fernández***, *Z Sun, E Rattigan,* Aarhus University, Denmark; *C Martín, E Carrasco,* IMDEA Nanoscience, Spain; *E Pellegrin, C Escudero,* ALBA Synchrotron Light Source, Spain; *D Ecija,* IMDEA Nanoscience, Spain; *J Lauritsen,* Aarhus University, Denmark
9:20am	**TF-FrM-4** Process Optimization in Atomic Layer Deposition Using Machine Learning, *A Yanguas-Gil, S Letourneau, A Mane,* ***Noah Paulson***, *A Lancaster, J Elam,* Argonne National Laboratory	**SS+HC+PS-FrM-4** Reaction of 2-Propanol on SnO_2(110) Studied with Ambient-Pressure X-ray Photoelectron Spectroscopy, *J Diulus, R Addou,* ***Gregory Herman***, Oregon State University
9:40am	**TF-FrM-5** Electroless Deposition of Cobalt Metal on a Palladium Layer on an Amine-modified Surface, *A Ng,* ***Anthony Muscat***, University of Arizona	**SS+HC+PS-FrM-5** Chemical Speciation and Structural Evolution of Rhodium and Silver Surfaces with High Oxygen Coverages, ***Daniel Killelea***, *M Turano,* Loyola University Chicago; *R Farber, K Gibson, S Sibener,* The University of Chicago; *W Walkosz,* Lake Forest College; *R Rosenberg,* Argonne National Laboratory
10:00am	**TF-FrM-6** The Origins of Condensation-Driven Degradation of Hydrophobic Thin Films, ***Jingcheng Ma***, *N Miljkovic,* University of Illinois at Urbana-Champaign	**INVITED: SS+HC+PS-FrM-6** Molecular Processes on Icy Surfaces in the Interstellar Medium and the Outer Solar System, ***Edith Fayolle***, *R Hodyss, P Johnson,* Jet Propulsion Laboratory, California Institute of Technology; *K Oberg,* Harvard University; *J Fillion, M Bertin,* Sorbonne Université
10:20am	**TF-FrM-7** Structural and Electrical Properties of Sputtered HEA Thin Films of CrFeCoNiCu and their Oxidation Studies, ***Jeyanthinath Mayandi***, SMN, Department of Physics,University of Oslo, Norway; *M Stange, E Sagvolden, M Sunding, Ø Dahl,* SINTEF Materials and Chemistry, Norway; *M Schrade,* SINTEF, Materials and Chemistry, Norway; *J Deuermeier, E Fortunato,* Universidade Nova de Lisboa, Portugal; *O Løvvik, S Diplas,* SINTEF Materials and Chemistry, Norway and University of Oslo, Norway; *P Carvalho,* SINTEF Materials and Chemistry, Norway and Universidade de Lisboa, Portugal; *T Finstad,* SMN, Department of Physics, University of Oslo, Norway	Invited talk continues.
10:40am	**TF-FrM-8** Observation of Topological Hall and Curie Temperature above Room Temperature in Strain-engineered FeGe Thin Films, ***Adam Hauser***, *S Budhathoki, K Law, S Ranjit, A Sapkota,* The University of Alabama; *A Thind, R Mishra,* Washington University in St. Louis; *D Heiman,* Northeastern University; *M Jamer,* United States Naval Acadamy; *A Borisevich,* Oak Ridge National Laboratory; *T Mewes,* The University of Alabama; *J Gallagher,* U.S. Naval Research Laboratory	**SS+HC+PS-FrM-8** Bilayer Silicates as Models for Space-weather-mediated Water-cycling Processes at the Interface of Airless Bodies, *B Dhar,* ***William E. Kaden***, University of Central Florida
11:00am	**TF-FrM-9** Infrared Absorption Oscillator Strength Factors in SiNx Thin Films, ***Sara DiGregorio***, *S Habermehl,* Sandia National Laboratories	**SS+HC+PS-FrM-9** Unraveling the Evolution of the Solid-Electrolyte Interphase Layer at Li-Metal Anodes, ***Venkateshkumar Prabhakaran***, *S Roy, G Johnson,* Pacific Northwest National Laboratory, Joint Center for Energy Storage Research; *M Engelhard, V Shutthanandan, A Martinez, S Thevuthasan,* Pacific Northwest National Laboratory; *K Mueller, V Murugesan,* Pacific Northwest National Laboratory, Joint Center for Energy Storage Research
11:20am	**TF-FrM-10** Computer Aided Molecular Design of novel precursor materials for Atomic Layer Deposition, ***Mina Shahmohammadi***, University of Illinois at Chicago; *R Mukherjee,* Vishwamitra Research Institute; *C Takoudis,* University of Illinois at Chicago; *U Diwekar,* Vishwamitra Research Institute	
11:40am	**TF-FrM-11** The Use of Molecular Oxygen for a Low Cost and Low Temperature ALD of Amorphous Titania, ***Harshdeep S. Bhatia***, *C Takoudis,* University of Illinois at Chicago	
12:00pm	**TF-FrM-12** Ultra-High Purity Process Capability for High-Performance Atomic layer Deposition, ***Noel O'Toole***, *G Rayner, Jr.,* Kurt J. Lesker Company; *N Strnad,* General Technical Services, LLC; *D Potrepka,* U.S. Army Research Laboratory	

Friday Morning, October 25, 2019

	Nanometer-scale Science and Technology Division **Room A222 - Session NS+AS-FrM** **Electron-Beam Promoted Nanoscience** **Moderators:** Omur E. Dagdeviren, Yale University, Qing Tu, Northwestern University	**Chemical Analysis and Imaging Interfaces Focus Topic** **Room A226 - Session CA+AS+NS+SE+SS-FrM** **Novel Applications and Approaches in Interfacial Analysis** **Moderators:** Paul Dietrich, SPECS Surface Nano Analysis GmbH, Germany, Jeong Young Park, Korea Advanced Institute of Science and Technology (KAIST), Republic of Korea
8:20am	**INVITED: NS+AS-FrM-1** Vibrational Spectroscopy in the Electron Microscope, ***Ondrej Krivanek***, *N Dellby, C Meyer, A Mitelberger, T Lovejoy,* Nion Co.	**INVITED: CA+AS+NS+SE+SS-FrM-1** Chemical Reactions on Bimetal Surfaces with Operando Surface Techniques, ***Jeong Young Park***, Korea Advanced Institute of Science and Technology (KAIST), Republic of Korea
8:40am	Invited talk continues.	Invited talk continues.
9:00am	**INVITED: NS+AS-FrM-3** In-situ Electron Microscopy of Localized Surface Plasmon Initiated Reactions, ***Canhui Wang***, *W Yang, A Bruma,* UMD/NIST; *R Sharma,* National Institute of Sandards and Technology (NIST)	**CA+AS+NS+SE+SS-FrM-3** Principal Component Analysis to Reveal Camouflaged Information in Spectromicroscopy of (complex) Oxides, ***David Mueller***, *M Giesen,* Forschungszentrum Juelich GmbH, Germany; *D Stadler,* University of Cologne, Germany; *T Duchon, F Gunkel, V Feyer,* Forschungszentrum Juelich GmbH, Germany; *S Mathur,* University of Cologne, Germany; *C Schneider,* Forschungszentrum Juelich GmbH, Germany
9:20am	Invited talk continues.	**INVITED: CA+AS+NS+SE+SS-FrM-4** *In situ* Electron Microscopy of Catalysts with Atomic Resolution under Atmospheric Pressure, ***Xiaoqing Pan***, University of California Irvine
9:40am	**INVITED: NS+AS-FrM-5** Nanoscale Manipulation of Redox of Ag by Electron Beam, ***Jianguo Wen***, *H Sheng,* Argonne National Laboratory; *J Wang,* Wuhan University, China	Invited talk continues.
10:00am	Invited talk continues.	**CA+AS+NS+SE+SS-FrM-6** Exposing Buried Interfaces in Thin Film Photovoltaics through Thermo-mechanical Cleaving, ***Deborah McGott***, Colorado School of Mines; *C Perkins, W Metzger,* National Renewable Energy Laboratory; *C Wolden,* Colorado School of Mines; *M Reese,* National Renewable Energy Laboratory
10:20am	**INVITED: NS+AS-FrM-7** Dynamics of Material Surfaces and Interfaces – The Good, the Bad and the Electron Beam, ***Jakob Birkedal Wagner***, DTU Nanolab, Technical University of Denmark, Denmark	**CA+AS+NS+SE+SS-FrM-7** Switchable Dopants on Percolation Networks of 2D Materials for Chemiresistive Sensing Applications in Aqueous Environments, ***Peter Kruse***, McMaster University, Canada
10:40am	Invited talk continues.	**CA+AS+NS+SE+SS-FrM-8** Analysis Of Radioactive Materials In Liquid Using In Situ Sem And Tof-Sims, ***Jennifer Yao***, *X Yu, Z Zhu, E Buck,* Pacific Northwest National Laboratory
11:00am	**NS+AS-FrM-9** Atomic-Scale Mechanism of Unidirectional Oxide Growth, ***Xianhu Sun***, *W Zhu, D Wu,* SUNY Binghamton University; *Z Liu,* University of Pittsburgh; *X Chen, L Yuan,* SUNY Binghamton University; *G Wang,* University of Pittsburgh; *R Sharma,* National Institute of Standards and Technology (NIST); *G Zhou,* SUNY Binghamton University	**CA+AS+NS+SE+SS-FrM-9** Interactions between Synthetic Bilgewater Emulsion and Biofilms, ***Jiyoung Son***, Earth and Biological Sciences Directorate; *J Yao,* Earth & Biological Sciences Directorate; *X Yu,* Pacific Northwest National Laboratory
11:20am	**NS+AS-FrM-10** Application of Electron-beam-excited Localized Surface Plasmon Resonance to Provide Guidelines for Plasmonic Catalysts, ***Wei-Chang Yang***[1], *C Wang, L Fredin, H Lezec, R Sharma,* National Institute of Standards and Technology (NIST)	**CA+AS+NS+SE+SS-FrM-10** Mechanistic Insights into the Study of γ -Al_2O_3 Surface and its Interface with Pt, ***Kofi Oware Sarfo***, *A Clauser, M Santala, L Árnadóttir,* Oregon State University
11:40am		**INVITED: CA+AS+NS+SE+SS-FrM-11** Artificial Intelligence--An Autonomous TEM for In-situ Studies, ***Huolin Xin***, University of California Irvine
12:00pm		Invited talk continues.

[1] **NSTD Early Career Award Finalist**

Room B130

Plasma Science and Technology Division
Session PS+2D+SE+TF-FrM
Plasma Deposition and Plasma-Enhanced Atomic Layer Deposition
Moderators: Scott Walton, Naval Research Laboratory, David Boris, U.S. Naval Research Laboratory

8:20am **INVITED: PS+2D+SE+TF-FrM-1** Plasma-based Synthesis of 2D Materials for Devices on Flexible Substrates, *N Glavin,* Air Force Research Laboratory; ***Christopher Muratore,*** Department of Chemical and Materials Engineering, University of Dayton

8:40am Invited talk continues.

9:00am **PS+2D+SE+TF-FrM-3** Homogeneous Ternary Oxides of Aluminum with Silicon, Molybdenum, and Niobium by Plasma Enhanced ALD by Sequential Precursor Pulses, ***Steven Vitale,*** MIT Lincoln Laboratory

9:20am **PS+2D+SE+TF-FrM-4** Piezoelectric Response of ZnO Thin Films Grown by Plasma-Enhanced Atomic Layer Deposition, ***Julian Pilz,*** *T Abu Ali,* Graz University of Technology, Austria; *P Schäffner, B Stadlober,* Joanneum Research Forschungsgesellschaft mbH, Austria; *A Coclite,* Graz University of Technology, Austria

9:40am

10:00am **PS+2D+SE+TF-FrM-6** Plasma-enhanced Molecular Layer Deposition of Boron Carbide from Carboranes, ***Michelle M. Paquette,*** *R Thapa, L Dorsett, R Bale, S Malik, D Bailey, A Caruso,* University of Missouri-Kansas City; *J Bielefeld, S King,* Intel Corporation

10:20am **PS+2D+SE+TF-FrM-7** Gas Phase Kinetics Optimization Study for Scaling-up Atmospheric Pressure Plasma Enhanced Spatial ALD, ***Yves Creyghton,*** Holst Centre / TNO, The Netherlands, Netherlands

10:40am **INVITED: PS+2D+SE+TF-FrM-8** Taking Plasma ALD to the Next Level: From Fundamental Understanding to Selective 3D Processing, *T Faraz, K Arts,* Eindhoven University of Technology, The Netherlands, Netherlands; *L Martini, R Engeln, H Knoops,* Eindhoven University of Technology, The Netherlands; ***Erwin Kessels,*** Eindhoven University of Technology, The Netherlands, Netherlands

11:00am Invited talk continues.

11:20am **PS+2D+SE+TF-FrM-10** Computational Investigation of Plasma Enhanced ALD of SiO_2, *C Qu,* University of Michigan; *P Agarwal, Y Sakiyama, A LaVoie,* Lam Research Corporation; ***Mark J. Kushner,*** University of Michigan

11:40am **PS+2D+SE+TF-FrM-11** 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, ***Ali Okyay,*** OkyayTech Inc., Turkey; *A Mohammad, D Shukla, S Ilhom,* University of Connecticut; *B Johs,* Film Sense LLC; *B Willis, N Biyikli,* University of Connecticut

12:00pm **PS+2D+SE+TF-FrM-12** Tribological Properties of Plasma Enhanced Atomic Layer Deposition TiMoN with Substrate Bias, ***Mark Sowa,*** Veeco ALD; *A Kozen,* University of Maryland; *N Strandwitz, T Babuska, B Krick,* Lehigh University

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