# Program Key

## AVS 68 PROGRAM TOPICS

| | |
|---|---|
| **2D** | 2D Materials Technical Group |
| **AC** | Actinides and Rare Earths Focus Topic |
| **AP** | Atomic Scale Processing Focus Topic |
| **AQS** | AVS Quantum Workshop |
| **AS** | Applied Surface Science Division |
| **BI** | Biomaterial Interfaces Division |
| **BP** | Biomaterials Plenary Session |
| **CA** | Chemical Analysis and Imaging Interfaces 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** | New Trends on Structural and Electronic Characterization of Materials, Interfaces, and Surfaces Using Synchrotron and FEL-Based Radiation Sources Focus Topic |
| **MI** | Magnetic Interfaces and Nanostructures Division |
| **MN** | MEMS and NEMS Technical Group |
| **MS** | Manufacturing Science and Technology Group |
| **MS-2DMS** | Mini Symposium on 2D Materials Synthesis |
| **NS** | Nanoscale Science and Technology Division |
| **NSP** | Nanoscale Science and Technology Plenary Session |
| **PS** | Plasma Science and Technology Division |
| **QS** | Quantum Information Science Focus Topic |
| **RE** | Radiation Effects on Materials Focus Topic |
| **SE** | Advanced Surface Engineering Division |
| **SM** | Smart Multifunctional Materials for Nanomedicine Focus Topic |
| **SS** | Surface Science Division |
| **TF** | Thin Films Division |
| **VT** | Vacuum Technology Division |

## KEY TO SESSION/ABSTRACT NUMBERS

Sessions sponsored by multiple topics are labeled with all 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:
**Mo**nday, **Tu**esday, **We**dnesday, **Th**ursday, **Fr**iday,
then a single letter for **M**orning, **A**fternoon, **P**oster,
and finally a number indicating the starting time slot for the paper.
Example: SS1-MoM9 (Surface Science, Monday morning, 11:00 am).

# AVS 68 Program Overview

| Room /Time | 301 | 302 | 303 | 304 | 305 | 315 | 316 | 317 |
|---|---|---|---|---|---|---|---|---|
| SuA | | | | NSP-SuA: Nanoscale Science and Technology Plenary Session | | | | |
| MoM | VT-MoM: Vacuum Measurement and Gas Analysis and Vac Tech for Quantum Apps | MN+AS+NS+QS+SE-MoM: Dynamics and Engineering of MEMS/NEMS | 2D+EM-MoM: Electronic, Mechanical, and Optical Properties | NS1+QS-MoM NS2+AS+EM+SS-MoM NS3+EM+TF-MoM | MS+HI-MoM: Machine Learning for Microelectronic Mfg Proc Control & Matls Disc R&D | PS-MoM: Plasmas for the Env & Sustain: Plasmas-Liquid Int, Water, Air, Soil Treatment | TF+EM-MoM: Microelectronics and Spintronics Application | AP+2D+AS+EM+PS+SS+TF-MoM: Area Selective Processing and Patterning |
| MoA | VT-MoA: Vacuum Technology for Accelerators | MN+2D-MoA: Emerging Materials and Structures for MEMS/NEMS Devices | 2D+AS+SS-MoA: Defects, Dopants, Edges, Functional-ization, and Intercalation | NS1+AS+EM-MoA: Corr Micro for Nano Char/NS2+AP+BI-MoA: Fab & Ope of Nano-Systems | MS+AP+AS+TF-MoA: Advanced Char & Met for 3D and ML for Micro Materials Discovery | PS+AS-MoA: Plasma Chemistry and Catalysis | TF+EM-MoA: Thin Films for Optics, Photonics, Metamaterials, and Soft Electronics | AP+AS+EL+MS+SS-MoA: Advancing Met and Char to Enable Atomic Scale Processing |
| TuM | VT-TuM: Vacuum Technology for Large Vacuum Systems | CA+AS+SE+SS-TuM: Progress and Challenges in Industrial Applications | MS-2DMS+2D+EM+NS-TuM: Direct Growth of 2D Matls, Incl CVD & MBE | EL+AS+EM-TuM: Optical Characterization of Thin Films and Nanostructures | PS1+NS-TuM: Adv Plas atterning: EUV-Based, Multi & Alt Patt Approaches (Imprint, DSA, Etc.) | PS2+MS-TuM: Model of Plasmas & Plas Driven Proc, and Machine Learning | TF-TuM: Growth in 3D, High Aspect Ratio and Nanostructured Materials | AP+AS+EM+HI+PS+SS+TF-TuM: Area Selective Processing and Patterning II |
| TuMB | | | | | | | | |
| TuL | | | | | | | | |
| TuA | VT-TuA: Vacuum Pumping, Leak Detection, and Modeling | CA+2D+AS+BI+HC+LS+NS-TuA: In Situ Micro, Spect & Proc at Liquid-Solid-Gas Interfaces | 2D+MI-TuA: Heterostructures, Twistronics, and Proximity Effects | EL1+AS+EM-TuA EL2+EM-TuA | PS1+TF-TuA: Plas Proc for Adv Emerging Memory Tech, Adv Packaging & Hetero Integration | PS2+AS+SS-TuA: Plasma-Surface Interactions | TF2+2D-TuA: Low Dimension Material Application | AP+PS+TF-TuA: Thermal Atomic Layer Etching |
| TuP | | | | | | | | |
| WeM | SM-WeM: Smart Multifunctional Materials for Nanomedicine and Theranostics | CA+HC+LS+VT-WeM: Multiphase Interfacial Analysis and Imaging | 2D+EM+MI+NS+QS-WeM: Quantum and Symmetry-Protected States | NS+AP+BI+SS-WeM: Frontiers in SPM Including Machine Learning | PS1+AP+TF-WeM: Plasma Deposition and ALD Processes for Coatings and Thin Films | PS2+TF-WeM: Plas Proc of Non-Si Rel Semi for Energy-Eff Dev in Power, Photo & Opto Apps | TF2+AP+SE+SS-WeM: TF3+MS-WeM | TF1+SE-WeM: Vapor Dep and Vapor Infiltration of Organic, Poly, &/or Hybrid Materials |
| WeL | | | | | | | | |
| WeA | HI+AP-WeA: Emerging Ion Sources, Optics, & Applications | QS+EM+MN+NS-WeA: Systems and Devices for Quantum Information | 2D+EM+MI-WeA: Charge Density Waves, Mag, and Superconductivity | NS1+BI-WeA NS2+AS+EM-WeA: | PS1+AP-WeA: Plasma Assisted Atomic Layer Etching | PS2+SE-WeA: Atmospheric Pressure Plasmas and their Applications | TF1+AP-WeA: Manufacturing and Scale-Up of CVD and (Spatial) ALD TF2-WeA: Solution | SE+MN+PS+TF-WeA: Vapor Deposition Technologies and New Trends in |
| ThM | HI+AS-ThM: Advanced Ion Microscopy & Surface Analysis | QS+AP+EM+MN+NS+SS-ThM: Systems and Devices for Quantum Computing | 2D+AS+NS+SS-ThM: Scanning Probe Microscopy and Spectroscopy | EM+AS-ThM EM+MN+TF-ThM | | PS-ThM: Plasma Processing for Advanced Semiconductor Devices | TF+AP-ThM TF1+SE+SS-ThM | SE+AS+BI+SS+TF-ThM: Nanostruct and Multifunctional Thin Films and Coatings I |
| ThA | HI-ThA: Novel Beam Induced Material Engineering and Nano Patterning | QS+EM+MN+NS-ThA: The Quantum Metrology Revolution | 2D+AS+EM-ThA: Electron Micro and Photoemission Spectroscopy | EM+AS+EL+NS+SS-ThA: Interfaces and Defect Engineering in Electronic & Photonic Materials | | PS-ThA: Harnessing the Power of Plasmas for Real-World Applications: PSTD Award | TF+AS-ThA: In-Situ Characterization of Thin Films and Interfaces | SE+AS+MN+SS-ThA: Mechanical and Tribological Properties of Thin Films and Coatings |
| ThP | | | | | | | | |
| FrM | AQS-FrM: AVS Quantum Science Workshop | | 2D+AS+BI+HC+SS-FrM: Biological, Electronic, Energy, and Other Applications | EM1+MN+NS-FrM: Piezo, Ferro, & Multi Dev & Micro EM2-FrM: Adv Dev & Fabrication | PS1+MS+SS-FrM: Mod of Plasmas & Plas riven Proc, & Plasma-Surface Interactions II | PS2+SE-FrM: Plasma Sources, Diagnostics, Sensors and Control | TF1+PS-FrM TF2+EM-FrM | SE+MN+PS-FrM: Nanostructured and Multifunctional Thin Films and Coatings II |

# AVS 68 Program Overview

| Room /Time | 318 | 319 | 320 | 321 | 330 | Ballroom A | Hall A |
|---|---|---|---|---|---|---|---|
| SuA | BP-SuA: Biomaterials Plenary Session: Programmable Biologic Materials & BID Flash Poster Sess | | | | | | |
| MoM | BI+AS+PS-MoM: Biomolecular Interfaces and Underwater Adhesion | SS+AS+TF-MoM: Dynamics and Mechanisms at Surfaces and Interfaces | AS+LS+RE+SS-MoM: Probing Surf & Int Struct with XPS: in Memory of Charles Fadley | | | | |
| MoA | BI+AS+HC+SS-MoA: Bioinspired Materials and Applications | SS+AS-MoA: Molecular Organization at Surfaces | AS+CA+EL+EM+LS+SE+SS-MoA: Quantitative Surface Analysis | HC+AS+SS-MoA: Advances in Materials and Analysis in Heterogeneous Catalysis I | | | |
| TuM | BI1+AS+EM+NS+SE+TF-TuM: Bioanal, Biosens & Diag<br>BI2+AS-TuM: Char of Bio & Biomaterials | SS-TuM: Liquid/Solid Interfaces and Electrochemistry | AS+LS+RE+SS-TuM: Synch-Based Photo Spect Studies of Tech Import Matls: in Mem of David Shirley | HC+AS+SS-TuM: Energetic Processes and Tailored Surfaces in Heterogeneous Catalysis | | | |
| TuMB | | | | | | | EW-TuMB: Exhibitor Technology Spotlight Session I |
| TuL | | | | | | | EW-TuL: Exhibitor Technology Spotlight Session II |
| TuA | LS1+2D+AS+EM+QS+SS-TuA: *Oper* Catal & Energ Syst<br>LS2+2D+AS+TF-TuA: Role of Def in Matls | SS+2D+AS-TuA: Structure, Adsorption and Reaction at 2D Material Surfaces | AS+EM+SE-TuA: Surface Analysis Using Complementary Techniques | HC+AS+SS-TuA: Bridging Gaps I: Structural and Dynamic Effects in Catalysis | MI-TuA: Topological Insulator Heterostructures | | |
| TuP | | | | | | POSTER SESSIONS: AC, AP, BI, CA, EL, MI, MN, MS, NS, LS, PS. SS. VT | |
| WeM | AC+LS+MI-WeM: Mag, Electron Correlation, and Superconductivity in the Actinides/Rare Earths | SS1+HC-WeM: Alloy Surface Reactivity<br>SS2+AS+HC-WeM: Nanoparticle Surfaces | AS+BI+CA+HC+LS+PS+SE+SS-WeM: Analysis of Surf & Int Related to Energy and the Environment | HC+AS+SS-WeM: Advances in Materials and Analysis in Heterogeneous Catalysis II | MI-WeM: Spin Landscape I (Magnetic Structures in Real and Momentum Space) | | |
| WeL | | | | | | | EW-WeL: Exhibitor Technology Spotlight Session III |
| WeA | AC+LS+MI-WeA: Chemistry and Physics of the Actinides/Rare Earths | SS+AS-WeA: Memorial Session in Honor of Patricia Thiel I | AS+CA+HC+LS-WeA: Shining a Light on Surface Chemical Metrology: In Memory of Martin Seah | HC+AS+SS-WeA: Bridging Gaps II: Single Atom Alloys and Desirable Defects | MI-WeA: Spin Land II (Mag Struct in Real & Mom Space)<br>EM-WeA: Compound Semiconductors | | |
| ThM | AC+AS+LS-ThM: Emerging Topics and Methods in Actinide/Rare Earth Science | SS+AS-ThM: Memorial Session in Honor of Patricia Thiel II | AS+AC+BI+CA+HI-ThM: Unraveling the Composition of Complex Systems with SIMS | HC+AS+SS-ThM: Bridging Gaps III: Combined Theory and Experiment in Catalysis | MI+2D+TF-ThM: Quantum Materials (2D) | | |
| ThA | | SS+AS+SE-ThA: ALD and CVD Surface Chemistry | AS+2D+EM+MS+NS+SS+TF-ThA: Probing Defects at Surfaces and Interfaces | HC+AS+NS+SS-ThA: Special Session and Recep for the HC Comm & to Celebrate Robert Madix | | | |
| ThP | | | | | | POSTER SESSIONS: 2D, AS, EM, HC, QS, SE, SM, TF | |
| FrM | RE+AS-FrM: Materials Analysis and Characterization with Radiation | SS1+AS+HC-FrM: Oxide Surface Structure and Reactivity | SS2+CA+AS-FrM: Environmental, Atmospheric and Astronomical Surfaces | | | | |

# Sunday Afternoon, November 6, 2022

| | **Biomaterials Plenary Session**<br>**Room 318 - Session BP-SuA**<br>**Biomaterials Plenary Session: Programmable Biologic Materials (ALL-INVITED SESSION) & Flash Poster Session**<br>**Moderators: Caitlin Howell**, University of Maine,<br>**Markus Valtiner**, Vienna University of Technology, Austria | **Nanoscale Science and Technology Plenary Session**<br>**Room 304 - Session NSP-SuA**<br>**Nanoscale Science and Technology Plenary Session (ALL-INVITED SESSION)**<br>**Moderator: David Czaplewski**, Argonne National Laboratory |
|---|---|---|
| 3:00pm | | **INVITED: NSP-SuA-1** Adventures in Nanofabrication and Manufacturing, from Electron-Beam Lithography to DNA: Science, Technology, and Lessons Learned, ***James Liddle,*** National Institute of Standards and Technology (NIST) |
| 3:20pm | | |
| 3:40pm | | |
| 4:00pm | | |
| 4:20pm | **INVITED: BP-SuA-5** Enhancing the Programmability of Engineered Extracellular Matrices with Sequence Specific Peptoids, ***Adrianne M. Rosales,*** The University of Texas at Austin | |
| 4:40pm | | |
| 5:00pm | **INVITED: BP-SuA-7** New Biomaterials and Bio-inspired Materials from Polyelectrolyte Complexation, ***Yun Fang,*** *M. Tirrell,* University of Chicago | |
| 5:20pm | | |
| 5:40pm | BP-SuA-9 **BID Flash Poster Session: Oral Presentations**<br>**5**:40. BI-TuP-2 - Hannah Omeoka<br>5:43: BI-TuP-8 - Juhi Jaiswal<br>5:46: BI-TuP-12 - Ainslie Allen<br>5:49: BI-TuP-6 Shahidul Alam Mohammad | |

| | **Vacuum Technology Division**<br>**Room 301 - Session VT-MoM**<br>**Vacuum Measurement and Gas Analysis and Vacuum Technology for Quantum Applications**<br>**Moderators:**<br>**James Fedchak**, National Institute of Standards and Technology | **MEMS and NEMS Technical Group**<br>**Room 302 - Session MN+AS+NS+QS+SE-MoM**<br>**Dynamics and Engineering of MEMS/NEMS**<br>**Moderators:**<br>**Jürgen Brugger**, EPFL, Switzerland,<br>**Eva Weig**, University of Munich, Germany |
|---|---|---|
| 8:20am | **INVITED: VT-MoM-1** "Much to Do About Nothing:" Advancing Compact UHV Packages for a "Quantum Everywhere" Future, ***Alex Tingle***, ColdQuanta | |
| 8:40am | | |
| 9:00am | **VT-MoM-3** Non-Magnetic UHV Chambers and Feedthroughs for Quantum Applications: A Challenge for Vacuum, Optics and Mechanics, ***Klaus Bergner***, *J. Hertel, A. Trützschler, M. Flaemmich,* VACOM Vakuum Komponenten & Messtechnik GmbH, Germany | **INVITED: MN+AS+NS+QS+SE-MoM-3** MEMS-Based Surface Nanoengineering Using Thermal AFM Probes: 30 Years and Counting, ***Jürgen Brugger***, École Polytechnique Fédérale de Lausanne, Switzerland |
| 9:20am | **VT-MoM-4** Comparison of Quantum and Classical Vacuum Standards, ***Daniel Barker***, *N. Klimov, E. Tiesinga, J. Fedchak, J. Scherschligt, S. Eckel,* National Institute of Standards and Technology | |
| 9:40am | **VT-MoM-5** Direct Comparison of Two Portable Cold Atom Vacuum Standards, ***Stephen Eckel***, National Institute of Standards and Technology (NIST); *L. Ehinger,* Seattle University; *D. Barker, J. Fedchak, J. Scherschligt,* National Institute of Standards and Technology (NIST) | |
| 10:00am | **VT-MoM-6** Reference Ionization Vacuum Gauge, ***Martin Wüest***, *F. Scuderi,* INFICON Ltd., Liechtenstein; *J. Šetina,* Institute of Metals and Technology, Slovenia; *K. Jousten, M. Bernien,* Physikalisch-Technische Bundesanstalt - Berlin, Germany; *C. Illgen,* Physikalisch-Technische Bundesanstalt - Berlin, Germany; *N. Bundaleski,* Nova School of Sciences and Technology, CEFITEC, Portugal; *B. Jenninger, A. Stöltzel,* CERN, Switzerland | |
| 10:20am | **BREAK** | **BREAK** |
| 10:40am | **INVITED: VT-MoM-8** Towards an Ionization Vacuum Gauge Suitable as a Reference Standard, ***Nenad Bundaleski***, CEFITEC, NOVA School of Science and Technology (FCT-NOVA), NOVA University Lisbon, Portugal | **INVITED: MN+AS+NS+QS+SE-MoM-8** Atomically-Thin $MoS_2$ Nanoelectromechanical Resonators, *R. Yang*, Shanghai Jiao Tong University, China, ***Jaesung Lee***, University of Texas at El Paso |
| 11:00am | | |
| 11:20am | **VT-MoM-10** Evaluating low Pressure Resolution Limits for Optical Refractometry, ***Jacob Ricker***, *K. Douglass, J. Hendricks,* National Institute of Standards and Technology (NIST); *S. White, S. Syssoev,* MKS Instruments, Inc. | **INVITED: MN+AS+NS+QS+SE-MoM-10** Can a Single Nanomechanical Mode Generate a Frequency Comb?, ***Eva Weig***, Technical University of Munich, Germany |
| 11:40am | **VT-MoM-11** Vacuum Fixed Length Optical Cavity (VFLOC): Optical Pressure Measurements Approaching Ultra-High Vacuum, ***Kevin Douglass***, *J. Ricker, J. Hendricks,* NIST | |

| | Room 303 | |
|---|---|---|
| 8:20am | **INVITED: 2D+EM-MoM-1** Scanning Tunneling Spectroscopy of 2d Electronic Materials – from Monolayers to Complex Heterostructures, ***Chih-Kang (Ken) Shih,*** Department of Physics, The University of Texas at Austin | **2D Materials Technical Group**<br>**Session 2D+EM-MoM**<br>**2D Materials: Electronic, Mechanical, and Optical Properties**<br>**Moderator:**<br>**Sarah Haigh**, University of Manchester, UK |
| 8:40am | | |
| 9:00am | **2D+EM-MoM-3** Strain and Charge-Transfer at the Device Relevant Interface Between Single Layer $MoS_2$ and Gold: In-Situ Raman Study, ***Stephanie Lough****, J. Thompson,* University of Central Florida*; R. Rao,* Air Force Research Laboratory*; M. Ishigami,* University of Central Florida | |
| 9:20am | **2D+EM-MoM-4** The Anti-Reflection Performance of Tetrahedral Amorphous Carbon Coatings by Metal Doping, ***HoeKun Kim****, S. Lee,* Korea Aerospace University, Republic of Korea | |
| 9:40am | **2D+EM-MoM-5** Optical and Electrical Investigation into $HfS_2$ Oxidation Mechanisms, *I. Chirca, A. Almutairi,* ***Stephan Hofmann,*** University of Cambridge, UK | |
| 10:00am | | |
| 10:20am | **BREAK** | |
| 10:40am | **2D+EM-MoM-8** Electrical Characterization of β-$In_2Se_3$ Thin Films Synthesized via Molecular Beam Epitaxy, ***Cooper Voigt****,* Georgia Institute of Technology, USA*; B. Wagner,* Georgia Tech Research Institute*; E. Vogel,* Georgia Institute of Technology, USA | |
| 11:00am | **2D+EM-MoM-9** Mechanics of Pristine and Pyrolysed Carbon Nanomembranes (CNMs), ***André Beyer****, F. Paneff, X. Zhang, A. Gölzhäuser,* Bielefeld University, Germany | |
| 11:20am | **INVITED: 2D+EM-MoM-10** Interplay between Electronic, Magnetic and Mechanical Properties in 2D Crystals, ***Young-Woo Son****,* Korea Institute for Advanced Study, Republic of Korea | |
| 11:40am | | |

| | Room 304 | |
|---|---|---|
| 8:20am | **INVITED: NS1+QS-MoM-1** Single Electrons on Solid Neon: A New Solid-State Qubit Platform with Ultralong Coherence, ***Xianjing Zhou***, Pritzker School of Molecular Engineering, University of Chicago | **Nanoscale Science and Technology Division**<br>**Session NS1+QS-MoM**<br>**Fabrication, Testing and Metrology of Quantum Devices and Systems**<br>**Moderator:**<br>**Wonhee Ko**, Oak Ridge Natinal Laboratory |
| 8:40am | | |
| 9:00am | **NS1+QS-MoM-3** Ultra-thin TaN Damascene Nanowire Structures on 300 mm Si Wafers for Quantum Applications, ***Ekta Bhatia***, *S. Kar, S. Olson, T. Vo, S. Schujman, J. Nalaskowski,* NY CREATES; *H. Frost,* SUNY Polytechnic Institute, Albany; *J. Mucci, B. Martinick, I. Wells, T. Murray, C. Johnson, V. Kaushik, S. Papa Rao,* NY CREATES | |
| 9:20am | **NS1+QS-MoM-4** Direct Integration of Atomic Precision Devices into a MOS-Compatible Process, ***Jeffrey Ivie***, *D. Campbell, A. Leenheer, C. Halsey, E. Anderson, S. Schmucker, D. Scrymgeour, X. Gao, W. Lepkowski, T. Lu, L. Tracy, S. Misra,* Sandia National Laboratories | |
| 9:40am | **NS1+QS-MoM-5** Low Thermal Budget PMOS in Low Temperature Epitaxial Silicon, ***Christopher Allemang***, *D. Campbell, J. Ivie, T. Lu, S. Misra,* Sandia National Laboratories | |
| 10:00am | | |
| 10:20am | **BREAK** | **Nanoscale Science and Technology Division**<br>**Session NS2+AS+EM+SS-MoM**<br>**Quantum Based Sensors and Metrology**<br>**Moderator: Nikolai Klimov**, National Institute of Standards and Technology |
| 10:40am | **INVITED: NS2+AS+EM+SS-MoM-8** Interfacing Biomolecules with Coherent Quantum Sensors, ***Peter Maurer***, University of Chicago | |
| 11:00am | | |
| 11:20am | **INVITED: NS3+EM+TF-MoM-10** Quantum and Nonlinear Photonics in Silicon Carbide with Inverse Design, ***Daniil Lukin***, *J. Vuckovic,* Stanford University | **Nanoscale Science and Technology Division**<br>**Session NS3+EM+TF-MoM**<br>**Nanophotonics, Metasurfaces and Plasmonic Systems Including Inverse Design Methods**<br>**Moderators: David Czaplewski**, Argonne National Laboratory, **Nikolai Klimov**, National Institute of Standards and Technology |
| 11:40am | | |

# Monday Morning, November 7, 2022

| | **Manufacturing Science and Technology Group**<br>**Room 305 - Session MS+HI-MoM**<br>**Machine Learning for Microelectronics Manufacturing Process Control and Materials Discovery R&D**<br>**Moderators: Tina Kaarsberg**, U.S. Department of Energy, Advanced Manufacturing Office,<br>**Gary Rubloff**, University of Maryland, College Park | **Plasma Science and Technology Division**<br>**Room 315 - Session PS-MoM**<br>**Plasmas for the Environment and Sustainability: Plasmas-Liquid Interactions, Water, Air, Soil Treatment**<br>**Moderators:**<br>**David Go**, University of Notre Dame,<br>**Jeffrey Shearer,** TEL |
|---|---|---|
| 8:20am | **INVITED: MS+HI-MoM-1** Progressing Process Control with Data-Centric AI, ***Jeff David,*** PDF Solutions | |
| 8:40am | | |
| 9:00am | **INVITED: MS+HI-MoM-3** Paths Toward Autonomous Plasma Process Tool Operation by Pairing of Plasma and Machine Learning Technologies, ***Jun Shinagawa****, P. Ventzek,* Tokyo Electron America Inc., | **PS-MoM-3** Nitrogen Fixation by Atmospheric Plasma: Effect of Process Parameters on Product Yield and Selectivity, *N. Maira,* Université libre de Bruxelles, Belgium*; A. Remy,* Université libre de Bruxelles, Belgium/ Ghent University, Belgium*; K. Van't Veer,* Université libre de Bruxelles / Antwerpen University, Belgium*; C. Pattyn, N. Roy,* Université libre de Bruxelles, Belgium*; A. Bogaerts,* University of Antwerp, Belgium*; N. De Geyter,* Ghent University, Belgium*;* ***Francois Reniers,*** Université libre de Bruxelles, Belgium |
| 9:20am | | **PS-MoM-4** Fundamental Insights Into Plasma-Liquid Interactions by Combined Experiments and Multiphase Modeling, ***Necip Uner,*** Middle East Technical University, Turkey*; S. Keniley,* LAM Research*; E. Perez, D. Curreli, M. Sankaran,* University of Illinois at Urbana-Champaign |
| 9:40am | **MS+HI-MoM-5** Compliant Hybrid Bonding for Large CTE Mismatched Electronic Materials, ***Mieko Hirabayashi Hirabayashi****, M. Wiwi, S. Herrera, E. Madison, M. Jordan,* Sandia National Laboratories | **INVITED: PS-MoM-5** Merging the Fundamental and Applied: Understanding Plasma Kinetics and Energetics to Build Better Mousetraps, ***Ellen Fisher***[1]*,* University of New Mexico |
| 10:00am | | |
| 10:20am | **BREAK** | **BREAK** |
| 10:40am | **INVITED: MS+HI-MoM-8** Machine Learning Accelerated Scale-up for Microporous Materials - An Industrial Perspective, ***Di Du****, P. Kamakoti,* ExxonMobil Technology and Engineering Company | **PS-MoM-8** Comparative Investigation of DC Plasma Versus Boron-doped Diamond Electrodes for Electrochemical Degradation of PFOA, ***Jasmine Dinari,*** University of Illinois at Urbana-Champaign*; N. Uner,* Middle East Technical University, Turkey*; P. Baldaguez Medina, M. Sankaran, X. Su,* University of Illinois at Urbana-Champaign |
| 11:00am | | **PS-MoM-9** Integrated circuit Manufacturing with Plasma Activated Chemical Treatment (IMPACT): A Potential Approach for Reducing the Dose-to-Clear in a Commercial Photoresist, ***Christian Williams****, S. Dubowsky, E. Barlaz, S. Marcinko, M. Sankaran,* University of Illinois at Urbana-Champaign*; E. Suga, A. Matsuyama,* TOK America, Japan*; D. Curreli, D. Ruzic,* University of Illinois at Urbana-Champaign |
| 11:20am | **MS+HI-MoM-10** Optimizing Copper Deposition in High Aspect Ratio Through Silicon Vias, ***Jessica N. McDow****, R. Schmitt, M. Hirabayashi, J. McClain, M. Jordan,* Sandia National Laboratories | **PS-MoM-10** Low Power Degradation of Perfluorooctane Sulfonate (PFOS) in Water Using a Nanosecond Pulsed Atmospheric Pressure Plasma, ***Michael Johnson,*** Syntek Technologies*; W. Maza, V. Breslin,* Naval Research Laboratory, Chemistry Division*; D. Boris, T. Petrova, S. Walton,* Naval Research Laboratory |
| 11:40am | **INVITED: MS+HI-MoM-11** Advanced Manufacturing using Virtual Metrology and Equipment Intelligence®, ***David Fried,*** Lam Research Corporation | |

[1] **2020 PSTD Plasma Prize Winner**

# Monday Morning, November 7, 2022

| | **Thin Films Division**<br>**Room 316 - Session TF+EM-MoM**<br>**Microelectronics and Spintronics Application**<br>**Moderator:**<br>**John F. Conley, Jr.**, Oregon State University | **Atomic Scale Processing Focus Topic**<br>**Room 317 - Session AP+2D+AS+EM+PS+SS+TF-MoM**<br>**Area Selective Processing and Patterning**<br>**Moderators: Eric A. Joseph**, IBM Research Division, T.J. Watson Research Center,<br>**Adrie Mackus**, Eindhoven University, Netherlands |
|---|---|---|
| 8:20am | **INVITED: TF+EM-MoM-1** Rare Earth Thin Oxide Films for Sustainable Energy, ***Ivona Z. Mitrovic****, H. Finch, S. Almalki, S. Tekin, L. Jones, V. Dhanak,* University of Liverpool, UK*; A. Hannah, R. Valizadeh,* STFC Daresbury Laboratory, UK*; A. Renz, V. Shah, P. Gammon, P. Mawby,* University of Warwick, UK | **INVITED: AP+2D+AS+EM+PS+SS+TF-MoM-1** Imperfectly Perfect Materials and/or Processes as a Route for ASD, ***Christophe Vallee****,* SUNY POLY, Albany*; M. Bonvalot, M. Jaffal, T. Yeghoyan,* University Grenoble Alpes, LTM, CNRS, France*; N. Posseme, R. Gassilloud, T. Chevolleau,* CEA/LETI-University Grenoble Alpes, France |
| 8:40am | | |
| 9:00am | **TF+EM-MoM-3** TaN Electrical Barrier for High-k MOS Capacitor*, R. César,* ***José Diniz****,* University of Campinas - UNICAMP, Brazil*; R. Cotrin, E. Joanni, M. Vidal,* Renato Archer Information Technology Center, Brazil | **AP+2D+AS+EM+PS+SS+TF-MoM-3** Area Selective Deposition on EUV Photoresist*,* ***Rosanna Robert****,* SUNY College of Nanoscale Science and Engineering*; H. Frost, K. Lutker-Lee,* TEL Technology Center, America, LLC, USA*; C. Vallée,* SUNY College of Nanoscale Science and Engineering |
| 9:20am | **TF+EM-MoM-4** Internal Photoemission (IPE) Spectroscopy Measurement of Interfacial Barrier Heights in Pristine and Poled Ferroelectric Hafnium Zirconium Oxide Devices*,* ***Jessica Peterson****,* Oregon State University*; T. Mimura,* Gakushuin University, Japan*; J. Ihlefeld,* University of Virginia*; J. Conley,* Oregon State University | **AP+2D+AS+EM+PS+SS+TF-MoM-4** Impact of Post-Exposure Treatments on TMSDMA-Passivated $SiO_2$ Surfaces*,* ***Anthony Valenti****, C. Vallée, C. Ventrice,* SUNY Polytechnic Institute, Albany*; K. Tapily, K. Yu, S. Consiglio, C. Wajda, R. Clark, G. Leusink,* TEL Technology Center, America, LLC |
| 9:40am | | **AP+2D+AS+EM+PS+SS+TF-MoM-5** Area-Selective ALD Using Small Molecule Inhibitors of Different Sizes: Single and Sequential Inhibitor Dosing*,* ***Pengmei Yu****, M. Merkx, I. Tezsevin,* Eindhoven University of Technology, Netherlands*; P. Lemaire, D. Hausmann,* Lam Research Corp.*; T. Sandoval,* Federico Santa María Technical University, Chile*; W. Kessels, A. Mackus,* Eindhoven University of Technology, Netherlands |
| 10:00am | | **AP+2D+AS+EM+PS+SS+TF-MoM-6** Role of Catalytic Surface Reactions During Area-Selective Tan ALD for Precursor Blocking Using Aniline Molecules*,* ***Marc Merkx***[1]*, I. Tezsevin, P. Vu, R. Heinemans, R. Lengers, E. Kessels, A. Mackus,* Eindhoven University of Technology, Netherlands; *T. Sandoval,* Federico Santa Maria Technical University, Chile |
| 10:20am | **BREAK** | **BREAK** |
| 10:40am | | **AP+2D+AS+EM+PS+SS+TF-MoM-8** AVS Russell and Sigurd Varian Awardee Talk: Sequential Application of Two Inhibitors to Achieve Area-Selective Atomic Layer Deposition of Dielectric on Metal*,* ***Tzu-Ling Liu***[2,3]*, M. Harake, S. Bent,* Stanford University |
| 11:00am | **TF+EM-MoM-9** On-Chip ALD LiPON Capacitors for High Frequency Application*, K. Ahuja,* University of Maryland, College Park*; V. Sallaz, F. Voiron,* Murata, France*; P. McCluskey, G. W. Rubloff,* University of Maryland, College Park*;* ***Keith E. Gregorczyk****,* University of Maryland | **AP+2D+AS+EM+PS+SS+TF-MoM-9** Carborane Self-Assembled Monolayers for Area-Selective Deposition*,* ***Michelle Paquette****, R. Bale, R. Thapa, S. Pinnepalli,* University of Missouri-Kansas City*; J. Bielefeld, S. King,* Intel Corporation |
| 11:20am | **INVITED: TF+EM-MoM-10** Designer Heusler Half-Metals for Ultra-Fast Spintronics*,* ***Avik Ghosh****,* University of Virginia | **INVITED: AP+2D+AS+EM+PS+SS+TF-MoM-10** Peter Mark Memorial Award Talk: Reactive Inhibitory Chemistries for Area Selective Depositions and Their Application in Back End of the Line Processes*,* ***Rudy Wojtecki***[4]*,* IBM Almaden Research Center |
| 11:40am | | |

[1] **2021 TFD James Harper Awardee**
[2] **TFD James Harper Award Finalist**
[3] **AVS Russell and Sigurd Varian Awardee**
[4] **Peter Mark Memorial Award Winner**

| | **Biomaterial Interfaces Division**<br>**Room 318 - Session BI+AS+PS-MoM**<br>**Biomolecular Interfaces and Underwater Adhesion**<br>**Moderator:**<br>**Morgan Alexander**, University of Nottingham, UK | **Surface Science Division**<br>**Room 319 - Session SS+AS+TF-MoM**<br>**Dynamics and Mechanisms at Surfaces and Interfaces**<br>**Moderators: Eric Altman**, Yale University, |
|---|---|---|
| 8:20am | **BI+AS+PS-MoM-1** Supported Lipid Bilayers as Model Systems to Understand Molecular Interactions at Complex Solid/Liquid Interfaces, ***Pierluigi Bilotto,*** Centre for Electrochemistry and Surface Technology, Austria; *L. Mears, M. Valtiner,* Vienna University of Technology, Austria | **INVITED: SS+AS+TF-MoM-1** Stereodynamics Effects in Grazing-Incidence Fast-Molecule Diffraction, ***Cristina Díaz,*** Universidad Complutense de Madrid, Spain |
| 8:40am | **BI+AS+PS-MoM-2** Recombinant Lubricin Improves Anti-Adhesive, Wear Protection and Lubrication of Collagen II Surface, *H. Yuan,* Tianjin University, China; ***Laura Mears,*** Vienna University of Technology, Austria; *R. Su,* Tianjin University, China; *M. Valtiner,* Vienna University of Technology, Austria | |
| 9:00am | | **SS+AS+TF-MoM-3** Intermolecular Interactions in Carbonyl Compounds Trigger Surface Reactivity, ***Swetlana Schauermann,*** *S. Attia, C. Schroeder, M. Schmidt,* Kiel University, Germany |
| 9:20am | | **SS+AS+TF-MoM-4** Velocity Map Images of Subsurface Oxygen Desorbing from Rh(111), ***Arved Cedric Dorst,*** *T. Schäfer,* University of Göettingen, Germany; *D. Killelea,* Loyola University Chicago |
| 9:40am | **BI+AS+PS-MoM-5** Hyaluronic Acid-Dopamine Conjugate for Facile Deposition onto Collagen I with Enhancing Anti-Adhesion and Lubrication, *H. Yuan,* Tianjin University, China; *L. Mears, M. Valtiner,* Vienna University of Technology, Austria; ***Rongxin Su,*** Tianjin University, China | **SS+AS+TF-MoM-5** In-Situ Characterization of $O_2$ Gas-Induced Rearrangement of Near-Surface Composition in Refractory High-Entropy Alloys, *H. Kersell,* Oregon State University; *X. Fan,* University of Tennessee Knoxville; *A. Herman,* Oregon State University; *Z. Lyu,* University of Tennessee Knoxville; *B. Steingrimsson,* Imagars LLC; *P. Liaw,* University of Tennessee Knoxville; ***michely*** |
| 10:00am | **BI+AS+PS-MoM-6** Anti-Fouling Properties of Amphiphilic Zwitterionic Hydrogels, ***Lisa Schardt,*** Ruhr University Bochum, Germany; *A. Martínez Guajardo,* University of Potsdam, Germany; *J. Koc,* Ruhr University Bochum, Germany; *J. Clarke, J. Finlay, A. Clare,* Newcastle University, UK; *H. Gardner, G. Swain, K. Hunsucker,* Florida Institute of Technology; *A. Laschewsky,* University of Potsdam, Germany; *A. Rosenhahn,* Ruhr University Bochum, Germany | **SS+AS+TF-MoM-6** Surface Faceting and Oxidation in Binary and Ternary Ni-Based Alloys, ***Devin Jessup,*** *K. Orson, Z. Harris, P. Reinke,* University of Virginia |
| 10:20am | **BREAK** | **BREAK** |
| 10:40am | **BI+AS+PS-MoM-8** Mussel Adhesion: A Fundamental Perspective on Factors Governing Strong Underwater Adhesion, *L. Mears, J. Appenroth, A. Celebi, A. Imre, H. Yuan,* TU Wien, Austria; *P. Bilotto,* CEST Centre for Electrochemistry and Surface Technology, Austria; *R. Su,* Tianjin University, China; ***Markus Valtiner,*** TU Wien, Austria | **INVITED: SS+AS+TF-MoM-8** Medard W. Welch Award Talk: Atomistic Simulations to Advance Surface Science, ***Susan Sinnott***[1], Pennsylvania State University |
| 11:00am | **BI+AS+PS-MoM-9** Bioinspired Underwater Adhesives Using Amyloids from Commonplace Proteins, *M. Wilson,* NRC Post-doctoral Fellow sited at the Naval Research Laboratory, Chemistry Division; *M. Beasley,* NRC post-doc sited at the Naval Research Laboratory, Chemistry division; *K. Fears,* Naval research laboratory, Chemistry Division; *E. Yates,* US Naval Academy, Chemistry Department; ***Christopher So***[2], Naval Research Laboratory, Chemistry Division | |
| 11:20am | **BI+AS+PS-MoM-10** Incorporation of Antimicrobial Cyclic Peptides in Polymeric Materials, *D. Regan, Q. Lu, D. Barlow,* ***Kenan Fears,*** US Naval Research Laboratory | **SS+AS+TF-MoM-10** STM Study of Ag Encapsulation of Pd and Pt Islands on Ag(111) at Room Temperature, ***Buddhika Alupothe Gedara,*** *M. Trenary,* University of Illinois - Chicago |
| 11:40am | **BI+AS+PS-MoM-11** Tuning Amphiphilicity of Alginic Acid-Based Polyelectrolyte Multilayers to Enhance Marine Fouling Resistance, ***Jana Karthäuser,*** *T. Gnanasampanthan, S. Spöllmann, R. Wanka, H. Becker, A. Rosenhahn,* Ruhr University Bochum, Germany | |

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

[2] **BID Early Career Researchers Award**

**Room 320**

**Applied Surface Science Division**
**Session AS+LS+RE+SS-MoM**
**Probing Surface and Interface Structure with X-ray Photoelectron Spectroscopy: In Memory of Charles Fadley**
**Moderators:**
**Gregory Herman**, Oregon State University,
**Theva Thevuthasan**, Pacific Northwest National Laboratory

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|---|---|
| 8:20am | |
| 8:40am | |
| 9:00am | **AS+LS+RE+SS-MoM-3** X-Ray Spectroscopic Identification of Strain and Structure-Based Resonances in a Series of Saturated Carbon-Cage Molecules: Adamantane, Twistane, Octahedrane, and Cubane, ***Trevor Willey,*** *J. Lee,* Lawrence Livermore National Laboratory*; D. Brehmer, O. Paredes Mellone,* SLAC National Accelerator Laboratory*; L. Landt,* Lawrence Livermore National Laboratory*; P. Schreiner, A. Fokin, B. Tkachenko,* Institute of Organic Chemistry, Justus Liebig University, Germany*; A. de Meijere, S. Kozhushkov,* Institute for Organic and Biomolecular Chemistry, Georg-August-University, Germany*; T. van Buuren,* Lawrence Livermore National Laboratory |
| 9:20am | **AS+LS+RE+SS-MoM-4** Composition and Thermal Stability Analysis of Passive Films on NiCr and NiCrMo Alloys, ***Keithen Orson,*** *A. Costine, E. Romanovskaia, J. Scully, P. Reinke,* University of Virginia |
| 9:40am | **AS+LS+RE+SS-MoM-5** Reversible Changes in Surface Charging and Surface Oxide of $NiFe_2O_4$ Thin Films: A Temperature Dependent X-Ray Photoemission Study, ***Arjun Subedi,*** *D. Yang, X. Xu, P. Dowben,* University of Nebraska-Lincoln |
| 10:00am | **AS+LS+RE+SS-MoM-6** The Reproducibility Crisis in Science as Manifested in X-Ray Photoelectron Spectroscopy (XPS). What's Been Done, and What's Being Done About It?, ***Matthew Linford,*** Brigham Young University*; D. Baer,* PNNL*; G. Major,* Brigham Young University |
| 10:20am | **BREAK** |
| 10:40am | **INVITED: AS+LS+RE+SS-MoM-8** Study of Surface Oxides on $Pt_3Ni(111)$ and $Pt_3Co(111)$ using Ambient Pressure XPS, ***Bongjin Simon Mun,*** Gwangju Institute of Science and Technology, Republic of Korea |
| 11:00am | |
| 11:20am | **AS+LS+RE+SS-MoM-10** Probing the Oxidation Chemistry of TRISO Nuclear Fuels Using Depth Profiled XPS and Ambient Pressure XPS, ***Jeff Terry,*** Illinois Institute of Technology |
| 11:40am | **AS+LS+RE+SS-MoM-11** Environmental X-ray Photoelectron Spectroscopy Study of Catalyst-Ionomer Interactions in Polymer Electrolyte Membrane Fuel Cells, ***Jayson Foster,*** *S. Zaccarine, M. Dzara,* Colorado School of Mines, USA*; C. Baez-Cotto,* National Renewable Energy Laboratory*; S. Kim,* Colorado School of Mines, USA*; M. Batool, J. Jankovic,* University of Connecticut*; M. Ulsh, S. Mauger,* National Renewable Energy Laboratory*; S. Pylypenko,* Colorado School of Mines, USA |

# Monday Afternoon, November 7, 2022

| | **Vacuum Technology Division**<br>**Room 301 - Session VT-MoA**<br>**Vacuum Technology for Accelerators**<br>**Moderators:**<br>**Giulia Lanza**, SLAC National Accelerator Laboratory,<br>**Yevgeniy Lushtak**, SAES Getters USA | **MEMS and NEMS Technical Group**<br>**Room 302 - Session MN+2D-MoA**<br>**Emerging Materials and Structures for MEMS/NEMS Devices**<br>**Moderators: Azadeh Ansari**, Georgia Institute of Technology,<br>**Yanan Wang**, University of Nebraska - Lincoln |
|---|---|---|
| 1:40pm | **INVITED: VT-MoA-1** Developments of the Vacuum Systems Required for the Electron Ion Collider, ***Charles Hetzel,*** Brookhaven National Laboratory | **INVITED: MN+2D-MoA-1** Phononic Crystals based on Two-Dimensional Materials, ***Yanan Wang,*** University of Nebraska - Lincoln |
| 2:00pm | | |
| 2:20pm | **INVITED: VT-MoA-3** Vacuum System of the MAX IV 3 GeV Storage Ring: Design and Performance, ***Marek Grabski,*** *M. Grabski,* Max IV Laboratory, Sweden | **INVITED: MN+2D-MoA-3** Scaling Acoustics into mm-Wave: Higher-Order Lamb Mode Devices in Piezoelectric Thin Films, ***Ruochen Lu,*** *J. Kramer, S. Cho, O. Barrera,* The University of Texas at Austin |
| 2:40pm | | |
| 3:00pm | **VT-MoA-5** Fabrication and Assembly Status of the APS-Upgrade Storage Ring Vacuum System, ***Jason Carter,*** *O. Mulvany, G. Wiemerslage,* Argonne National Laboratory | **INVITED: MN+2D-MoA-5** AlScN Piezoelectric Metamaterials for Next Generation RF Systems, *C. Cassella,* ***Dan Zhao,*** Northeastern University |
| 3:20pm | | |
| 3:40pm | **BREAK** | **BREAK** |
| 4:00pm | **INVITED: VT-MoA-8** CW Superconducting Linac for the LCLS-II HE Free Electron Laser at SLAC, ***Marc Ross,*** SLAC National Accelerator Laboratory | **INVITED: MN+2D-MoA-8** Fabrication, Actuation and Control of 3D-Printed Microscale Robots, ***Azadeh Ansari,*** The Georgia Institute of Technology |
| 4:20pm | | |
| 4:40pm | **VT-MoA-10** Upgrades for the Jefferson Lab Injector and Linac Accelerator Vacuum Systems, ***Marcy Stutzman,*** Thomas Jefferson National Accelerator Facility | **MN+2D-MoA-10** Fabrication of Resistor-based Zinc Devices using Selective Chemical Deoxidation of Screen Printed Zinc Inks by Inkjet Printing, *A. Radwan,* Case Western Reserve University; *Y. Sui,* University of Colorado at Boulder; ***Christian Zorman,*** Case Western Reserve University |
| 5:00pm | **VT-MoA-11** Vacuum Leak Detection with Variational Smoothing for Vacuum Process Chamber, ***Taekyung Ha,*** PSK, Republic of Korea | **MN+2D-MoA-11** Mechanically Tunable One-Dimensional Photonic Crystals Fabricated by Two-Photon Polymerization, ***Victoria P. Stinson,*** *N. Shuchi, M. McLamb, G. Boreman, T. Hofmann,* University of North Carolina at Charlotte |

**Room 303**

**2D Materials Technical Group**
**Session 2D+AS+SS-MoA**
**2D Materials: Defects, Dopants, Edges, Functionalization, and Intercalation**
**Moderators:**
**Chih-Kang (Ken) Shih**, University of Texas at Austin,
**Young-Woo Son**, Korea Institute for Advanced Study, Republic of Korea

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|---|---|
| 1:40pm | |
| 2:00pm | |
| 2:20pm | **2D+AS+SS-MoA-3** Effect of Defects in 2D Materials on the Dielectric **BREAK**down, ***Abdulrahman H. Basher****, M. Lanza, U. Schwingenschlogl,* King Abdullah University of Science and Technology (KAUST), Saudi Arabia |
| 2:40pm | **2D+AS+SS-MoA-4** Palladium Nucleation and Alloying at the $WTe_2$(001) Surface*,* ***Prescott E. Evans****, P. Sushko, Z. Dohnálek,* Physical and Computational Sciences Directorate and Institute for Interfacial Catalysis, Pacific Northwest National Laboratory |
| 3:00pm | **2D+AS+SS-MoA-5** Advanced Doping Schemes for 2D Nb:$WS_2$ for Catalysis and Electronics*,* ***Jeff Schulpen****, C. Lam, W. Kessels, M. Verheijen,* Eindhoven University of Technology, The Netherlands*; A. Bol,* University of Michigan, Ann Arbor |
| 3:20pm | |
| 3:40pm | **BREAK** |
| 4:00pm | **INVITED: 2D+AS+SS-MoA-8** Atomic Imaging of Dynamic Behaviour at 2D Material Solid-Solid and Solid-Liquid Interfaces*,* ***Sarah Haigh****,* University of Manchester, UK |
| 4:20pm | |
| 4:40pm | **2D+AS+SS-MoA-10** Electrodeposition of Nanofiberous H-Type $MnO_2$ Birnessite on Epitaxial Graphene Silicon Carbide Heterostructures, and transformation to Alkali Birnessites (Na, Li, K) via Simple Intercalation*,* ***Michael Pedowitz****, D. Lewis, K. Daniels,* University of Maryland, College Park |
| 5:00pm | **2D+AS+SS-MoA-11** Signature of Coexistence of Ferroelectricity and Ferromagnetism in a Quantum Material*,* ***I-Hsuan Kao****, S. Yuan, J. Katoch, S. Singh,* Carnegie Mellon University |

| | Room 304 | |
|---|---|---|
| 1:40pm | **INVITED: NS1+AS+EM-MoA-1** Large Volume 3D Biological Imaging with Electron and Cryo-Super-Resolution Microscopy, ***Harald Hess,*** HHMI, Janelia | **Nanoscale Science and Technology Division**<br>**Session NS1+AS+EM-MoA**<br>**Correlative Microscopy for Nanoscale Characterization**<br>**Moderators:**<br>**Sidney Cohen**, Weizmann Institute of Science, Israel,<br>**Georg Fantner**, EPFL, Switzerland |
| 2:00pm | | |
| 2:20pm | **NS1+AS+EM-MoA-3** The Role of $SnO_2$ Processing on Ionic Migration in Multi-Halide Perovskites, ***Holland Hysmith,*** University of Tennessee Knoxville; *S. Park,* National Renewable Energy Laboratory; *A. Ievlev, Y. Liu,* Oak Ridge National Laboratory; *K. Zhu,* National Renewable Energy Laboratory; *M. Ahmadi,* University of Tennessee Knoxville; *J. Berry,* National Renewable Energy Laboratory; *O. Ovchinnikova,* Oak Ridge National Laboratory | |
| 2:40pm | **NS1+AS+EM-MoA-4** Nanoplastic Arrays – from Chaotic Measurements to New Order, *A. Madison, D. Westly, R. Ilic, C. Copeland, A. Pintar, C. Camp, J. Liddle,* ***Samuel M. Stavis,*** National Institute of Standards and Technology (NIST) | |
| 3:00pm | **NS1+AS+EM-MoA-5** Development of Nanoendoscopy-AFM for Visualizing Intracellular Nanostructures of Living Cells, ***Keisuke Miyazawa,*** Kanazawa University, Japan; *M. Penedo,* EPFL, Switzerland; *N. Okano, H. Furusho, T. Ichikawa, M. Shahidul Alam, K. Miyata,* Kanazawa University, Japan; *C. Nakamura,* AIST, Japan; *T. Fukuma,* Kanazawa University, Japan | |
| 3:20pm | **NS1+AS+EM-MoA-6** Nanoplastic Arrays – from Chaotic Measurements to New Order, *A. Madison, D. Westly, R. Ilic, C. Copeland, A. Pintar, C. Camp, J. Liddle,* ***Samuel M. Stavis,*** National Institute of Standards and Technology (NIST) | |
| 3:40pm | **BREAK** | **Nanoscale Science and Technology Division**<br>**Session NS2+AP+BI-MoA**<br>**Fabrication and Operation of Nano-Systems**<br>**Moderators:**<br>**David Czaplewski**, Argonne National Laboratory |
| 4:00pm | **INVITED: NS2+AP+BI-MoA-8** Control of Color Centers in Diamond using Photonic and Phononic Crystals, ***Kazuhiro Kuruma,*** Harvard University | |
| 4:20pm | | |
| 4:40pm | **NS2+AP+BI-MoA-10** Scalable Preparation of Intrinsically Chiral Metal Surfaces for Enantioselective Processes, ***Nisha Shukla,*** *A. Gellman,* Carnegie Mellon University, USA | |
| 5:00pm | **NS2+AP+BI-MoA-11** Wrinkle-Induced, Scale-Dependent Mechanical Properties in Nanometer Thick Films, ***Jian Zhou,*** *N. Moldovan, L. Stan, J. Wen, D. Jin,* Argonne National Lab; *D. Lopez,* Pennsylvania State University; *D. Czaplewski,* Argonne National Lab | |

| | **Manufacturing Science and Technology Group**<br>**Room 305 - Session MS+AP+AS+TF-MoA**<br>**Advanced Characterization and Metrology for 3D and ML for Microelectronics Materials Discovery**<br>**Moderators: Alain Diebold**, SUNY Polytechnic Institute,<br>**Jeremy Mehta**, U.S. Department of Energy | **Plasma Science and Technology Division**<br>**Room 315 - Session PS+AS-MoA**<br>**Plasma Chemistry and Catalysis**<br>**Moderators:**<br>**Michael Gordon**, University of California at Santa Barbara,<br>**Floran Peeters**, LeydenJar Technologies, Netherlands |
|---|---|---|
| 1:40pm | **INVITED: MS+AP+AS+TF-MoA-1** Semiconductor Metrology for Dimensional and Materials Scaling, ***Bryan Barnes,*** NIST | **PS+AS-MoA-1** Study of Plasma-Catalyst Surface Interactions for Nitrogen Oxidation, ***Michael Hinshelwood,*** *Y. Li, G. Oehrlein,* University of Maryland College Park |
| 2:00pm | | **PS+AS-MoA-2** Investigation of the Interaction Between Non-Thermal Plasma Activated Nitrogen and Metal Surfaces, ***Garam Lee,*** *C. Yan, W. Schneider, D. Go, C. O'Brien,* University of Notre Dame |
| 2:20pm | **INVITED: MS+AP+AS+TF-MoA-3** Towards a Digital Twin for Spatiotemporal Experiments, ***Subramanian Sankaranarayanan,*** Argonne National Laboratory | **PS+AS-MoA-3** Long-Term Degradation of PTFE in a Low Temperature Oxygen Plasma, ***Tobias Wagner,*** *T. Zeller, M. Rohnke, J. Janek,* Institute of Physical Chemistry, Justus Liebig University Giessen, Germany |
| 2:40pm | | **PS+AS-MoA-4** Study of Elastomer Degradation in Processing and Cleaning Plasma Chemistries, ***Nicholas Connolly,*** *D. Barlaz, R. Garza, D. Ruzic, M. Sankaran,* University of Illinois Urbana-Champaign*; N. Kolliopoulos, G. Lunardi,* DuPont Precision Parts & Solutions |
| 3:00pm | **INVITED: MS+AP+AS+TF-MoA-5** Autonomous Scanning Probe Microscopy: from Streaming Image Analysis to Learning Physics, *S. Kalinin,* ***Yongao Liu,*** Oak Ridge National Laboratory | **PS+AS-MoA-5** Utilizing Optical Spectroscopy to Explore Mechanisms of Plasma-Assisted Catalysis in Model Exhaust Systems, ***Joshua Blechle,*** Wilkes University |
| 3:20pm | | **PS+AS-MoA-6** Gasification of Carbon and $CO_2$ Into CO at Low Vacuum Through Combined Plasma and Heating Exposure, ***Edwin Devid,*** DIFFER, Netherlands*; R. Van de Sanden,* DIFFER & EIRES, Netherlands*; M. Gleeson,* DIFFER, Netherlands |
| 3:40pm | **BREAK** | **BREAK** |
| 4:00pm | **INVITED: MS+AP+AS+TF-MoA-8** New in-Line Metrology for Advanced Semiconductor Nodes, ***Cornel Bozdog,*** Onto Innovation | **PS+AS-MoA-8** Investigation of Oxygen Permeation Enhancement with $He/O_2$ Plasma and SOEC Interaction, ***Xingyu Chen,*** Dutch Institute for Fundamental Energy Research, China*; F. Peeters, F. Smits, W. Bongers, R. van de Sanden,* Dutch Institute for Fundamental Energy Research, Netherlands |
| 4:20pm | | **PS+AS-MoA-9** Application of Plasma-Liquid Chemistry to Carbon-Carbon Bond Formation via Pinacol Coupling Reaction, ***Scott Dubowsky,*** *J. Wang,* University of Illinois at Urbana-Champaign*; N. Üner,* Middle East Technical University, Turkey*; J. Moore, M. Sankaran,* University of Illinois at Urbana-Champaign |
| 4:40pm | **INVITED: MS+AP+AS+TF-MoA-10** Applications of Artificial Intelligence AI and Machine Learning ML to Semiconductor Materials Discovery and Optimization, ***Brian Valentine,*** DOE | **PS+AS-MoA-10** Understanding Temperature Inhibition of Methane Conversion in DBD Plasma Using Electrical Characterization and Optical Emission Spectroscopy, ***Ibukunoluwa Akintola,*** *G. Rivera-Castro, J. Yang, J. Hicks, D. Go,* University of Notre Dame |
| 5:00pm | | **PS+AS-MoA-11** Optimization of $CO_2$ Dissociation Efficiency and Conversion in Vortex-Stabilized Microwave Plasmas by Effluent Nozzles, ***Cas van Deursen,*** DIFFER, Netherlands*; H. van Poyer,* DIFFER, Belgium*; Q. Shen,* DIFFER, China*; W. Bongers,* DIFFER, Netherlands*; F. Peeters,* Technical University of Eindhoven, Netherlands*; F. Smits, R. van de Sanden,* DIFFER, Netherlands |

| | **Thin Films Division**<br>**Room 316 - Session TF+EM-MoA**<br>**Thin Films for Optics, Photonics, Metamaterials, and Soft Electronics**<br>**Moderator:**<br>**April Jewell**, Jet Propulsion Laboratory | **Atomic Scale Processing Focus Topic**<br>**Room 317 - Session AP+AS+EL+MS+SS-MoA**<br>**Advancing Metrology and Characterization to Enable Atomic Scale Processing**<br>**Moderators: Steven M. George**, University of Colorado at Boulder, **Rudy Wojteki**, IBM Almaden Research Center |
|---|---|---|
| 1:40pm | **INVITED: TF+EM-MoA-1** Strategies for Achieving Tunable Infrared Emission in III-V Materials, ***Michelle Povinelli****, H. Chae, A. Ghanekar, B. Shrewsbury, R. Ahsan, R. Kapadia,* University of Southern California | **INVITED: AP+AS+EL+MS+SS-MoA-1** Nanoscale Chemical Analysis and Mapping of Atomic and Molecular Scale Processes via Infrared Photo-Induced Force Microscopy, ***Sung Park****,* Molecular Vista |
| 2:00pm | | |
| 2:20pm | **TF+EM-MoA-3** Effects of Ultra-Thin Conformal Coatings on the Spectral Location of Reciprocal Plasmonic Metasurface Resonances, ***Micheal McLamb****, V. Stinson, N. Shuchi, G. Boreman, T. Hofmann,* University of North Carolina at Charlotte | **AP+AS+EL+MS+SS-MoA-3** Area-Selective Deposition/Patterning of Boron Carbide Layers: Etch Studies, ***Raja Sekhar Bale****, R. Thapa, A. Caruso,* University of Missouri-Kansas City*; J. Bielefeld, S. King,* Intel Corporation*; M. Paquette,* University of Missouri-Kansas City |
| 2:40pm | **TF+EM-MoA-4** Integrating Structural Colors with Additive Manufacturing Using Atomic Layer Deposition, ***Tae Cho****, B. Rorem, N. Farjam, J. Lenef, K. Barton, J. Guo, N. Dasgupta,* University of Michigan, Ann Arbor | **AP+AS+EL+MS+SS-MoA-4** Smoothing of Surfaces by Atomic Layer Deposition and Etching, *S. Gerritsen, N. Chittock, V. Vandalon, M. Verheijen,* Eindhoven University of Technology, The Netherlands*; H. Knoops,* Oxford Instruments Plasma Technology, Netherlands*; E. Kessels,* ***Adrie Mackus****,* Eindhoven University of Technology, The Netherlands |
| 3:00pm | **TF+EM-MoA-5** Biosensor Encapsulation via Photoinitiated Chemical Vapor Deposition (piCVD), ***Ruolan Fan****, T. Andrew,* University of Massachusetts - Amherst | **AP+AS+EL+MS+SS-MoA-5** Thermal Atomic Layer Etching of Amorphous Aluminum Nitride Using $Sf_6$ Plasma and $Al(Ch_3)_3$, ***Haozhe Wang****, A. Houssain, D. Catherall, A. Minnich,* California Institute of Technology |
| 3:20pm | **TF+EM-MoA-6** Harnessing Wide-Range, Highly Stable Pressure Sensitivity Via PEDOT-Cl Vapor Printed Textiles for Health Monitoring, ***S. Zohreh Homayounfar****, A. Kiaghadi, D. Ganesan, T. Andrew,* University of Massachusetts, Amherst | **AP+AS+EL+MS+SS-MoA-6** Thermal Atomic Layer Etching using MoF6-H2O precursors, ***Anil Mane****, J. Elam,* Argonne National Laboratory, USA |
| 3:40pm | **BREAK** | **BREAK** |
| 4:00pm | | **INVITED: AP+AS+EL+MS+SS-MoA-8** The Thinner, the Better - Characterization of Ultra-Thin Films by Low Energy Ion Scattering (Leis), ***Thomas Grehl****,* IONTOF GmbH, Germany |
| 4:20pm | | |
| 4:40pm | | **AP+AS+EL+MS+SS-MoA-10** Intrinsic Area Selective Atomic Layer Deposition of $MoS_2$ Thin Films, *J. Soares,* ***Wesley Jen****, S. Hues,* Boise State University*; J. Wensel,* Micron Technology Inc*; E. Graugnard,* Boise State University |
| 5:00pm | | **AP+AS+EL+MS+SS-MoA-11** In Situ Measurements of Surface and Film Stress during Atomic Layer Deposition of $Al_2O_3$ and $AlF_3$ using Wafer Curvature Techniques, ***Ryan B. Vanfleet****, E. Sorinto, A. Cavanagh, V. Bright, S. George,* University of Colorado at Boulder |

| | **Biomaterial Interfaces Division**<br>**Room 318 - Session BI+AS+HC+SS-MoA**<br>**Bioinspired Materials and Applications**<br>**Moderators:**<br>**Sally M. McArthur**, Daeking University, Australia,<br>**Tobias Weidner**, Aarhus University, Denmark | **Surface Science Division**<br>**Room 319 - Session SS+AS-MoA**<br>**Molecular Organization at Surfaces**<br>**Moderator:**<br>**Donna Chen**, University of South Carolina |
|---|---|---|
| 1:40pm | **INVITED: BI+AS+HC+SS-MoA-1** Bioinspired Approaches to Prevent Microbes and Fouling on the Surface of Membranes, *R. Shah, T. Goodwin,* ***Jessica Schiffman,*** University of Massachusetts Amherst | |
| 2:00pm | | |
| 2:20pm | **BI+AS+HC+SS-MoA-3** Antibiotic-Free Liquid Layers Decrease Bacterial Adhesion on Catheters In Vivo, *C. Fong,* University of Maine*; M. Andersen, A. Flores Mireles,* Notre Dame*;* ***Caitlin Howell,*** 5737 Jenness Hall | |
| 2:40pm | **BI+AS+HC+SS-MoA-4** Discovery of Cell Instructive Materials for Next Generation Medical Devices: Exploring Microtopography and 3D Shapes, ***Morgan Alexander,*** University of Nottingham, UK | **SS+AS-MoA-4** Protein Structure and Dynamics at the Air-Water Interface Using Sum Frequency Generation Simulations, ***Kris Strunge,*** Aarhus University, Denmark*; Y. Nagata,* Max Planck Institute for Polymer Research, Germany, Denmark*; T. Weidner,* Aarhus University, Denmark |
| 3:00pm | **BI+AS+HC+SS-MoA-5** Development of a Method for Visualizing Nanometer-Scale Three-Dimensional Structures of Chromosomes by Three-Dimensional Atomic Force Microscopy, ***Ryohei Kojima****, K. Miyazawa, K. Teramae,* Kanazawa University, Japan*; T. Sumikama,* PRESTO, JST, Japan*; M. Meguro,* Research Center for Experimental Modeling of Human Disease, Kanazawa University, Japan*; K. Imadate,* Osaka University, Japan*; N. Okano,* Kanazawa Unversity, Japan*; S. Horike,* Research Center for Experimental Modeling of Human Disease, Kanazawa University, Japan*; K. Hirahara,* Osaka University, Japan*; T. Fukuma,* Kanazawa University, Japan | **SS+AS-MoA-5** Confinement at Solid-solid Interfaces Enhances Crystallinity of COF Thin Films, ***Joshua Roys***[1]*, J. O'Brien, N. Stucchi,* Clarkson University*; A. Hill,* St. Lawrence University*; J. Ye, R. Brown,* Clarkson University |
| 3:20pm | **BI+AS+HC+SS-MoA-6** Mass-Manufactured Surface Textures Kill Bacteria as Part of Low-Cost Water Purification Devices, ***Liza White****, C. Howell,* University of Maine | **SS+AS-MoA-6** Metal Tetraphenylporphyrin Induced Organic/Metal Interactions, ***Isheta Majumdar****, F. Goto, A. Calloni, M. Finazzi, L. Duò, F. Ciccacci, G. Bussetti,* Politecnico di Milano, Italy |
| 3:40pm | **BREAK** | **BREAK** |
| 4:00pm | **INVITED: BI+AS+HC+SS-MoA-8** Nature-inspired Materials for Energy and Environmental Sustainability, ***Tak Sing Wong,*** The Pennsylvania State University | |
| 4:20pm | | |
| 4:40pm | **BI+AS+HC+SS-MoA-10** Programmable Biomimetic Light-Harvesting Systems: Quantum-Optical Control of Light-Matter Interactions, *A. Lishchuk, E. Csanyi,* ***Graham Leggett,*** University of Sheffield, UK | **SS+AS-MoA-10** Characterization of Oxygen Evolution from Rh(111), ***Maxwell Gillum****, E. Jamka, C. Grytsyshyn-Giger, F. Lewis, A. Kerr, D. Killelea,* Loyola University Chicago |
| 5:00pm | **BI+AS+HC+SS-MoA-11** Microfluidic QCM with Ultrahigh Q-Factor: A New Paradigm for Acoustic Biosensing?*, Y. Zhao,* Duke University*; Z. Parlak,* Qatch LLC.*; M. Yu,* Duke University*; D. French,* Qatch LLC.*; W. Aquino,* ***Stefan Zauscher,*** Duke University | **SS+AS-MoA-11** Developing a Mechanistic Understanding of $Nb_3Sn$ Growth: Sn Adsorption and Diffusion Behavior on (3×1)-O Nb(100), ***Rachael Farber,*** University of Kansas*; S. Willson,* University of Chicago*; A. Hire, R. Hennig,* University of Florida*; S. Sibener,* University of Chicago |

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

| | **Applied Surface Science Division**<br>**Room 320 - Session AS+CA+EL+EM+LS+SE+SS-MoA**<br>**Quantitative Surface Analysis**<br>**Moderators:**<br>**Jordan Lerach**, PPG Industries,<br>**Hong Piao**, FUJIFILM Electronic Materials USA., Inc. | **Fundamental Discoveries in Heterogeneous Catalysis Focus Topic**<br>**Room 321 - Session HC+AS+SS-MoA**<br>**Advances in Materials and Analysis in Heterogeneous Catalysis I**<br>**Moderators: Dan Killelea**, Loyola University Chicago, **Swetlana Schauermann**, Christian-Albrechts-University Kiel, Germany |
|---|---|---|
| 1:40pm | **INVITED: AS+CA+EL+EM+LS+SE+SS-MoA-1** Hard Targets: Developing Tools for Quantitative HAXPES, ***David Cant,*** National Physical Laboratory, UK | |
| 2:00pm | | **HC+AS+SS-MoA-2** Electrocatalytic Activity of Size-Selected Sub-Nano Pt Clusters Toward the Hydrogen Evolution Reaction, ***Tsugunosuke Masubuchi,*** University of Utah*; S. Kumari, Z. Zhang, P. Sautet, A. Alexandrova,* University of California at Los Angeles*; H. White, S. Anderson,* University of Utah |
| 2:20pm | **AS+CA+EL+EM+LS+SE+SS-MoA-3** Process-Induced Reactions in Interfaces of High-K/Metal Gate Stacks Studied Using HAXPES, ***Thierry Conard****, A. Vanleenhove, F. Mascarenhas, I. Hoflijk, I. Vaesen,* IMEC, Belgium | **INVITED: HC+AS+SS-MoA-3** In situ X-ray Absorption Spectroscopy to Probe the Dynamics of $Ni_3Fe$ catalysts: Implications for Dry Methane Reforming*, L. Cruz,* University of California, Riverside*; J. Hong,* Stanford Institute for Materials and Energy Sciences, SLAC National Accelerator Laboratory*; S. Shah,* University of California - Riverside*; S. Bare,* Stanford Institute for Materials and Energy Sciences, SLAC National Accelerator Laboratory*;* ***Kandis Leslie Gilliard-AbdulAziz****,* University of California - Riverside |
| 2:40pm | **AS+CA+EL+EM+LS+SE+SS-MoA-4** Quantification and Reporting of XPS Data Taken Under Near Ambient Pressure Conditions – Chances and Challenges in Acquision Speed, Beam Damage, Sensitivity, Reliability, Reproducibility and Repeatability*, P. Dietrich,* ***Andreas Thissen****,* SPECS Surface Nano Analysis GmbH, Germany | |
| 3:00pm | **AS+CA+EL+EM+LS+SE+SS-MoA-5** The Modern Spectrometer – Reliable, Repeatable and Relatable*, S. Coultas, J. Counsell,* Kratos Analytical Limited, UK*;* ***Christopher Moffitt,*** Kratos Analytical Inc.*; C. Blomfield,* Kratos Analytical Limited, UK | **INVITED: HC+AS+SS-MoA-5** Photocatalysis between High-Purity and Applied Reaction Conditions: Understanding Carbon Dioxide Reduction on the Molecular Level, ***Jennifer Strunk****,* Leibniz Institute for Catalysis, Germany |
| 3:20pm | **AS+CA+EL+EM+LS+SE+SS-MoA-6** Modulation with Atomic Number of the Shirley Background of the Photoemission Spectra of Transition Metals*,* ***Alberto Herrera-Gomez****, D. Guzman-Bucio,* CINVESTAV-Queretaro, Mexico*; D. Cabrera-German, M. Mayorga-Garay, O. Cortazar-Martinez, J. Torres-Ochoa, A. Carmona-Carmona,* CINVESTAV-Unidad Queretaro, Mexico*; M. Gonzalez Reyna ,* UNAM-Mexico*; V. Crist,* XPS Library*; C. Ospina-Ocampo,* Cinvestav-Unidad Queretaro, Mexico | |
| 3:40pm | **BREAK** | **BREAK** |
| 4:00pm | **AS+CA+EL+EM+LS+SE+SS-MoA-8** Thin Film Analysis by XPS: Quantitative Modeling of Sputtering and Depth Profile Data*,* ***Lev Gelb****, A. Walker,* University of Texas at Dallas | **INVITED: HC+AS+SS-MoA-8** Electrocatalytic Nitrate Reduction: Controlling Adsorbate Affinity to Tailor Reaction Products*,* ***Kelsey Stoerzinger,*** Oregon State University |
| 4:20pm | **AS+CA+EL+EM+LS+SE+SS-MoA-9** Understanding and Controlling Sample Degradation on Modern XPS Spectrometers*,* ***David Morgan****,* Cardiff University, UK | |
| 4:40pm | **AS+CA+EL+EM+LS+SE+SS-MoA-10** XPS Intensity Calibration and Validation Using Polyethylene and Ionic Liquids*,* ***Benjamen Reed****,* National Physical Laboratory (NPL), UK*; J. Radnik,* Bundesanstalt für Materialforschung und -prüfung (BAM), Germany*; A. Shard,* National Physical Laboratory (NPL), UK | **HC+AS+SS-MoA-10** Energetics and Growth Modes of Ni and Pd Nanoparticles on Graphene / Ni(111), ***Kun Zhao****, J. Rumptz, N. Janulaitis, C. Campbell,* University of Washington |
| 5:00pm | | **HC+AS+SS-MoA-11** Size Dependent $CO_2$ Reduction Activity and Selectivity of Ag Nanoparticle Electrocatalysts in sub-5 nm Regime*,* ***Xingyi Deng,*** NETL/LRST*; D. Alfonso,* NETL*; T. Nguyen-Phan,* NETL/LRST*; D. Kauffman,* NETL |

# Tuesday Morning, November 8, 2022

| | **Vacuum Technology Division**<br>**Room 301 - Session VT-TuM**<br>**Vacuum Technology for Large Vacuum Systems**<br>**Moderators: Chandra Romel**, Consultant,<br>**Marcy Stutzman**, Jefferson Lab | **Chemical Analysis and Imaging Interfaces Focus Topic**<br>**Room 302 - Session CA+AS+SE+SS-TuM**<br>**Progress and Challenges in Industrial Applications**<br>**Moderators: Alex Tselev**, University of Aveiro, Portugal,<br>**Xiao-Ying Yu**, Oak Ridge National Laboratory, USA |
|---|---|---|
| 8:00am | **INVITED: VT-TuM-1** Vacuum Materials for the Next Generation Gravitational Wave Detectors, ***Ivo Wevers***, *G. Bregliozzi, P. Chiggiato, M. Rimoldi, C. Scarcia, M. Taborelli,* CERN, Switzerland | **INVITED: CA+AS+SE+SS-TuM-1** Progress on Commercializing Doped Diamond Materials and Devices, ***Anna Zaniewski***, Advent Diamond |
| 8:20am | | |
| 8:40am | **INVITED: VT-TuM-3** Vacuum Design for a Cryogenic Gravitational Wave Detector, ***Rana Adhikari***, *C. Wipf,* California Institute of Technology | **INVITED: CA+AS+SE+SS-TuM-3** Advanced in Situ Transmission Electron Microscopy: A Powerful Tool for Materials Science, Catalysis, Energy Storage & Lifescience Applications, ***Hugo Pérez-Garza***, DENSsolutions, Netherlands |
| 9:00am | | |
| 9:20am | **VT-TuM-5** CSI; the New Space Calibration Facility at TNO, ***Freek Molkenboer***, *R. Jansen,* TNO Science and Industry, the Netherlands; *W. van Werkhoven, T. Luijkx, W. Mulckhuyse,* tno Science and Industry, the Netherlands | **CA+AS+SE+SS-TuM-5** Chemical Analysis Using Laboratory-Based Hard X-Ray Photoelectron Spectroscopy: The Binding Energy Reference Challenge, *A. Vanleenhove*, *F. Mascarenhas,* ***Thierry Conard***, IMEC, Belgium |
| 9:40am | **VT-TuM-6** The Challenges of Heating a Sample in Vacuum, *H. Bekman*, ***Johannes Velthuis***, *F. Molkenboer,* TNO Science and Industry, the Netherlands | |
| 10:00am | **BREAK** - Complimentary Coffee in Exhibit Hall | **BREAK** - Complimentary Coffee in Exhibit Hall |
| 10:20am | | |
| 10:40am | | |
| 11:00am | **INVITED: VT-TuM-10** Design of ITER Roughing Pump System, ***Charles Smith***, *S. Smith,* US ITER | **INVITED: CA+AS+SE+SS-TuM-10** Integrating Spatial Multiomics Using Giant Cluster Imaging Mass Spectrometry at the Single-Cell Level, ***Hua Tian,*** University of Pittsburgh |
| 11:20am | | |
| 11:40am | **VT-TuM-12** Monte Carlo Simulation Studies to Support an Integrated Design for the Cryogenic Vacuum Systems of the Einstein Telescope, ***Xueli Luo***, Karlsruhe Institute of Technology, Institute for Technical Physics, Germany; *S. Hanke, K. Battes, C. Day,* Karlsruhe Institute of Technology (KIT), Germany | **INVITED: CA+AS+SE+SS-TuM-12** Atom Probe Tomography Using Wavelength-Tunable, Femtosecond-Pulsed Coherent Extreme Ultraviolet Radiation, ***Ann Chiaramonti***, *B. Caplins, J. Garcia, L. Miaja-Avila, N. Sanford,* National Institute of Standards and Technology (NIST) |
| 12:00pm | | |

| | **Mini Symposium on 2D Materials Synthesis**<br>**Room 303 - Session MS-2DMS+2D+EM+NS-TuM**<br>**Direct Growth of 2D Materials, Including CVD and MBE**<br>**Moderators: Matthias Batzill**, University of South Florida,<br>**Erica Douglas**, Sandia National Laboratories,<br>**Maryam Ebrahimi**, Lakehead University, Canada,<br>**Kathleen McCreary**, Naval Research Laboratory | **Spectroscopic Ellipsometry Focus Topic**<br>**Room 304 - Session EL+AS+EM-TuM**<br>**Optical Characterization of Thin Films and Nanostructures**<br>**Moderators:**<br>**Tino Hofmann**, University of North Carolina at Charlotte,<br>**Mathias Schubert**, University of Nebraska - Lincoln |
|---|---|---|
| 8:00am | **INVITED: MS-2DMS+2D+EM+NS-TuM-1** Efficient Control of 2D Magnetism, ***Cheng Gong,*** University of Maryland | **INVITED: EL+AS+EM-TuM-1** Femtosecond Time Resolved Pump-Probe Spectroscopic Ellipsometry – Applications and Challenges, ***Rüdiger Schmidt-Grund,*** TU Ilmenau, Germany |
| 8:20am | | |
| 8:40am | **INVITED: MS-2DMS+2D+EM+NS-TuM-3** Epitaxial Growth of Transition Metal Dichalcogenide Monolayers for Large Area Device Applications, *J. Redwing,* ***Thomas V. Mc Knight,*** The Pennsylvania State University | **EL+AS+EM-TuM-3** Evolution of Anisotropy and Order of Band-to-Band Transitions, Excitons, Phonons, Static and High Frequency Dielectric Constants Including Strain Dependencies in Alpha and Beta Phase $(Al_xGa_{1-x})_2O_3$, ***Megan Stokey,*** *R. Korlacki, M. Hilfiker, T. Gramer, J. Knudtson,* University of Nebraska-Lincoln; *S. Richter,* Lund University, Sweden; *S. Knight,* Linkoping University, Sweden; *A. Mock,* Weber State University; *A. Mauze, Y. Zhang, J. Speck,* University of California Santa Barbara; *R. Jinno, Y. Cho, H. Xing, D. Jena,* Cornell University; *E. Ahmadi,* University of Michigan; *V. Darakchieva,* Lund University, Sweden; *M. Schubert,* University of Nebraska-Lincoln |
| 9:00am | | **EL+AS+EM-TuM-4** Engineering the Bi-Signate Broadband Enhanced Chirality Revealed by All Dielectric *Nanoboomerang* Structure, ***Ufuk Kilic,*** *M. Hilfiker, A. Ruder, S. Wimer, S. G. Kilic, E. Schubert, C. Argyropoulos, M. Schubert,* University of Nebraska-Lincoln |
| 9:20am | **MS-2DMS+2D+EM+NS-TuM-5** Formation of Transition Metal Dichalcogenide Janus Monolayers and 2D Alloys Through Non-Equilibrium Synthesis and Processing Approaches, ***Kai Xiao,*** *S. Harris, Y. Lin, C. Liu,* Center for Nanophase Materials Sciences, Oak Ridge National Laboratory; *G. Duscher,* University of Tennessee Knoxville; *M. Yoon,* Oak Ridge National Laboratory, Oak Ridge, TN 37831, USA; *L. Liang, C. Rouleau, A. Puretzky, D. Geohegan,* Center for Nanophase Materials Sciences, Oak Ridge National Laboratory | **EL+AS+EM-TuM-5** Structural Properties and Optical Constants of $CaF_2$ at 300 K from 0.03 to 6.5 eV, ***Jaden R. Love,*** *N. Samarasingha, C. Armenta, S. Zollner,* New Mexico State University; *H. Kim,* National Institute of Aerospace (NIA) |
| 9:40am | **MS-2DMS+2D+EM+NS-TuM-6** Effects of Deposition Technique on Monolayer $MoS_2$ and $WS_2$, ***Ama Agyapong,*** *S. Mohney,* Pennsylvania State University | **EL+AS+EM-TuM-6** Optical Dielectric Function of a Solution-Processable Thiazolothiazole Thin Films Determined by Spectroscopic Ellipsometry, ***Nuren Shuchi,*** *J. Mower, V. Stinson, . McLamb, G. Boreman, M. Walter, T. Hofmann,* University of North Carolina at Charlotte |
| 10:00am | **BREAK - Complimentary Coffee in Exhibit Hall** | **BREAK - Complimentary Coffee in Exhibit Hall** |
| 10:20am | | |
| 10:40am | | |
| 11:00am | | **EL+AS+EM-TuM-10** Bandgap Engineering of Polycrystalline Ge-doped $Sb_2Se_3$ Thin-Film: Surface and Optical Properties, ***Sanghyun (Philip) Lee,*** University of Kentucky; *M. McInenery,* Rose-Hulman Institute of Technology |
| 11:20am | | **EL+AS+EM-TuM-11** Optical Properties of Orthorhombic $LiGaO_2$ from Far-Infrared to Vacuum Ultraviolet, ***Teresa Gramer,*** *E. Williams, M. Stokey, R. Korlacki, U. Kilic, M. Hilfiker, M. Schubert,* University of Nebraska - Lincoln |
| 11:40am | **MS-2DMS+2D+EM+NS-TuM-12** The Growth of $Nb_{1+x}Se_2$ by Molecular Beam Epitaxy, ***Peter Litwin,*** *S. Jaszewski, J. Ihlefeld, S. McDonnell,* University of Virginia | **EL+AS+EM-TuM-12** Optical and X-ray Characterization of Ge-Sn Alloys on GaAs, ***Haley Woolf,*** *C. Emminger, C. Armenta,* New Mexico State University; *M. Kim,* QuantTera; *S. Zollner,* New Mexico State University |
| 12:00pm | **MS-2DMS+2D+EM+NS-TuM-13** Formation of 1D and 2D Carbon-Based Nanomaterials on Surfaces, ***Maryam Ebrahimi,*** Lakehead University, Canada | **EL+AS+EM-TuM-13** Zinc Gallate ($ZnGa_2O_4$) Epitaxial Thin Films: Determination of Optical Properties and Bandgap Estimation Using Spectroscopic Ellipsometry, *S. Bairagi, J. Chang, C. Hsiao, R. Magnusson, J. Birch,* Linköping University, Sweden; ***Jinn P Chu,*** National Taiwan University of Science and Technology, Taiwan; *F. Tarntair,* National Yang Ming Chiao Tung University, Taiwan; *R. Horng,* National Yang Ming Chiao Tung University, Taiwan; *K. Järrendahl,* Linköping University, Sweden |

# Tuesday Morning, November 8, 2022

| | **Plasma Science and Technology Division**<br>**Room 305 - Session PS1+NS-TuM**<br>**Advanced Plasma Patterning: EUV-Based, Multipatterning and Alternative Patterning Approaches (Imprint, DSA, Etc.)**<br>**Moderators: Yohei Ishii**, Hitachi High Technologies America Inc., **Angelique Raley**, TEL US | **Plasma Science and Technology Division**<br>**Room 315 - Session PS2+MS-TuM**<br>**Modelling of Plasmas and Plasma Driven Processes, and Machine Learning**<br>**Moderators:**<br>**Mingmei Wang**, Lam Research Corporation,<br>**David Lishan**, Plasma-Therm LLC |
|---|---|---|
| 8:00am | **INVITED: PS1+NS-TuM-1** EUV Patterning: Plasma Processing Innovations for Single Exposure and Multi-Patterning, ***Katie Lutker-Lee,*** TEL Technology Center, America, LLC | **PS2+MS-TuM-1** Molecular Dynamics Simulation of Oxide and Nitride Etching by $CF_3^+$ and $Cl^+$, ***Charisse Marie Cagomoc***[1], *S. Taira, M. Isobe, T. Ito, K. Karahashi,* Osaka University, Japan*; L. Belau, E. Hudson,* Lam Research Corporation*; S. Hamaguchi,* Osaka University, Japan |
| 8:20am | | **PS2+MS-TuM-2** Molecular Dynamics Simulations of High-Energy Ion Bombardment ALE Processes for Smooth Surfaces, ***Joseph Vella,*** Princeton Plasma Physics Laboratory*; D. Humbird,* DWH Consulting*; D. Graves,* Princeton Plasma Physics Laboratory, Department of Chemical and Biological Engineering Princeton University |
| 8:40am | **PS1+NS-TuM-3** Reduction of EUV Resist Damage by using Neutral Beam Etching, *N. Soo,* School of Advanced Materials Science and Engineering, Sungkyunkwan University, Republic of Korea*;* ***Geun Young Yeom,*** School of Advanced Materials Science and Engineering, Sungkyunkwan University / SKKU Advanced Institute of Nano Technology (SAINT), Sungkyunkwan University, | **PS2+MS-TuM-3** Analysis of RF Sheath Dynamics in Dual-Frequency Capacitively Coupled Ar Plasmas Using a Two-Dimensional Particle-in-Cell Simulation, ***Ji Hyun Shin,*** *H. Kim, C. Kim, S. Choi, H. Lee,* Pusan National University, Republic of Korea |
| 9:00am | **PS1+NS-TuM-4** Numerical Investigation of EUV Induced $H_2$-$O_2$ Plasmas and Surface Chemistry, ***Tugba Piskin,*** University of Michigan*; V. Volynets, S. Nam,* Mechatronics Research, Samsung Electronics Co., Ltd, Republic of Korea*; H. Lee,* Mechatronics Research, Samsung Electronics Co., Ltd., Republic of Korea*; M. Kushner,* University of Michigan | **PS2+MS-TuM-4** Incorporation of Match timing in a Global Plasma Circuit Model, ***Carl Smith,*** North Carolina State University*; S. Nam, K. Bae, . Lee,* Samsung Mechatronics R&D Center, Republic of Korea*; S. Shannon,* North Carolina State University |
| 9:20am | **PS1+NS-TuM-5** Modeling of Shallow Trench Isolation Etch in Self-aligned Double Patterning Process, ***Shuo Huang,*** *P. Panneerchelvam, C. Huard,* KLA Corporation*; S. Sridhar, P. Ventzek,* Tokyo Electron America*; M. Smith,* KLA Corporation | **INVITED: PS2+MS-TuM-5** Nanosheet GAA Transistor Manufacturing Modeling Study: Build Fundamental Knowledge of SiGe to Si Selective Etching in $ClF_3$ Gas, ***Yu-Hao Tsai,*** *M. Wang,* TEL Technology Center, America, LLC |
| 9:40am | **PS1+NS-TuM-6** Polymer Engineering for High Aspect Ratio Plasma Etching Enabled by Chemistry, ***Phong Nguyen,*** *S. Biltek, X. Guo, N. Nathan Stafford,* American Air Liquide | |
| 10:00am | **BREAK - Complimentary Coffee in Exhibit Hall** | **BREAK - Complimentary Coffee in Exhibit Hall** |
| 10:20am | | |
| 10:40am | | |
| 11:00am | **INVITED: PS1+NS-TuM-10** Achieving Better Etching Performance with Lower GWP Gases, ***Nicolas Gosset,*** *T. Hasegawa, V. Gamaleev,* Air Liquide Laboratories, Japan | **PS2+MS-TuM-10** Study on Spatiotemporal Evolution of Plasma Arcing in Low-Temperature Plasma, ***Si-jun Kim,*** *C. Cho, M. Choi, Y. Lee, I. Seong, W. Jeong, Y. You,* Chungnam National University, Republic of Korea*; J. Lee,* Samsung Electronics Co., Inc., Republic of Korea*; S. You,* Chungnam National University and Institute of Quantum Systems (IQS), Republic of Korea |
| 11:20am | | **PS2+MS-TuM-11** Instabilities in Low Pressure Magnetized Capacitively Coupled Plasmas, ***Sathya Ganta,*** *K. Bera, S. Rauf,* Applied Materials, Inc.*; I. Kaganovich,* Princeton University Plasma Physics Lab*; D. Sydorenko,* University of Alberta, Canada*; A. Khrabov, T. Powis,* Princeton University Plasma Physics Lab*; L. Xu,* Ruhr Universität Bochum, Germany |
| 11:40am | **PS1+NS-TuM-12** Etch Profile Control for High-Aspect-Ratio Amorphous Carbon Mask Layer Etching, ***Du Zhang,*** *S. Chang, P. Luan, M. Wang,* TEL Technology Center, America, LLC | **PS2+MS-TuM-12** 2D Hybrid Simulation of a CF4 Plasma in a DF CCP Reactor: Influence of Operating Conditions on Plasma Bulk Properties and Fluxes on the Wafer, ***Pierre Ducluzaux,*** LTM/CNRS-UGA, France; STmicroelectronics, France*; D. RISTOIU,* STmicroelectronics, France*; C. Gilles, E. Despiau-Pujo,* LTM/CNRS-UGA, France |
| 12:00pm | **PS1+NS-TuM-13** A Mask-free and Contactless Plasma Patterning Technique for Interdigitated Back Contact Silicon Heterojunction Solar Cells Fabrication, ***Junkang Wang,*** *M. Ghosh, P. Bulkin, D. Daineka, P. Roca i Cabarrocas,* LPICM-CNRS, École Polytechnique, Institut Polytechnique de Paris, France*; S. Filonovich,* TotalEnergies GRP, France*; J. Alvarez,* Laboratoire de Génie Electrique et Electronique de Paris, CNRS, CentraleSupélec, Université Paris-Saclay, France*; E. V. Johnson,* LPICM-CNRS, École Polytechnique, Institut Polytechnique de Paris, France | **PS2+MS-TuM-13** Investigation of $N_2$ Plasma in Plasma Enhanced Atomic Layer Deposition of Silicon Nitride Using First Principles Calculation, ***Tsung-Hsuan Yang,*** *T. Wang, G. Hwang,* University of Texas at Austin*; P. Ventzek, T. Iwao, J. Zhao,* Tokyo Electron America Inc.,*; K. Ishibashi,* Tokyo Electron Ltd., Japan |

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

# Tuesday Morning, November 8, 2022

| | **Thin Films Division**<br>**Room 316 - Session TF-TuM**<br>**Growth in 3D, High Aspect Ratio and Nanostructured Materials**<br>**Moderators:**<br>**Richard Vanfleet**, Brigham Young University | **Atomic Scale Processing Focus Topic**<br>**Room 317 - Session AP+AS+EM+HI+PS+SS+TF-TuM**<br>**Area Selective Processing and Patterning II**<br>**Moderators:**<br>**Michelle Paquette**, University of Missouri-Kansas City,<br>**Christophe Vallee**, SUNY College of Nanoscale Science and Engineering |
|---|---|---|
| 8:00am<br>8:20am | **INVITED: TF-TuM-1** Tailoring 3-D Nanomaterial Architectures Using ALD: Bridging Scales from Atoms to Bulk, ***Neil Dasgupta***, University of Michigan | **INVITED: AP+AS+EM+HI+PS+SS+TF-TuM-1** New Precursors and Approaches to ALD and AS-ALD of Metals, ***Mikko Ritala***, University of Helsinki, Finland |
| 8:40am | **TF-TuM-3** Thin Film Technology and Diagnostics for Multilayered Solid-State Batteries, ***Victoria Castagna Ferrari***, *G. Rubloff, D. Stewart,* University of Maryland, College Park | **AP+AS+EM+HI+PS+SS+TF-TuM-3** Comparing Interface and Bulk Physicochemical Properties of $TiO_2$ Deposited by PEALD Assisted by Substrate Biasing on Thermal $SiO_2$ and TiN Substrates, for Area Selective Deposition Application, ***Jennifer Not***, LTM - MINATEC - CEA/LETI, France; *L. Mazet,* STMicroelectronics, France; *T. Maindron,* Minalogic, France; *R. Gassilloud,* CEA-LETI, France; *M. Bonvalot,* LTM - MINATEC - CEA/LETI, France |
| 9:00am | **TF-TuM-4** Interface Mixing in Thin-Film Solid-State Sodium Batteries, ***Blake Nuwayhid***, *A. Kozen,* University of Maryland; *D. Long,* Air Force Research Laboratory, USA; *G. Rubloff, K. Gregorczyk,* University of Maryland | **AP+AS+EM+HI+PS+SS+TF-TuM-4** Area Selective Atomic Layer Deposition of $SnO_2$ as An Etch Barrier, ***Xin Yang***, University of Texas at Austin; *B. Coffey,* Lam Research Corp; *J. Ekerdt,* University of Texas at Austin |
| 9:20am | **TF-TuM-5** Direct CVD Synthesis of $MgH_2$ Thin Films and Nanowires by Decomposition of the Novel Magnesium *Bis*-Diamidodiboranate Precursor, ***Laurent Souqui***, *C. Caroff, S. Shrivastav, G. Girolami, J. Abelson,* University of Illinois at Urbana-Champaign | **AP+AS+EM+HI+PS+SS+TF-TuM-5** Selective Deposition Two Ways: Chemical Bath Deposition of Metal Sulfides on Organic Substrates, *T. Estrada,* ***Amy Walker***, University of Texas at Dallas |
| 9:40am | **TF-TuM-6** The Fabrication of Heterojunctions by Atomic Layer Deposition for Gas Sensing Applications, ***Nicola Pinna***, *H. Raza,* Humboldt University Berlin, Germany | **AP+AS+EM+HI+PS+SS+TF-TuM-6** Anatase Crystalline Phase Discovery on Ultra-Thin Layer TiO2Films During Low-Temperature Ald on Fluorine-Rich Carbon Substrates, ***Brian Butkus***, *S. Dabas, C. Feit, J. Ganesan, Z. Parsons, X. Feng, P. Banerjee,* University of Central Florida |
| 10:00am<br>10:20am<br>10:40am | **BREAK - Complimentary Coffee in Exhibit Hall** | **BREAK - Complimentary Coffee in Exhibit Hall** |
| 11:00am | **TF-TuM-10** Tunable ALD Infiltration into High-Aspect-Ratio Aerogels Enabled by Process Modeling for Solar Thermal Applications, ***Andrew J. Gayle***[1], *Z. Berquist, Y. Chen, A. Davoodabadi, A. Hill, J. Hoffman, A. Bielinski, A. Lenert, N. Dasgupta,* University of Michigan, Ann Arbor | **INVITED: AP+AS+EM+HI+PS+SS+TF-TuM-10** Site-selective Atomic Layer Deposition: Targeting Electronic Defects, ***Alex Martinson***, Argonne National Laboratory |
| 11:20am | **TF-TuM-11** Ultra-thin, Conformal ALD Films for Reliable Corrosion Resistance in SLM Metal Additive Manufactured Surfaces, ***Timothy J. Gorey***, Los Alamos National Laboratory | |
| 11:40am | **TF-TuM-12** Atomic Layer Deposition of Superconducting Films for Through-Silicon-Via Structures and Photon Detection, ***John Femi-Oyetoro***, *H. LeDuc, P. Day, F. Greer,* Jet Propulsion Laboratory (NASA/JPL) | **INVITED: AP+AS+EM+HI+PS+SS+TF-TuM-12** Low Temperature Area-selective ALD and ALE of Pd, *H. Nallan, X. Yang, B. Coffey,* ***John Ekerdt***, University of Texas at Austin |
| 12:00pm | **TF-TuM-13** Reliable RF and DC Plasma-Power Solutions Supporting Today's Demanding Industrial Applications, ***Mike Meyer***, *P. Maloney,* Advanced Energy Industries, Inc., USA | |

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

| | Room 318 | |
|---|---|---|
| 8:00am | **BI1+AS+EM+NS+SE+TF-TuM-1** Understanding and Employing Adhesion Forces in Microfluidic Channels for Cell Separation, ***Avi Gupta***, *F. Chrit, A. Liu, A. Alexeev, T. Sulchek,* Georgia Institute of Technology, USA | **Biomaterial Interfaces Division**<br>**Session BI1+AS+EM+NS+SE+TF-TuM**<br>**Bioanalytics, Biosensors and Diagnostics**<br>**Moderators:**<br>**Caitlin Howell**, University of Maine,<br>**Laura Mears**, TU Wien, Austria |
| 8:20am | **BI1+AS+EM+NS+SE+TF-TuM-2** Wafer-Scale Metallic Nanotube Arrays with Highly Ordered Periodicity for SERS Application, ***Jinn Chu***, National Taiwan University of Science and Technology, Taiwan | |
| 8:40am | **BI1+AS+EM+NS+SE+TF-TuM-3** Customizing Silk Film Surface Properties Using Plasma-Enhanced Chemical Vapor Deposition, *A. Devore, G. Reyes,* ***Morgan Hawker***, California State University, Fresno | |
| 9:00am | **BI1+AS+EM+NS+SE+TF-TuM-4** Biopotential Sensing Using Flexible, Reusable Smart Textile-Based Dry Electrodes, ***Jitendra Pratap Singh***, Physics Dept IIT Delhi, India | |
| 9:20am | **INVITED: BI1+AS+EM+NS+SE+TF-TuM-5** Functional Plasma Polymers for Biosensing Applications, ***Melanie McGregor***, University of South Australia | |
| 9:40am | | |
| 10:00am | **BREAK - Complimentary Coffee in Exhibit Hall** | |
| 10:20am | | |
| 10:40am | | |
| 11:00am | **INVITED: BI2+AS-TuM-10** Getting to the Surface of Biology, ***Lara Gamble***, University of Washington | **Biomaterial Interfaces Division**<br>**Session BI2+AS-TuM**<br>**Characterization of Biological and Biomaterials Surfaces**<br>**Moderators:**<br>**Kenan Fears**, U.S. Naval Research Laboratory,<br>**Graham Leggett**, University of Sheffield, UK |
| 11:20am | | |
| 11:40am | **BI2+AS-TuM-12** 3D Investigation of $Sr^{2+}$ Mobility in Bone Marrow by ToF- and Orbi-SIMS, *C. Kern, A. Pauli, R. Jamous, T. El Khassawna,* ***Marcus Rohnke***, Justus Liebig University Giessen, Germany | |
| 12:00pm | **BI2+AS-TuM-13** Comparison of NAP-XPS and Cryo-XPS for Studies of the Surface Chemistry of the Bacterial Cell-Envelope, ***Paul Dietrich***, SPECS Surface Nano Analysis GmbH, Germany; *M. Kjærvik,* BAM Berlin, Germany, Norway; *M. Ramstedt,* Umeå University, Sweden; *W. Unger,* BAM, Germany | |

# Tuesday Morning, November 8, 2022

| | **Surface Science Division**<br>**Room 319 - Session SS-TuM**<br>**Liquid/Solid Interfaces and Electrochemistry**<br>**Moderator:**<br>**Kathryn Perrine,** Michigan Technological University,<br>**Michelle Personick**, Wesleyan University | **Applied Surface Science Division**<br>**Room 320 - Session AS+LS+RE+SS-TuM**<br>**Synchrotron-Based Photoelectron Spectroscopy Studies of Technologically Important Materials: in Memory of David Shirley**<br>**Moderators: James G. Tobin**, University of Wisconsin-Oshkosh,<br>**Eric L. Shirley**, National Institute of Standard and Technology |
|---|---|---|
| 8:00am | **SS-TuM-1** Investigating the Oxidation of Pt(111) Using High-Pressure Scanning Tunneling Microscopy, Force Field Calculations, and Ab Inito Thermodynamics*, D. Boden,* Leiden University, Netherlands*; M. van Spronsen,* Diamond Light Source, UK*; J. Frenken,* ARCNL*; J. Meyer,* ***Irene Groot****,* Leiden University, Netherlands | |
| 8:20am | **SS-TuM-2** Operando Electrochemistry: NAP-XPS on Electrolyte/Electrode Interfaces - Studies of Liquid Electrolytes and Their Interfaces to Battery Cathodes for Lithium Ion Battery Applications*,* ***Francesca Mirabella****, P. Dietrich, A. Thissen,* SPECS Surface Nano Analysis GmbH, Germany | **AS+LS+RE+SS-TuM-2** Limitations in the Structural Determination of a Close-Packed Overlayer*,* ***JG Tobin****,* U. Wisconsin-Oshkosh |
| 8:40am | **SS-TuM-3** AVS Dorothy M. and Earl S. Hoffman Scholarship Talk: Infrared Nanospectroscopy for Solid-Liquid Interface*,* ***Xiao Zhao***[12]*, M. Salmeron,* LBNL | **INVITED: AS+LS+RE+SS-TuM-3** Sub-Micron Chemical Speciation Mapping of Uranium Dioxide Aged Under Humid Conditions*,* ***David Shuh****, A. Ditter, J. Pacold,* Lawrence Berkeley National Laboratory (LBNL)*; Z. Dai, L. Davison,* Lawrence Livermore National Laboratory*; D. Vine,* Lawrence Berkeley National Laboratory (LBNL)*; S. Donald, B. Chung,* Lawrence Livermore National Laboratory |
| 9:00am | **SS-TuM-4** Methods for Exposing UHV-prepared Metal Oxide Surfaces to Liquid Water: A Comparison of $TiO_2$, $Fe_2O_3$, and $Fe_3O_4$*,* ***Jiri Pavelec****, J. Balajka, F. Kraushofer,* Vienna University of Technology, Austria*; Z. Jakub,* CEITEC, Czechia*; G. Franceschi, M. Schmid, G. Parkinson, U. Diebold,* Vienna University of Technology, Austria | |
| 9:20am | **SS-TuM-5** Interplay of Structure, Dynamics and Energetics of Alkali Metal Ions on Muscovite Mica Surfaces: Molecular Dynamics Simulation*,* ***Alper T. Celebi****,* Vienna University of Technology, Austria*; S. Reindl,* Friedrich-Alexander-Universität Erlangen-Nürnberg, Germany*; M. Olgiati,* Vienna University of Technology, Austria*; T. Bauer,* Friedrich-Alexander-Universität Erlangen-Nürnberg, Germany*; L. Maers, M. Valtiner,* Vienna University of Technology, Austria | **INVITED: AS+LS+RE+SS-TuM-5** On Photoelectron Spectroscopy and the Shirley Background*,* ***Eric L. Shirley****,* NIST |
| 9:40am | **SS-TuM-6** Corrosion Mechanism of Aluminum Alloy at Grain Boundaries Investigated by in-Liquid Nanoscale Potential Measurement Technique*,* ***Shinnosuke Yamamoto****, D. Taniguchi, T. Okamoto, K. Hirata,* Kanazawa University, Japan*; T. Ozawa,* Kobe Steel, Ltd., Japan*; T. Fukuma,* Kanazawa University, Japan | |
| 10:00am | **BREAK - Complimentary Coffee in Exhibit Hall** | **BREAK - Complimentary Coffee in Exhibit Hall** |
| 10:20am | | |
| 10:40am | | |
| 11:00am | **SS-TuM-10** Identifying Available Adsorption Sites on Au-Ps Alloys by FTIR Spectroscopy and Monte Carlo Simulations*, S. Manzi,* Dep. de Física, Universidad Nacional de San Luis, Instituto de Física Aplicada, CONICET, Argentina*; M. Bosco, M. Brites Helú,* Instituto de Desarrollo Tecnológico para la Industria Química (INTEC), UNL/CONICET, Argentina*; A. Baldo,* Fac. de Ingeniería Química (FIQ), Universidad Nacional del Litoral (UNL), Argentina*; S. Collins,* ***Florencia Calaza****,* Instituto de Desarrollo Tecnológico para la Industria Química (INTEC), UNL/CONICET, Argentina | **INVITED: AS+LS+RE+SS-TuM-10** Origin of the Complex Main and Satellite Features in Oxides*,* ***Paul S. Bagus****,* University of North Texas*; C. Nelin, C. Brundle, B. Crist,* Consultant*; N. Lahiri, K. Rosso,* PNNL |
| 11:20am | **SS-TuM-11** Role of Chemisorbing Species in Growth at Liquid Metal-Electrolyte Interfaces Revealed by in Situ X Ray Scattering*,* ***Andrea Sartori****,* ESRF, France | |
| 11:40am | **SS-TuM-12** In Situ Electrochemical STM Imaging of an Au Electrode Identifying the Active Sites during the Electrocatalytic Process*,* ***Yongman Kim****,* Korea Advanced Institute of Science and Technology (KAIST) & Institute for Basic Science (IBS), Republic of Korea*; Y. Jeong,* Institute for Basic Science (IBS), Republic of Korea*; Y. Kim, J. Park,* Korea Advanced Institute of Science and Technology (KAIST) & Institute for Basic Science (IBS), Republic of Korea | |
| 12:00pm | **SS-TuM-13** Extreme Atomic-Scale Surface Roughening: Amino Acids on Ag on Au(111)*, E. Cook, K. P.S. Boyd, M. Paszkowiak,* ***Erin Iski****,* The University of Tulsa | |

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

[2] **AVS Dorothy M. and Earl S. Hoffman Scholarship Recipient**

**Room 321**

**Fundamental Discoveries in Heterogeneous Catalysis Focus Topic**
**Session HC+AS+SS-TuM**
**Energetic Processes and Tailored Surfaces in Heterogeneous Catalysis**
**Moderators:**
**Tim Schäfer**, Georg-August Universität, Göttingen, Germany,
**Arthur Utz**, Tufts University

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|---|---|
| 8:00am<br>8:20am | |
| 8:40am | **HC+AS+SS-TuM-3** Adsorption and Reaction of Acetic Acid on Single-Crystal and Faceted Nanoparticle Anatase $TiO_2$(101) Surfaces*, C. O'Connor, R. Ma, Y. Wu, W. DeBenedetti, F. Gao, Y. Wang, G. Kimmel,* ***Zdenek Dohnálek****,* Pacific Northwest National Laboratory |
| 9:00am | **HC+AS+SS-TuM-4** Phase Transformation of Single Micro-Sized $TiO_2$ Crystals*, W. Lu, H. Zhu, N. Craft, K. Park,* ***Zhenrong Zhang****,* Baylor University |
| 9:20am | **HC+AS+SS-TuM-5** Reactivity of Formic Acid on Single Atom Rh Supported on $Fe_3O_4$(001)*,* ***Christopher Lee****, M. Sharp, S. Smith, B. Kay, Z. Dohnálek,* Pacific Northwest National Laboratory |
| 9:40am | **HC+AS+SS-TuM-6** $WO_3/Ag_2S$ type-II Hierarchical Heterojunction for Improved Charge Carrier Separation and Photoelectrochemical Water Splitting Performance*,* ***Jyoti Yadav****, J. Singh,* IIT DELHI, India |
| 10:00am<br>10:20am<br>10:40am | **BREAK - Complimentary Coffee in Exhibit Hall** |
| 11:00am<br>11:20am | **INVITED: HC+AS+SS-TuM-10** Using Photon-Stimulated Desorption to Probe the Structure and Reaction Dynamics of Molecules Adsorbed on $TiO_2$(110)*,* ***Greg Kimmel****,* Pacific Northwest National Laboratory |
| 11:40am | **HC+AS+SS-TuM-12** Comparison of Pt, Rh and Ir Single Atoms on a $Fe_2O_3$ Model Support*,* ***Gareth Parkinson****, A. Rafsanjani Abbasi, L. Puntscher, F. Kraushofer, P. Sombut, C. Wang,* TU Wien, Austria*; M. Meier,* University of Vienna, Austria*; M. Eder, J. Pavelec, G. Franceschi, M. Riva, M. Schmid, U. Diebold,* TU Wien, Austria*; C. Franchini,* University of Vienna, Austria |
| 12:00pm | **HC+AS+SS-TuM-13** HC Graduate Student Finalist Talk: Preparation and Characterization of Model Homotopic Catalysts: Rh Adatoms, Nanoparticles, and Mixed Oxide Surfaces on $Fe_3O_{-4}$(001)*,* ***Marcus Sharp****,* PNNL/WSU*; C. Lee, M. Mahapatra, S. Smith, B. Kay, Z. Dohnálek,* PNNL |

# Tuesday Morning BREAK, November 8, 2022

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| | **Exhibitor Technology Spotlight Workshops**<br>**Room Hall A - Session EW-TuMB**<br>**Exhibitor Technology Spotlight Session I**<br>**Moderator: Christopher Moffitt**, Kratos Analytical Inc | |
| 10:00am | | |
| 10:20am | **EW-TuMB-2** Edwards Vacuum Presentation - The Future of Vacuum I & II: A Review of Safety Considerations in the Design and Operation of Vacuum Systems, ***Andrew Chew,*** Edwards | |
| 11:00am | | |

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

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| 12:00pm | | |
| 12:20pm | | |
| 12:40pm | **EW-TuL-3** New Developments in Surface Analysis from Thermo Fisher Scientific*, **Adam Bushell**, T. Nunney, P. Mack, R. Simpson,* Thermo Fisher Scientific, UK | |
| 1:00pm | **EW-TuL-4** PHI Surface Analysis Solutions: No Compromise*, **Jennifer Mann**,* Physical Electronics | |
| 1:20pm | **EW-TuL-5** EnviroMetros – A Novel Surface and Multilayer Thin Film Analysis Tool*, **Andreas Thissen**,* SPECS Surface Nano Analysis GmbH, Germany | |
| 1:40pm | **EW-TuL-6** AFM - The Instrument of Choice for Twisted Graphene Preparation and Characterization*, **Ted Limpoco**,* Oxford Instruments Asylum Research Inc. | |
| 2:00pm | **EW-TuL-7** Automated, High-Performance X-Ray Photoelectron Spectroscopy System for Advanced Analysis of Solid-State Energy Materials and Systems*, **Chris Blomfield**,* Kratos Analytical Inc., UK | |

# Tuesday Afternoon, November 8, 2022

| | Vacuum Technology Division<br>Room 301 - Session VT-TuA<br>Vacuum Pumping, Leak Detection, and Modeling<br>**Moderators:**<br>**Jason Alfrey**, Vacuum Technology, Inc.,<br>**Freek Molkenboer**, TNO Science and Industry, the Netherlands | Chemical Analysis and Imaging Interfaces Focus Topic<br>Room 302 - Session CA+2D+AS+BI+HC+LS+NS-TuA<br>In Situ Microscopy, Spectroscopy and Processing at Liquid-Solid-Gas Interfaces<br>**Moderators: Andrei Kolmakov**, National Institute of Standards and Technology (NIST),<br>**Xiao-Ying Yu**, Oak Ridge National Laboratory, USA |
|---|---|---|
| 2:20pm | **INVITED: VT-TuA-1** Design and Fabrication of Ultra-High Vacuum Test System for Quantitative Determination of Hydrogen Gettering and Permeation of Various Materials, ***Ewa Ronnebro***, *R. Storms, S. Suffield,* Pacific Northwest National Laboratory; *M. Boeckmann, A. Parrot, J. Alfrey,* Vacuum Technology, Inc. | **INVITED: CA+2D+AS+BI+HC+LS+NS-TuA-1** Understanding Charge Carrier Variations on the Nanoscale Using Microwave Near-Field Microscopy, ***T. Mitch Wallis***, *S. Berweger, P. Kabos,* National Institute of Standards and Technology |
| 2:40pm | | |
| 3:00pm | **VT-TuA-3** Gas Partial Pressure Measurement by Remote Plasma Optical Emission Spectroscopy & Automated Analysis Using Artificial Intelligence, ***Dermot Monaghan***, *J. Brindley, B. Daniel, V. Bellido-Gonzales,* Gencoa Ltd, UK | **CA+2D+AS+BI+HC+LS+NS-TuA-3** Oxidation/Reduction of Cu Nanoparticles at a Single-Layer Graphene/Electrolyte Interface Monitored by Scanning Kelvin Probe Microscopy, ***Sidney Cohen***, *S. Khatun, M. Andres, I. Pinkas, I. Kaplan-ashiri, O. Brontvein,* Weizmann Institute of Science, Israel; *I. Rosenhek-Goldian,* weizmann Institute of Science, Israel; *R. Weatherup,* Oxford University, UK; *B. Eren,* Weizmann Institute of Science, Israel |
| 3:20pm | | **CA+2D+AS+BI+HC+LS+NS-TuA-4** Investigation Tritium and Lithium transport along the Tritium-Producing Burnable Absorber Rod, ***Jiyoung Son***, Pacific Northwest National Lab; *J. Gao,* PNNL; *G. Sevigny, S. Tripathi, B. Matthews,* Pacific Northwest National Lab; *X. Yu,* Oak Ridge National Laboratory |
| 3:40pm | **BREAK** | **BREAK** |
| 4:00pm | | |
| 4:20pm | | **INVITED: CA+2D+AS+BI+HC+LS+NS-TuA-7** Development of a Workflow for Multiscale Elemental Analysis with X-ray Fluorescence Microscopy and Tomography, ***Si Chen***, Argonne National Lab; *Y. Luo,* Argonne National Laboratory; *T. Paunesku,* Northwestern University; *O. Antipova, Y. Liu, N. Zaluzec, Z. Di,* Argonne National Laboratory; *G. Woloschak,* Northwestern University |
| 4:40pm | **VT-TuA-8** How Vacuum Controlled Venting Can Improve the Imagery of Electron Microscopy, ***Tim Collins***, DigiVac | |
| 5:00pm | **VT-TuA-9** Novel Cylindrical Hot Cathode Ionisation Gauge, ***Ricardo A.S. Silva***, *N. Bundaleski, O. Teodoro,* CeFiTec - Nova School of Science and Technology, Portugal | **CA+2D+AS+BI+HC+LS+NS-TuA-9** in Situ Molecular Imaging of Green Solvents for $CO_2$ Capture, ***Xiao-Ying Yu***, Oak Ridge National Laboratory, USA |
| 5:20pm | **VT-TuA-10** High Performance Sealing In Extreme Environments, ***Christopher Cosgrove***, Technetics Group | **CA+2D+AS+BI+HC+LS+NS-TuA-10** Depth Dependence of Salt Ions at the Liquid/Vapor Interface Studied by Ambient Pressure X-Ray Photoelectron Spectroscopy, *A. Siebert, K. Goodman,* ***Monika Blum***, LBNL |
| 5:40pm | | **CA+2D+AS+BI+HC+LS+NS-TuA-11** Room-Temperature Oxidation of Pt Nanoparticles Catalyzed by Partially Reduced $CeO_2$, ***Shuonan Ye***, *X. Sun,* State University of New York at Binghamton, China; *J. Wang,* state University of New York at Binghamton, China; *X. Chen,* State University of New York at Binghamton, China; *J. Yang,* University of Pittsburgh; *G. Zhou,* State University of New York at Binghamton |

| | Room 303 | |
|---|---|---|
| 2:20pm | **INVITED: 2D+MI-TuA-1** Strategies for Controlling Structure and Magnetic Texture in 2D Magnets, ***Frances Ross,*** MIT*; J. Klein,* MIT, USA | **2D Materials Technical Group**<br>**Session 2D+MI-TuA**<br>**2D Materials: Heterostructures, Twistronics, and Proximity Effects**<br>**Moderators:**<br>**Francesca Tavazza**, National Institute of Standard and Technology,<br>**Suyang Xu**, Harvard University |
| 2:40pm | | |
| 3:00pm | **2D+MI-TuA-3** Bidirectional Phonon Emission in van der Waals Heterojunctions During Ultrafast Charge Transfer, ***Aditya Sood,*** Stanford University | |
| 3:20pm | | |
| 3:40pm | **BREAK** | |
| 4:00pm | | |
| 4:20pm | **INVITED: 2D+MI-TuA-7** Understanding Structural, Chemical, and Number of Layer-Dependent Properties in 2D Lateral and Vertical Structures for Subsequent Optical Measurements, *U. Kaiser,* ***Michael Mohn,*** University of Ulm, Germany | |
| 4:40pm | | |
| 5:00pm | **2D+MI-TuA-9** Determination of Band Offsets in Semiconductor Heterostructures (2D/3D) by Using XPS, ***Mohamed Nejib Hedhili,*** *NG, B. Ooi,* King Abdullah University of Science and Technology, Saudi Arabia | |
| 5:20pm | **2D+MI-TuA-10** Investigation of a Novel Layer-by-Layer Growth Methodology for Surface Metal-Organic Frameworks, ***Nicholas Stucchi,*** Clarkson University | |
| 5:40pm | | |
| 6:00pm | | |

# Tuesday Afternoon, November 8, 2022

| | Room 304 | |
|---|---|---|
| 2:20pm | **INVITED: EL1+AS+EM-TuA-1** Terahertz to Vacuum Ultraviolet Ellipsometry Characterization of Spin, Lattice, Strain, Free Charge Carrier, Dielectric Constants, Exciton and Band-to-Band Transition Properties in Ultrawideband Gap Alpha and Beta Aluminum Gallium Oxide Semiconductor Alloys, ***Mathias Schubert****, R. Korlacki, M. Stokey,* University of Nebraska-Lincoln*; A. Mock,* Weber State University*; M. Hilfiker,* University of Nebraska-Lincoln*; J. Knudtson,* University of Nebraska-Lincoln, USA*; U. Kilic,* University of Nebraska-Lincoln*; S. Richter,* Lund University, Sweden*; S. Knight, P. Kuehne,* Linkoping University, Sweden*; V. Darakchieva,* Lund University, Sweden | **Spectroscopic Ellipsometry Focus Topic**<br>**Session EL1+AS+EM-TuA**<br>**Emerging Technological Advances and BREAKthroughs of Spectroscopic Ellipsometry**<br>**Moderators:**<br>**Alain Diebold**, SUNY Polytechnic Institute,<br>**Ruediger Schmidt-Grund**, Technical University Ilmenau, Germany |
| 2:40pm | | |
| 3:00pm | | |
| 3:20pm | | |
| 3:40pm | **BREAK** | **Spectroscopic Ellipsometry Focus Topic**<br>**Session EL2+EM-TuA**<br>**Spectroscopic Ellipsometry: Novel Applications and Theoretical Approaches**<br>**Moderators:**<br>**Alain Diebold**, SUNY Polytechnic Institute,<br>**Ruediger Schmidt-Grund**, Technical University Ilmenau, Germany |
| 4:00pm | | |
| 4:20pm | **EL2+EM-TuA-7** A Study of Wire Grid Polarizers with Mueller Matrix Ellipsometry, *T. Gholian Avval, M. Linford,* Brigham Young University*; N. Keller,* ***G. Andrew Antonelli****,* Onto Innovation, Inc. | |
| 4:40pm | **EL2+EM-TuA-8** Temperature Dependence of the Direct Band Gap of InSb from 80 to 700 K, ***Melissa Rivero Arias****, N. S. Samarasingha, C. Emminger, S. Zollner,* New Mexico State University | |
| 5:00pm | **EL2+EM-TuA-9** Coherent Acoustic Phonon Oscillations in Ge Using Pump-Pulse Time-Resolved Spectroscopic Ellipsometry, ***Carlos Armenta****,* New Mexico State University*; M. Zahradnik,* ELI Beamlines, Czechia*; C. Emminger,* Humboldt University Berlin, Germany*; S. Espinoza, M. Rebarz, J. Andreasson,* ELI Beamlines, Czechia*; S. Zollner,* New Mexico State University | |
| 5:20pm | **EL2+EM-TuA-10** Time-Resolved Spectroscopic Ellipsometry Helped by Imaging Spectroscopic Ellipsometry, ***Shirly Espinoza****,* ELI Beamlines, Czechia | |

| | **Plasma Science and Technology Division**<br>**Room 305 - Session PS1+TF-TuA**<br>**Plasma Processing for Advanced Emerging Memory Technologies, Advanced Packaging and Heterogeneous Integration**<br>**Moderators: Hisataka Hayashi**, KIOXIA, Japan,<br>**Samson Odunuga**, Intel Corporation | **Plasma Science and Technology Division**<br>**Room 315 - Session PS2+AS+SS-TuA**<br>**Plasma-Surface Interactions**<br>**Moderators:**<br>**Pingshan Luan**, TEL Technology Center America,<br>**Kenji Maeda**, Hitachi High Technologies America Inc. |
|---|---|---|
| 2:20pm | **PS1+TF-TuA-1** Study of Residues Formation after Ge-Rich GST Etching Using Halogen Gases, ***Benjamin Fontaine,*** STMicroelectronics, France; *C. Boixaderas,* Univ. Grenoble Alpes, CEA, Leti, France; *J. Dubois, P. Gouraud, A. Rival,* STMicroelectronics, France; *N. Posseme,* Univ. Grenoble Alpes, CEA, Leti, France | **INVITED: PS2+AS+SS-TuA-1** Selective Mask Deposition Using $SiCl_4$ Plasma for a Highly Selective Etching Process, ***Miyako Matsui,*** Hitachi Ltd., Japan; *K. Kuwahara,* Hitachi High-Tech Corp., Japan |
| 2:40pm | **PS1+TF-TuA-2** Magnetron Plasma Sputtered $Ge_2Sb_2Se_4Te$ as a Non-Volatile Optical Switch Material, ***Steven Vitale,*** *P. Miller, P. Robinson, C. Roberts, V. Liberman,* MIT Lincoln Laboratory; *Q. Du, Y. Zhang, C. Popescu, M. Shalaginov, T. Gu,* Massachusetts Institute of Technology; *M. Kang, K. Richardson,* University of Central Florida; *C. Rios,* University of Maryland; *J. Hu,* Massachusetts Institute of Technology | |
| 3:00pm | **PS1+TF-TuA-3** Phase-Change Memory Materials Processing Requirements, ***Luxherta Buzi,*** IBM Research Division, T.J. Watson Research Center; *H. Cheng,* Macronix; *M. Hopstaken,* IBM Research Division, T.J. Watson Research Center; *L. Gignac,* IBM Research, T. J. Watson Research Center; *C. Tabachnick, J. Papalia, H. Miyazoe, S. Engelmann, R. Bruce,* IBM Research Division, T.J. Watson Research Center | **PS2+AS+SS-TuA-3** On the Self-bias Voltages at Sintered Yttrium Oxyfluoride (Y-O-F) and $Y_2O_3$ During Plasma Irradiation and Their Etching Rates due to Ion Bombardment, ***Tetsuya Goto,*** *Y. Shiba,* Tohoku University, Japan; *A. Teramoto,* Hiroshima University, Japan; *Y. Kishi,* Nippon Yttrium Co., Ltd, Japan; *S. Sugawa,* Tohoku University, Japan |
| 3:20pm | **PS1+TF-TuA-4** Exploration of Alternative Hard Mask Materials for the IBE Patterning of 50nm Pitch STT-MRAM High Density Orthogonal Pillar Array, ***Romuald Blanc,*** *L. Souriau, W. Devulder, S. Couet, F. Lazzarino,* IMEC, Belgium | |
| 3:40pm | **BREAK** | **BREAK** |
| 4:00pm | | |
| 4:20pm | **INVITED: PS1+TF-TuA-7** Patterning Approaches for Integration of Complex Metal Alloys Towards Advanced Memory and Compute Applications, ***Shreya Kundu,*** *F. Lazzarino,* IMEC, Belgium | **PS2+AS+SS-TuA-7** In-Plasma Photo-Assisted Etching of Si with Chlorine Aided by an External Vacuum Ultraviolet Source, *L. Du, D. Economou,* ***Vincent M Donnelly,*** University of Houston |
| 4:40pm | | **PS2+AS+SS-TuA-8** Etching of Silicon Dioxide ($SiO_2$) Based on Remote Plasma-Based Functionalization and Electron Beam-Activation, ***Yudong Li,*** *K. Lin,* University of Maryland, College Park; *C. Preischl, C. Hermanns, D. Rhinow, H. Solowan, M. Budach, H. Marbach, K. Edinger,* Carl Zeiss SMT, Germany; *G. Oehrlein,* University of Maryland, College Park |
| 5:00pm | **PS1+TF-TuA-9** Plasma Etch Challenges and Processing Optimization in Spin Logic Device Fabrication, ***Yann Canvel,*** *L. Souriau,* IMEC, Belgium | **PS2+AS+SS-TuA-9** Investigation of Plasma-Surface Interactions During Plasma Enhanced Atomic Layer Deposition (PE-ALD) of Silicon Nitride Using *in Situ* Surface Chemistry Measurements, ***Samuel Johnson,*** University of Texas at Austin; *J. Zhao, T. Iwao, J. Carroll, C. Schlechte, P. Ventzek,* Tokyo Electron America; *J. Ekerdt,* University of Texas at Austin |
| 5:20pm | **PS1+TF-TuA-10** Effects of Bias Frequency on High Aspect Ratio Etching Using Voltage Waveform Tailoring, ***Florian Krüger,*** University of Michigan; *H. Lee, S. Nam,* Mechatronics Research, Samsung Electronics Co., Ltd., Republic of Korea; *M. Kushner,* University of Michigan | **PS2+AS+SS-TuA-10** Differences in Sidewall Chemistry for $SiO_2$ and $Si_3N_4$ after Ar/HFC or Ar/FC Plasma Processing Using High Aspect Ratio Structures, ***Sang-Jin Chung,*** University of Maryland, College Park; *P. Luan, A. Metz, M. Park,* TEL Technology Center, America, LLC, USA; *G. Oehrlein,* University of Maryland, College Park |
| 5:40pm | **PS1+TF-TuA-11** Wafer Bevel Deposition by Localized $SiO_2$ and $Si_3N_4$ PECVD and Application to 3D Integration, ***Francois Boulard,*** *F. Fournel, V. Lapras, L. Brunet, D. Truffier-Boutry,* CEA-University Grenoble Alps, France; *P. Ruault,* Lam Research, France; *M. Keovisai,* Lam Research; *C. Porzier, V. Gros, N. Posseme,* CEA-University Grenoble Alps, France | **PS2+AS+SS-TuA-11** Significance of Plasma-Surface Interactions in the Etch Behavior of Low-k Materials, ***Adam Pranda,*** *S. Grzeskowiak, Y. Yoshida, E. Liu, Y. Han, P. Biolsi,* TEL Technology Center, America, LLC; *K. Kobayashi, N. Ikezawa,* Tokyo Electron Miyagi Ltd., Japan |
| 6:00pm | **PS1+TF-TuA-12** Plasma Etching of Copper for the Microfabrication of High-Density Interconnects in Advanced Packaging, ***Juliano Borges,*** *M. Darnon, Y. Beilliard, D. Drouin,* Université de Sherbrooke, Canada | **PS2+AS+SS-TuA-12** Low Temperature Superpermeability in Metal Foils Exposed to Hydrogen Plasma, ***Chao Li,*** *A. Job,* Colorado School of Mines; *M. Shimada, T. Fuerst,* Idaho National Laboratory; *D. Way, C. Wolden,* Colorado School of Mines |

# Tuesday Afternoon, November 8, 2022

| | **Thin Films Division**<br>**Room 316 - Session TF2+2D-TuA**<br>**Low Dimension Material Application**<br>**Moderator:**<br>**Mark Losego**, Georgia Institute of Technology | **Atomic Scale Processing Focus Topic**<br>**Room 317 - Session AP+PS+TF-TuA**<br>**Thermal Atomic Layer Etching**<br>**Moderators: Silvia Armini**, IMEC, Belgium, **Eric A. Joseph**, IBM Research Division, T.J. Watson Research Center |
|---|---|---|
| 2:20pm | **INVITED: TF2+2D-TuA-1** Operando and High-throughput Approaches to Advance Integrated Process Technology of Atomically Thin Device Materials, ***Stephan Hofmann,*** University of Cambridge, UK | **INVITED: AP+PS+TF-TuA-1** Thermal Atomic Layer Etching: The Right Etch Technology at the Right Time, ***Andreas Fischer,*** *A. Routzahn, R. Gasvoda, J. Sims, T. Lill,* Lam Research Corporation |
| 2:40pm | | |
| 3:00pm | **TF2+2D-TuA-3** Versatile Synthesis of 2D Superlattices from Conversion of Sequentially Layered Sub-nanomater Metal Films, ***Nicholas Glavin***[1]*,* Air Force Research Laboratory, Materials and Manufacturing Directorate, USA | **AP+PS+TF-TuA-3** Atomic Layer Etching of Titanium Nitride with Surface Modification by Cl Radicals and Rapid Thermal Annealing, *N. Miyoshi,* Hitachi High Technologies America Inc., Japan*;* ***Nicholas McDowell,*** Hitachi High Technologies America Inc.*; H. Kobayashi,* Hitachi Global Storage Technologies Inc, Japan |
| 3:20pm | **TF2+2D-TuA-4** Study of the Functionality of Spin Crossover Thin Films on the $Ti_3C_2$ Mxene Substrates, ***Saeed Yazdani,*** Department of Physics, Indiana University-Purdue University Indianapolis*; J. Phillips,* Department of Physics, Indiana University-Purdue University Indianapolis*; B. Wyatt,* Department of Mechanical and Energy Engineering, and Integrated Nanosystems Development*; P. Wang,* Department of Chemistry and Biochemistry, Florida State University*; M. Shatruk,* Department of Chemistry and Biochemistry, Florida State University*; B. Anasori,* Department of Mechanical and Energy Engineering, and Integrated Nanosystems Development*; P. Dowben,* Department of Physics and Astronomy, Jorgensen Hall, University of Nebraska*; R. Cheng,* Department of Physics, Indiana University-Purdue University Indianapolis | **AP+PS+TF-TuA-4** Thermal Atomic Layer Etching (ALE) of Metal Oxides by Chlorination and Ligand Addition using $SO_2Cl_2$ and Tetramethylethylenediamine (TMEDA), ***Jonathan Partridge****, J. Murdzek, S. George,* University of Colorado Boulder |
| 3:40pm | **BREAK** | **BREAK** |
| 4:00pm | | |
| 4:20pm | | **INVITED: AP+PS+TF-TuA-7** Thermal Atomic Layer Etch Processes in Semiconductor Manufacturing Challenges and Opportunities, ***Gert Leusink,*** TEL Technology Center, America, LLC |
| 4:40pm | **TF2+2D-TuA-8** AVS Thin Film Division/Graduate Student Harper Award TED-Talk Competition, | |
| 5:00pm | | **AP+PS+TF-TuA-9** Thermal Atomic Layer Etching (ALE) of InGaP:Processing Chemistry and Removal of Surface Defects, ***Ross Edel****, T. Nam, S. George,* University of Colorado Boulder |
| 5:20pm | | **AP+PS+TF-TuA-10** Thermal Atomic Layer Etching of MoS2 Films, ***Jake Soares,*** Boise State University*; A. Mane,* Argonne National Laboratory*; S. Hues,* Boise State University*; J. Elam,* Argonne National Laboratory*; E. Graugnard,* Boise State University |
| 5:40pm | | **AP+PS+TF-TuA-11** Atomically-Precise Surface Processes: From Molecular Mechanisms to Realistic Devices, ***Andrew Teplyakov,*** University of Delaware |
| 6:00pm | | **AP+PS+TF-TuA-12** Deposit and Etchback Approach for Ultrathin and Continuous Films Using Atomic Layer Deposition and Atomic Layer Etching, *J. Gertsch, E. Sortino, V. Bright,* ***Steven George****,* University of Colorado Boulder |

[1] **TFD Paul Holloway Award Winner**

**Room 318**

2:20pm – 2:40pm
**INVITED: LS1+2D+AS+EM+QS+SS-TuA-1** In-situ/Real-time XPS Study of Electrochemical Reactions in All-solid-state Thin-film Lithium-Ion Batteries, ***Takuya Masuda,*** National Institute for Materials Science, Japan

3:00pm
**LS1+2D+AS+EM+QS+SS-TuA-3** Interaction of Molecular Nitrogen with Vanadium Oxide in the Absence and Presence of Water Vapor at Room Temperature: Near-Ambient Pressure XPS, *S. Nemsak,* Lawrence Berkeley National Laboratory; ***Kabirat Balogun****, P. Chukwunenye, T. Cundari, P. Bagus, J. Kelber,* Department of Chemistry, University of North Texas

3:20pm
**LS1+2D+AS+EM+QS+SS-TuA-4** Catalysts Caught in the Act: an Operando Investigation of Copper during $CO_2$ Hydrogenation, ***Elizabeth Jones,*** University of Oxford, UK

3:40pm – 4:00pm
**BREAK**

4:20pm – 4:40pm
**INVITED: LS2+2D+AS+TF-TuA-7** Visualizing Complex Many-Body Phenomena in 2D Materials Based Heterostructures and Devices, ***Jyoti Katoch,*** Carnegie Mellon University

5:00pm
**LS2+2D+AS+TF-TuA-9** Dynamic Grating Development for Neutron Imaging Across Multiple Length Scales, ***Sarah M. Robinson****, R. Murphy, J. LaManna, C. Wolf,* National Institute of Standards and Technology (NIST); *Y. Kim, M. Daugherty,* National Institute of Standards and Technology (NIST)/ University of Maryland, College Park; *M. Huber, P. Bajcsy, P. Kienzle, K. Weigandt, D. Hussey, N. Klimov,* National Institute of Standards and Technology (NIST)

5:20pm – 5:40pm
**INVITED: LS2+2D+AS+TF-TuA-10** Dynamics, Stability and History-Dependence of Magnetic Skyrmions in the 2D van der Waals Magnets $Fe_xGeTe_2$, ***Kai Litzius****, M. Birch, L. Powalla, S. Wintz,* Max Plank Institute for Intelligent Systems, Germany; *M. Weigand,* 4Helmholtz-Zentrum Berlin für Materialien und Energie GmbH, Germany; *K. Kern, M. Burghard, G. Schutz,* Max Plank Institute for Intelligent Systems, Germany

6:00pm

**New Trends on Structural and Electronic Characterization of Materials, Interfaces, and Surfaces Using Synchrotron and FEL-Based Radiation Sources Focus Topic**
**Session LS1+2D+AS+EM+QS+SS-TuA**
***Operando*** **Catalysis and Energy Systems**
**Moderator:**
**Jyoti Katoch**, Carnegie Mellon University

**New Trends on Structural and Electronic Characterization of Materials, Interfaces, and Surfaces Using Synchrotron and FEL-Based Radiation Sources Focus Topic**
**Session LS2+2D+AS+TF-TuA**
**Role of Defects in Materials**
**Moderator:**
**Takuya Masuda**, National Institute for Materials Science, Japan

| | **Surface Science Division**<br>**Room 319 - Session SS+2D+AS-TuA**<br>**Structure, Adsorption and Reaction at 2D Material Surfaces**<br>**Moderators: Florencia C. Calaza**, Instituto de Desarrollo Tecnológico para la Industria Química, Argentina,<br>**Arthur Utz**, Tufts University | **Applied Surface Science Division**<br>**Room 320 - Session AS+EM+SE-TuA**<br>**Surface Analysis Using Complementary Techniques**<br>**Moderators:**<br>**Samantha Rosenberg**, Sandia National Laboratory,<br>**Carl A. Ventrice, Jr.**, SUNY Polytechnic Institute |
|---|---|---|
| 2:20pm | **SS+2D+AS-TuA-1** Chemically Identifying Single Adatoms with Single-Bond Sensitivity During Oxidation Reactions of Borophene, *L. Li, N. Jiang,* ***Sayantan Mahapatra,*** University of Illinois - Chicago | **INVITED: AS+EM+SE-TuA-1** Origins of the Emergent Phenomena at Oxide Interfaces Studied with Complementary X-Ray Spectroscopic and Scattering Techniques, ***Alexander Gray,*** Temple University |
| 2:40pm | **SS+2D+AS-TuA-2** Tailoring the Interfacial Properties of 2D Transition Metal Silicates on Metal Supports, *N. Doudin, K. Saritas,* Yale University*; J. Boscoboinik, G. Li,* Brookhaven National Laboratory*; S. Ismail-Beigi,* ***Eric Altman,*** Yale University | |
| 3:00pm | **INVITED: SS+2D+AS-TuA-3** Metal Oxide and Metal Dichalcogenide 2D Nanocrystals: Structure, Adsorption and Catalytic Properties, ***Jeppe V. Lauritsen,*** Aarhus University, Denmark | **AS+EM+SE-TuA-3** Multi-Technique Forensic Analysis by Co-Incident XPS & Raman Imaging, ***Robin Simpson,*** *P. Mack,* Thermo Fisher Scientific, UK |
| 3:20pm | | **AS+EM+SE-TuA-4** Comparison of Methods to Quantify Silicone on Hair, ***Michaeleen Pacholski,*** *B. Johnson, T. Case, T. Powell, D. Carsten, J. Stratton,* The Dow Chemical Company*; C. Ji,* The Dow Chemical Company, China*; M. McIvor, N. Goodman, S. Yusuf, M. Upshur,* The Dow Chemical Company |
| 3:40pm | **BREAK** | **BREAK** |
| 4:00pm | | |
| 4:20pm | **SS+2D+AS-TuA-7** Intercalated $Cu_{2-x}O$ Thin Film Confined Underneath Hexagonal Boron Nitride, ***J. Trey Diulus****, Z. Novotny, N. Dongfang, N. Comini, J. Beckord, Y. Al-Hamdani,* University of Zurich, Switzerland*; M. Muntwiler,* Paul Scherrer Institute, Switzerland*; M. Hengsberger, M. Iannuzzi, J. Osterwalder,* University of Zurich, Switzerland | **INVITED: AS+EM+SE-TuA-7** Progress Towards Atomic Scale Analytical Tomography, ***Brian Gorman,*** Colorado School of Mines*; T. Kelly,* Steam Instruments, Inc*; M. Holtz,* Colorado School of Mines |
| 4:40pm | **SS+2D+AS-TuA-8** Imaging Surface Defects on $MoS_2$, ***Blake Birmingham,*** Baylor University | |
| 5:00pm | **INVITED: SS+2D+AS-TuA-9** Modifying 2D Transition Metal Dichalcogenides (TMDs) by Incorporating Excess Transition Metals, ***Matthias Batzill,*** University of South Florida | **AS+EM+SE-TuA-9** Investigating 2d-Materials Using Correlative Spectroscopy & Microscopy, ***Tim Nunney****, R. Simpson, P. Mack, H. Tseng,* Thermo Fisher Scientific, UK |
| 5:20pm | | **AS+EM+SE-TuA-10** Surface Analysis in Fujifilm Electronic Materials Research & Development Laboratory: Applications on Chemical Mechanical Planarization, ***Hong Piao,*** FUJIFILM Electronic materials USA., Inc.*; Y. Liang, K. Huang, B. Duong, J. McDonough, Y. Zhang, H. Lee, B. Hu,* FUJIFILM Electronic materials USA., Inc. |
| 5:40pm | **SS+2D+AS-TuA-11 SSD Flash Poster Session:** Oral Presentations<br>5:40: SS-TuP-7 - Dr. Pierluigi Bilotto;<br>5:43: SS-TuP-12 - Dr. Benjamen Reed;<br>5:46: SS-TuP-13 - Mr. Xiao Zhao;<br>5:49: SS-TuP-6 - Dr. J. Trey Diulus; | **AS+EM+SE-TuA-11** Investigating GeTe as an Ovonic Threshold Switch with Spectroscopic and Electronic Techniques, ***Melissa Meyerson****, M. Kalaswad, M. King, D. Adams, J. Custer, P. Kotula, M. Rodriguez, S. Rosenberg,* Sandia National Laboratories |
| 6:00pm | 5:52: SS-TuP-9 - Mr. Dustin Johnson;<br>5:55: SS-TuP-18 - Aman Patel | **AS+EM+SE-TuA-12** Multi-Technique Analysis of Organic and Inorganic Semiconductors for Composition and Electronic Information, ***Paul Mack,*** Thermo Fisher Scientific, UK*; M. Modreanu,* Tyndall National Institute-University College Cork, Ireland |

| | **Fundamental Discoveries in Heterogeneous Catalysis Focus Topic**<br>**Room 321 - Session HC+AS+SS-TuA**<br>**Bridging Gaps I: Structural and Dynamic Effects in Catalysis**<br>**Moderators:**<br>**Dan Killelea**, Loyola University Chicago | **Magnetic Interfaces and Nanostructures Division**<br>**Room 330 - Session MI-TuA**<br>**Topological Insulator Heterostructures**<br>**Moderators:**<br>**Axel Enders**, University of Nebraska-Lincoln, Germany,<br>**Valeria Lauter**, Oak Ridge National Laboratory |
|---|---|---|
| 2:20pm | **INVITED: HC+AS+SS-TuA-1** Fundamental Studies of C1 Catalysis on Metal-oxide and Metal-Carbide Interfaces, ***Jose Rodriguez,*** Brookhaven National Laboratory | **INVITED: MI-TuA-1** Evidence of Antiferromagnetic Coupling between Topological and Magnetic Insulators, ***Leonid Rokhinson,*** Purdue University |
| 2:40pm | | |
| 3:00pm | **HC+AS+SS-TuA-3** Atomic Scale Studies of Chromium Species on Iron Oxide Surfaces, ***Moritz Eder,*** TU Wien, Austria; *P. Sombut,* University of Vienna, Austria; *C. Wang, L. Puntscher, A. Rafsanjani-Abbasi, M. Meier, J. Pavelec, G. Franceschi, M. Riva,* TU Wien, Austria; *C. Franchini,* University of Vienna, Austria; *M. Schmid, U. Diebold, G. Parkinson,* TU Wien, Austria | **INVITED: MI-TuA-3** Infrared Magnetospectroscopy of Magnetic Topological Insulator Heterostructures, ***Badih Assaf,*** University of Notre Dame |
| 3:20pm | **HC+AS+SS-TuA-4** Investigation of CO Oxidation on Oxygenated Rh(111) Surfaces with RAIRS, ***Elizabeth Jamka,*** *D. Killelea,* Loyola University Chicago | |
| 3:40pm | **BREAK** | **BREAK** |
| 4:00pm | | |
| 4:20pm | **INVITED: HC+AS+SS-TuA-7** Molecular Beam Surface Reaction Experiments with Chiral Molecules, ***Tim Schäfer,*** Georg August University, Goettingen, Germany | **INVITED: MI-TuA-7** Topological States in the van der Waals Magnet $MnBi_2Te_4$: from 3D to 2D, ***Hendrik Bentmann,*** Wuerzburg University, Germany |
| 4:40pm | | |
| 5:00pm | **INVITED: HC+AS+SS-TuA-9** A Local View on the Influence of Solvent and Product on the Reactivity of Surface-Catalyzed Reactions, ***Karina Morgenstern,*** Ruhr Universität Bochum, Germany | **MI-TuA-9** Rashba-Type Splitting of the Au(110) Surface State: A Combined Inverse and Direct Photoemission Study, ***Markus Donath,*** *K. Ritter,* University of Münster, Germany; *K. Miyamoto, T. Okuda,* Hiroshima University, Japan |
| 5:20pm | | **INVITED: MI-TuA-10** Spin-Polarized Resonant Tunneling - a New Tool for Sensing and Manipulating Magnetism on the Atomic Scale, ***Anika Schlenhoff,*** Department of Physics, University of Hamburg, Germany |
| 5:40pm | **HC+AS+SS-TuA-11** Enhanced Catalytic Selectivity Due to Topographically Reduced Work Function of Carbon Nanospikes, ***Arthur P. Baddorf,*** Center for Nanophase Materials Sciences, Oak Ridge National Laboratory; *A. Rondinone,* Center for Integrated Nanotechnologies, Los Alamos National Laboratory; *D. Hensley,* Center for Nanophase Materials Sciences, Oak Ridge National Laboratory | |
| 6:00pm | **HC+AS+SS-TuA-12** HC Graduate Student Finalist Talk: Enhanced Descriptor Identification and Mechanic Understanding for Catalytic Activity using Data-Driven Framework: A Case Study of CO Hydrogenation over Cu-Based Single Atom Alloys, ***Wenjie Liao,*** Stony Brook University/Brookhaven National Laboratory; *P. Liu,* Brookhaven National Laboratory and State University of New York at Stony Brook | |

## Actinides and Rare Earths Focus Topic
## Room Ballroom A - Session AC-TuP
## Actinides and Rare Earths Poster Session, 6:30-8:30pm

**AC-TuP-1** The Underlying Simplicity of 5f Unoccupied Electronic Structure, ***JG Tobin,*** U. Wisconsin-Oshkosh*; S. Nowak,* SLAC National Accelerator Laboratory*; S. Yu,* LLNL*; P. Roussel,* AWE, UK*; R. Alonso-Mori, T. Kroll, D. Nordlund, T. Weng, D. Sokaras,* SLAC National Accelerator Laboratory

**AC-TuP-4** Epitaxial Actinide Heterostructures: Synthesis and Characterization, ***Kevin Vallejo,*** *B. May, F. Kabir, C. Dennett,* Idaho National Laboratory*; P. Simmonds,* Boise State University*; D. Hurley, K. Gofryk,* Idaho National Laboratory

## Atomic Scale Processing Focus Topic
## Room Ballroom A - Session AP-TuP
## Atomic Scale Processing Poster Session, 6:30-8:30pm

**AP-TuP-1** A Computational and Experimental Investigation of Platinum Vapor Deposition Reactions on Oxygen and Nitrogen Functionalized Carbon, *I. Campbell, N. Nayir,* Penn State University*; S. Kuespert, N. Ortlieb, A. Fischer,* University of Freiburg, Germany*; A. Van Duin,* ***Suzanne Mohney,*** Penn State University

**AP-TuP-2** Subtractive Printing of Atomic Layer Deposition using Electrohydrodynamic Jet Printing, ***Tae Cho,*** *N. Farjam, K. Barton, N. Dasgupta,* University of Michigan, Ann Arbor

**AP-TuP-4** Design of Gas Flow Field for a Sustainable ALD Process Chamber, ***Kyung-Hoon Yoo,*** Korea Institute of Industrial Technology (KITECH), Republic of Korea*; G. Song,* KUMYOUNG ENG Inc., Republic of Korea*; C. Kim,* TNG Co., Republic of Korea*; J. Hwang, H. Lee,* Korea Institute of Industrial Technology, Republic of Korea*; K. Lee,* SAMSUNG DISPLAY, Republic of Korea

**AP-TuP-5** Atomic Structure Characterization of PEALE Semiconductors by Using HRSTEM, ***Chien-Nan Hsiao,*** *C.C. Chen ,* National Applied Research Laboratories, Taiwan*; W.-C. Chen,* National applied research Laboratories, Taiwan*; F.Z. Chen,* National Applied Research Laboratories, Taiwan

## Biomaterial Interfaces Division
## Room Ballroom A - Session BI-TuP
## Biomaterial Interfaces Poster Session, 6:30-8:30pm

**BI-TuP-2** Direct Detection of COVID-19 Oligonucleotides Through Formation of Nanoparticle Satellite Conjugates, ***Hannah Umoeka,*** *A. Martinez, C. Afzulpurkar, M. Sharma, S. Talasila, T. Nguyen, D. Singh, I. Shortt, E. La Plante, S. Koh,* The University of Texas at Arlington

**BI-TuP-3** Study of Catechol Reaction Mechanisms, *J. Appenroth,* ***Laura L. E. Mears,*** *A. Celebi, M. Valtiner,* Vienna University of Technology, Austria

**BI-TuP-6** Direct Observation of Focal Adhesion by Nanoendoscopy-AFM in Live Cells, ***Alam Mohammad Shahidul,*** *T. Shirokawa, T. Ichikawa, K. Miyazawa, k. Miyata, T. Fukuma,* Kanazawa University, Japan

**BI-TuP-8** pH Responsive Functionally Graded Nano-Composites Coatings for Studying Hepatocellular Carcinoma Cellular Behaviour, ***Juhi Jaiswal,*** *M. Dhayal,* Indian Institute of Technology (Banaras Hindu University), India

**BI-TuP-9** 'Plasmoresistor' Device – Electronic Transduction of Plasmon Signals for Highly Sensitive Detection of Biomolecules, ***Corbin Feit,*** University of Central Florida*; P. Rathi, S. Singamaneni,* Washington University, St. Louis*; P. Banerjee,* University of Central Florida

**BI-TuP-10** Hemoglobin-Bound Iron Fraction In Thin Films Rapidly Solidified From 100µL Drops Measured By Extended X-ray Absorption Fine Structure (EXAFS), ***Arjun Sekar,*** *A. Suresh, R. Rane, A. Thinakaran,* Arizona State University*; J. Bischoff,* Simon Fraser University, Canada*; N. Herbots,* Arizona State University*; K. Kavanagh,* Simon Fraser University, Canada

**BI-TuP-12** Detecting Shared Touch Surface Contamination with a Deep Learning-Enhanced Smartphone and Nanopatterned Material System, ***Ainslie Allen,*** *J. Andle, O. Biswas,* University of Maine*; R. Perry,* VEMI Lab*; S. Yasaei Sekeh, C. Howell,* University of Maine

**BI-TuP-13** Smartphone Enabled Micro/ Nano Microscopy for Biomedical Sensing, *M. Sami,* Rutgers University*;* ***Umer Hassan,*** Rutgers, The State University of New Jersey

## Chemical Analysis and Imaging Interfaces Focus Topic
## Room Ballroom A - Session CA-TuP
## Chemical Analysis and Imaging Interfaces Poster Session 6:30pm

**CA-TuP-1** The Metrology Platform for in Operando Characterization of the Diamond Based High Power Devices and Detectors, ***Andrei Kolmakov,*** NIST

**CA-TuP-2** Using Complimentary Characterization Techniques to Understand Interfacial Phenomena, ***Vincent Smentkowski,*** GE-R*; I. Spinelli, M. Knussman, M. Larson, J. Della Villa ,* 1 Research Circle

## Magnetic Interfaces and Nanostructures Division
## Room Ballroom A - Session MI-TuP
## Magnetic Interfaces and Nanostructures Poster Session 6:30pm

**MI-TuP-1** Microscopy with Momentum and Imaging Spin-Filter (Au/Ir), ***Marten Patt,*** *M. Escher, N. Weber, T. Kuehn, M. Merkel,* FOCUS GmbH, Germany

**MI-TuP-2** Investigating the Magnetic Properties of the Co-Tb Phase Diagram, ***Sydney Harrington,*** *B. Wilfong,* United States Naval Academy*; D. Heiman,* Northeastern University*; M. Jamer,* United States Naval Academy

## Manufacturing Science and Technology Group
## Room Ballroom A - Session MS-TuP
## Manufacturing Science and Technology Poster Session 6:30-8:30pm

**MS-TuP-2** Materials Metrology Using in-Line SIMS System for Improved Manufacturing Process Control in Advanced Nodes, ***Ganesh Vanamu,*** *J. Hoffman, L. Rooney, S. Okada,* Nova Measuring Instruments

## MEMS and NEMS Technical Group
## Room Ballroom A - Session MN-TuP
## MEMS and NEMS Poster Session, 6:30-8:30pm

**MN-TuP-1** Nanoelectromechanical Resonators Based on Mechanically Anisotropic 2D Material, ***Bo Xu,*** *F. Xiao, J. Zhu, Y. Liang, C. Jiao, J. Li, Q. Deng, S. Wu, T. Wen, S. Pei, J. Xia, Z. Wang,* University of Electronic Science and Technology of China

**MN-TuP-2** Frequency Scaling in Electrically Tunable $WSe_2$ Nanomechanical Resonators, ***Jiankai Zhu,*** *B. Xu, F. Xiao, Y. Liang, C. Jiao, J. Li, Q. Deng, S. Wu, T. Wen, S. Pei, J. Xia, Z. Wang,* University of Electronic Science and Technology of China

**MN-TuP-3** Strain-Modulated Dissipation and Signal Transduction in Two-Dimensional Molybdenum Disulfide Nanoelectromechanical Resonators, ***Pengcheng Zhang,*** *Y. Rui,* Shanghai Jiao Tong University, China

**MN-TuP-4** Titania Nanotube Array Electrochemical Characterization and Integration Into a Mechanically-Adaptive Neural Interface, *D. Sacco, H. Wang, T. Stegall, A. Menon, Y. Yang, J. Capadona,* Case Western Reserve University*; H. Amani Hamedani,* ***Allison Hess-Dunning,*** Louis Stokes Cleveland VA Medical Center

**MN-TuP-5** One-Dimensional Photonic Crystals with Narrow-Band Defect Modes Fabricated by Direct Laser Writing, ***Victoria P. Stinson,*** *M. McLamb, T. Hofmann,* University of North Carolina at Charlotte

**MN-TuP-6** Ultra-High-Quality-Factor Membrane Resonators for Gas Pressure Sensing, ***Christoph Reinhardt,*** Deutsches Elektronen-Synchrotron (DESY), Germany*; H. Masalehdan,* University of Hamburg, Germany

**MN-TuP-7** The Effect of Laser Processing on Drug-Loaded Polymers for Microfabricated Neural Interfaces, ***Natalie Mueller,*** *M. Ya Mungu Ocoko, D. Chirra, P. Dernelle, A. Hermoso, J. Capadona, A. Hess-Dunning,* Case Western Reserve University

**MN-TuP-8** Pressure Control During Bronze Infiltration of Binder-Jet Printed Stainless-Steel to Create Metal Microchannels, *H. Davis, J. Harkness, I. Kohls, N. Crane, B. Jensen, R. Vanfleet,* ***Robert C. Davis,*** Brigham Young University

## Nanoscale Science and Technology Division
## Room Ballroom A - Session NS-TuP
## Nanoscale Science and Technology Poster Session 6:30pm

**NS-TuP-1** Collection of Raman Signal in a Liquid Using Plasmonic Vortex Fiber, ***Rohil Kayastha,*** *B. Birmingham, Z. Zhang,* Baylor University

**NS-TuP-2** Chemical Mechanical Planarization Slurry Stability Study, ***Yibin Zhang,*** FUJIFILM Electronic Materials USA., Inc.

**NS-TuP-3** A New Tool for Quantum and Nanoscale Materials Engineering, ***Gianfranco Aresta,*** Ionoptika Ltd, UK

**NS-TuP-4** Atomic Silicon Wires: Dopant Mediated Charging Characterization, ***Max Yuan,*** University of Alberta, Canada; *R. Wolkow,* University of Alberta, Quantum silicon, Canada; *R. Achal, J. Croshaw,* Quantum Silicon, Canada; *T. Chutora, F. Altincicek, C. Leon,* University of Alberta, Canada; *L. Livadaru,* Quantum silicon, Romania; *J. Pitters,* Quantum silicon, Canada

## New Trends on Structural and Electronic Characterization of Materials, Interfaces, and Surfaces Using Synchrotron and FEL-Based Radiation Sources Focus Topic
## Room Ballroom A - Session LS-TuP
## New Trends on Structural and Electronic Characterization of Materials, Interfaces, and Surfaces Using Synchrotron and FEL-Based Radiation Sources Poster Session
## 6:30pm

**LS-TuP-2** Synchrotron Hard X-Ray Scattering for Investigation of ALD Processes, ***Jeffrey Woodward,*** U.S. Naval Research Laboratory; *P. Myint, B. Jiang,* Boston University; *X. Zhang,* University of Vermont; *C. Wang, K. Ludwig,* Boston University; *R. Headrick,* University of Vermont; *S. Rosenberg,* U.S. Naval Research Laboratory; *K. Evans-Lutterodt, L. Wiegart, A. Fluerasu, R. Li, M. Fukuto,* Brookhaven National Laboratory; *C. Eddy,* U.S. Naval Research Laboratory

**LS-TuP-3** High Energy X-Ray Photoelectron Spectroscopy of COTS Electronics Interfacial Failure Modes, ***Samantha G. Rosenberg,*** *M. Meyerson, M. Kottwitz,* Sandia National Laboratories; *R. Rajendran,* Georgia Institute of Technology; *M. Reingold, B. Young,* Sandia National Laboratories; *P. Singh, J. Kacher,* Georgia Institute of Technology; *J. Fowler,* Sandia National Laboratories

**LS-TuP-4** Insitu AFM Imaging of the Structural and Morphological Evolution of Epitaxial $LiCoO_2$ Films during Charge and Overcharge, ***Yingge Du,*** Pacific Northwest National Laboratory; *W. Samarakoon,* Oregon State University; *J. Hu, L. Wang,* Pacific Northwest National Laboratory; *Z. Feng,* Oregon State University; *J. Tao,* Pacific Northwest National Laboratory

## Plasma Science and Technology Division
## Room Ballroom A - Session PS-TuP
## Plasma Science and Technology Poster Session
## 6:30pm-8:30pm

**PS-TuP-1** $SiO_2$ Contact Hole Etching Using Heptafluoropropyl Methyl Ether Plasmas, ***Sanghyun You,*** *C. Kim,* Ajou University, Republic of Korea

**PS-TuP-2** Selective Cyclic Etching of Silicon Oxide Over Silicon Nitride Using $NF_3/H_2$ Remote Plasma and $NH_3$, ***Hong Seong Gil,*** *Y. Gill, D. Kim, Y. Jang, H. Kwon, D. Kim, G. Yeom,* Sungkyunkwan University (SKKU), Republic of Korea

**PS-TuP-3** Identification of Critical Factors in Plasma Enhanced Atomic Layer Etching of Silicon Nitride through First-Principles-Based Simulations, ***Erik Cheng,*** *G. Hwang,* The University of Texas at Austin; *P. Ventzek, Z. Chen, S. Sridhar,* Tokyo Electron America

**PS-TuP-6** Dry Etching of Co Thin Films Using High Density Plasma of Organic Gases, ***S. Y. Park,*** *E. Lim,* ***Seon Jae Kim,*** *C. Chung, S.J. Kim,* Inha University, Republic of Korea

**PS-TuP-8** Selective Etching of Silicon Nitride with Remote $ClF_3/H_2$ Plasma, ***Seongjae Yu,*** *K. Kim, Y. Ji, J. Kang, G. Yeom,* Sungkyunkwan University (SKKU), Republic of Korea

**PS-TuP-9** Treatment and Gasification of Spent Caustic wastes using transferred Arc Thermal Plasma Torch with Syngas Production, *R. Aghayee,* ***Farzaneh Ostovarpour,*** *M. Abbassi Shanbehbazari,* Laser and Plasma Research Institute (LAPRI), Shahid Beheshti University, Iran (Islamic Republic of); *M. Shafiei, M. Khani, B. Shokri,* Laser and Plasma Research Institute (LAPRI), Shahid Beheshti University, Iran (Islamic Republic of)

**PS-TuP-10** Layer-by-Layer Etching of Copper Thin Films Under Acetylacetone/$O_2$ Gas Mixture, ***Seung Hyun Kim,*** *E. Lim, S. Park, C. Chung,* Inha University, Republic of Korea

**PS-TuP-11** Enhancement of Plasma Uniformity Controlling Thermal Conductivity by Insulator Ring, ***Jinuk Park,*** *J. Park,* Sungkyunkwan University (SKKU), Republic of Korea

**PS-TuP-12** Effect of $C_4H_2F_6$ Isomers on the Etch Characteristics of $SiO_2$, ***Hyejoo Lee,*** *H. Tak, S. Kim, D. Sung, T. Park, J. Kim, J. Min,* Sungkyunkwan University (SKKU), Republic of Korea; *W. Long,* Sungkyunkwan University (SKKU), China; *D. Kim, G. Yeom,* Sungkyunkwan University (SKKU), Republic of Korea

**PS-TuP-13** Analysis on Ion Energy Distribution and Ion Mean Energy for All Radio-Frequencies and Pressures, ***Inho Seong,*** *S. Kim, Y. Lee, C. Cho, W. Jeong, Y. You, S. You,* Chungnam National University, Republic of Korea

**PS-TuP-14** Moving Toward Antibacterial Wound Dressings: Modifying Commercially-available Materials Using Pulsed and Continuous-wave 1,8-cineole Plasma, ***Mia-Rose Kayaian,*** *M. Hawker,* California State University, Fresno

**PS-TuP-15** To What Extent Do Nitrogen and Water Vapor Plasma Treated Silk Films Exhibit Hydrophobic Recovery?, ***Ashley Keobounnam,*** *C. Lenert-Mondou, M. Hawker,* California State University, Fresno

**PS-TuP-16** Ion Energy Control Independent with Ion Density Using a Passive Antenna in an Inductively Coupled Plasma Source, ***Minsu Choi,*** *S. Kim, I. Seong, C. Cho, Y. Lee, W. Jeong, Y. You, B. Choi, S. You,* Chungnam National University, Republic of Korea

**PS-TuP-17** The Impact of $Si_3N_4$ Ultra-thin Layer on InN Growth on Si(111) by RF-MOMBE, ***Wei-Chun Chen,*** Taiwan Instrument Research Institute, National Applied Research Laboratories, Taiwan; *S. Chen, C. Cheng,* Department of Mechatronic Engineering, National Taiwan Normal University, Taiwan

**PS-TuP-18** Machine Learning Based Surrogate Models for Capacitively Coupled Plasmas, *L. Yan,* Applied Materials, Inc. (Currently with University of Pennsylvania); ***Abhishek Verma,*** *S. Ganta, K. Bera,* Applied Materials, Inc.

**PS-TuP-19** Chemistry Reduction in Fluid Plasma Simulations, ***Ramanish Singh,*** Applied Materials Inc. (Currently with University of Minnesota); *S. Ganta, A. Verma, K. Bera,* Applied Materials, Inc.

## Spectroscopic Ellipsometry Focus Topic
## Room Ballroom A - Session EL-TuP
## Spectroscopic Ellipsometry Poster Session, 6:30-8:30pm

**EL-TuP-2** Unraveling the Ultra-Violet Active Chiroptical Response by $ZrO_2$ Helical Nanostructures, ***Ufuk Kilic,*** *M. Hilfiker, S. Wimer, S. G. Kilic, C. Argyropoulos, E. Schubert, M. Schubert,* University of Nebraska-Lincoln

**EL-TuP-4** A Review of Refractive Index Refinements Analysis in Mono layers Absorbents Atomic Layer Deposition (ALD) or Molecular Physisorption Phenomena, *F. Ferrieu,* Optical Polarimetry Ellipsometry, Switzerland; ***Christophe Vallee,*** SUNY POLY, Albany

## Surface Science Division
## Room Ballroom A - Session SS-TuP
## Surface Science Poster Session, 6:30-8:30pm

**SS-TuP-1** Monolayer Functionalization of Semiconductor and Metal Oxide Surfaces with Boron-Containing Precursors, ***Dhamelyz Silva Quinones,*** *C. Byron, A. Teplyakov,* University of Delaware

**SS-TuP-2** Detection of Chemically-induced Hot Electron Flux Amplified by Plasmonic Effect on Pt/Ag/$TiO_2$ Nanodiodes, ***Mincheol Kang,*** *B. Jeon, J. Park,* Korea Advanced Institute of Science and Technology (KAIST) & Institute for Basic Science (IBS), Republic of Korea

**SS-TuP-3** Boosting Hot Electron Generation and Catalytic Performance by Engineering Metal-Oxide Interfaces, ***Kyoungjae Song,*** *J. Park,* Korea Advanced Institute of Science and Technology (KAIST) & Institute for Basic Science (IBS), Republic of Korea

**SS-TuP-4** Effect of Water Vapor on Oxidation Process of Cu(111) Surface and Sublayer; Ambient Pressure STM and XPS Studies, ***Youngjae Kim,*** *D. Kim, Y. Kim,* Korea Advanced Institute of Science and Technology (KAIST) & Institute for Basic Science (IBS), Republic of Korea; *Y. Jeong,* Institute for Basic Science (IBS), Republic of Korea; *B. Jeong,* Korea Basic Science Institute (KBSI), Republic of Korea; *J. Park,* Korea Advanced Institute of Science and Technology (KAIST) & Institute for Basic Science (IBS), Republic of Korea

**SS-TuP-5** Phase-Dependence on the Friction of Exfoliated $MoX_2$ (X:S, Te) Layers, ***Dooho Lee,*** Korea Advanced Institute of Science and Technology (KAIST) & Institute for Basic Science (IBS), Republic of Korea; *H. Jeong,* Korea Advanced Institute of Science and Technology, Republic of Korea; *H. Lee,* Korea Advanced Institute of Science and Technology (KAIST) & Institute for Basic Science (IBS), Republic of Korea; *Y. Kim,* Korea Advanced Institute of Science and Technology, Republic of Korea; *J. Park,* Korea Advanced Institute of Science and Technology (KAIST) & Institute for Basic Science (IBS), Republic of Korea

**SS-TuP-6** Electron Dynamics at a Confined $Cu_{2-x}O$/Cu Interface, ***J. Trey Diulus***, *J. Beckord, Z. Novotny, N. Comini, M. Hengsberger, J. Osterwalder,* University of Zurich, Switzerland

**SS-TuP-7** Understanding Interfaces to Develop Advanced Materials for Industrial Applications, ***Pierluigi Bilotto Bilotto***, *M. Ostermann, D. Miano,* Centre for Electrochemistry and Surface Technology (CEST GmbH), Austria; *M. Valtiner,* Centre for Electrochemistry and Surface Technology (CEST Gmbh), Vienna University of Technology (TUW), Austria

**SS-TuP-8** Investigation of CO Oxidation on Rh(111) with IRRAS, ***Faith Lewis***, *D. Killelea,* Loyola University Chicago

**SS-TuP-9** Modifications of Surface Optoelectronics in ZnO Nano- and Microcrystals Following Exposure to *Staphylococcus Aureus* and Bacterial Growth Media, ***Dustin Johnson***, Texas Christian University; *J. Reeks,* INSTITUTE OF LOW TEMPERATURE AND STRUCTURE RESEARCH - POLISH ACADEMY OF SCIENCES, Poland; *A. Caron,* Texas Christian University; *I. Tzoka,* University of Texas at Arlington; *O. Castillo, K. Nguyen,* Paschal High School; *M. Hattarki,* Rice University; *S. McGillivray, Y. Strzhemechny,* Texas Christian University

**SS-TuP-10** A Potential Model for Investigating the Edge Properties of FeO by Taking Advantage of Different Metal Affinities, ***Dairong Liu***, *L. Li, S. Mahapatra, N. Jiang,* University of Illinois - Chicago

**SS-TuP-11** Effects of Thermal Atomic Layer Etching on the Magnetic Properties of CoFeB, ***Marissa Pina***, *M. Konh, Y. Wang, J. Xiao, A. Teplyakov,* University of Delaware

**SS-TuP-12** The Diamond (111) Surface Reconstruction and Epitaxial Graphene Interface, ***Benjamen Reed***, National Physical Laboratory, UK; *M. Bathen,* ETH Zurich, Switzerland; *J. Ash,* Aberystwyth University, UK; *C. Meara,* Newcastle University, UK; *A. Zakharov,* Max IV Laboratory, Sweden; *J. Goss,* Newcastle University, UK; *J. Wells,* University of Oslo, Norway; *D. Evans,* Aberystwyth University, UK; *S. Cooil,* University of Oslo, Norway

**SS-TuP-13** The Nature of Electrical Double Layer Near Graphene and Anatase, ***Xiao Zhao***, *S. Yang, M. Salmeron,* LBNL

**SS-TuP-14** Reactions of Tetrakis(Dimethylamido)Titanium on Halogenated, Hydrogenated, and Oxidized Silicon Monolayer Resists for Atomic Layer Deposition, ***Tyler Parke***, *D. Silva-Quinones, A. Teplyakov,* University of Delaware

**SS-TuP-15** A 2D Bismuth-induced Honeycomb Surface Structure on GaAs(111), ***Yi Liu***, *S. Benter,* Lund University, Sweden; *C. Ong, R. Maciel, O. Eriksson,* Uppsala University, Sweden; *A. Mikkelsen, R. Timm,* Lund University, Sweden

**SS-TuP-16** Hydrochloride Production from Dichlorosilane Decomposition and Its Impact on Atomic Layer Deposition of Silicon Nitride, ***Tsung-Hsuan Yang***, *E. Cheng, G. Hwang, S. Johnson, J. Ekerdt,* University of Texas at Austin; *P. Ventzek, T. Iwao, J. Zhao,* Tokyo Electron America Inc.,; *K. Ishibashi,* Tokyo Electron Ltd., Japan

**SS-TuP-18** Enhancing Fiber-Coupled Thermal Emission Collection Using IR Plasmonic Coating, ***Aman Patel***, *R. Kayastha, K. Agyepong, B. Birmingham, Z. Zhang,* Baylor University

**SS-TuP-19** The Effects of Surface Treatments on the Nucleation and Growth of Ruthenium on Tantalum Nitride, *C. Feit, U. Kumar, N. Berriel,* ***Luis Tomar***, *S. Seal, P. Banerjee,* University of Central Florida

**SS-TuP-20** Laser Assisted Thermal Reactivity of Alkanes on Pt(111), ***Julissa Velasquez***, University of Virginia

**SS-TuP-21** ID31 - High-Energy Beamline at ESRF for Buried Interface Structure and Materials Processing, ***Andrea Sartori***, *J. Drnec,* ESRF, France

**SS-TuP-22** Modeling Surface Interactions: Methods and Select Applications, ***Sierra Jubin***, Princeton University; *Y. Barsukov,* Princeton Plasma Physics Laboratory; *I. Kaganovich,* Princeton Plasma Physcis Laboratory

**SS-TuP-24** Deterministic Switching Using Unconventional Spin-Orbit Torques in Atomically Clean $WTe_2$/FGT Heterostructures, ***Sean Yuan***, *I. Kao, R. Muzzio,* Carnegie Mellon University; *J. Edgar,* Kansas State University; *J. Goldberger,* Ohio State University; *J. Yan,* Oak Ridge National Laboratory; *J. Hwang,* Ohio State University; *J. Katoch, S. Singh,* Carnegie Mellon University

**SS-TuP-25** Preparing and Characterizing Thin Hexagonal Boron Nitride Flakes for Creating Spin Defects, ***Seth Eisenberger***, *I. Kao, R. Muzzio, J. Katoch, S. Singh,* Carnegie Mellon University

**SS-TuP-26** Visualizing the Electronic Structure of Multiple Twisted Bilayer Graphene Domains, ***Indra Periwal***, *R. Muzzio,* Carnegie Mellon University; *C. Jozwiak, A. Bostwick, E. Rotenberg,* Lawrence Berkeley National Laboratory; *S. Singh, J. Katoch,* Carnegie Mellon University

**SS-TuP-27** Angle-Resolved XPS Analysis of the Oxidation of Ru Thin Films, ***Shivan Antar***, *A. Valenti, R. Wheeler, C. Ventrice,* SUNY Polytechnic Institute; *M. Strohmayer, J. Brewer, C. Nassar, C. Keimel,* Menlo Micro

## Vacuum Technology Division
## Room Ballroom A - Session VT-TuP
## Vacuum Technology Poster Session, 6:30-8:30pm

**VT-TuP-1** Analysis and Quantification of the Impurities in a 300mm Etch Tool Exhaust During an Oxide Etch Process with CF4 Under Plasma, ***Anup Kumar Doraiswamy***, *C. Jennings,* Air Liquide; *N. Stafford,* air liquide; *P. Nguyen,* Air Liquide

**VT-TuP-2** Amorphous Carbon Thin Films: Influence of Hydrogen Contamination on the Secondary Electron Emission Properties, ***Carolina Adame***, CEFITEC, NOVA School of Science and Technology, Portugal; *E. Alves, N. Barradas,* DECN and IPFN, Instituto Superior Técnico, University of Lisbon, Portugal; *N. Bundaleski,* CEFITEC, NOVA School of Science and Technology, Portugal; *P. Pinto,* CERN, Switzerland; *J. Deuermeier,* CENIMAT|i3N, NOVA School of Science and Technology and CEMOP/UNINOVA, Portugal; *Y. Delaup,* CERN, Switzerland; *I. Ferreira,* CENIMAT|i3N, NOVA School of Science and Technology and CEMOP/UNINOVA, Portugal; *H. Neupert, M. Himmerlich , S. Pfeiffer, M. Rimoldi, M. Taborelli,* CERN, Switzerland; *O. Teodoro,* CEFITEC, NOVA School of Science and Technology, Portugal

| | **Smart Multifunctional Materials for Nanomedicine Focus Topic**<br>**Room 301 - Session SM-WeM**<br>**Smart Multifunctional Materials for Nanomedicine and Theranostics**<br>**Moderators: Diego La Mendola**, University of Pisa, Italy,<br>**François Reniers**, Université Libre de Bruxelles, Belgium,<br>**Cristina Satriano**, University of Catania, Italy | **Chemical Analysis and Imaging Interfaces Focus Topic**<br>**Room 302 - Session CA+HC+LS+VT-WeM**<br>**Multiphase Interfacial Analysis and Imaging**<br>**Moderators:**<br>**Andrei Kolmakov**, National Institute of Standards and Technology (NIST),<br>**Slavomir Nemsak**, Advanced Light Source, Lawrence Berkeley National Laboratory |
|---|---|---|
| 8:00am | | **INVITED: CA+HC+LS+VT-WeM-1** Probing the Impact of Nanoscale Defect Sites in Perovskite Photovoltaic Films with Time-Resolved Photoemission Electron Microscopy*, **Keshav Dani**,* 1919-1 Tancha, Kunigami-kun, Japan |
| 8:20am | | |
| 8:40am | **INVITED: SM-WeM-3** Plasma-Enabled Switchable Surfaces: Going from Molecules to Bacteria*, U. Cvelbar, **Martina Modic,*** Jozef Stefan Institute, Slovenia | **INVITED: CA+HC+LS+VT-WeM-3** Correlating Structure and Chemistry Using Ambient Pressure Photoemission and X-Ray Scattering*, **Slavomir Nemsak**,* Lawrence Berkeley Laboratory Advanced Light Source |
| 9:00am | | |
| 9:20am | **SM-WeM-5** Cisplatin-Loaded Pd Nanoparticles as Bimodal Theranostic Nanomedicine in the Tumor Treatment*, A. Bellissima, G. Scivoletto, L. Cucci, V. Sanfilippo,* University of Catania, Italy*; A. De Bonis,* University of Basilicata, Italy*; R. Fiorenza, S. Scirè,* University of Catania, Italy*; V. Notarstefano, E. Giorgini,* Polytechnic University of Marche, Italy*; **Cristina Satriano**,* University of Catania, Italy | **CA+HC+LS+VT-WeM-5** Gating of the 2D Hole Transport in Diamond by Subsurface Charges*, E. Strelcov, **Andrei Kolmakov**,* NIST |
| 9:40am | **SM-WeM-6** Old Drugs for a Golden Future: Clinically Established Au-Based Complexes…from Repurposing to Potential Application in Nanomedicine*, **Tiziano Marzo**, L. Chiaverini, D. La Mendola,* University of Pisa, Department of Pharmacy, Italy | **CA+HC+LS+VT-WeM-6** Development of 0–D Argon Collisional Radiative Model conjoined with Optical Emission Spectroscopy between 1 mTorr to 760 Torr*, **Tag Choi**, N. Abuyazid, D. Patel,* University of Illinois at Urbana-Champaign*; D. Jacobson,* LytEn. Inc*; S. Keniley, S. Dubowsky, D. Barlaz, D. Curreli, D. Ruzic,* University of Illinois at Urbana-Champaign |
| 10:00am | **BREAK - Complimentary Coffee in Exhibit Hall** | **BREAK - Complimentary Coffee in Exhibit Hall** |
| 10:20am | | |
| 10:40am | | |
| 11:00am | **SM-WeM-10** Plasmonic Tuning of Go-Based Nanosheets by Plasmonic Noble Metal Nanorods for Self-Cleaning Photothermal Surfaces to Fight Surface Contamination*, **Vanessa Sanfilippo**, T. Pascal, A. Foti,* University of Catania, Department of Chemical Sciences, Italy*; A. Fraix, S. Petralia, G. Forte,* University of Catania, Department of Drug and Health Sciences, Italy*; C. Fortuna,* University of Catania, Department of Chemical Sciences , Italy*; A. Giuffrida, C. Satriano,* University of Catania, Department of Chemical Sciences, Italy | **INVITED: CA+HC+LS+VT-WeM-10** Atomic-Scale Modeling of Bismuth and Argon Clusters Sputtering of Water/Vacuum Interfaces*, **Zbigniew Postawa**, M. Kański, C. Chang, S. Hrabar,* Jagiellonian University, Poland |
| 11:20am | **SM-WeM-11** Green Synthesis of Metal Nanoparticles for Wound Healing Applications*, **Alice Foti**, V. Sanfilippo,* University of Catania, Italy*; V. Caruso, R. Inturri, P. Amico, S. Vaccaro,* Fidia Farmaceutici S.p.A., Italy*; C. Satriano,* University of Catania, Italy | |
| 11:40am | **SM-WeM-12** Nanoparticles Loaded with Histidine Rich Peptides for Wound Healing*, **Diego La Mendola**,* Università di Pisa, Italy*; L. Chiaverini, T. Marzo,* University of Pisa, Italy | **INVITED: CA+HC+LS+VT-WeM-12** Finite-Elements Modeling of Solid-Electrolyte Interfaces in Through-Membranes Imaging and in-Liquid Scanning Probe Experiments*, **Alexander Tselev**,* Department of Physics & CICECO-Aveiro Institute of Materials, University of Aveiro, Portugal |
| 12:00pm | | |

# Wednesday Morning, November 9, 2022

| | **2D Materials Technical Group**<br>**Room 303 - Session 2D+EM+MI+NS+QS-WeM**<br>**2D Materials: Quantum and Symmetry-Protected States**<br>**Moderators:**<br>**Thomas Michely**, University of Cologne, Germany,<br>**Frances Ross**, Massachusetts Institute of Technology | **Nanoscale Science and Technology Division**<br>**Room 304 - Session NS+AP+BI+SS-WeM**<br>**Frontiers in Scanning Probe Microscopy Including Machine Learning**<br>**Moderators: Wonhee Ko**, University of Tennessee, Knoxville,<br>**Adina Luican-Mayer**, University of Ottawa, Canada |
|---|---|---|
| 8:00am | **INVITED: 2D+EM+MI+NS+QS-WeM-1** Semi-High Throughput Investigation of 2d Materials: Anomalous Quantum Confinement Effect and Spectral Properties, ***Francesca Tavazza***, *K. Choudhary,* National Institute of Standard and Technology | |
| 8:20am | | |
| 8:40am | **2D+EM+MI+NS+QS-WeM-3** Dry Patterning Chemically Sensitive Quantum Materials, ***Joseph Benigno***, *Q. Zou, C. Cen, L. Li,* West Virginia University | **NS+AP+BI+SS-WeM-3** Decay Rate Spectroscopy for a Direct Probe of Josephson and Andreev Currents on the Atomic Scale, ***Wonhee Ko***, University of Tennessee, Knoxville; *J. Lado,* Aalto University, Finland; *E. Dumitrescu, P. Maksymovych,* Oak Ridge National Laboratory |
| 9:00am | **2D+EM+MI+NS+QS-WeM-4** Electron Transport and Charge Sensing in Strongly Coupled Quantum Dot Array in Silicon, ***Fan Fei***, *J. Wyrick, P. Namboodiri, J. Fox,* NIST; *E. Khatami,* SJSU; *R. Silver,* NIST | **NS+AP+BI+SS-WeM-4** Machine Learning-Driven Automated Scanning Probe Microscopy: Application to Ferroelectric Materials, ***Yongtao Liu***, *K. Kelley, R. Vasudevan,* Oak Ridge National Laboratory, USA; *H. Funakubo,* Tokyo Institute of Technology, Japan; *S. Kalinin,* University of Tennessee Knoxville; *M. Ziatdinov,* Oak Ridge National Laboratory, USA |
| 9:20am | **INVITED: 2D+EM+MI+NS+QS-WeM-5** Observation of the Layer Hall Effect in Topological Axion Antiferromagnet $MnBi_2Te_4$, ***Suyang Xu***, Harvard University | **NS+AP+BI+SS-WeM-5** AVS Dorothy M. and Earl S. Hoffman Scholarship Talk: Direct Imaging of Light-Matter Interaction of 0-dimensional Excitonic Emitters using Tip-enhanced Scanning Probe Technique, ***Kiyoung Jo***[1], *E. Marino, J. Lynch, Z. Jiang, N. Gogotsi,* University of Pennsylvania; *P. Schuck,* Columbia University; *N. Borys,* Montana State University; *C. Murray, D. Jariwala,* University of Pennsylvania |
| 9:40am | | **NS+AP+BI+SS-WeM-6** Nanoscale Subsurface Depth Sensitivity of Contact Resonance Atomic Force Microscopy on Layered Films, ***Gheorghe Stan***, National Institute for Science and Technology (NIST); *C. Ciobanu,* Colorado School of Mines; *S. King,* Intel Corporation |
| 10:00am | **BREAK - Complimentary Coffee in Exhibit Hall** | **BREAK - Complimentary Coffee in Exhibit Hall** |
| 10:20am | | |
| 10:40am | | |
| 11:00am | **2D+EM+MI+NS+QS-WeM-10** Phonon Limited Mobility and Phonon Drag in h-BN Encapsulated Monolayer and AB-stacked Bilayer Graphene, ***Vasili Perebeinos***, University at Buffalo | **NS+AP+BI+SS-WeM-10** The Impact of Temperature on Viscoelastic Properties of Nanoscale Domains Within Polymer Composites, ***Bede Pittenger***, *S. Osechinskiy, J. Thornton, S. Loire, T. Mueller,* Bruker Nano Surfaces |
| 11:20am | **2D+EM+MI+NS+QS-WeM-11** Exciton Physics at the Atomic Scale, ***Daniel Gunlycke***, U.S. Naval Research Laboratory | **NS+AP+BI+SS-WeM-11** AFM Force Spectroscopy Combined with Machine-Learning Methods for Identifying Malaria Derived- EV Subpopulations, ***Irit Rosenhek-Goldian***, *P. Abou Karam,* Weizmann Institute of Science, Israel; *T. Ziv,* Technion - Israel Institute of Technology, Israel; *H. Ben Ami Pilo, I. Azuri, A. Rivkin, E. Kiper, R. Rotkopf, S. Cohen,* Weizmann Institute of Science, Israel; *A. Torrecilhas,* Federal University of São Paulo, Brazil; *O. Avinoam,* Weizmann Institute of Science, Israel; *A. Rojas,* University of Costa Rica; *M. Morandi, N. Regev-Rudzki,* Weizmann Institute of Science, Israel |
| 11:40am | **INVITED: 2D+EM+MI+NS+QS-WeM-12** Weyl Semimetals with Low-Symmetry Crystal Structure for Generating Out-of-Plane Oriented Spin Current, ***Simranjeet Singh***, Carnegie Mellon University | |
| 12:00pm | | |

[1] **AVS Dorothy M. and Earl S. Hoffman Scholarship Recipient**

# Wednesday Morning, November 9, 2022

| | **Plasma Science and Technology Division**<br>**Room 305 - Session PS1+AP+TF-WeM**<br>**Plasma Deposition and ALD Processes for Coatings and Thin Films**<br>**Moderators:**<br>**Sumit Agarwal**, Colorado School of Mines | **Plasma Science and Technology Division**<br>**Room 315 - Session PS2+TF-WeM**<br>**Plasma Processes of Non-Silicon Related Semiconductors for Energy-Efficient Devices in Power, Photovoltaics and Optoelectronics Applications**<br>**Moderators: Kenji Ishikawa**, Nagoya University, Japan,<br>**Steven Vitale**, MIT Lincoln Laboratory |
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| 8:00am | **PS1+AP+TF-WeM-1** Hollow Cathode Enhanced Capacitively Coupled Plasmas in Ar / $N_2$ / $H_2$ Mixtures and Implications for Plasma Enhanced ALD, ***David Boris,*** U.S. Naval Research Laboratory; *M. Johnson,* Syntek Technologies; *C. Eddy,* ONR Global; *S. Walton,* U.S. Naval Research Laboratory | **INVITED: PS2+TF-WeM-1** Low-Damage Etching of Nitride Semiconductors Utilizing Photo-Electrochemical Reactions, ***Taketomo Sato,*** Hokkaido University, Japan |
| 8:20am | **PS1+AP+TF-WeM-2** Chasing Oxygen Out of Nitrides Grown on PEALD and Thermal ALD, ***Bangzhi Liu,*** The Pennsylvania State University; *B. Rayner,* KJ Lesker | |
| 8:40am | **INVITED: PS1+AP+TF-WeM-3** Area-Selective Deposition: A Bottom-Up Approach to Nanoelectronics Fabrication, ***Silvia Armini,*** IMEC, Belgium | **PS2+TF-WeM-3** Gan Profile Understanding During the Plasma Etching of an HEMT Recessed-Gate with a Photoresist Mask, ***Simon Ruel,*** CEA-LETI, France; *P. Thoueille,* Lam Research Corporation, France; *P. Pimenta-Barros, N. Posseme,* CEA-LETI, France |
| 9:00am | | **PS2+TF-WeM-4** Quantitative Characterization of Plasma-Induced Defect Creation in InP Substrates Using Conductance Analysis, ***Takahiro Goya,*** Kyoto University, Japan; *Y. Kodama, Y. Zaizen, M. Fukasawa,* Sony Semiconductor Solutions Corporation, Japan; *K. Urabe, K. Eriguchi,* Kyoto University, Japan |
| 9:20am | **PS1+AP+TF-WeM-5** The Role of Plasma in Plasma Enhanced Atomic Layer Epitaxy, ***Scott Walton,*** *D. Boris,* US Naval Research Laboratory; *M. Johnson,* Syntek Technologies, Inc.; *V. Wheeler, J. Woodward, S. Rosenberg, S. Johnson,* US Naval Research Laboratory; *K. Ludwig,* Boston University; *J. Hite, C. Eddy,* US Naval Research Laboratory | **PS2+TF-WeM-5** Impact of Bias Power and Oxygen Addition on Selective Dry Etching of TiAlC over TiN Using $N_2$/$H_2$-based Plasmas, ***Kenji Ishikawa,*** *T. Nguyen,* Nagoya University, Japan; *K. Shinoda, H. Hamamura,* Hitachi, Japan; *K. Maeda, K. Yokogawa, M. Izawa,* Hitachi High Technologies, Japan; *M. Hori,* Nagoya University, Japan |
| 9:40am | **PS1+AP+TF-WeM-6** Plasma-Enhanced Atomic Layer Deposition of TiAlN Thin Films: A Novel Approach for MAX-phase Synthesis, ***Moses Nnaji,*** Georgia Institute of Technology, USA; *D. Hitchcock,* Savannah River National Laboratory, USA; *E. Vogel,* Georgia Institute of Technology, USA | |
| 10:00am | **BREAK - Complimentary Coffee in Exhibit Hall** | **BREAK - Complimentary Coffee in Exhibit Hall** |
| 10:20am | | |
| 10:40am | | |
| 11:00am | **PS1+AP+TF-WeM-10** AVS Graduate Research Awardee Talk: Temporal Evolution of Densities and Temperatures in Sub-Microsecond Pulsed Microwave Discharges, ***Dhruval Patel[12],*** *T. Choi, H. Swearingen,* University of Illinois at Urbana Champaign; *D. Jacobson,* Lyten; *J. Bruehl,* University of Illinois at Urbana Champaign; *B. Gittleman, M. Stowell,* Lyten; *E. Barlaz, S. Dubowsky, D. Ruzic,* University of Illinois at Urbana Champaign | **PS2+TF-WeM-10** Bulk Titanium Micromachining and Simultaneous Sidewalls Passivation for Bio-MEMS Applications, ***Rim Ettouri,*** *T. Tillocher, P. Lefaucheux,* GREMI CNRS/Université d'Orléans, France; *B. Boutaud, J. Phung, H. Philippe,* MISTIC, France; *R. Dussart,* GREMI CNRS/Université d'Orléans, France |
| 11:20am | **PS1+AP+TF-WeM-11** In situ Atomic Layer Doping Coupled Low-temperature Epitaxial Growth of β-$Ga_2O_3$ Films via Plasma-enhanced ALD, ***Saidjafarzoda Ilhom,*** *A. Mohammad, J. Grasso,* University of Connecticut; *A. Okyay,* Stanford University; *B. Willis, N. Biyikli,* University of Connecticut | **PS2+TF-WeM-11** Selective Dry Etching of TiAlC over TiN using $N_2$/$H_2$ Plasma Chemistry, ***Thi-Thuy-Nga Nguyen,*** Nagoya University, Japan; *K. Shinoda, H. Hamamura,* Hitachi, Japan; *K. Maeda, K. Yokogawa, M. Izawa,* Hitachi High-Tech, Japan , Japan; *K. Ishikawa, M. Hori,* Nagoya University, Japan |
| 11:40am | **PS1+AP+TF-WeM-12** Plasma-Polymer Coating of Li-Metal Anodes for the Improvement of Li-Ion Batteries, ***Yannik Moryson,*** *H. Hartmann, S. Otto,* Justus Liebig University Giessen, Germany; *X. Fang,* Technical University of Darmstadt, Germany; *M. Rohnke, J. Janek,* Justus Liebig University Giessen, Germany | **PS2+TF-WeM-12** Surface Modification of CoSi through Interconnect Fabrication Processes, ***Nathan Marchack,*** *A. Orefice, M. Hopstaken, G. Cohen, C. Lavoie, R. Bruce, C. Chen,* IBM Research |
| 12:00pm | **PS1+AP+TF-WeM-13** Fabrication and Evaluation of Composite Thin Film Membranes for Tritium Management in Future Fusion Plants, ***Adam Job,*** *C. Li,* Colorado School of Mines; *T. Fuerst, C. Taylor,* Idaho National Laboratory; *J. Way, C. Wolden,* Colorado School of Mines | **PS2+TF-WeM-13** PbS Quantum Dots Thin Film Dry Etching, ***Nicolas Le Brun,*** LTM - MINATEC - CEA/LETI, France; *P. Gouraud,* STMicroelectronics, France; *G. Cunge,* LTM - MINATEC - CEA/LETI, France; *L. Parmigiani, S. Allegret-Maret,* STMicroelectronics, France |

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

[2] **AVS Graduate Research Awardee**

**Room 316**

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| 8:00am | **TF2+AP+SE+SS-WeM-1** Nucleation Enhancement of Ruthenium Atomic Layer Deposition Using Organometallic Molecules, ***Amnon Rothman***, *D. Tsousis, S. Bent,* Stanford University | **Thin Films Division**<br>**Session TF2+AP+SE+SS-WeM**<br>**ALD and CVD: Surface Reactions, Mechanisms and Kinetics**<br>**Moderators:**<br>**Jessica Kachian**, Intel Corporation |
| 8:20am | **INVITED: TF2+AP+SE+SS-WeM-2** Ald of Chalcogenide and III-V Materials for Memory Applications, ***Laura Nyns***, *A. Delabie, W. Devulder,* IMEC, Belgium; *J. Girard,* Air Liquide, France; *B. McKeown, V. Pallem,* Air Liquide; *T. Peissker, J. Sinha,* IMEC, Belgium; *N. Stafford,* Air Liquide; *J. Swerts,* IMEC, Belgium | |
| 8:40am | | |
| 9:00am | **TF2+AP+SE+SS-WeM-4** Plasma-enhanced Spatial ALD of $SiO_2$ investigated by gas-phase Infrared and Optical Emission Spectroscopy, *M. Mione, V. Vandalon,* Eindhoven University of Technology, Netherlands; *A. Mameli,* TNO-Holst Centre & Eindhoven University of Technology, The Netherlands; *F. Roozeboom,* TNO-Holst Centre & Eindhoven University of Technology, Netherlands; ***Erwin Kessels***, Eindhoven University of Technology, Netherlands | |
| 9:20am | **TF2+AP+SE+SS-WeM-5** Role of Al in Enhancing Growth Rate and Crystallinity in Chemical Vapor Deposition of $Hf_{1-x}Al_xB_2$ Coatings Below 300 °C, ***Kinsey Canova***[1], *S. Shrivastav, C. Caroff, L. Souqui, G. Girolami, J. Krogstad, J. Abelson,* University of Illinois at Urbana-Champaign | |
| 9:40am | **TF2+AP+SE+SS-WeM-6** Pushing the Limits of ALD Infilling to Produce Macroscopic Nanocomposites, ***Benjamin Greenberg***, *K. Anderson, A. Jacobs, J. Wollmershauser, B. Feigelson,* U.S. Naval Research Laboratory | |
| 10:00am | **BREAK - Complimentary Coffee in Exhibit Hall** | |
| 10:20am | **BREAK** - Complimentary Coffee in Exhibit Hall | **Thin Films Division**<br>**Session TF3+MS-WeM**<br>**Simulations and Machine Learning Applications for Thin Films**<br>**Moderator:**<br>**Angel Yanguas-Gil**, Argonne National Lab |
| 10:40am | | |
| 11:00am | **INVITED: TF3+MS-WeM-10** What an Experimentalist Needs from Computational Materials Science (Including Machine Learning) – Studies in Semiconductor Processing and Metrology, ***Rafael Jaramillo***, MIT | |
| 11:20am | | |
| 11:40am | **TF3+MS-WeM-12** Computational Analysis and Design of Precursors for ALD and CVD of Metals, ***S.D. Elliott***, *A. Chandrasekaran, S. Tiwari, A. Fonari, D. Giesen,* ***Casey Brock***, Schrödinger | |
| 12:00pm | **TF3+MS-WeM-13** Dopant-selective Atomic Layer Deposition of Metals for Bottom-up Nanoelectronics, ***Nishant Deshmukh***, Georgia Institute of Technology, USA; *D. Aziz, A. Brummer, M. Filler,* Georgia Institute of Technology | |

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

# Wednesday Morning, November 9, 2022

| | **Thin Films Division**<br>**Room 317 - Session TF1+SE-WeM**<br>**Vapor Deposition and Vapor Infiltration of Organic, Polymeric, and/or Hybrid Materials**<br>**Moderator:**<br>**Siamak Nejati**, University of Nebraska-Lincoln | **Actinides and Rare Earths Focus Topic**<br>**Room 318 - Session AC+LS+MI-WeM**<br>**Magnetism, Electron Correlation, and Superconductivity in the Actinides/Rare Earths**<br>**Moderators: James G. Tobin**, University of Wisconsin-Oshkosh, **Ladislav Havela**, Charles University, Czech Republic, **Gertrud Zwicknagl**, Technical University Brauschweig, Germany |
|---|---|---|
| 8:00am | **TF1+SE-WeM-1** Thermophysical Properties of Organic-Inorganic Hybrid Thin Films Created via Vapor Phase Infiltration (VPI), ***Mark Losego,*** Georgia Institute of Technology | **INVITED: AC+LS+MI-WeM-1** The Relation between Crystal Chemistry and Superconductivity in Actinide-Based Superconductors, ***Eteri Svanidze,*** Max Plank Institute, Dresden, Germany |
| 8:20am | **INVITED: TF1+SE-WeM-2** Chemical Vapor Deposition of Soft Materials for Garment-Integrated Sensor Systems and Plant Electronics, ***Trisha L. Andrew,*** University of Massachusetts Amherst | |
| 8:40am | | **INVITED: AC+LS+MI-WeM-3** Revealing The Beauty of Uranium Compounds:the $UMB_4$ (M=V, Cr, Fe, Co, Mo, W, Re, Os) and $UFe_xSb_2$ Cases, ***Antonio Pereira Gonçalves,*** Instituto Superior Técnico, Univ. Lisboa, Portugal |
| 9:00am | **TF1+SE-WeM-4** Effects of Trimethylaluminum Vapor Pressure and Exposure Time on Inorganic Loading in Vapor Phase Infiltrated PIM-1 Polymer Membranes, ***Benjamin Jean,*** *Y. Ren, E. McGuinness, R. Lively, M. Losego,* Georgia Institute of Technology | |
| 9:20am | **TF1+SE-WeM-5** Elucidating the Sequential Infiltration of Trimethylaluminum and Water Into Polycarbonate Membranes and Thin Films, ***Rajesh Pathak,*** *R. Shevate, A. Mane , J. Elam,* Argonne National Laboratory, USA | |
| 9:40am | **TF1+SE-WeM-6** Kinetics of $TiCl_4$ Vapor Phase Infiltration (VPI) into PMMA and the Resulting Thermophysical and Optical Properties of the $TiO_2$ -PMMA Hybrids, ***Shuaib Balogun,*** Georgia Institute of Technology*; A. Steiner,* Sandia National Lab*; M. Losego,* Georgia Institute of Technology | |
| 10:00am | **BREAK - Complimentary Coffee in Exhibit Hall** | **BREAK - Complimentary Coffee in Exhibit Hall** |
| 10:20am | | |
| 10:40am | | |
| 11:00am | | **AC+LS+MI-WeM-10** Uranium Hydrides Revisited, ***Ladislav Havela,*** Charles University, Faculty of Mathematics and Physics, Czechia*; D. Legut,* VSB Technical University Ostrava, Czechia*; J. Kolorenc,* Institute of Physics, Czech Academy of Sciences, Czechia |
| 11:20am | **TF1+SE-WeM-11** Effect of the Metal-Heteroatom Bond on Film Growth and Properties in Vapor-Deposited, Hybrid Metal Organic Thin Films, ***Jacqueline Lewis,*** *J. Shi, A. Ravi, S. I-Cheng Hsu, S. Bent,* Stanford University | **AC+LS+MI-WeM-11** Towards a Better Understanding of the Rkky Interaction in Ce- and Yb-Based Compounds: Anisotropies from Cef Effects and Fermi Surfaces, ***Gertrud Zwicknagel,*** Institut für Mathematische Physik, Germany*; V. Zevin,* The Racah Institute of Physics, Israel |
| 11:40am | **TF1+SE-WeM-12** Oxidative Molecular Layer Deposition of Electrochemically Active Polymers, ***Matthias Young***[1]*, Q. Wyatt, M. Vaninger, N. Paranamana, T. Heitmann, H. Kaiser,* University of Missouri | **AC+LS+MI-WeM-12** Mechanically Forced Tuning of Interactions in Tetragonal 221 Intermetallics, ***Petr Král,*** *J. Prchal,* Charles University, Czech Republic*; J. Kaštil,* Czech Academy of Sciences, Czech Republic*; D. Daisenberger,* Diamond Light Source, UK*; D. Staško,* Charles University, Czech Republic |
| 12:00pm | **TF1+SE-WeM-13** Towards High Throughput Molecular Layer Deposition of Alucone Films, ***Hardik Shantilal Jain***[2]*,* Holst Centre / TNO and Eindhoven University of Technology, The Netherlands*; M. Creatore,* Eindhoven University of Technology, The Netherlands*; P. Poodt,* Holst Centre / TNO and Eindhoven University of Technology, The Netherlands | **AC+LS+MI-WeM-13** Effects of $O_2$ Growth Pressure on the Magnetization of $LaMnO_3$-$SrTiO_3$ Thin Films, ***Ghadendra Bhandari,*** West Virginia University*; R. Trappen,* University of Waterloo*; N. Mottaghi, M. Holcomb,* West Virginia University |

[1] **2020 TFD Paul Holloway Awardee**

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

**Room 319**

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| 8:00am | **SS1+HC-WeM-1** Development of a Predictive Model for $Nb_3Sn$ Thin Film Growth: Elucidating the Substrate-Mediated Diffusion Pathways Guiding Alloy Formation in Accelerator Infrastructure, ***Sarah Willson,*** University of Chicago; *R. Farber,* University of Kansas; *S. Sibener,* University of Chicago | **Surface Science Division**<br>**Session SS1+HC-WeM**<br>**Alloy Surface Reactivity**<br>**Moderators:**<br>**Zdenek Dohnalek**, Pacific Northwest National Laboratory |
| 8:20am | **SS1+HC-WeM-2** Surface Chemical Reactions in the Oxidation of NiCr and NiCrW Alloys, ***Petra Reinke,*** *C. Volders,* University of Virginia, USA; *V. Avincola Angelici ,* University of Virginia; *I. Waluyo, A. Hunt,* Brookhaven National Laboratory; *L. Arnadottir,* University of Oregon | |
| 8:40am | **INVITED: SS1+HC-WeM-3** High Throughput Methods for Comprehensive Study of Alloy Segregation and Structure Sensitivity, ***Andrew Gellman,*** *C. Fernandez-Caban, Z. Guo, R. Burnley,* Carnegie Mellon University, USA | |
| 9:00am | | |
| 9:20am | **SS1+HC-WeM-5** Unveiling the Ability of Rh Single Atoms to Enhance the Dissociation of Molecular Oxygen and Spillover to Cu, ***Volkan Cinar***[1], Tufts University; *D. Guo,* Washington State University, US; *Y. Wang, C. Easton, H. Chen,* Tufts University; *N. Ulumuddin,* Washington State University, US; *R. Hannagan,* Tufts University; *I. Waluyo,* Brookhaven National Laboratory; *J. McEwen,* Washington State University, US; *C. Sykes,* Tufts University | |
| 9:40am | **SS2+AS+HC-WeM-6** Understanding the Growth of Sn and Pt-Sn Clusters on Titania and Carbon Surfaces, *S. Beniwal,* University of South Carolina; *W. Chai,* University of Texas at Austin; *M. Qiao, P. Kasala,* University of South Carolina; *K. Shin, G. Henkelman,* University of Texas at Austin; ***Donna Chen,*** University of South Carolina | **Surface Science Division**<br>**Session SS2+AS+HC-WeM**<br>**Nanoparticle Surfaces**<br>**Moderators:**<br>**Zdenek Dohnalek**, Pacific Northwest National Laboratory |
| 10:00am | **BREAK - Complimentary Coffee in Exhibit Hall** | |
| 10:20am | | |
| 10:40am | | |
| 11:00am | **SS2+AS+HC-WeM-10** Single Nanoparticle Surface Chemistry: Structure-Reactivity Relationships, Evolution During Reactions, and an Approach to Ultra-High Temperature Surface Chemistry, *C. Lau, A. Friese, D. Rodriguez,* ***Scott Anderson,*** University of Utah | |
| 11:20am | **SS2+AS+HC-WeM-11** Oxidation of Size-Selected Ag Clusters on Graphene: Bulk Motifs and Electronic Anomalies at sub-Nanoscale, *F. Loi,* University of Trieste, Italy; *M. Pozzo,* University College London, UK; ***Luca Bignardi,*** *L. Sbuelz,* University of Trieste, Italy; *P. Lacovig, E. Tosi, S. Lizzit,* Elettra Sincrotrone Trieste, Italy; *A. Kartouzian, U. Heiz,* Technical University Munich, Germany; *R. Larciprete,* Institute for complex systems - CNR, Italy; *D. Alfè,* University College London, UK; *A. Baraldi,* University of Trieste, Italy | |
| 11:40am | **INVITED: SS2+AS+HC-WeM-12** Precision Engineering of Metal Nanoparticle Surfaces for Fundamental Studies of Catalytic Reactivity, ***Michelle Personick,*** Wesleyan University | |
| 12:00pm | | |

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

| | **Applied Surface Science Division**<br>**Room 320 - Session AS+BI+CA+HC+LS+PS+SE+SS-WeM**<br>**Analysis of Surfaces and Interfaces Related to Energy and the Environment**<br>**Moderators:**<br>**Kateryna Artyushkova**, Physical Electronics,<br>**Tony Ohlhausen**, Sandia National Laboratory | **Fundamental Discoveries in Heterogeneous Catalysis Focus Topic**<br>**Room 321 - Session HC+AS+SS-WeM**<br>**Advances in Materials and Analysis in Heterogeneous Catalysis II**<br>**Moderators: Sanjaya Sennayake**, Brookhaven National Lab,<br>**Jason Weaver**, University of Florida |
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| 8:00am | **AS+BI+CA+HC+LS+PS+SE+SS-WeM-1** Adhesion Properties of Industrial Steel Samples, ***Lukas Kalchgruber,*** *M. Hahn, L. Mears, M. Valtiner,* TU Wien, Austria | |
| 8:20am | **AS+BI+CA+HC+LS+PS+SE+SS-WeM-2** An Electrochemically Polymerized Protective Layer for Magnesium Metal Anode, *Y. Wang,* University of Maryland College Park; ***Alexander Kozen,*** University of Maryland | **HC+AS+SS-WeM-2** Development and Characterization of Highly Stable ALD Coated Catalysts for Dehydrogenation of Light Alkanes, ***Jonathan Travis,*** *J. Burger, A. Dameron,* Forge Nano |
| 8:40am | **INVITED: AS+BI+CA+HC+LS+PS+SE+SS-WeM-3** Analysis of Surfaces and Interfaces in Polymer Electrolyte Membrane Fuel Cell and Electrolyzer Devices, ***Svitlana Pylypenko,*** Colorado School of Mines | **INVITED: HC+AS+SS-WeM-3** Combining Theory with Ambient Pressure XPS to Reveal Chemistry at Interfaces Under *In Situ* and *Operando* Conditions, ***Ethan Crumlin,*** Lawrence Berkeley National Laboratory |
| 9:00am | | |
| 9:20am | **AS+BI+CA+HC+LS+PS+SE+SS-WeM-5** XPS Analysis of Battery Materials, ***Sarah Zaccarine,*** *B. Schmidt, K. Artyushkova,* Physical Electronics USA; *A. Baniya, Q. Qiao,* Syracuse University | **INVITED: HC+AS+SS-WeM-5** The Electrochemical Interface as a Reactive Environment to Resynthesize Electrode Surface Chemistry Using the Dissolution-Redeposition Dynamics, ***Feng Lin,*** Virginia Tech |
| 9:40am | **AS+BI+CA+HC+LS+PS+SE+SS-WeM-6** Novel Battery Material Analysis with High-Resolution and High-Throughput XPS, *J. Counsell, S. Coultas,* Kratos Analytical Inc., UK; *C. Moffitt,* Kratos Analytical Inc.; *C. Blomfield,* ***Adam Roberts,*** Kratos Analytical Limted, UK | |
| 10:00am | **BREAK - Complimentary Coffee in Exhibit Hall** | **BREAK - Complimentary Coffee in Exhibit Hall** |
| 10:20am | | |
| 10:40am | | |
| 11:00am | **AS+BI+CA+HC+LS+PS+SE+SS-WeM-10** Multimodal Analysis and Imaging of the Boehmite Layer on AA6061, ***Lyndi Strange,*** Pacific Northwest National Lab; *X. Yu,* Oak Ridge National Laboratory; *V. Shutthahandan, M. Song, Q. Miller, M. Bowden, J. Gao, Y. Zhang, J. Son, R. Shimskey, R. Prabhakaran,* Pacific Northwest National Lab; *V. Joshi,* Pacific Northwest National Laboratory | **INVITED: HC+AS+SS-WeM-10** Ambient Pressure Spectroscopy of Catalytic Porous Nanofilms, *C. Eads,* MAX IV Laboratory, Sweden; *T. Hu, S. Tenney,* ***Ashley Head,*** Brookhaven National Laboratory |
| 11:20am | **AS+BI+CA+HC+LS+PS+SE+SS-WeM-11** Study of $Cs_x(CH_3NH_3)_{1-x}PbBr_3$ Perovskite with XPS Imaging and Small Area Spectra, ***Tatyana Bendikov,*** Weizmann Institute of Science, Israel; *Y. Rakita,* Columbia University; *H. Kaslasi, G. Hodes, D. Cahen,* Weizmann Institute of Science, Israel | |
| 11:40am | **AS+BI+CA+HC+LS+PS+SE+SS-WeM-12** Surface Characterization of Mineral Associated Organic Matters in Environmental Samples by Using X-Ray Photoelectron Spectroscopy (XPS), ***Qian Zhao,*** *M. Engelhard, O. Qafoku, K. Hofmockel,* Pacific Northwest National Laboratory | **HC+AS+SS-WeM-12** Catalytic Oxidation of Methane on $IrO_2$(110) Films, ***Jovenal Jamir,*** *R. Martin,* University of Florida; *M. Kim,* Yeungnam University , Republic of Korea; *C. Lee, V. Mehar,* University of Florida; *A. Asthagiri,* The Ohio State University; *J. Weaver,* University of Florida |
| 12:00pm | | **HC+AS+SS-WeM-13** HC Graduate Student Finalist Talk: *Operando* Observation of Metal Encapsulation Causing Strong Metal-Support Interaction at the Pt-$Co_3O_4$ Interface, ***Daeho Kim,*** Korea Advanced Institute of Science and Technology (KAIST) & Institute for Basic Science (IBS), Republic of Korea; *D. Park,* Korea Advanced Institute of Science and Technology, Republic of Korea; *H. Song,* Korea Advanced Institute of Science and Technology (KAIST) & Institute for Basic Science (IBS), Republic of Korea; *B. Jeong,* Korea Basic Science Institute (KBSI), Republic of Korea; *Y. Jung,* Korea Advanced Institute of Science and Technology, Republic of Korea; *J. Park,* Korea Advanced Institute of Science and Technology (KAIST) & Institute for Basic Science (IBS), Republic of Korea |

| | Room 330 | |
|---|---|---|
| 8:00am | **INVITED: MI-WeM-1** Voltage Controlled Néel Vector Rotation in Zero Magnetic Field, ***Christian Binek****, A. Mahmood,* University of Nebraska-Lincoln*; W. Echtenkamp,* University of Minnesota*; M. Street, J. Wang, S. Cao, T. Komesu, P. Dowben, P. Buragohain, H. Lu, A. Gruverman, A. Parthasaraty, S. Rakheja,* University of Nebraska-Lincoln*; J. Weaver, J. Lynn,* NIST-Gaithersburg | **Magnetic Interfaces and Nanostructures Division Session MI-WeM**<br>**Spin Landscape I (Magnetic Structures in Real and Momentum Space)**<br>**Moderators: Mikel Holcomb**, West Virginia University, |
| 8:20am | | |
| 8:40am | **INVITED: MI-WeM-3** Discovering Magnetic Mechanisms in Room-Temperature Metallic Antiferromagnet $Fe_3Ga_4$, ***Michelle Jamer****, B. Wilfong,* United States Naval Academy*; D. Baigutlin, O. Miroshkina, V. Buchelnikov, V. Sokolovskiy,* Chelyabinsk State University, Russian Federation*; G. Stephen, A. Friedman,* Laboratory for Physical Sciences*; R. Barua,* Virginia Commonwealth University*; B. Barbiellini,* LUT University, Finland*; D. Heiman,* Northeastern University | |
| 9:00am | | |
| 9:20am | | |
| 9:40am | | |
| 10:00am | **BREAK - Complimentary Coffee in Exhibit Hall** | |
| 10:20am | | |
| 10:40am | | |
| 11:00am | **INVITED: MI-WeM-10** Irradiative Control of FeRh's Metamagnetic Phase Change Under Three-Dimensional Spatial Confinement Interrogated by Polarized Neutron Scattering, ***Steven Bennett****,* Naval Research Laboratory | |
| 11:20am | | |

# Wednesday Afternoon, November 9, 2022

**Exhibitor Technology Spotlight Workshops**
**Room Hall A - Session EW-WeL**
**Exhibitor Technology Spotlight Session III**
**Moderator: Christopher Moffitt**, Kratos Analytical Inc

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| 12:20pm | **EW-WeL-1** PHI Lunch & Learn Session*,* PHI Lunch & Learn Session: Analysis of Heterogeneous Samples using Surface Analytical Techniques - The Role of Small Area Analysis and Imaging, ***Kateryna Artyushkova,*** Physical Electronics | |
| 12:40pm | | |
| 1:00pm | | |
| 1:20pm | | |
| 1:40pm | | |

# Wednesday Afternoon, November 9, 2022

| | **Advanced Ion Microscopy and Ion Beam Nano-engineering Focus Topic**<br>**Room 301 - Session HI+AP-WeA**<br>**Emerging Ion Sources, Optics, & Applications**<br>**Moderators: Rosa Cordoba**, University of Valencia, Spain,<br>**Florian Vollnhals**, INAM, Germany | **Quantum Information Science Focus Topic**<br>**Room 302 - Session QS+EM+MN+NS-WeA**<br>**Systems and Devices for Quantum Information**<br>**Moderators:**<br>**Megan Ivory**, Sandia National Laboratories,<br>**Dave Pappas**, Rigetti Computing |
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| 2:20pm | **INVITED: HI+AP-WeA-1** Rationalizing and Controlling the Composition and Properties of Materials Deposited Using Charged Particles, ***Howard Fairbrother,*** Johns Hopkins University | **INVITED: QS+EM+MN+NS-WeA-1** Photonics-Integrated Microfabricated Surface Traps for Trapped Ion Applications, ***Megan Ivory****, W. Setzer, N. Karl, J. Schultz, J. Kwon, M. Revelle, R. Kay, M. Gehl, H. McGuinness,* Sandia National Laboratories |
| 2:40pm | | |
| 3:00pm | **HI+AP-WeA-3** Ion Beam Induced Reactions and Deposition of $Pt(CO)_2Br_2$ and $Pt(CO)_2Cl_2$, ***Mohammed Abdel-Rahman****, P. Eckhert,* Johns Hopkins University*; J. Yu, A. Chaudhary, L. McElwee-White,* University of Florida*; H. Fairbrother,* Johns Hopkins University | **INVITED: QS+EM+MN+NS-WeA-3** Toward Heterogeneous Quantum Networks: Interfacing Trapped Ion, Superconducting, and Integrated Photonic Qubits, ***Kathy-Anne Soderberg****, A. Paul,* Air Force Research Laboratory*; N. Barton, A. Brownell,* Murray Associates*; D. Campbell,* Air Force Research Laboratory*; C. Craft,* Technergetics*; M. Fanto, D. Hucul,* Air Force Research Laboratory*; A. Klug,* Griffiss Institute*; M. LaHaye,* Air Force Research Laboratory*; M. Macalik,* Booz Allen Hamilton*; K. Scalzi,* Technergetics*; J. Schneeloch,* Air Force Research Laboratory*; M. Senatore,* Griffiss Institute*; E. Sheridan,* National Academies of Sciences, Engineering, and Medicine*; D. Sica,* Griffiss Institute*; A. Smith, Z. Smith, C. Tison,* Air Force Research Laboratory*; C. Woodford,* Griffiss Institute |
| 3:20pm | **HI+AP-WeA-4** Next Generation Ion Beam Resists: Sub-10 nm Helium Ion Beam Lithography, ***Scott Lewis****, G. Derose,* California Institute of Technology | |
| 3:40pm | **BREAK** | **BREAK** |
| 4:00pm | | |
| 4:20pm | **INVITED: HI+AP-WeA-7** Novel Source Development for Focused Ion Beam Implantation and Irradiation, ***Edward S. Bielejec****, M. Titze, A. Katzenmeyer, A. Belianinov,* Sandia National Laboratories*; Y. Wang,* Los Alamos National Laboratory*; B. Doyle,* Sandia National Laboratories | **INVITED: QS+EM+MN+NS-WeA-7** Superconductor/Semiconductor Heterostructures for Quantum Computing Applications, ***Chris Palmstrøm****,* University of California, Santa Barbara |
| 4:40pm | | |
| 5:00pm | **HI+AP-WeA-9** Focused Ion Beams from GaBiLi LMAIS for Nanofabrication and Ion Imaging, ***Torsten Richter****, P. Mazarov, A. Nadzeyka, L. Bruchhaus, U. Mantz,* Raith GmbH, Germany | **QS+EM+MN+NS-WeA-9** High Throughput Measurements of III-V Semiconductor Materials Stack of 2DEG-Based Tunable Couplers, ***Nicholas Materise****,* Colorado School of Mines*; J. Pitten,* University of Colorado at Boulder*; W. Strictland,* New York University*; A. McFadden,* National Institute for Science and Technology (NIST)*; J. Shabani,* New York University*; E. Kapit,* Colorado School of Mines*; C. McRae,* University of Colorado at Boulder |
| 5:20pm | | **INVITED: QS+EM+MN+NS-WeA-10** Strong Coupling between a Superconducting Microwave Resonator and Low-Damping Magnons Using Vanadium Tetracyanoethylene Thin Films, *Q. Xu, H. Cheung,* Cornell University*; D. Cormode, H. Yusuf,* The Ohio State University*; Y. Shi,* University of Iowa*; M. Chilcote,* Cornell University*; M. Flatté,* University of Iowa*; E. Johnston-Halperin,* The Ohio State University*;* ***G. D. Fuchs****,* Cornell University |
| 5:40pm | | |
| 6:00pm | | **QS+EM+MN+NS-WeA-12** Role of Point Defect Disorder on the Extraordinary Magnetotransport Properties of Epitaxial $Cd_3As_2$, ***Jocienne Nelson****, A. Rice, C. Brooks, I. Leahy, G. Teeter, M. van Schilfgaarde, S. Lany, B. Fluegel, M. Lee, K. Alberi,* NREL |

**Room 303**

**2D Materials Technical Group**
**Session 2D+EM+MI-WeA**
**2D Materials: Charge Density Waves, Magnetism, and Superconductivity**
**Moderators:**
**An-Ping Li**, Oak Ridge National Laboratory,
**Xiaomeng Liu**, Princeton University

2:20pm – 2:40pm
**INVITED: 2D+EM+MI-WeA-1** Tunable Electronic Structure and Correlations in Quasi-Freestanding Monolayer Transition Metal Disulfides, ***Thomas Michely***, Universität zu Köln, Germany

3:00pm
**2D+EM+MI-WeA-3** Dopants Modulated Interplay of Charge Density Wave and Superconductivity in 2D VdW Layered ZrTe3, ***Xiao Tong***, . Center of Functional Nanomaterials, Brookhaven National Laboratory; *Y. Liu, Z. Hu,* Condensed Matter Physics and Materials Science Department, Brookhaven National Laboratory; *D. Leshchev,* National Synchrotron Light Source II, Brookhaven National Laboratory; *X. Zhu, H. Lei,* Condensed Matter Physics and Materials Science Department, Brookhaven National Laboratory; *E. Stavitski, K. Attenkofer,* National Synchrotron Light Source II, Brookhaven National Laboratory; *C. Petrovic,* Condensed Matter Physics and Materials Science, Department, Brookhaven National Laboratory

3:20pm
**2D+EM+MI-WeA-4** Magnetic Order in a Coherent Kondo Lattice in 1T/1H $TaSe_2$ Heterostructures, *W. Wan,* ***Rishav Harsh***, *P. Dreher, S. Sajan,* Donostia International Physics Center , Spain; *A. Menino, I. Errea,* Centro de Física de Materiales (CSIC-UPV-EHU), Spain; *F. de Juan, M. Ugeda,* Donostia International Physics Center , Spain

3:40pm – 4:00pm
**BREAK**

4:20pm
**2D+EM+MI-WeA-7** Structural and Magnetic Properties of Ultrathin $Cr_{(1+\delta)}Te_2$ Films Grown by Van Der Waals Epitaxy, ***Kinga Lasek***, *P. Coelho,* University of South Florida; *P. Gargiani , M. Valvidares,* ALBA Synchrotron Light Source, Spain; *K. Mohseni , H. Meyerheim , I. Kostanovskiy,* Max Planck Institute of Microstructure Physics, Germany; *K. Zberecki,* Warsaw University of Technology, Poland; *M. Batzill,* University of South Florida

4:40pm
**2D+EM+MI-WeA-8** Transition Metal Silicates as a Platform for Robust Single Layer, Two-Dimensional Ferromagnetism, ***Nassar Doudin***, *K. Saritas,* Yale University; *P. Shafer, A. T. N'Diaye,* Lawrence Berkeley National Laboratory (LBNL); *S. Ismail-Beigi, E. Altman,* Yale University

5:00pm – 5:20pm
**INVITED: 2D+EM+MI-WeA-9** Novel Materials for Quantum Computing Devices: Monolayer Topological Superconductors, ***Yi-Ting Hsu***, University of Notre Dame

5:40pm
**2D+EM+MI-WeA-11** Tuning Magnetism and Superconductivity in Single Layer FeSeTe by Chemical Pressure, ***Basu Oli***, *Q. Zou, H. Zhang,* West Virginia University; *T. Shishidou, M. Weinert,* University of Wisconsin, Millwaukie; *L. Li,* West Virginia University

6:00pm
**2D+EM+MI-WeA-12** Peculiar Near-Contact Regime of Andreev Reflection at the **BREAK**down of a Tunnel Junction, ***Petro Maksymovych***, *S. Song,* Oak Ridge National Laboratory; *J. Lado,* Aalto University, Finland; *W. Ko,* Oak Ridge National Laboratory

| | Room 304 | |
|---|---|---|
| 2:20pm | **INVITED: NS1+BI-WeA-1** Single Cell and Single Molecule Biophysics with Glass Nanopores, ***Georg Fantner,*** EPFL, Switzerland | **Nanoscale Science and Technology Division**<br>**Session NS1+BI-WeA**<br>**Nanopore Sensing and Fabrication, Operation and Metrology of Biodevices**<br>**Moderators:**<br>**David Czaplewski**, Argonne National Laboratory,<br>**Georg Fantner**, EPFL, Switzerland |
| 2:40pm | | |
| 3:00pm | **NS1+BI-WeA-3** Ultrasensitive Nanoporous Gold Substrates for SERS Detection in Liquids or Gases, ***Issraa Shahine,*** *B. Humbert, J. Mevellec, M. Richard-Plouet, P. Tessier,* Nantes Université, CNRS, Institut des Matériaux de Nantes Jean Rouxel (IMN), France | |
| 3:20pm | | |
| 3:40pm | **BREAK** | |
| 4:00pm | | |
| 4:20pm | **INVITED: NS2+AS+EM-WeA-7** New on-Surface Synthesis Techniques for Creating Precise 1D Graphene Nanoribbon Heterojunctions and Device-Tunable 2D Molecular Arrays, ***Michael Crommie,*** UC Berkeley Department of Physics*; G. Dong,* University of Chicago Department of Chemistry*; J. Lischner,* Imperial College London Department of Materials, UK*; A. Zettl, P. Jacobse, Z. Wang,* UC Berkeley Department of Physics*; J. Yin,* University of Chicago Department of Chemistry*; H. Tsai, F. Liou, A. Aikawa,* UC Berkeley Department of Physics | **Nanoscale Science and Technology Division**<br>**Session NS2+AS+EM-WeA**<br>**Scanning Probe Metrology of 1D and 2D Materials**<br>**Moderators:**<br>**Maryam Ebrahimi**, Lakehead University, Canada,<br>**Aubrey Hanbicki**, Laboratory for Physical Sciences |
| 4:40pm | | |
| 5:00pm | **NS2+AS+EM-WeA-9** Temperature-Mediated Adsorption and Assembly of Internally Fluorinated Chevron Graphene Nanoribbon Precursors on Au(111), ***Jacob Teeter,*** Center for Nanophase Materials Sciences, Oak Ridge National Laboratory*; M. Sarker,* University of Nebraska - Lincoln*; C. Tao, J. Huang,* Center for Nanophase Materials Sciences, Oak Ridge National Laboratory*; W. Lu, J. Bernholc,* North Carolina State University*; A. Sinitskii,* University of Nebraska - Lincoln*; A. Li,* Center for Nanophase Materials Sciences, Oak Ridge National Laboratory | |
| 5:20pm | **NS2+AS+EM-WeA-10** STM Study of Superconducting Film FeTe(1-x)Se(x) on Topological Insulator $Bi_2Te_3$, ***Hoyeon Jeon,*** *W. Ko, M. Brahlek, R. G. Moore II, A. Li,* Oak Ridge National Laboratory, USA | |
| 5:40pm | **NS2+AS+EM-WeA-11** Atomic-Scale Mapping of Thermoelectric Properties of Noble Transition Metal Dichalcogenides, ***Saban Hus,*** *A. Li,* Oak Ridge National Laboratory*; L. Liu, Y. Chen,* Purdue University | |

# Wednesday Afternoon, November 9, 2022

| | **Plasma Science and Technology Division**<br>**Room 305 - Session PS1+AP-WeA**<br>**Plasma Assisted Atomic Layer Etching**<br>**Moderators: Harm Knoops**, Oxford Instruments Plasma Technology, UK, Eindhoven University of Technology, Netherlands,<br>**Emilie Despiau-Pujo**, Univ. Grenoble Alpes, CNRS, LTM, France | **Plasma Science and Technology Division**<br>**Room 315 - Session PS2+SE-WeA**<br>**Atmospheric Pressure Plasmas and their Applications**<br>**Moderators:**<br>**Adam Pranda**, TEL Technology Center, America, LLC,<br>**François Reniers**, Université Libre de Bruxelles, Belgium |
|---|---|---|
| 2:20pm | **PS1+AP-WeA-1** Mechanism of Isotropic Plasma Atomic Layer Etching Using Hexafluoroacetylacetone and $H_2$ Plasma, ***Nicholas J. Chittock***, *J. Maas, M. Merkx, W. Kessels,* Eindhoven University of Technology, The Netherlands; *H. Knoops,* Oxford Instruments Plasma Technology, UK; *A. Mackus,* Eindhoven University of Technology, The Netherlands | **PS2+SE-WeA-1** Organized DBD Streamers for Maskless Chemical and Topographic Patterning of Surfaces, *O. Polonskyi, T. Hartig,* UCSB Chemical Engineering; *J. Uzarski,* U.S. Army Combat Capabilities Development Command Soldier Center; ***Michael Gordon***, UCSB Chemical Engineering |
| 2:40pm | **PS1+AP-WeA-2** AVS Dorothy M. and Earl S. Hoffman Awardee Talk: On the Chemical and Physical Mechanisms of Etch Product Volatilization in Plasma Enhanced Atomic Layer Etch of Silicon Nitride with Hydrofluorocarbons, ***Erik Cheng***[12], *G. Hwang,* The University of Texas at Austin; *P. Ventzek, Z. Chen, S. Sridhar,* Tokyo Electron America | **PS2+SE-WeA-2** Electrical and Optical Study of the Dielectric Barrier-Free Atmospheric Plasma System, *M. Gulan,* Technological University Dublin, Ireland; ***Vladimir Milosavljevic***, Technological University Dublin, Ireland & University of Belgrade, Serbia |
| 3:00pm | **INVITED: PS1+AP-WeA-3** Use of Atomic Layer Etching Techniques in Todays and Tomorrows Industry, ***Dominik Metzler***, IBM Research Division, Albany, NY | **PS2+SE-WeA-3** An Atmospheric-Pressure Microwave Plasma Source for "Chemical Waste-Free" Surface Cleaning and Anti-Corrosion Coatings, *D. Ellis*, University of Illinois at Urbana-Champaign; *D. Krogstad,* Applied Research Institute, University of Illinois at Urbana-Champaign; *M. Sankaran,* ***David Ruzic***, University of Illinois at Urbana-Champaign |
| 3:20pm | | **PS2+SE-WeA-4** Characteristics of Ionization Wave Propagation on Variable Thickness Dielectric Substrate, ***Joshua Morsell***, *S. Shannon,* North Carolina State University |
| 3:40pm | **BREAK** | **BREAK** |
| 4:00pm | | |
| 4:20pm | **PS1+AP-WeA-7** Approaches to Improve the $SiO_2$ to $SiN_x$ Etch Selectivity during ALE and RIE, ***Xue Wang***, Colorado School of Mines; *R. Gasvoda, P. Kumar, E. Hudson,* Lam Research Corporation; *S. Agarwal,* Colorado School of Mines | |
| 4:40pm | **PS1+AP-WeA-8** Plasma Atomic Layer Etching of Molybdenum with Fluorocarbon and Hydrofluorocarbon, ***Yongjae Kim***, *H. Kang, H. Ha, H. Chae,* Sungkyunkwan University, Korea | |
| 5:00pm | **PS1+AP-WeA-9** Atomic Layer Etching of Si by Surface Chlorination, Ar or He Sputtering, ***Tao Li***, *E. Miller,* IBM Research Division, Albany, NY; *S. Schmitz, P. Friddle, W. Yang,* Lam Research Corporation | **INVITED: PS2+SE-WeA-9** Synthesis and Applications of Metal Oxides NPs, ***Davide Mariotti***, University of Ulster, UK |
| 5:20pm | **PS1+AP-WeA-10** Real-Time Monitoring of Atomic Layer Etching in $Cl_2$/Ar Pulsed Gas, Pulsed Power Plasmas by Optical Emission Spectroscopy, ***Qinzhen Hao***, *V. Donnelly,* University of Houston; *S. Nam, H. Yoon,* Samsung Electronics, Republic of Korea | |
| 5:40pm | **PS1+AP-WeA-11** Self-Limited Cyclic Etching of Copper Thin Films in Hydrogen and Argon Plasmas for Copper Hybrid Bonding, ***Qi Wang***, *C. Netzband, G. Gibney, S. Voronin, S. Han, S. Arkalgud, P. Biolsi,* TEL Technology Center, America, LLC; *C. Vallee,* College of Nanoscale Science and Engineering, SUNY Polytechnic Institute | **PS2+SE-WeA-11** AVS Graduate Research Awardee Talk: Immobilization of Plasma Filaments in a DBD: Discharge Characterization and Patterned Coating Deposition, ***Annaëlle Demaude***[13], *A. Remy, D. Petitjean, J. Zveny,* Université libre de Bruxelles, Belgium; *K. Baert, T. Hauffman,* Vrije Universiteit Brussel, Belgium; *E. Goormaghtigh,* Université libre de Bruxelles, Belgium; *M. Gordon,* University of California Santa Barbara; *F. Reniers,* Université libre de Bruxelles, Belgium |
| 6:00pm | **PS1+AP-WeA-12** Examination of Mechanisms and Processes of Atomic Layer Etching of Copper, ***Taylor Smith***, University of California, Los Angeles; *E. Crumlin,* Lawrence Berkeley National Laboratory; *J. Chang,* University of California, Los Angeles | **PS2+SE-WeA-12** Maximizing Photon Flux in a Miniaturized Photoionization Detector, ***Mackenzie Meyer***, *X. Huang, A. Sivakumar, X. Fan, M. Kushner,* University of Michigan |

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

[2] **AVS Dorothy M. and Earl S. Hoffman Awardee**

[3] **AVS Graduate Research Awardee**

| | Room 316 | |
|---|---|---|
| 2:20pm | **TF1+AP-WeA-1** Optimizing Vapor Delivery of a Nickel Diazadienyl Complex for Nickel Metal Atomic Layer Deposition, *J. Maslar,* ***Berc Kalanyan,*** NIST-Gaithersburg; *V. Dwivedi,* NASA; *D. Moser,* EMD Electronics | **Thin Films Division**<br>**Session TF1+AP-WeA**<br>**Manufacturing and Scale-Up of CVD and (Spatial) ALD**<br>**Moderators:**<br>**Joe Becker**, Kurt J. Lesker Company,<br>**Marceline Bonvalot**, Grenoble Alpes University, France |
| 2:40pm | **TF1+AP-WeA-2** Mechatronic Spatial Atomic Layer Deposition: Model-Informed Design for Scalable Manufacturing, ***Daniel Penley,*** *T. Cho, O. Trejo, K. Barton, N. Dasgupta,* University of Michigan, Ann Arbor | |
| 3:00pm | **TF1+AP-WeA-3** Atmospheric Pressure Spatial ALD of Al-Doped ZnO: Co-injection vs. Supercycles, ***Mike van de Poll,*** *B. Macco, E. Kessels,* Eindhoven University of Technology, Netherlands | |
| 3:20pm | **TF1+AP-WeA-4** Manufacturing of ALD-enhanced Li-ion Batteries via Particle ALD Coatings And R2R ALD on Separators, ***Markus Groner,*** *A. Dameron, B. Hughes, D. Lewis, J. Keene, M. Martinez, J. Burger, M. Rodgers, J. Ragonesi,* Forge Nano; *J. Li,* Oak Ridge National Laboratory, China; *W. Steenman, K. Livingston,* Oak Ridge National Laboratory | |
| 3:40pm | **BREAK** | |
| 4:00pm | | |
| 4:20pm | **TF2-WeA-7** The Truth About Graphene - Where Is It and Why It Is Taking This Long to Get Here, ***Michael Stanford,*** *M. Baraket,* General Graphene Corporation | **Thin Films Division**<br>**Session TF2-WeA**<br>**Solution Based and Graphene or Polymer Deposition Techniques**<br>**Moderators:**<br>**Parag Banerjee**, University of Central Florida,<br>**Mark Losego**, Georgia Institute of Technology |
| 4:40pm | **TF2-WeA-8** Initiated Chemical Vapor Deposition (iCVD) for Shape-Programmed Polymer Nanoparticles, ***Rong Yang,*** Cornell University | |
| 5:00pm | **TF2-WeA-9** Synthesis, Properties and Applications of Donor-Acceptor Conductive Polymers by Oxidative Chemical Vapor Deposition, ***Marek Charyton,*** *N. Boscher,* Luxembourg Institute of Science and Technology (LIST), Luxembourg | |
| 5:20pm | **TF2-WeA-10** Effect of doping and annealing on the Optical and Magnetic properties of Sol-Gel deposited NiZn Ferrite films, ***Roni Paul,*** *S. Kothapally, J. Abu Qahouq , S. Kotru,* The University of Alabama | |
| 5:40pm | **TF2-WeA-11** A Scalable Method for Rare Earth Oxide Thin Films by Chemical Solution Deposition, ***Daniel Rodriguez,*** *A. Edgar, D. Vodnik, I. Usov,* Los Alamos National Laboratory | |
| 6:00pm | | |

# Wednesday Afternoon, November 9, 2022

| | **Advanced Surface Engineering Division**<br>**Room 317 - Session SE+MN+PS+TF-WeA**<br>**Vapor Deposition Technologies and New Trends in Surface Engineering**<br>**Moderators: Jianliang Lin**, Southwest Research Institute, **Filippo Mangolini**, The University of Texas at Austin | **Actinides and Rare Earths Focus Topic**<br>**Room 318 - Session AC+LS+MI-WeA**<br>**Chemistry and Physics of the Actinides/Rare Earths**<br>**Moderator:**<br>**Krzysztof Gofryk**, Idaho National Laboratory |
|---|---|---|
| 2:20pm | **INVITED: SE+MN+PS+TF-WeA-1 BREAK**ing the Back-Attraction by Bipolar HiPIMS Bursts, ***Rajesh Ganesan,*** University of Illinois at Urbana-Champaign | **INVITED: AC+LS+MI-WeA-1** *Novel Preorganized Ligands for Selective and Efficient Separation of f-Elements* , ***Santa Jansone-Popova,*** Oak Ridge National Laboratory |
| 2:40pm | | |
| 3:00pm | **SE+MN+PS+TF-WeA-3** Experimental and Theoretical Study of the Thermal Shock Behavior of MAX Phase Thin Films, ***Matej Fekete,*** *C. Azina, P. Ondračka, L. Löfler, D. Bogdanovski,* RWTH Aachen University, Germany*; D. Primetzhofer,* Uppsala University, Sweden*; M. Hans, J. Schneider,* RWTH Aachen University, Germany | **INVITED: AC+LS+MI-WeA-3** Impact of Noncovalent Interactions on Actinide Structural Chemistry, ***Karah E. Knope,*** Georgetown University*; J. Wacker,* Lawrence Berkeley National Lab*; M. Shore,* Georgetown University |
| 3:20pm | | |
| 3:40pm | **BREAK** | **BREAK** |
| 4:00pm | | |
| 4:20pm | **INVITED: SE+MN+PS+TF-WeA-7** Combinatorial Application of Advanced Characterization Methods to Illuminate the Role of Interfaces in Multilayer Coatings, ***Nina Schalk,*** *C. Kainz, F. Frank,* Montanuniversität Leoben, Austria*; C. Czettl, M. Pohler,* CERATIZIT Austria GmbH, Austria*; M. Tkadletz,* Montanuniversität Leoben, Austria | **AC+LS+MI-WeA-7** XPS Characterization of a Pu-7at.%-Ga Alloy, ***Paul Roussel,*** AWE, UK*; K. Graham, S. Hernandez, J. Joyce, T. Venhaus,* Los Alamos National Laboratory |
| 4:40pm | | **AC+LS+MI-WeA-8** Nanoscale Uranium Oxide: Correlating Colloidal Synthesis Pathways with Structure at the Atomic and Nanometer Length Scale, ***Liane Moreau,*** Washington State University |
| 5:00pm | **SE+MN+PS+TF-WeA-9** Influence of Al-Content on Structure, Mechanical Properties and Thermal Stability of Reactively Sputtered AlTaTiVZr High-Entropy Nitride Coatings, ***Alexander Kirnbauer***[1], TU Wien, Austria*; S. Kolozsvári,* Plansee Composite Materials GmbH, Germany*; P. Mayrhofer,* TU Wien, Austria | **AC+LS+MI-WeA-9** Chemical Speciation Mapping of Spent Nuclear Fuel Using Soft X-Ray Spectromicroscopy at the Advanced Light Source, ***Alexander Ditter,*** *D. Smiles, D. Lussier,* Lawrence Berkeley National Laboratory (LBNL)*; A. Altman,* Northwestern University*; M. Bachhav, L. He,* Idaho National Laboratory*; M. Mara,* Northwestern University*; S. Minasian,* Lawrence Berkeley National Laboratory (LBNL)*; C. Degueldre,* Lancaster, UK*; D. Shuh,* Lawrence Berkeley National Laboratory (LBNL) |
| 5:20pm | **SE+MN+PS+TF-WeA-10** Ternary Transition Metal Diborides – Future Defect Engineered Protective Coating Materials?, *A. Hirle, L. Zauner, C. Fuger, A. Bahr, R. Hahn, T. Wojcik, T. Glechner,* Christian Doppler Laboratory for Surface Engineering of high-performance Components, TU Wien, Austria*; J. Ramm, O. Hunold,* Oerlikon Balzers, Oerlikon Surface Solutions AG, Liechtenstein*; P. Polcik,* Plansee Composite Materials GmbH, Germany*;* ***Helmut Riedl,*** TU Wien, Austria | **AC+LS+MI-WeA-10** Structural, Thermodynamics, and the Electronic Properties of Al, Ga, In, and Tl Stabilized δ-Pu, ***Sajib Barman,*** *S. Hernandez,* Los Alamos National Laboratory |
| 5:40pm | **SE+MN+PS+TF-WeA-11** Influence of Interplay of Substrate Template Effects and Bias Voltage on the Microstructure of Cathodic Arc Evaporated Fcc-$Ti_{0.5}Al_{0.5}N$ Coatings, ***Michael Tkadletz,*** *N. Schalk, H. Waldl,* Montanuniversität Leoben, Austria*; B. Sartory, J. Wosik,* Materials Center Leoben Forschung GmbH, Austria*; C. Czettl, M. Pohler,* CERATIZIT Austria GmbH, Austria | |
| 6:00pm | **SE+MN+PS+TF-WeA-12** Super Hard High Temperature TaC-Based Superlattice Protective Coatings Prepared by Magnetron Sputtering, ***Barbara Schmid,*** TU Wien, Austria*; S. Kolozsvari,* Plansee Composite Materials GmbH, Germany*; P. Mayrhofer,* TU Wien, Austria | |

[1] **2021 ASED Young Investigator Awardee**

# Wednesday Afternoon, November 9, 2022

| | **Surface Science Division**<br>**Room 319 - Session SS+AS-WeA**<br>**Memorial Session in Honor of Patricia Thiel I**<br>**Moderators:**<br>**Alex Belianinov**, Oak Ridge National Laboratory,<br>**Dapeng Jing**, Iowa State University | **Applied Surface Science Division**<br>**Room 320 - Session AS+CA+HC+LS-WeA**<br>**Shining a Light on Surface Chemical Metrology: In Memory of Martin Seah**<br>**Moderators: Donald Baer**, Pacific Northwest National Lab,<br>**Alexander Shard**, National Physical Laboratory, UK |
|---|---|---|
| 2:20pm | **INVITED: SS+AS-WeA-1** Assembly and Stability of Metal Nanoclusters at Surfaces: Modeling Inspired by Thiel-Group STM Studies, ***Jim Evans,*** *Y. Han,* Iowa State University*; D. Liu,* Ames Laboratory USDOE*; K. Lai,* Fritz Haber Institute of the Max Planck Society, Germany | **INVITED: AS+CA+HC+LS-WeA-1** Metrology Lights the Way for Advances in Metabolic Imaging at the Single-cell Scale, ***Ian Gilmore,*** National Physical Laboratory, UK |
| 2:40pm | **INVITED: SS+AS-WeA-2** Stability and Dynamics of Sulfur-Metal Complexes on Coinage Metal Surfaces, ***Da-Jiang Liu,*** Iowa State University | |
| 3:00pm | **INVITED: SS+AS-WeA-3** The Atomic of Structure of Surfaces: From Vacuum to Gas and Liquid Environments, ***Miquel Salmeron,*** Lawrence Berkeley National Laboratory | **AS+CA+HC+LS-WeA-3** Two-Point Calibration Method for Quantifying Organic Binary Mixtures Using SIMS in the Presence of Matrix Effects, ***Alexander Shard,*** National Physical Laboratory, U.K.*; A. Miisho,* Kobelco, Japan*; J. Vorng, R. Havelund, I. Gilmore,* National Physical Laboratory, U.K.*; S. Aoyagi,* Seikei University, Japan |
| 3:20pm | | **AS+CA+HC+LS-WeA-4** OrbiSIMS Metrology: Optimization of Inorganic Depth Profiling using Ge and Sb Delta-layer Samples, *Y. Zhou,* National Physical Laboratory, UK*; A. Franquet, V. Spampinato,* IMEC, Belgium*; A. Pirkl,* IONTOF GmbH, Germany*; W. Vandervorst, P. Van Der Heide,* IMEC, Belgium*;* ***Ian Gilmore,*** National Physical Laboratory, UK |
| 3:40pm | **BREAK** | **BREAK** |
| 4:00pm | | |
| 4:20pm | **INVITED: SS+AS-WeA-7** The Influence of Alloying on Surface Kinetics, ***Karina Morgenstern,*** Ruhr-Universität Bochum, Germany | **INVITED: AS+CA+HC+LS-WeA-7** Complementary Perspectives on the Impacts of Martin Seah on Surface Analysis, ***Don Baer,*** Pacific Northwest National Laboratory |
| 4:40pm | | |
| 5:00pm | **INVITED: SS+AS-WeA-9** Cluster Superlattice Membranes, ***Thomas Michely,*** University of Cologne, Germany | **AS+CA+HC+LS-WeA-9** The 'Crypto-Electron' Question: XPS of Tribo-electrified Insulators, ***Hagai Cohen,*** Perlman bdg., The Weizmann Institute, Israel |
| 5:20pm | | **AS+CA+HC+LS-WeA-10** Effects, in XPS, on Composition Determination Using Different Background Removal Procedures: Single Crystal $Fe_2O_3$ as an Example, ***Christopher R. Brundle,*** C R Brundle and Associates*; B. Crist,* xpsdata*; P. Bagus,* University of North Texas |
| 5:40pm | **INVITED: SS+AS-WeA-11** High Quality 2-D Materials Characterized Paradoxically from Broad Diffraction Features., ***Michael Tringides,*** Iowa State University and Ames Laboratory US-DOE | **AS+CA+HC+LS-WeA-11** XPSOasis.org: the XPS Peak-Fitting Network, ***Alberto Herrera-Gomez,*** CINVESTAV, Mexico*; D. Herrera-Rendon, E. Aguilar-Diaz,* RDATAA, Mexico |
| 6:00pm | | **INVITED: AS+CA+HC+LS-WeA-12** ASSD Peter Sherwood Mid-Career Award Talk: Advancing X-ray Photoelectron Spectroscopy (XPS) Methodologies for Materials Research, ***Mark Biesinger***[1], Surface Science Western, Canada |

[1] **ASSD Peter Sherwood Award**

| | Room 321 | |
|---|---|---|
| 2:20pm | | **Fundamental Discoveries in Heterogeneous Catalysis Focus Topic**<br>**Session HC+AS+SS-WeA**<br>**Bridging Gaps II: Single Atom Alloys and Desirable Defects**<br>**Moderators:**<br>**Rachel Farber**, University of Chicago,<br>**Gareth Parkinson**, TU Wien, Austria |
| 2:40pm | | |
| 3:00pm | **HC+AS+SS-WeA-3** Atomic-Scale Structure-Function Relationships of Pt-based Copper Oxide Single-Atom Catalysts, ***Audrey Dannar***, *A. Schilling, G. Giannakakis, A. Therrien, E. Sykes,* Tufts University | |
| 3:20pm | | |
| 3:40pm | **BREAK** | |
| 4:00pm | | |
| 4:20pm | **HC+AS+SS-WeA-7** Comparison Study of Several Transition Metals on Two Different $TiO_2$ Model Supports: Anatase $TiO_2$ (101) and Rutile $TiO_2$ (110), ***Lena Puntscher***, *K. Daninger, P. Sombut,* TU Wien, Austria*; M. Meier,* University of Vienna, Austria*; M. Schmid,* TU Wien, Austria*; C. Franchini,* Alma Mater Studiorum, Università di Bologna, Bologna, Italy*; U. Diebold, G. Parkinson,* TU Wien, Austria | |
| 4:40pm | **HC+AS+SS-WeA-8** Boron Effect Improves Catalytic Performance on Supported Pt/$SiO_2$ Catalysts for Dry Reforming of Methane at Reduced Temperatures, ***Carly Byron,*** University of Delaware*; M. Ferrandon, A. Kropf,* Argonne National Laboratory*; S. Bai,* University of Delaware*; M. Delferro,* Argonne National Laboratory*; A. Teplyakov,* University of Delaware | |
| 5:00pm | **HC+AS+SS-WeA-9** Facet Dependence of RhCu Single-Atom Alloy Structure and Reactivity, ***Yicheng Wang***, *R. Hannagan,* Tufts University*; J. Schumann, M. Stamatakis,* University College London, UK*; C. Sykes,* Tufts University, UK | |
| 5:20pm | **HC+AS+SS-WeA-10** Crossing the Great Divide Again: Psuedo-Molecular Beams at Atmospheric Pressure, *E. High,* ***Christian Reece***, Harvard University | |
| 5:40pm | **HC+AS+SS-WeA-11** Self-Propagating High Temperature Synthesis of Chevrel Phase Sulfides from Elemental Precursors, ***Tessa Gilmore***, *M. Pawar, P. Gouma,* The Ohio State University | |
| 6:00pm | **HC+AS+SS-WeA-12** Growth and Activity of Ni Catalysts Supported over Ti-doped Ceria from Single Crystal Thin Films to Nanocrystals, *J. Miao, T. Ara,* ***Jing Zhou***, University of Wyoming | |

# Wednesday Afternoon, November 9, 2022

| | Room 330 | |
|---|---|---|
| 2:20pm | **INVITED: MI-WeA-1** Exploring Magnetic Reversal Behavior and Domain Structure in Perpendicular Anisotropy Layered Synthetic Antiferromagnets, ***Olav Hellwig,*** Chemnitz University of Technology and Helmholtz Zentrum Dresden-Rossendorf, Germany | **Magnetic Interfaces and Nanostructures Division**<br>**Session MI-WeA**<br>**Spin Landscape II (Magnetic Structures in Real and Momentum Space)**<br>**Moderator:**<br>**Markus Donath**, Muenster University, Germany |
| 2:40pm | | |
| 3:00pm | **MI-WeA-3** Influence of Underlayer Quality and Sputter Gas Pressure on Structural and Magnetic Properties of Co/Pt Multilayers, ***Rico Ehrler,*** *T. Uhlig, O. Hellwig,* Chemnitz University of Technology, Germany | |
| 3:20pm | **MI-WeA-4** Thickness and Oxygen Growth Pressure Effects on Spontaneous Magnetization Reversal, ***Mikel Barry Holcomb,*** *G. Bhandari, N. Mottaghi, R. Trappen,* West Virginia University | |
| 3:40pm | **BREAK** | |
| 4:00pm | | |
| 4:20pm | **INVITED: MI-WeA-7** Thermally Induced Magnetic Order from Glassiness in Elemental Neodymium, ***Daniel Wegner,*** Radboud University, Netherlands | |
| 4:40pm | | |
| 5:00pm | **MI-WeA-9** Designing Antiferromagnetic Domain Landscapes via Focused Ion Beam Irradiation, ***Fabian Samad,*** Helmholtz-Zentrum Dresden - Rossendorf, Germany; *G. Hlawacek,* Helmholtz Zentrum Dresden-Rossendorf, Germany; *L. Koch,* Technische Universität Chemnitz, Germany; *X. Xu,* Helmholtz Zentrum Dresden-Rossendorf, Germany; *O. Hellwig,* Helmholtz-Zentrum Dresden - Rossendorf, Germany | |
| 5:20pm | **EM-WeA-10** Strain-Induced Semiconducting to Metallic Phase Transition in Suspended $MoTe_2$ using a Single-Ion Conductor, ***Shubham Awate,*** University of Pittsburgh; *K. Xu,* Rochester Institute of Technology; *J. Liang, B. Mostek,* University of Pittsburgh; *B. Katz,* Pennsylvania State University; *R. Muzzio,* Carnegie Mellon University; *V. Crespi,* Pennsylvania State University; *J. Katoch,* Carnegie Mellon University; *E. Backman, S. Fullerton-Shirey,* University of Pittsburgh | **Electronic Materials and Photonics Division**<br>**Session EM-WeA**<br>**Compound Semiconductors**<br>**Moderator:**<br>**Erica Douglas**, Sandia National Laboratories |
| 5:40pm | **EM-WeA-11** Investigation of Thermal Stability of Pure-Metal Schottky Contacts to β-$Ga_2O_3$, ***Elizabeth Favela,*** *K. Zhang, A. Ho, S. Kim,* Carnegie Mellon University; *K. Das,* North Carolina State University; *L. Porter ,* Carnegie Mellon University | |
| 6:00pm | **EM-WeA-12** Electrical and Chemical Effects of Metal Contacts to β-$Ga_2O_3$ Surfaces, ***Luke Lyle,*** Pennsylvania State University | |

# Thursday Morning, November 10, 2022

| | **Advanced Ion Microscopy and Ion Beam Nano-engineering Focus Topic**<br>**Room 301 - Session HI+AS-ThM**<br>**Advanced Ion Microscopy & Surface Analysis**<br>**Moderators: Armin Golzhauser**, Bielefeld University, Germany, **Shida Tan**, Intel Corporation | **Quantum Information Science Focus Topic**<br>**Room 302 - Session QS+AP+EM+MN+NS+SS-ThM**<br>**Systems and Devices for Quantum Computing**<br>**Moderators:**<br>**Kathy-Anne Soderberg**, Air Force Research Laboratory, **Vivekananda Adiga**, IBM |
|---|---|---|
| 8:00am | **INVITED: HI+AS-ThM-1** Defect Engineering on the Atomic Scale with the Helium Ion Microscope, ***Frances I. Allen***, UC Berkeley | **INVITED: QS+AP+EM+MN+NS+SS-ThM-1** Effects of Environmental Radioactivity on Superconducting Qubits, *L. Cardani,* ***Ambra Mariani***, Istituto Nazionale di Fisica Nucleare, Italy |
| 8:20am | | |
| 8:40am | **HI+AS-ThM-3** Effects of Defects and Si Doping on Ion Motion in TaOx Bilayer Memristors, ***Matthew Flynn-Hepford***, University of Tennessee Knoxville; *J. Keum, I. Kravchenko, S. Randolph, A. Ievlev, B. Sumpter,* Oak Ridge National Laboratory; *M. Marinella,* Arizona State University; *O. Ovchinnikova,* Oak Ridge National Laboratory | **QS+AP+EM+MN+NS+SS-ThM-3** Dynamics of a Dispersively Coupled Transmon in the Presence of Noise from the Control Line, ***Antti Vaaranta***, Bluefors Oy, Finland; *M. Cattaneo,* University of Helsinki, Italy; *R. Lake,* Bluefors Oy |
| 9:00am | **HI+AS-ThM-4** Advantages of Using Helium Ion Microscopy for Morphological Analysis of $BiScO_3$-$PbTiO_3$ Piezoelectric Ceramics, *S. Chen, A. Bunevich, Y. Yuan,* ***Karen Kavanagh***, *Z. Ye,* Simon Fraser University, Canada | **QS+AP+EM+MN+NS+SS-ThM-4** Accurate Microwave Characterization for Superconducting Quantum Technology, ***Slawomir Simbierowicz***, Bluefors Oy, Finland |
| 9:20am | **HI+AS-ThM-5** Low-Energy Ion Implantation - Range Comparisons between Theory and Experiment, ***Michael Titze***, Sandia National Laboratories; *J. Poplawsky,* Oak Ridge National Laboratory; *A. Belianinov, E. Bielejec,* Sandia National Laboratories | **INVITED: QS+AP+EM+MN+NS+SS-ThM-5** Improving Qubit Performance Through Engineering of the Substrate-Josephson Junction Interface, ***Cameron Kopas***, *H. Cansizoglu, R. Cochrane, B. Ercan,* Rigetti Computing; *D. Goronzy, C. Torres-Castanedo,* Northwestern University; *J. Oh,* Ames Laboratory; *A. Murthy,* Fermi Lab; *E. Lachman,* Rigetti Computing; *A. Romanenko, A. Grassellino,* Fermi Lab; *M. Kramer, L. Zhou,* Ames Laboratory; *M. Bedzyk,* Northwestern University; *J. Mutus,* Rigetti Computing; *M. Hersam,* Northwestern University; *K. Yadavalli,* Rigetti Computing |
| 9:40am | | |
| 10:00am | **BREAK - Complimentary Coffee in Exhibit Hall** | **BREAK - Complimentary Coffee in Exhibit Hall** |
| 10:20am | | |
| 10:40am | | |
| 11:00am | **INVITED: HI+AS-ThM-10** Correlative Microscopy Using HIM and HIM/SIMS, ***Florian Vollnhals***, Institute for Nanotechnology and Correlative Microscopy - INAM, Germany; *G. Sarau,* Fraunhofer Institute for Ceramics Technology and Systems - IKTS, Germany; *A. Kraus,* Institute for Nanotechnology and Correlative Microscopy - INAM, Germany; *S. Christiansen,* Fraunhofer Institute for Ceramics Technology and Systems - IKTS, Germany | **INVITED: QS+AP+EM+MN+NS+SS-ThM-10** Design and Optimal Control of Superconducting Qubits to Achieve Quantum Speed Limits, ***Meenakshi Singh***, Colorado School of Mines, USA |
| 11:20am | | |
| 11:40am | **HI+AS-ThM-12** Electronic vs. Nuclear Sputtering of Coronene, ***Lars Breuer***, *T. Heckhoff, M. Herder,* University of Duisburg-Essen, Germany; *H. Tian, N. Winograd,* The Pennsylvania State University; *A. Wucher,* University of Duisburg-Essen, Germany | **INVITED: QS+AP+EM+MN+NS+SS-ThM-12** Atomic Scale Processing for Quantum Computing, ***Harm Knoops***, Oxford Instruments Plasma Technology, Netherlands |
| 12:00pm | **HI+AS-ThM-13** Scanning Transmission Helium Ion Microscopy- How Does It Compare to TEM?, ***Annalena Wolff***, Caltech; *R. Fieth,* QUT, Australia | |

| | Room 303 | |
|---|---|---|
| 8:00am | **INVITED: 2D+AS+NS+SS-ThM-1** Atomically Precise Graphene Nanoribbons for Quantum Electronics, ***An-Ping Li,*** Oak Ridge National Laboratory | **2D Materials Technical Group**<br>**Session 2D+AS+NS+SS-ThM**<br>**2D Materials: Scanning Probe Microscopy and Spectroscopy**<br>**Moderators:**<br>**Matthias Batzill,** University of South Florida,<br>**Yi-Ting Hsu**, University of Notre Dame, |
| 8:20am | | |
| 8:40am | **2D+AS+NS+SS-ThM-3** Band Gaps of Single-Layer Transition-Metal-Dichalcogenides Determined by Scanning Tunneling Spectroscopy, ***Randall Feenstra,*** *G. Frazier, J. Lou,* Carnegie Mellon University*; Y. Pan, S. Foelsch,* Paul Drude Institute, Germany*; Y. Lin, B. Jariwala, K. Zhang, J. Robinson,* Penn State University | |
| 9:00am | **2D+AS+NS+SS-ThM-4** Open-Source Controller for Scanning Probe Microscopy Applications, *M. Kangül,* ***N. Asmari Saadabad, M. Penedo, Georg Fantner,*** École Polytechnique Fédéral de Lausanne, Switzerland | |
| 9:20am | **2D+AS+NS+SS-ThM-5** Activation of Resistive Switching in TaOx on the Nanoscale, ***Olha Popova,*** ORNL | |
| 9:40am | **2D+AS+NS+SS-ThM-6** Probing Sub-Nanoscale Photophysical and Photochemical Processes via Localized Surface Plasmons: Vibrational Nano-Spectroscopy, ***Sayantan Mahapatra,*** *N. Jiang,* University of Illinois - Chicago | |
| 10:00am | **BREAK - Complimentary Coffee in Exhibit Hall** | |
| 10:20am | | |
| 10:40am | | |
| 11:00am | **INVITED: 2D+AS+NS+SS-ThM-10** Visualize Emergent Electron Orders in Two-Dimensional Quantum Materials, ***Xiaomeng Liu,*** Princeton University | |
| 11:20am | | |
| 11:40am | **2D+AS+NS+SS-ThM-12** Reconstruct the Intrinsic Force Landscape of Interfacial Interaction with Excitation-Enhanced Force Spectroscopy, ***Alan Liu,*** *T. Sulchek,* Georgia Institute of Technology | |
| 12:00pm | **2D+AS+NS+SS-ThM-13** AVS Graduate Research Awardee Talk: True Atomic-Resolution Imaging under Ambient Conditions via Conductive Atomic Force Microscopy, ***Saima Sumaiya***[1], *M. Baykara,* University of California, Merced | |

[1] **AVS Graduate Research Awardee**

| | Room 304 | |
|---|---|---|
| 8:00am | **INVITED: EM+MN+TF-ThM-1** What Can We Do With $Ga_2O_3$?, ***Man Hoi Wong,*** University of Massachusetts Lowell | **Electronic Materials and Photonics Division**<br>**Session EM+MN+TF-ThM**<br>**Wide and Ultra Wide Band Gap Materials and Devices**<br>**Moderators:**<br>**Erica Douglas**, Sandia National Laboratories,<br>**Rehan Kapadia**, University of Southern California,<br>**Rachael Myers-Ward**, U.S. Naval Research Laboratory |
| 8:20am | | |
| 8:40am | **EM+MN+TF-ThM-3** Controlled Growth of Epitaxial $Ga_2O_3$ Polymorphs for Ultra-Wide Bandgap Semiconductor Devices, ***Lisa Porter,*** *K. Jiang, J. Tang, M. Cabral, R. Davis,* Carnegie Mellon University, USA | |
| 9:00am | **EM+MN+TF-ThM-4** Plasma Enhanced-ALD Amorphous Gallium-Oxide Channel Thin Film Transistors for Back-End-of-Line Integration, ***Charlotte Van Dijck,*** Helmholtz-Zentrum -Berlin für Materialen und Energy, Germany*; F. Maudet,* Helmholtz-Zentrum-Berlin für materialen und Energy, Germany*; S. Banerjee, V. Deshpande, C. Dubourdieu,* Helmholtz-Zentrum Berlin für Materialen und Energy, Germany | |
| 9:20am | **EM+MN+TF-ThM-5** Interface Trap State Analysis of ALD-deposited Gate Dielectrics on Gallium Nitride using a Modified *C*-$\psi_s$ Procedure, ***Brian Rummel,*** *L. Yates, C. Glaser, A. Binder, J. Steinfeldt, T. Smith, P. Sharps,* Sandia National Laboratories*; J. Cooper,* Sonrisa Research*; R. Kaplar,* Sandia National Laboratories | |
| 9:40am | **EM+MN+TF-ThM-6** Characterization of Intervalence Band (IVB) Transitions in Boron-Doped Diamond, ***Souvik Bhattacharya,*** University of Illinois at Urbana Champaign*; J. Boyd,* Case Western Reserve University*; A. Hossein, S. Reichardt,* University of Luxembourg*; N. Maccaferri,* Umea University, Sweden*; O. Shenderova,* Adamas Nanotechnologies Inc.*; L. Wirtz,* University of Luxembourg*; M. Sankaran,* University of Illinois at Urbana Champaign*; G. Strangi,* Case Western Reserve University | |
| 10:00am | **BREAK - Complimentary Coffee in Exhibit Hall** | |
| 10:20am | | |
| 10:40am | **BREAK - Complimentary Coffee in Exhibit Hall** | **Electronic Materials and Photonics Division**<br>**Session EM+AS-ThM**<br>**Photovoltaic Materials, Characterization, and Applications**<br>**Moderators:**<br>**Seth King,** University of Wisconsin - LaCrosse |
| 11:00am | **EM+AS-ThM-10** Translating Materials-Level Characterization of Carbon-Nanotube-Reinforced Composite Gridlines To Module-Level Degradation, ***Sang Han,*** The Univeristy of New Mexico and Osazda Energy*; A. Chavez,* The University of New Mexico and Osazda Energy*; B. Rummel,* The University of New Mexico and Osazda Energy*; A. Jeffries,* Osazda Energy*; N. Bosco,* National Renewable Energy Laboratory*; B. Rounsaville , A. Rohatgi,* Georgia Institute of Technology | |
| 11:20am | **EM+AS-ThM-11** Effects of Carbon-Nanotube-Reinforced Composite Gridlines on Photovoltaic PERC Cell and Module Efficiency, ***Andre Chavez,*** The University of New Mexico and Osazda Energy*; S. Han,* The Univeristy of New Mexico and Osada Energy*; A. Jeffries,* Osazda Energy*; S. Huneycutt,* The Univeristy of North Carolina at Charlotte*; A. Ebong,* The University of North Caronlina at Charlotte*; D. Harwood, N. Azpiroz,* D2 Solar | |
| 11:40am | | |
| 12:00pm | **EM+AS-ThM-13** XPS Depth Profiling of Single Film and Two-Layer Heterojunction Metal-Halide Perovskites, ***Jennifer Mann,*** Physical Electronics*; C. Clark, W. Hsu, E. Pettit,* University of Minnesota*; K. Artyushkova,* Physical Electronics*; R. Holmes,* University of Minnesota | |

# Thursday Morning, November 10, 2022

| | Room 315 | |
|---|---|---|
| 8:00am | **INVITED: PS-ThM-1** Dry Etch Solution to a Challenge in Si/SiGe Dual Channel Process Integration, ***Yohei Ishii***[1], Hitachi High-Tech America, Inc.; *R. Sugano,* Hitachi, Ltd., Japan; *Y. Lee, W. Wu,* Taiwan Semiconductor Research Institute, Taiwan; *L. Kovatch,* Hitachi High-Tech America, Inc.; *K. Maeda, M. Miura,* Hitachi High-Tech Corporation, Japan | **Plasma Science and Technology Division**<br>**Session PS-ThM**<br>**Plasma Processing for Advanced Semiconductor Devices**<br>**Moderators:**<br>**John Arnold**, IBM Research Division, Albany, NY,<br>**Kenji Maeda**, Hitachi High Technologies America Inc. |
| 8:20am | | |
| 8:40am | **PS-ThM-3** Investigation into the Effect of Plasma-Deposited $SiCl_4/O_2$ Chamber Wall Coatings on the Selective Fluorine-Based Etching of TaN with Respect to Polycrystalline Silicon and Silicon Oxide, ***Ivo Otto IV,*** Tokyo Electron Ltd.; *C. Vallée,* SUNY Polytechnic Institute; *K. Yu, S. Kal, A. Mosden, P. Biolsi,* Tokyo Electron Ltd. | |
| 9:00am | **PS-ThM-4** Influence of Aspect Ratio on Isotropic Etch Process: A Case Study with SiCN Material, *P. Luan,* ***Andrew Nolan,*** *Y. Yoshida, Y. Han, P. Biolsi,* TEL Technology Center, America, LLC, USA; *K. Ken, N. Ikezawa,* Tokyo Electron Ltd., Japan | |
| 9:20am | | |
| 9:40am | | |
| 10:00am | **BREAK - Complimentary Coffee in Exhibit Hall** | |
| 10:20am | | |
| 10:40am | | |
| 11:00am | **INVITED: PS-ThM-10** Plasma Etch Fundamentals and Engineering: Advancing Interconnect Scaling, ***Theo Standaert,*** IBM Research Division, Albany, NY | |
| 11:20am | | |
| 11:40am | **PS-ThM-12** Exploring the Use of Tungsten-Based Hard Masks in Beol Interconnects for 3 nm Node and Beyond, ***Daniel Montero,*** *V. Vega-Gonzalez, H. Puliyalil,* IMEC, Belgium; *J. Nie, J. Yang,* LAM Research; *F. Schleicher,* IMEC, Belgium; *K. Mclaughlin,* LAM Research; *J. Versluijs, F. Lazzarino, S. Park, Z. Tokei,* IMEC, Belgium | |
| 12:00pm | **PS-ThM-13** Reactive Ion Etch of Subtractive Metal for Advanced Interconnect, ***Lijuan Zou,*** *Y. Mignot, C. Penny, J. Arnold,* IBM Research Division, Albany, NY; *G. Stojakovic, P. Friddle, S. Schmitz,* Lam Research Corporation | |

[1] **2020 PSTD Young Investigator Award Winner**

| | Room 316 | |
|---|---|---|
| 8:00am | **INVITED: TF1+SE+SS-ThM-1** Opportunities of Complex Oxides Prepared by Atomic Layer Depositions, *P. Sallés, P. Machado,* ***Mariona Coll,*** ICMAB-CSIC, Spain | **Thin Films Division**<br>**Session TF1+SE+SS-ThM**<br>**Nucleation, and Interface Phenomena in Thin Films**<br>**Moderators:**<br>**Adrie Mackus**, Eindhoven University, Netherlands,<br>**Qing Peng**, University of Alabama |
| 8:20am | | |
| 8:40am | **TF1+SE+SS-ThM-3** An Atomic-Scale Study of Si Epitaxial Growth on Cl-Si(100), ***Azadeh Farzaneh,*** University of Maryland, College Park*; R. Butera,* Laboratory for Physical Sciences | |
| 9:00am | **TF1+SE+SS-ThM-4** The Effect of Oxygen Plasma on the ZnO Growth on Polymer Substrates During Plasma-Enhanced Atomic Layer Deposition, ***Lisanne Demelius,*** Graz University of Technology, Austria*; M. Blatnik,* CEITEC – Central European Institute of Technology, Brno University of Technology, Czechia*; K. Unger,* Graz University of Technology, Austria*; P. Parlanti, M. Gemmi,* Istituto Italiano di Tecnologia, Center for Materials Interfaces, Italy*; A. Coclite,* Graz University of Technology, Austria | |
| 9:20am | **TF1+SE+SS-ThM-5** Measuring Local Atomic Structure Variations Through the Depth of Ultrathin ALD Aluminum Oxide, ***Nikhila Paranamana,*** *M. Young, R. Gettler, H. Koenig, S. Montgomery-Smith, X. He,* University of Missouri, Columbia | |
| 9:40am | **TF1+SE+SS-ThM-6** Interfacial Reactions and Energy Transfer in Sputter Deposited Thermite Reactive Nanolaminates, ***Chloe Skidmore,*** *J. Maria,* Pennsylvania State University | |
| 10:00am | **BREAK - Complimentary Coffee in Exhibit Hall** | |
| 10:20am | **BREAK - Complimentary Coffee in Exhibit Hall** | **Thin Films Division**<br>**Session TF+AP-ThM**<br>**Novel ALD CVD Precursors, Processes, Deposited Morphologies and Substrate Architectures**<br>**Moderators:**<br>**Parag Banerjee**, University of Central Florida,<br>**Richard Vanfleet**, Brigham Young University |
| 10:40am | | |
| 11:00am | **INVITED: TF+AP-ThM-10** The Electrical and Magnetic Properties of Nonstoichiometric Nickel Oxide Thin Films, ***Mari Napari,*** University of Southampton, UK | |
| 11:20am | | |
| 11:40am | **TF+AP-ThM-12** $Al_2O_3$ Thin Films with Controlled Nanoporosity Prepared by Low Temperature Thermal ALD, ***Marceline Bonvalot,*** *S. Hekking,* LTM - MINATEC - CEA/LETI, France*; C. Vallée,* SUNY POLY, Albany | |
| 12:00pm | **TF+AP-ThM-13** Thermal ALD Process of NiO Based on Ni($^t$Bu-MeAMD)$_2$ Precursor, ***Cristian van Helvoirt,*** *N. Phung, M. Creatore,* Eindhoven University of Technology, Netherlands | |

# Thursday Morning, November 10, 2022

| | **Advanced Surface Engineering Division**<br>**Room 317 - Session SE+AS+BI+SS+TF-ThM**<br>**Nanostructured and Multifunctional Thin Films and Coatings I**<br>**Moderators: Suneel Kodambaka**, University of California Los Angeles, **Jianliang Lin**, Southwest Research Institute | **Actinides and Rare Earths Focus Topic**<br>**Room 318 - Session AC+AS+LS-ThM**<br>**Emerging Topics and Methods in Actinide/Rare Earth Science**<br>**Moderators: David Shuh**, Lawrence Berkeley National Lab, **Alison Pugmire**, LANL, **Paul Roussel**, AWE, UK |
|---|---|---|
| 8:00am | **INVITED: SE+AS+BI+SS+TF-ThM-1** Nanostructured Optical Thin Films for Energy Applications and More, ***Bill Baloukas,*** Polytechnique Montréal, Canada | **INVITED: AC+AS+LS-ThM-1** Nuclear Forensics 2020:A Strategic Inflection Point, ***David Willingham,*** Lawrence Livermore Laboratory |
| 8:20am | | |
| 8:40am | **SE+AS+BI+SS+TF-ThM-3** Constitution, Microstructure and Mechanical Properties of Magnetron Sputtered RuAl Thin Films, ***Vincent Ott,*** Karlsruhe Institute of Technology (KIT), Institute for Applied Materials (IAM), Germany; *T. Wojcik,* TU Wien, Austria; *S. Ulrich,* Karlsruhe Institute of Technology (KIT), Institute for Applied Materials (IAM), Germany; *S. Kolozsvári,* Plansee Composite Materials GmbH , Germany; *P. Polcik,* Plansee Composite Materials GmbH, Germany; *P. Mayrhofer, H. Riedl,* TU Wien, Austria; *M. Stueber,* Karlsruhe Institute of Technology (KIT), Institute for Applied Materials (IAM), Germany | **INVITED: AC+AS+LS-ThM-3** The Non-Integer Occupancy Ground State Hypothesis, ***Miles Beaux,*** Los Alamos National Laboratory |
| 9:00am | **SE+AS+BI+SS+TF-ThM-4** Microstructure, Thermal Stability and Oxidation Resistance of an arc-evaporated $Cr_{0.74}Ta_{0.26}N$ Coating, ***Christina Kainz,*** Christian Doppler Laboratory for Advanced Coated Cutting Tools at the Department of Materials Science, Montanuniversität Leoben, Austria; *M. Tkadletz, M. Burtscher,* Department of Materials Science, Montanuniversität Leoben, Austria; *C. Saringer,* Christian Doppler Laboratory for Advanced Coated Cutting Tools at the Department of Materials Science, Montanuniversität Leoben, Austria; *A. Stark, N. Schell,* Institute of Materials Physics, Helmholtz-Zentrum Hereon, Germany; *C. Czettl, M. Pohler,* CERATIZIT Austria GmbH, Austria; *D. Kiener,* Department of Materials Science, Montanuniversität Leoben, Austria; *N. Schalk,* Christian Doppler Laboratory for Advanced Coated Cutting Tools at the Department of Materials Science, Montanuniversität Leoben, Austria | |
| 9:20am | **SE+AS+BI+SS+TF-ThM-5** Microstructural Characterization and Tribological Evaluation of TiN, CrN, TiSiCN, and CrSiCN Coatings for Applications in Cold Regions, ***Nicholas D'Attilio,*** *F. Thompson, G. Crawford,* South Dakota School of Mines and Technology; *E. Asenath-Smith,* US Army Corps of Engineers Cold Regions Research and Engineering Laboratory | **INVITED: AC+AS+LS-ThM-5** Legacy Plutonium at the Hanford Site, ***Edgar Buck,*** *D. Reilly, G. Hall, K. Kruska, L. Liu, S. Triphathi, B. McNamara, A. Casella, D. Meier,* Pacific Northwest National Laboratory |
| 9:40am | **SE+AS+BI+SS+TF-ThM-6** Development and Evaluation of TiAlNb/YSZ Protective Coatings for Titanium Alloys, ***Jianliang Lin,*** Southwest Research Institute, San Antonio Texas; *T. Stinnett,* Lockheed Martin Missiles and Fire Control | |
| 10:00am | **BREAK - Complimentary Coffee in Exhibit Hall** | **BREAK - Complimentary Coffee in Exhibit Hall** |
| 10:20am | | |
| 10:40am | | |
| 11:00am | **INVITED: SE+AS+BI+SS+TF-ThM-10** Imperfections in Metal Diborides – from Ab-Inito Calculations to Transmission Electron Microscopy, ***Martin Dahlqvist,*** IFM, Linköping University, Sweden; *M. Dahlqvist,* Linköping University, Sweden | **AC+AS+LS-ThM-10** Focused Ion Beam for Spatially Resolved Morphological Analysis of Nuclear Materials, ***Brandon Chung,*** *S. Donald , D. Rosas, S. Sen-Britain, V. Som, N. Teslich, A. Baker,* Lawrence Livermore National Laboratory; *A. Ditter, D. Shuh,* Lawrence Berkeley National Laboratory |
| 11:20am | | **AC+AS+LS-ThM-11** Studying Combined Influence of Alpha Irradiation and Dissolved Hydrogen on $UO_{-2}$ Corrosion Using a Microfluidic Electrochemical Cell, ***Jennifer Yao,*** *B. McNamara, M. O'Hara,* Pacific Northwest National Laboratory; *N. Lahiri,* Pacific Northwest National Lab; *E. Ilton, C. Wang, E. Buck,* Pacific Northwest National Laboratory |
| 11:40am | **SE+AS+BI+SS+TF-ThM-12** Mechanical Property and Corrosion Resistance Evaluation of $Ti_xZrNbTaFeB_y$ High Entropy Alloy Thin Films, *B. Lou,* Chang Gung University, Taiwan; *F. Kan,* Ming Chi University of Technology, Taiwan; ***Jyh-Wei Lee,*** Ming Chi University of Technology, Taiwan | **AC+AS+LS-ThM-12** A Model to Extract the Size-Dependent Surface Structure of Actinide Oxide Nanoparticles, ***Shinhyo Bang,*** *L. Moreau,* Washington State University |
| 12:00pm | **SE+AS+BI+SS+TF-ThM-13** Tuning the Properties of Thin Films via Disorder, ***Alessandro Troglia,*** *M. van de Poll,* Advanced Research Center for Nanolithography (ARCNL), Netherlands; *J. van de Groep, A. de Visser,* Van der Waals-Zeeman Institute, University of Amsterdam, Netherlands; *R. Bliem,* Advanced Research Center for Nanolithography (ARCNL), Netherlands | |

# Thursday Morning, November 10, 2022

| | **Surface Science Division**<br>**Room 319 - Session SS+AS-ThM**<br>**Memorial Session in Honor of Patricia Thiel II**<br>**Moderators: James Evans**, Ames Laboratory,<br>**Cynthia Jenks**, Oak Ridge Natinal Laboratory | **Applied Surface Science Division**<br>**Room 320 - Session AS+AC+BI+CA+HI-ThM**<br>**Unraveling the Composition of Complex Systems with SIMS**<br>**Moderators: Steve Consiglio**, Tokyo Electron,<br>**Gregory L. Fisher**, Physical Electronics |
|---|---|---|
| 8:00am | | |
| 8:20am | **INVITED: SS+AS-ThM-2** Navigating Complex Interfaces: In Memory of Patricia A. Thiel*,* ***Cynthia Jenks****,* Oak Ridge National Laboratory | **AS+AC+BI+CA+HI-ThM-2** Ex-Situ, Surface and Bulk Investigations of Defluxing Chemistry Effects on Solder Mask*,* ***J. Elliott Fowler****,* Sandia National Laboratories*; R. Gerhardt,* Georgia Institute of Technology*; J. Ohlhausen, R. Callaway,* Sandia National Laboratories*; M. Watt,* Georgia Institute of Technology*; S. Grosso, S. Rosenberg,* Sandia National Laboratories |
| 8:40am | **INVITED: SS+AS-ThM-3** Atomic Scale Investigation of Friction Properties of Quasicrystals and Beyond*,* ***Jeong Young Park****,* Korea Advanced Institute of Science and Technology (KAIST) & Institute for Basic Science (IBS), Republic of Korea | **INVITED: AS+AC+BI+CA+HI-ThM-3** Unraveling the Composition of Complex Systems with SIMS*,* ***Birgit Hagenhoff****,* Tascon GmbH, Germany |
| 9:00am | | |
| 9:20am | **INVITED: SS+AS-ThM-5** Quantification of Structure-Property Relationships at Interfaces*,* ***Susan B. Sinnott****,* Pennsylvania State University | **AS+AC+BI+CA+HI-ThM-5** Time of Flight Secondary Ion Mass Spectrometry (ToF-SIMS) as a Novel Approach to the Characterization of Coatings and Interfaces of Porous Transport Layers*,* ***Genevieve Stelmacovich****, M. Walker, J. Foster,* Colorado School of Mines*; D. Cullen ,* Oak Ridge National Laboratory*; A. Paxson ,* Plug Power*; G. Bender, T. Schuler, S. Ware,* National Renewable Energy Laboratory*; S. Pylypenko,* Colorado School of Mines |
| 9:40am | **INVITED: SS+AS-ThM-6** Metal Nodes in Bimetallic Metal-Organic Frameworks as Isolated Sites for Gas-Phase Catalytic Hydrogenation*,* ***Donna Chen***, University of South Carolina | **AS+AC+BI+CA+HI-ThM-6** Construction of Accurate 3D NanoSIMS Depth Profiling Images of Cells in the Presence of Lateral Variations in Sputter Rate*, M. Brunet, B. Gorman,* ***Mary Kraft****,* University of Illinois Urbana-Champaign |
| 10:00am | **BREAK - Complimentary Coffee in Exhibit Hall** | **BREAK - Complimentary Coffee in Exhibit Hall** |
| 10:20am | | |
| 10:40am | | |
| 11:00am | **INVITED: SS+AS-ThM-10** Quasicrystals in Two Dimensions: From Metals To Molecules And Oxides*,* ***Vincent Fournée****,* Institut Jean Lamour - CNRS-Université de Lorraine, France | **INVITED: AS+AC+BI+CA+HI-ThM-10** Innovations in Nuclear Materials Analysis with SIMS*,* ***Christopher Szakal****,* National Institute of Standards and Technology (NIST) |
| 11:20am | | |
| 11:40am | **INVITED: SS+AS-ThM-12** Unusual Flat and Extended Morphology of Intercalated Cu Under $MoS_2$*,* ***Dapeng Jing****, Y. Han, J. Evans, M. Kolmer, Z. Fei, M. Tringides,* Ames Laboratory USDOE | **AS+AC+BI+CA+HI-ThM-12** Understanding Surface Bonding and Molecular Structure with MS/MS Imaging: From Click-Chemistry to Biogenesis*,* ***Gregory L. Fisher****,* Physical Electronics |
| 12:00pm | **INVITED: SS+AS-ThM-13** Helium Ion Microscopy for Surface Modification and Characterization*,* ***Alex Belianinov****,* Sandia National Laboratory | **AS+AC+BI+CA+HI-ThM-13** Probing Grain Boundary Segregation in 304L Stainless Steel using Time-of-Flight Secondary Ion Mass Spectrometry (ToF-SIMS)*,* ***James Ohlhausen****, E. Barrick, D. Susan, C. Robino, K. Hattar, J. Herrmann, P. Duran, J. Rodelas,* Sandia National Laboratories |

# Thursday Morning, November 10, 2022

| | **Fundamental Discoveries in Heterogeneous Catalysis Focus Topic**<br>**Room 321 - Session HC+AS+SS-ThM**<br>**Bridging Gaps III: Combined Theory and Experiment in Catalysis**<br>**Moderators: Liney Arnadottir**, Oregon State University, **Sharani Roy**, University of Tennessee Knoxville | **Magnetic Interfaces and Nanostructures Division**<br>**Room 330 - Session MI+2D+TF-ThM**<br>**Quantum Materials (2D)**<br>**Moderator:**<br>**Zheng Gai**, Oak Ridge National Laboratory |
|---|---|---|
| 8:00am | **INVITED: HC+AS+SS-ThM-1** Mechanistic Understanding and Catalyst Design for Selective Methane Activations, ***Ping Liu,*** Brookhaven National Laboratory | **MI+2D+TF-ThM-1** Exploration of Two Surfaces Observed in Weyl Semimetal $BaMnSb_2$, ***Zheng Gai,*** *Q. Zou,* Oak Ridge Natinal Laboratory*; S. Huang,* University of South Carolina*; W. Ko, M. Fu,* Oak Ridge Natinal Laboratory*; Y. Yang, K. Zhao,* Louisiana State University*; S. Crittenden,* University of South Carolina*; E. Plummer,* Louisiana State University*; R. Jin,* University of South Carolina |
| 8:20am | | **MI+2D+TF-ThM-2** Properties of $Mn_3Sn$ Films Grown on Sapphire Substrates Using Molecular Beam Epitaxy, ***Sneha Upadhyay,*** Ohio University*; T. Erickson, D. Ingram,* Ohio University*; K. Sun,* The University of Michigan , Ann Arbor*; A. Smith,* Ohio University |
| 8:40am | **HC+AS+SS-ThM-3** A First Principles Study of Propane Dehydrogenation Reactions on Hydroxyl-Terminated $Al_2O_3$ Decorated Platinum Surfaces, ***Sumandeep Kaur****, H. Nguyen, L. Árnadóttir,* Oregon State University | **INVITED: MI+2D+TF-ThM-3** Interfacial Magnetism in Oxide Heterostructures, ***Alex Demkov,*** The University of Texas at Austin |
| 9:00am | **HC+AS+SS-ThM-4** Atomic-Level Studies of $C_2H_4$ on clean and $Rh_1$-Decorated $Fe_3O_4(001)$, ***Panukorn Sombut****, L. Puntscher, C. Wang, M. Ulreich,* TU Wien, Austria*; M. Meier,* University of Vienna, Austria*; J. Pavelec, Z. Jakub, F. Kraushofer, M. Schmid, U. Diebold,* TU Wien, Austria*; C. Franchini,* University of Vienna, Austria*; G. Parkinson,* TU Wien, Austria | |
| 9:20am | **INVITED: HC+AS+SS-ThM-5** How the Support Dictates the Reactivity of $FeO_x$-Based Single-Atom Catalysts, ***Matthias Meier,*** TU Wien, Austria | **INVITED: MI+2D+TF-ThM-5** Epitaxial 2D Van Der Waals Magnets, ***Roland Kawakami,*** Ohio State University |
| 9:40am | | |
| 10:00am | **BREAK - Complimentary Coffee in Exhibit Hall** | **BREAK - Complimentary Coffee in Exhibit Hall** |
| 10:20am | | |
| 10:40am | | |
| 11:00am | **INVITED: HC+AS+SS-ThM-10** Modifying Ethane Oxidation Selectivity on the stoichiometric $IrO_2(110)$ surface through anion substitution, ***Aravind Asthagiri,*** The Ohio State University | **INVITED: MI+2D+TF-ThM-10** Hybrid Superconductor-Semiconductor Device, ***Sergey Frolov,*** University of Pittsburgh |
| 11:20am | | |
| 11:40am | **HC+AS+SS-ThM-12** HC Graduate Student Finalist Talk: Insight into Subsurface Adsorption and Reconstruction of Ag(111) Deduced from a Lattice-Gas Model and Monte Carlo Simulations, ***Carson Mize,*** University of Tennessee Knoxville*; L. Crosby,* Joint Institute for Computational Sciences; University of Tennessee Knoxville*; E. Lander, S. Roy,* University of Tennessee Knoxville | **MI+2D+TF-ThM-12** Magnetotransport in Graphene/$Pb_{0.24}Sn_{0.76}Te$ Heterostructures: Finding a Way to Avoid Catastrophe, *G. Stephen,* Laboratory for Physical Sciences*; I. Naumov,* Howard University*; N. Blumenschein, L. Sun,* ***Jennifer DeMell,*** Laboratory for Physical Sciences*; S. Shirodkar, P. Dev,* Howard University*; P. Taylor,* Army Research Laboratory*; J. Robinson, P. Campbell,* Naval Research Laboratory*; A. Hanbicki, A. Friedman,* Laboratory for Physical Sciences |
| 12:00pm | **HC+AS+SS-ThM-13** Measuring and Predicting a Key Catalyst-Performance Descriptor for Supported Metal Nanoparticle Catalysts: Metal Chemical Potential, ***Charles T. Campbell****, J. Rumptz, K. Zhao,* University of Washington | |

| | **2D Materials Technical Group**<br>**Room 303 - Session 2D+AS+EM-ThA**<br>**2D Materials: Electron Microscopy and Photoemission Spectroscopy**<br>**Moderators:**<br>**Keun Su Kim**, Yonsei University, Republic of Korea,<br>**Dmitry Kireev**, University of Texas at Austin | **Advanced Ion Microscopy and Ion Beam Nano-engineering Focus Topic**<br>**Room 301 - Session HI-ThA**<br>**Novel Beam Induced Material Engineering and Nano Patterning**<br>**Moderators: Frances Allen**, UC Berkeley,<br>**Annalena Wolff**, Caltech |
|---|---|---|
| 2:20pm | **INVITED: 2D+AS+EM-ThA-1** Periodic Lattice Displacements in Low Dimensional Materials, ***Robert Hovden,*** University of Michigan | **INVITED: HI-ThA-1** Additive Nano-Manufacturing of Advanced Superconductors, and Devices Using Focused Ion Beam Technology, ***Rosa Córdoba,*** Institute of Molecular Science (ICMol), University of Valencia, Spain |
| 2:40pm | | |
| 3:00pm | **2D+AS+EM-ThA-3** Engineering of Nanoscale Heterogenous Transition Metal Dichalcogenide-Au Interfaces, ***Alex Boehm,*** Sandia National Laboratories; *J. Fonseca,* Naval Research Laboratory; *K. Thuermer, J. Sugar,* Sandia National Laboratories; *J. Robinson,* Naval Research Laboratory; *T. Ohta,* Sandia National Laboratories | **HI-ThA-3** On Demand Spatially Controlled Fabrication of Single Photon Emitters in Si, ***Gregor Hlawacek,*** *N. Klingner, M. Hollenbach, U. Kentsch, G. Astakhov,* Helmholtz-Zentrum Dresden - Rossendorf, Germany |
| 3:20pm | **2D+AS+EM-ThA-4** Advanced Laboratory-Based Momentum Microscopy and PEEM Analysis, ***Stefan Böttcher Böttcher,*** SPECS Surface Nano Analysis GmbH, Germany; *D. Singh, T. Conard,* IMEC, Belgium; *M. Wietstruck,* SPECS Surface Nano Analysis GmbH, Germany; *P. van der Heide,* IMEC, Belgium; *A. Thissen,* SPECS Surface Nano Analysis GmbH, Belgium | **HI-ThA-4** Towards FIB Patterning of Reconfigurable Plasmonic Arrays, ***Ivan Kravchenko,*** *N. Lavrik,* Center for Nanophase Materials Sciences, Oak Ridge National Laboratory |
| 3:40pm | **2D+AS+EM-ThA-5** Epitaxial Growth and Electronic States of Ultrathin Bi (111) Films on Insb (111)B: Evidence of Inversion Symmetry Breaking via Film-Substrate Interactions, ***Hadass S. Inbar,*** *J. Dong, A. Engel, C. Dempsey, Y. Chang,* University of California Santa Barbara; *A. Fedorov,* Advanced Light Source, Lawrence Berkeley National Laboratory; *C. Palmstrom,* University of California Santa Barbara | **HI-ThA-5** Low Energy Ion Beam Backside Circuit Edit Applications in FinFET Devices, *M. Usman Raza,* ***R. Livengood*** *, T. Malik, O. Sidorov, Z. Malamud, I. Ronen,* ***Shida Tan,*** Intel Corporation; *M. Wong,* Thermofisher Scientific |
| 4:00pm | **2D+AS+EM-ThA-6** Band Modulations: Revealing Moiré Effects in Twisted Bilayer 2D Materials, ***Ryan Muzzio,*** Carnegie Mellon University; *A. Jones, P. Majchrzak,* Aarhus University, Denmark; *H. Martins, S. Singh,* Carnegie Mellon University; *C. Jozwiak, A. Bostwick, E. Rotenberg,* Lawrence Berkeley National Laboratory; *P. Hofmann,* Aarhus University, Denmark; *S. Ulstrup,* aarhus University, Denmark; *J. Katoch,* Carnegie Mellon University | |

| | **Advanced Surface Engineering Division**<br>**Room 317 - Session SE+AS+MN+SS-ThA**<br>**Mechanical and Tribological Properties of Thin Films and Coatings**<br>**Moderators: Jyh-Wei Lee**, Ming Chi University of Technology, Taiwan, **Filippo Mangolini**, The University of Texas at Austin | **Applied Surface Science Division**<br>**Room 320 - Session AS+2D+EM+MS+NS+SS+TF-ThA**<br>**Probing Defects at Surfaces and Interfaces**<br>**Moderators:**<br>**Michaeleen Pacholski**, The Dow Chemical Company, **Zachary Robinson**, SUNY Brockport |
|---|---|---|
| 2:20pm | **INVITED: SE+AS+MN+SS-ThA-1** Investigating Solid and Boundary Lubrication Processes With an Environment Controlled Tribometer Based on a Unique 6 Axes Sensor, ***Julien Fontaine,*** LTDS - CNRS/Ecole Centrale de Lyon, France*; C. Minfray,* LTDS - Ecole Centrale de Lyon/CNRS, France*; J. Galipaud,* LTDS - CNRS/Ecole Centrale de Lyon, France | **INVITED: AS+2D+EM+MS+NS+SS+TF-ThA-1** Controlling InP Quantum Dot Surface Defects Using ALD-inspired Surface Chemistry and Phosphorus Kα and Kβ X-ray Emission Spectroscopy, ***Nayon Park,*** University of Washington |
| 2:40pm | | |
| 3:00pm | **SE+AS+MN+SS-ThA-3** Differential Impact of Scale Dependent Roughness on Lubricant Infused Surfaces, ***Robert Chrostowski,*** *B. Fang, J. Smith, F. Mangolini,* University of Texas at Austin | **AS+2D+EM+MS+NS+SS+TF-ThA-3** Characterization of MAX Phases using a Combination of Micro-spot XPS, HAXPES and C60 Cluster Depth Profiling, ***Kateryna Artyushkova,*** Physical Electronics USA*; M. Anayee, Y. Gogotsi,* Drexel University |
| 3:20pm | **INVITED: SE+AS+MN+SS-ThA-4** Imperfectly Perfect Coatings for Rolling Bearing Applications, ***Esteban Broitman,*** SKF B.V. - Research and Technology Development, Netherlands | **AS+2D+EM+MS+NS+SS+TF-ThA-4** Unusual Trend in Thermal Stability of Alanine Different Ni Surfaces, *J. Ontaneda,* Queen Mary University of London, UK*; R. Grau-Crespo,* University of Reading, UK*;* ***Georg Held,*** Diamond Light Source, UK |
| 3:40pm | | **AS+2D+EM+MS+NS+SS+TF-ThA-5** Correlative Theoretical and Experimental Study of the PC \| X Interfacial Bond Formation (X = TiN, AlN, TiAlN) During DC Magnetron Sputtering, ***Lena Patterer,*** *P. Ondračka, D. Bogdanovski, S. Karimi Aghda, J. Schneider,* Materials Chemistry, RWTH Aachen University, Germany |
| 4:00pm | **SE+AS+MN+SS-ThA-6** Tribological Behavior of WC/WCN/CNx Thin Films Deposited by HIPIMS, ***Luis Flores-Cova,*** *O. Jimenez, M. Flores,* Universidad de Guadalajara, Mexico | **AS+2D+EM+MS+NS+SS+TF-ThA-6** Using Resonant Photoemission Spectroscopy to Probe the Electronic Structure of Complex Oxides with Elemental and Orbital Specificity, ***Jessica McChesney,*** *D. Fong, H. Hong,* Argonne National Laboratory, USA |

| | **Electronic Materials and Photonics Division**<br>**Room 304 - Session EM+AS+EL+NS+SS-ThA**<br>**Interfaces and Defect Engineering in Electronic & Photonic Materials & Devices**<br>**Moderators:**<br>**Erin Cleveland**, U.S. Naval Research Laboratory | **Fundamental Discoveries in Heterogeneous Catalysis Focus Topic**<br>**Room 321 - Session HC+AS+NS+SS-ThA**<br>**Special Session and Reception for the HC Community and to Celebrate Robert Madix**<br>**Moderators: Liney Arnadottir**, Oregon State University,<br>**Dan Killelea**, Loyola University Chicago,<br>**Jason Weaver**, University of Florida |
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| 2:20pm | **INVITED: EM+AS+EL+NS+SS-ThA-1** Design and Control of Defect-Mediated Properties in Electronic Ceramics, ***Elizabeth Dickey,*** Carnegie Mellon University | **INVITED: HC+AS+NS+SS-ThA-1** Gaede-Langmuir Award Talk: Not a Divide - A Continuum: Surface Science to Heterogeneous Catalysis, ***Robert J. Madix***[1], Harvard University |
| 2:40pm | | |
| 3:00pm | **EM+AS+EL+NS+SS-ThA-3** In-Situ Investigation of the Interface Formation between Si-Terminated Diamond and a NbxOy Electron Acceptor Layer for Electronic Applications, ***Gabrielle Abad,*** *P. Hopkins, S. McDonnell,* University of Virginia | |
| 3:20pm | **EM+AS+EL+NS+SS-ThA-4** Effects of Atmospheric UV-$O_3$ Exposure of $WSe_2$ on the Properties of the $HfO_2/WSe_2$ Interface, ***Maria Gabriela Sales,*** University of Virginia; *A. Mazzoni,* University of Maryland College Park; *W. Sarney,* Army Research Laboratory; *J. Pearson,* University of Maryland College Park; *S. Najmaei,* Army Research Laboratory; *S. McDonnell,* University of Virginia | |
| 3:40pm | **EM+AS+EL+NS+SS-ThA-5** Near Zero Field Magnetoresistance and Electrically Detected Magnetic Resonance Studies of Instabilities in Semiconductor/ Insulator Systems, ***Patrick Lenahan,*** Pennsylvania State University | |
| 4:00pm | | |

[1] **Gaede Langmuir Award Winner**

# Thursday Afternoon, November 10, 2022

| | **Plasma Science and Technology Division**<br>**Room 315 - Session PS-ThA**<br>**Harnessing the Power of Plasmas for Real-World Applications: PSTD Award Lectures**<br>**Moderators:**<br>**Sebastian Engelmann**, IBM T. J. Watson Research Center,<br>**Mingmei Wang**, Lam Research Corporation | **Quantum Information Science Focus Topic**<br>**Room 302 - Session QS+EM+MN+NS-ThA**<br>**The Quantum Metrology Revolution**<br>**Moderator:**<br>**Dave Pappas**, Rigetti Computing |
|---|---|---|
| 2:20pm | **INVITED: PS-ThA-1** *Time-Resolved Energy and Ion Energy Distributions during High-Powered Impulse Magnetron Sputtering (HIPIMS) with Cathode Voltage Reversal* , ***David Ruzic***[1], University of Illinois*; D. Barlaz, Z. Jeckell,* University of Illinois at Urbana-Champaign*; W. Huber, I. Haehnlein,* University of Illinois at Urbana-Champaign, Starfire Industries LLC*; T. Houlihan, B. Jurczyk,* Starfire Industries LLC | **INVITED: QS+EM+MN+NS-ThA-1** Magnetic Textures in Quantum Materials Revealed by SQUID-on-tip Microscopy*,* ***Ella Lachman****,* Rigetti Computing |
| 2:40pm | | |
| 3:00pm | **INVITED: PS-ThA-3** PSTD Plasma Prize Award Talk: Plasma ON then OFF, ON - OFF, ON – OFF, ON - OFF: Who Knew Being Indecisive Could Work So Well!, ***Lawrence Overzet***[2], University of Texas at Dallas | **QS+EM+MN+NS-ThA-3** Quantum-Based Measurements for Pressure and Vacuum and the NIST on a Chip Program*,* ***Jay Hendricks****, B. Goldstein,* NIST |
| 3:20pm | | **INVITED: QS+EM+MN+NS-ThA-4** Materials and Devices for Efficient Quantum Memories and Sensors*,* ***Lee Bassett****,* University of Pennsylvania |
| 3:40pm | **INVITED: PS-ThA-5** PSTD Young Investigator Award Talk: Next Generation "Birkeland-Eyde": From $NH_3$ to NO*,* ***Floran Peeters***[3]*,* DIFFER, Netherlands | |
| 4:00pm | | |

[1] **2020 AVS Gaede-Langmuir Awardee**

[2] **2021 PSTD Plasma Prize Winner**

[3] **2021 PSTD Young Investigator Awardee**

| | **Surface Science Division**<br>**Room 319 - Session SS+AS+SE-ThA**<br>**ALD and CVD Surface Chemistry**<br>**Moderators: Melissa Hines**, Cornell University,<br>**Dario Stacchiola**, Brookhaven National Laboratory | **Thin Films Division**<br>**Room 316 - Session TF+AS-ThA**<br>**In-Situ Characterization of Thin Films and Interfaces**<br>**Moderators: James Fitz-Gerald**, University of Virginia,<br>**Robert Grubbs**, IMEC, Belgium |
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| 2:20pm | **INVITED: SS+AS+SE-ThA-1** ALD Surface Chemistry on Lithium-Ion Battery Cathodes, ***Jeffrey Elam,*** Argonne National Laboratory | **TF+AS-ThA-1** *In situ* IRRAS and XPS for the Characterization of Gas Interactions with MOF Nanofilms, ***Tianhao Hu,*** Stony Brook University/Brookhaven National Laboratory*; C. Eads,* Max IV Laboratory, Sweden*; D. Stacchiola, A. Head,* Brookhaven National Laboratory |
| 2:40pm | | **TF+AS-ThA-2** AVS Nellie Yeoh Whetten Awardee Talk: Characterizing Early-Stage Morphology and Defect Dynamics in Block Copolymer Thin Films with Environmentally Controlled High-Speed Atomic Force Microscopy, ***Julia Murphy***[1]*,* University of Chicago*; J. Raybin,* University of California at Berkeley*; S. Sibener,* University of Chicago |
| 3:00pm | **SS+AS+SE-ThA-3** Role of Temperature, Pressure and Surface Oxygen Migration in the Initial Atomic Layer Deposition of $HfO_2$ on Anatase $TiO_2$(101), *G. D'Acunto, R. Jones,* Lund University, Sweden*; L. Pérez Ramírez,* Synchrotron Soleil, France*; P. Shayesteh, E. Kokkonen, F. Rehman,* Lund University, Sweden*; F. Lim, F. Bournel, J. Gallet,* Sorbonne Université, France*; R. Timm,* ***Joachim Schnadt,*** Lund University, Sweden | **TF+AS-ThA-3** *In Situ* X-Ray Scattering Studies of the Influence of Plasma Properties on Epitaxial InN Growth by PEALD, ***Jeffrey Woodward****, S. Rosenberg, D. Boris,* U.S. Naval Research Laboratory*; M. Johnson,* Syntek Technologies*; S. Walton, S. Johnson,* U.S. Naval Research Laboratory*; Z. Robinson,* SUNY Brockport*; N. Nepal,* U.S. Naval Research Laboratory*; K. Ludwig,* Boston University*; J. Hite, C. Eddy,* U.S. Naval Research Laboratory |
| 3:20pm | **SS+AS+SE-ThA-4** ALD of Well-Defined Mixed-Oxide and Metal-Oxide Catalytic Interfaces, ***Francisco Zaera,*** University of California - Riverside | **TF+AS-ThA-4** Optical Monitoring of $MoCl_5$ and $H_2S$ Delivery During Atomic Layer Deposition of $MoS_2$, ***Berc Kalanyan,*** National Institute of Standards and Technology*; E. Jahrman,* National Institute of Standard and Technology*; J. Maslar,* National Institute of Standards and Technology |
| 3:40pm | **SS+AS+SE-ThA-5** Mechanistic studies on Catalytically Activated ALD of $Fe_2O_3$ on Pt, ***Andreas Werbrouck,*** Stanford University, Belgium*; J. Schneider, S. Nathan, A. Rothman, S. Bent,* Stanford University | **TF+AS-ThA-5** Temperature-Time-Thickness (TTT) Topography Maps: A Parameter Space Visualization Approach for ALD Processes, ***S. Novia Berriel,*** *C. Feit, U. Kumar,* University of Central Florida*; A. Arunachalam,* University of Texas at Dallas*; S. Seal,* University of Central Florida*; K. Basu,* University of Texas at Dallas*; P. Banerjee,* University of Central Florida |
| 4:00pm | | **TF+AS-ThA-6** Surface Functionalization of Cu with Inhibitors to Enable Area-Selective Atomic Layer Deposition, ***Andrew Kaye****, S. Agarwal,* Colorado School of Mines |

[1] **AVS Nellie Yeoh Whetten Awardee**

## 2D Materials Technical Group
## Room Ballroom A - Session 2D-ThP
## 2D Materials: Poster Session, 4:30-6:30pm

**2D-ThP-1** $MoS_2$ on Sapphire for Aligned Growth Using Liquid Precursor, ***Anindita Chakravarty***, University at Buffalo

**2D-ThP-2** Growing and Analyzing Ultra-Thin Polyaniline Films, ***Anthony Annerino***, *P. Gouma,* The Ohio State University

**2D-ThP-3** Modification of Bilayer $VSe_2$ by Intercalating Transition Metals, ***Vimukthi Pathirage***, *K. Lasek, J. Li, I. Ponomareva, M. Batzill* , University of South Florida

**2D-ThP-6** Chemical Vapor Deposition of Large Grain and Continuous $Mos_2$ Layers on Catalyzed $SiO_2$/Si Substrate, *Z. Graham*, ***Matara Indika***, *M. Williams,* Clark Atlanta University

**2D-ThP-7** Quantum Confinement in Topological Semimetal Nano-Platelets, ***Margaret Brown***, *R. Laing, T. Muratore,* University of Dayton; *K. Burzynski, J. Brown,* Wright Patterson Air Force Base; *J. Corbett,* Miami University; *K. Eyink,* Wright Patterson Air Force Base; *S. Elhamri,* University of Dayton; *A. Reed,* Wright Patterson Air Force Base

**2D-ThP-8** Characterizing the Low-Symmetry Crystallographic Axis in Atomically Thin WTe2 Layers Using Raman Spectroscopy for Spin-Orbit Torque Studies, ***Anh Ramirez***, *I. Kao, R. Muzzio, J. Katoch, S. Singh,* Carnegie Mellon University, USA

**2D-ThP-11** Designing a Green Synthesis Route and a Green Solvent to Exfoliate Graphene for Cost-Efficient Supercapacitors, S. Kittur, J. Zhang, A. Pangal, I. Agrawal, S. Raj, **Abhiram Hanumanchi,** N. Sangeneni, ASDRP

## Advanced Surface Engineering Division
## Room Ballroom A - Session SE-ThP
## Advanced Surface Engineering Poster Session, 4:30-6:30pm

**SE-ThP-1** Can a Nanoindenter be Used as a Hardness Spectrometer?, ***Esteban Broitman***, SKF B.V. - Research & Technology Development, Netherlands

**SE-ThP-2** Diagnosing Stress in Thin Films with High-Throughput Experimentation and Simulation-Based Methods, ***Matias Kalaswad***, *A. Shrivastava, S. Desai, J. Custer, S. Addamane, M. Rodriguez, P. Kotula, M. D'Elia, H. Najm, R. Dingreville, B. Boyce, D. Adams,* Sandia National Laboratories

**SE-ThP-3** Significant Texture and Wear Resistance Improvement of TiN Coatings Using Pulsed DC Magnetron Sputtering, ***Nicholas Richter***, *B. Yang, J. Barnard, T. Niu,* Purdue University; *Y. Zhang,* Los Alamos National Laboratory; *D. Shaw,* Advanced Energy Industries, Inc.; *H. Wang, X. Zhang,* Purdue University

**SE-ThP-4** Investigation of Laser Ablation Coating Removal (LACR) for Steel Surface Cleaning and Coating Adhesion, ***William Moffat***, University of Virginia; *J. Provines, S. Sharp,* Virginia Transportation Research Council (VTRC); *S. Agnew, J. Fitz-Gerald,* University of Virginia

**SE-ThP-5** Study of the Corrosion Resistance and Adhesion of DLC with a CrC/CrCN/Cr Bonding Multilayer Deposited by HIPIMS on AISI 4317 Steel, ***Martin Flores***, *L. Flores,* Universidad de Guadalajara, Mexico; *J. Aguilar, A. Gonzalez,* Universidad Autonoma de Tamaulipas, Mexico

## Applied Surface Science Division
## Room Ballroom A - Session AS-ThP
## Applied Surface Science Poster Session, 4:30-6:30pm

**AS-ThP-1** Isolation of Pt Metal Atoms Using a Surface-Catalyzed Covalent Organic Framework, ***David Wisman***, Indiana University Department of Chemistry; NAVSEA Crane; *Y. Bai, S. Tait,* Indiana University Department of Chemistry

**AS-ThP-2** In situ Spectroscopic Evaluation of the Aging Mechanisms of Molybdenum Disulfide, ***Robert Chrostowski***, University of Texas at Austin; *J. Curry, M. Dugger,* Sandia National Lab; *F. Mangolini,* University of Texas at Austin

**AS-ThP-4** Stm Investigations of Self-Assembly of Proline, ***Benjamin Heiner***, *A. Pittsford, S. Kandel,* University of Notre Dame

**AS-ThP-5** Efforts to Improve XPS Analysis Quality in an Era of Increasingly Diverse Uses and Users, ***Don Baer***, Pacific Northwest National Laboratory; *J. Watts,* University of Surrey, U.K.; *A. Herrera-Gomez,* CINVESTAV-Unidad Queretaro, Mexico; *M. Linford, G. Major,* Brigham Young University

**AS-ThP-6** Metrology Developments in XPS and HAXPES, ***David Cant***, *B. Reed, A. Shard,* National Physical Laboratory, UK

**AS-ThP-7** Advances in Automated XPS Analysis – from Data to Answers, *S. Coultas, J. Counsell,* Kratos Analytical Limited, UK; *C. Moffitt,* Kratos Analytical Inc; *K. Good, K. Macak,* ***Christopher Blomfield,*** Kratos Analytical Limited, UK

**AS-ThP-10** The Role of Artificial Intelligence in Minimizing Analysis Errors, Illustrated with EXAFS, Nanoindentation, and Core Level Photoemission, ***Jeff Terry***, Illinois Institute of Technology

**AS-ThP-11** X-ray Photoelectron Spectroscopy of Polymer Electrolyte Membrane Fuel Cell Components, ***Maxim Shepherd***, *S. Pylypenko,* Colorado School of Mines

**AS-ThP-12** Nanoscale Surface Sensitive Chemical Imaging of Additive Manufacturing Materials, ***Ashley Maloney***, *K. Artyushkova,* Physical Electronics USA; *O. Renault, E. De Vito,* CEA/LETI-University Grenoble Alpes, France

**AS-ThP-13** Data Reporting in XPS: A Consistent Lack of Information, ***Max Clark***, *G. Major, M. Linford,* Brigham Young University

**AS-ThP-14** Electrochemical Flow Cell for Surface and Interface Analysis Cluster, ***Soniya Gahlawat***, CEST Kompetenzzentrum für elektrochemische Oberflächentechnologie GmbH, Austria; *M. Valtiner,* TU Wien/IAP, CEST Kompetenzzentrum für elektrochemische Oberflächentechnologie GmbH, Austria

**AS-ThP-15** Optical Measurements of Temperature Driven Phase Change in Doped Niobium Oxides for Neuromorphic Computing Applications, ***James Michels***, *Z. Robinson, V. Daviero,* State University of New York College at Brockport; *K. Beckmann, N. Cady,* SUNY Polytechnic Institute, Albany

**AS-ThP-16** Laser Surface Melting to Mitigate Intergranular Corrosion of Sensitized AA 5083, ***Md Sojib Hossain***, University of Virginia, USA, Bangladesh; *J. Skelton,* University of Virginia; *W. Moffat, A. Wang, G. Lu, J. Fitz-Gerald,* University of Virginia, USA

**AS-ThP-17** Chemistry and Mechanism of Two-Dimensional Transition Metal Carbide and Nitride Mxene Synthesis, ***Mark Anayee***, *R. Wang, Y. Gogotsi,* Drexel University

**AS-ThP-19** Multilayer Method Modification for the Quantitative Chemical Composition Analysis on Initial Oxidation of Nickel, *D. Guzmán Bucio, G. Gómez Sosa, D. Cabrera German , M. Bravo Sánchez, J. Torres Ochoa, O. Cortazar Martínez , A. Carmona Carmona,* ***Alberto Herrera Gómez***, *M. Mayorga-Garay,* CINVESTAV-Unidad Queretaro, Mexico

## Electronic Materials and Photonics Division
## Room Ballroom A - Session EM-ThP
## Electronic Materials and Photonics Poster Session
## 4:30-6:30pm

**EM-ThP-2** Synthesis and Characterization of $Pb(In_{1/2}Nb_{1/2}O_3)$-$Pb(Mg_{1/3}Nb_{2/3}O_3)$-$PbTiO_3$ Thin Films Grown by Pulsed Laser Deposition, ***Da-Ren Liu***, Taiwan Instrument Research Institute, National Applied Research Laboratories, Taiwan

**EM-ThP-3** The Study of Magnetic and Electrical Properties of Co Spin Crossover Molecule Thin Films, ***Jared Phillips***, *S. Yazdani,* Indiana University-Purdue University-Indianapolis; *T. Ekanayaka, E. Mishra,* University of Nebraska; *J. Soruco,* Indiana University-Purdue University-Indianapolis; *A. N'Diaye,* Advanced Light Source, Lawrence Berkeley National Laboratory; *P. Wang,* University of Florida; *M. Shatruk,* Florida State University; *P. Dowben,* University of Nebraska; *R. Cheng,* Indiana University-Purdue University-Indianapolis

**EM-ThP-5** Multi-Frame Gated X-Ray Imager (MGXI) for Fast Hard X-Ray Imaging, ***Mary Ann Mort***, *C. Hunt,* University of California at Davis; *A. Carpenter,* Lawrence Livermore National Laboratory

## Fundamental Discoveries in Heterogeneous Catalysis Focus Topic
## Room Ballroom A - Session HC-ThP
## Heterogenous Catalysis Poster Session, 4:30-6:30pm

**HC-ThP-2** Facet-Dependent Strong Metal-Support Interaction of Pt Nanoparticles on Morphology Controlled $Cu_2O$ Under CO Oxidation, ***Seunghwa Hong***, *D. Kim,* Korea Advanced Institute of Science and Technology (KAIST) & Institute for Basic Science (IBS), Republic of Korea; *Y. Song,* Korea Advanced Institute of Science and Technology, Republic of Korea; *K. Kim,* Pohang Accelerator Laboratory (PAL), Republic of Korea; *J. Park,* Korea Advanced Institute of Science and Technology (KAIST) & Institute for Basic Science (IBS), Republic of Korea

**HC-ThP-3** Investigation of Strong metal-support Interaction at the Pt-CoO interface Formed on Pt-Co Bimetallic Nanoparticles, ***Yejin Song,*** *D. Kim, S. Hong,* Korea Advanced Institute of Science and Technology (KAIST) & Institute for Basic Science (IBS), Republic of Korea*; K. Kim,* Pohang Accelerator Laboratory (PAL), Republic of Korea*; J. Park,* Korea Advanced Institute of Science and Technology (KAIST) & Institute for Basic Science (IBS), Republic of Korea

**HC-ThP-4** Effusive Molecular Beam Study of $CH_4$ Dissociative Chemisorption on Rh(111): The Remarkable Activity of Step Sites and Extrapolation to Catalytic Rh Films at Temperatures where Tunneling Dominates, ***Xingyu Wang,*** *I. Harrison,* University of Virginia

**HC-ThP-5** Adsorption and Decomposition of Zirconium Tetrahydroborate on Pd(111), ***Ravi Ranjan,*** *M. Trenary,* University of Illinois - Chicago

**HC-ThP-6** Preliminary Studies of RhCu Single-Atom Alloys Using Molecular Beams, ***Laurin Joseph,*** *M. Powers, A. Utz,* Tufts University

**HC-ThP-8** Characterization of a Pt/Cu(111) Single Atom Alloy using CO-RAIRS and CO-TPD, ***David Molina,*** *M. Trenary,* University of Illinois - Chicago

**HC-ThP-9** Surface Chemistry of Acrolein and its Hydrogenation Products on Cu(111) and Single Atom Alloy Pd-Cu(111), ***Arephin Islam,*** *D. Molina, M. Trenary,* University of Illinois - Chicago

**HC-ThP-10** Characterizing the Ag/$Al_2O_3$ Catalyst and Nonthermal Plasma Couple via Native OES Diagnostics, ***Ryan Chapman,*** *J. Blechle,* Wilkes University

**HC-ThP-11** Analysis of Microsilicon and Nanosilicon for Lithium-Ion Battery Anodes, ***Aaron Hsi,*** *A. Sheth, C. Chu, A. Suen, S. Annamalai, S. Adibnia, M. Uddin, N. Sangeneni,* Aspiring Scholars Directed Research Program

**HC-ThP-12** Chemical Speciation and Structural Evolution of Rhodium and Silver Surfaces with High Oxygen Coverages, ***Dan Killelea,*** *E. Jamka, M. Gillum, M. Turano,* Loyola University Chicago*; L. Juurlink,* Leiden University, Netherlands

**HC-ThP-13** Density Functional Theory Computed Descriptors for Heterogeneous Catalysis of $CO_2$ Sorbent Amines, ***Joshua Gabriel,*** Argonne National Laboratory, USA

**HC-ThP-14** Reactivity of Primary and Secondary Butanol Isomers on $TiO_2$/Au(111), ***Haley Frankovich,*** *L. Garber, A. Galgano, C. Grant, E. Schell, J. Yoo, C. Rogers, J. Carmany, A. Baber,* James Madison University

**HC-ThP-16** Synthesis and Characterization of Mixed-Ligand Monolayers on Silver Nanoparticles, *X. Wang,* ***William Hemmingson,*** *D. Green,* University of Virginia, USA

**HC-ThP-17** Morphological Studies of $TiO_2$ Nanoparticles on Au(111), ***Erin Schell,*** *J. Yoo, A. Baber,* James Madison University

## Quantum Information Science Focus Topic
## Room Ballroom A - Session QS-ThP
## Quantum Information Science Poster Session, 4:30-6:30pm

**QS-ThP-2** Creating, Controlling, and Characterizing Quantum Emission in Hexagonal Boron Nitride, ***Annemarie Exarhos,*** Lafayette College*; D. Hopper, R. Patel, R. Grote,* University of Pennsylvania*; A. Alkauskas,* Center for Physical Sciences and Technology, Lithuania*; M. Doherty,* Australian National University, Australia*; L. Bassett,* University of Pennsylvania

## Smart Multifunctional Materials for Nanomedicine Focus Topic
## Room Ballroom A - Session SM-ThP
## Smart Multifunctional Materials for Nanomedicine and Theranostics Poster Session, 4:30-6:30pm

**SM-ThP-1** Electrospun Alligned and Randomly Oriented Fibers Using a Novel Collector, ***Tessa Gilmore,*** *P. Gouma,* The Ohio State University

**SM-ThP-2** Effect of Metal-Mediated Oxidative Stress on Lysosomal Damage/Dysfunction, *V. Sanfilippo, C. Bonaccorso, L. Cucci,* University of Catania, Italy*; R. Inturri,* Fidia Farmaceutici S.p.A., R&D Unità locale Fidia Research sud, Italy*; P. Amico,* Fidia Farmaceutici S.p.A., R&D Unità locale Fidia Research sud , Italy*; S. Vaccaro,* Fidia Farmaceutici S.p.A., R&D Unità locale Fidia Research sud, Italy*;* ***Cristina Satriano,*** University of Catania, Italy

**SM-ThP-3** The Interaction of Neurotrophin-Mimicking Peptides and Artificial Cell Membranes: An Experimental and Theoretical Study, ***Vanessa Sanfilippo,*** *L. Redigolo,* University of Catania, Department of Chemical Sciences, Italy*; G. Forte,* University of Catania, Department of Drug and Health Sciences, Italy*; C. Satriano,* University of Catania, Department of Chemical Sciences, Italy

**SM-ThP-4** CTAB Removal and Graphene Oxide Functionalization of Metallic Nanorods for Theranostic Applications, ***Alice Foti,*** *V. Sanfilippo, P. Tomasella,* University of Catania, Italy*; L. Le Meur, T. Bretot,* University of Rennes, France*; C. Satriano,* University of Catania, Italy

**SM-ThP-5** Hydropolymers, Hydrogels and Hydrogel Composites as Lubricants, ***Nir Kampf,*** *W. Lin, M. Kluzek,* Weizmann Institute of Science, Israel*; S. Angayarkanni,* SRMIST, India*; N. Iuster, E. Shimoni,* Weizmann Institute of Science, Israel*; R. Goldberg,* lipo-sphere, Israel*; J. Klein,* Weizmann Institute of Science, Israel

**SM-ThP-6** Nanocomposites of Gold Nanoparticles-Graphene Oxide and Angiogenin for Wound Care Treatment, *L. Chiaverini, T. Marzo,* ***Diego La Mendola,*** University of Pisa, Italy

**SM-ThP-7** Novel Synthesis of Silver Nanoparticles and Their Antibacterial Activity for Therapeutic Applications, *H. Arshad,* Rutgers, The State University of New Jersey*;* ***Umer Hassan,*** Rutgers The State University of New Jersey

## Thin Films Division
## Room Ballroom A - Session TF-ThP
## Thin Film Poster Session, 4:30-6:30pm

**TF-ThP-1** Effect of Metallic Bonding on the Optical Properties of Transition Metal Based Thin Films, ***Nimarta Kaur Chowdhary,*** *T. Gougousi,* UMBC

**TF-ThP-2** Water Transfer of Electronic Circuits on Flexible and Stretchable 3D Objects, ***Issraa Shahine,*** Nantes Université, CNRS, Institut des Matériaux de Nantes Jean Rouxel (IMN). iété d'Accélération du Transfert de Technologie, SATT Ouest ValorisatSocion SAS, France*; M. Harnois,* Université Rennes 1, CNRS, Institut d'Électronique et des Télécommunications de Rennes (IETR), France*; P. Tessier,* Nantes Université, CNRS, Institut des Matériaux de Nantes Jean Rouxel (IMN), France

**TF-ThP-3** Magnetic Field Assisted Epitaxial Growth of Magnetite Films, ***Adam Dziwoki,*** Jerzy Haber Institute of Catalysis and Surface Chemistry PAS, Poland*; B. Blizniuk,* Jerzy Haber Institute of Catalysis and Surface Chemistry, PAS, Ukraine*; K. Freindl, J. Korecki, N. Spiridis,* Jerzy Haber Institute of Catalysis and Surface Chemistry, PAS, Poland

**TF-ThP-4** Spectra Analyses of Antirreflection Coatings and Hydrogeneted Amorphous Silicon Deposited at Room Temperature for Silicon Photovoltaic Cells Aplications, *H. da Silva Alvarez, A. Roberto Silva, F. Hummel Cioldin, L. Carvalho Jayme Espindola,* **José *Alexandre Diniz,*** University of Campinas, Brazil

**TF-ThP-5** Characteristics of Low Temperature Deposited $SiO_2$ Film based on Very High Frequency Plasma Enhanced Atomic Layer Deposition with Substrate Bias, ***Yongki Lee,*** *H. Kim, G. Ahn, G. Yeom,* Sungkyunkwan University (SKKU), Republic of Korea

**TF-ThP-6** $Sio_2$ Bottom-Up Trench Fill of a High Aspect Ratio Hole by Plasma Enhanced Atomic Layer Deposition Using a Very High Frequency Plasmas and Inhibitor Surface Treatment, ***Gyuhwan An,*** *H. Kim, Y. Lee, G. Yeom,* Sungkyunkwan University (SKKU), Republic of Korea

**TF-ThP-8** Using Metal Precursors to Passivate Surfaces for Area Selective Deposition, ***Kinsey Canova,*** *L. Souqui, G. Girolami, J. Abelson,* University of Illinois at Urbana-Champaign

**TF-ThP-9** Amorphous GeSe Thin Films Prepared by Magnetron Co-Sputtering with Rapid Thermal Annealing for UV Optoelectronic Applications, *S. Pech,* Chosun University, Cambodia*;* ***Sara Kim,*** *Y. Jun, N. Kim,* Chosun University, Republic of Korea

**TF-ThP-10** Considering XPS Characterisation of Ultra-Thin Films, *J. Counsell, S. Coultas,* ***Christopher Moffitt,*** Kratos Analytical Inc.

**TF-ThP-11** Characterization of Polycrystalline Hf-doped $Ga_2O_3$, ***Sara Chamberlin,*** *V. Singh,* Washington and Jefferson College*; S. King,* University of Wisconsin - La Crosse

**TF-ThP-12** A Novel Direct Current Chemical Vapor Deposition (DC-CVD) Reactor for Large Area Diamond Deposition, *G. Major, A. Lizarbe,* Brigham Young University*; B. Lawrence,* Exolv*;* ***Matthew Linford,*** Brigham Young University

**TF-ThP-13** Surface Modification of Additively Manufactured Materials via Stress Gradients on Thin Film Growth, ***Andrew Miceli,*** *S. Stagon,* University of North Florida

**TF-ThP-14** Decoding Thickness Profiles: Conformality as a Tool to Study Process Kinetics, ***Andreas Werbrouck,*** Stanford University, Belgium*; V. Cremers, J. Dendooven, C. Detavernier,* Ghent University, Belgium

**TF-ThP-15** Low-Temperature Synthesis of Crystalline $VO_X$ Films via Hollow-Cathode Plasma-Assisted ALD: Impact of Vanadium Precursor, ***Adnan Mohammad,*** *K. Joshi, S. Ilhom, B. Wells,* University of Connecticut*; A. Kemal Okyay,* Stanford University*; B. Willis, N. BIYIKLI,* University of Connecticut

**TF-ThP-16** Dielectric Property on the Post-Heating Treatment of PVDF Thin Film Prepared by Atmospheric Pressure Plasma Deposition, ***Eun Young Jung,*** Kyungpook National University, Republic of Korea; *C. Park,* Milligan University; *H. Tae,* Kyungpook National University, Republic of Korea

**TF-ThP-17** The Microstructure, Roughness, and Electrical Properties of v-Doped SiC Films, ***Chao-Te Lee Lee,*** *W. Chen, H. Chen,* Taiwan Instrument Research Institute, National Applied Research Laboratories, Taiwan

**TF-ThP-19** Fluorine-Doped $SiO_2$ Films Applied to Optical Coating Deposited by Reactive Magnetron Sputtering, *B.-H. Liao,* Taiwan Instrument Research Institute, Taiwan; ***Chien-Nan Hsiao,*** National Applied Research Laboratories, Taiwan

**TF-ThP-20** Low-Density SiOC Thin Films Grown by Low Temperature Plasma-Enhanced Chemical Vapor Deposition for High Performance Acoustic Bragg Mirrors, ***Julian Pilz,*** *N. Andrianov,* Microsystems Division, Silicon Austria Labs, Austria; *T. Sinani,* Sensor Systems Division, Silicon Austria Labs, Austria; *S. Azeem, T. Dao, M. Moridi,* Microsystems Division, Silicon Austria Labs, Austria; *G. Bruckner,* Sensor Systems Division, Silicon Austria Labs, Austria

# Friday Morning, November 11, 2022

| | Room 303 | |
|---|---|---|
| 8:20am | **INVITED: 2D+AS+BI+HC+SS-FrM-1** Printable Electrochemical Biosensors based on 2D and 3D Graphene*, A. Ebrahimi,* ***Derrick Butler****, V. Kammarchedu, K. Zhou,* Penn State University | **2D Materials Technical Group**<br>**Session 2D+AS+BI+HC+SS-FrM**<br>**2D Materials: Biological, Electronic, Energy, and Other Applications**<br>**Moderators:**<br>**Robert Hovden**, University of Michigan,<br>**Jyoti Katoch**, Carnegie Mellon University |
| 8:40am | | |
| 9:00am | **2D+AS+BI+HC+SS-FrM-3** A Large Area Selective Emitter for Thermophotovoltaic Applications*,* ***Minsu Oh****, K. Grossklaus, D. DeMeo, Z. Kranefeld, T. Vandervelde,* Tufts University | |
| 9:20am | **2D+AS+BI+HC+SS-FrM-4** Advanced Two-Dimensional Nanohybrids for Efficient Electrocatalytic Hydrogen Evolution*,* ***Fei Yao****,* University at Buffalo-SUNY | |
| 9:40am | **INVITED: 2D+AS+BI+HC+SS-FrM-5** Bandstructure Engineering in Two-Dimensional Semiconductors*,* ***Keun Su Kim****,* Yonsei University, Republic of Korea | |
| 10:00am | | |
| 10:20am | **2D+AS+BI+HC+SS-FrM-7** Graphene – Ferritin Interface Unpins Fermi-Level and Induces Temperature Dependent Coherent Tunneling Across Biomolecular Junctions*,* ***Ayelet Vilan****,* Weizmann Institute of Science, Israel*; N. Kumar Gupta,* National University of Singapore*; S. Kumar Karuppannan,* National Quantum Fabless Foundry, Singapore*; R. Reddy Pasula,* Nanyang Technological University Singapore*; J. Martin, W. Xu,* National University of Singapore*; E. May,* Nanyang Technological University, Singapore*; A. Pike,* Newcastle University, UK*; H. Astier, T. Salim,* National University of Singapore*; S. Lim,* Nanyang Technological University, Singapore*; C. Nijhuis,* University of Twente, Netherlands |
| 10:40am | **2D+AS+BI+HC+SS-FrM-8** The Influence of Selenium Incorporation on the HER Catalytic Activity of Electrodeposited Se-$MoS_x$ Electrocatalysts*,* ***Lee Kendall****, G. Zangari , S. Mc,* University of Virginia | |
| 11:00am | **INVITED: 2D+AS+BI+HC+SS-FrM-9** Two-Dimensional Skintronics*,* ***Dmitry Kireev****, D. Akinwande,* The University of Texas at Austin | |
| 11:20am | | |
| 11:40am | **2D+AS+BI+HC+SS-FrM-11** Ultrasonic-Assisted Assembly of Metal Nanoparticles within Graphene Oxide for Tailoring Stem Cell Response*, J. Jaiswal ,* Indian Institute of Technology (Banaras Hindu University) , India*;* ***Marshal Dhayal****,* Indian Institute of Technology (Banaras Hindu University) , India | |
| 12:00pm | | |
| 12:20pm | | |

**Room 304**

**Electronic Materials and Photonics Division**
**Session EM1+MN+NS-FrM**
**Piezoelectric, Ferroelectric, and Multiferroic Devices & Microelectronics**
**Moderators:**
**M. David Henry**, Sandia National Labs,
**Stephen McDonnell**, University of Virginia

8:20am **INVITED: EM1+MN+NS-FrM-1** Piezoelectric Adjustable X-ray Optics, ***Susan Trolier-McKinstry,*** Penn State University

8:40am

9:00am **EM1+MN+NS-FrM-3** Oxide and Nitride Ferroelectric Wurtzite Crystals, ***Jon-Paul Maria,*** Penn State University

9:20am **EM1+MN+NS-FrM-4** Development and Processing of $Al_{1-x}Sc_xN$ (x<0.40) Films for Resonator and Filter Applications, ***Giovanni Esteves***, *S. Yen, T. Young,* Sandia National Laboratories*; Z. Tang,* The University of Pennsylvania*; E. Schmidt, L. Gastian, M. Henry, T. Bauer, C. Nordquist,* Sandia National Laboratories*; R. Olsson,* The University of Pennsylvania

9:40am **EM1+MN+NS-FrM-5** Formation of Aluminum Scandium Nitride Microelectromechanical Systems Via Etching in Aqueous Potassium Hydroxide (KOH), ***Zichen Tang,*** *M. D'Agati, R. Beaucejour, S. Sofronici, J. Zheng, K. Kaylan,* University of Pennsylvania*; G. Esteves,* Sandia National Laboratories*; R. Olsson,* University of Pennsylvania

10:00am **EM1+MN+NS-FrM-6** Interface Reactions During the Ferroelectric Switching of HfZrO Thin Films on InAs, *A. Irish, Y. Liu, R. Atle, A. Persson, R. Yadav, M. Borg, L. Wernersson,* ***Rainer Timm,*** Lund University, Sweden

10:20am **EM1+MN+NS-FrM-7** The Effect of Hf Doping on Piezomagnetic Properties of FeCo for Magnetoelectric Heterostructure Devices, ***Thomas Mion****, K. Bussmann, M. Staruch, P. Finkel,* US Naval Research Laboratory

**Electronic Materials and Photonics Division**
**Session EM2-FrM**
**Advanced Devices & Fabrication Methods**
**Moderators:**
**Parag Banerjee**, University of Central Florida,
**Bryan Wiggins**, Intel Corporation

10:40am **EM2-FrM-8** Two-Dimensional Steep-Slope Transistors Using Graphene Cold Sources, *M. Liu, H. Jaiswal, S. Shahi, S. Wei, Y. Fu, A. Chakravarty, A. Cabanillas, A. Ahmed, F. Yao,* ***Huamin Li,*** University at Buffalo

11:00am **EM2-FrM-9** High Performance, RF Interposer Fabrication on Glass with 3 Metal Layers and Embedded TGVs, *S. Herrera, A. Ruyack, S. Lepkowski, M. Hirabayashi, M. Powner, C. Nordquist,* ***Matthew Jordan,*** Sandia National Laboratories

11:20am **EM2-FrM-10** Single Step Fabrication Process of Alignment Markers for Direct-Write Electron Beam Lithography in Metal-Organic Negative Tone Resist, ***Guy DeRose,*** California Institute of Technology

11:40am **EM2-FrM-11** Non-Destructive Metrology Techniques for Characterizing a-C Hard Mask Films in 3D NAND Structures, *P. Mukundhan****, G. Andrew Antonelli,*** Onto Innovation

# Friday Morning, November 11, 2022

| | **Plasma Science and Technology Division**<br>**Room 305 - Session PS1+MS+SS-FrM**<br>**Modelling of Plasmas and Plasma Driven Processes, and Plasma-Surface Interactions II**<br>**Moderators: Tetsuya Tatsumi**, Sony Semiconductor Solutions Corporation, Japan,<br>**Yu-Hao Tsai**, TEL Technology Center, America, LLC | **Plasma Science and Technology Division**<br>**Room 315 - Session PS2+SE-FrM**<br>**Plasma Sources, Diagnostics, Sensors and Control**<br>**Moderators:**<br>**Nathan Marchack**, IBM T.J. Watson Research Center |
|---|---|---|
| 8:20am | **PS1+MS+SS-FrM-1** Helium and Hydrogen Plasmas Interaction with Si-Based Materials for Advanced Etch Applications: Insights from MD Simulations, ***Emilie Despiau-Pujo***, *V. Martirosyan, F. Pinzan,* Univ. Grenoble Alpes, CNRS, LTM, France*; F. Leverd,* ST Microelectronics, France*; O. Joubert,* Univ. Grenoble Alpes, CNRS, LTM, France | **INVITED: PS2+SE-FrM-1** Optical and Electrical Diagnostics of Industrial Plasma Reactors: Measuring the Relevant Physical Quantities to Assist Process Development, ***Gilles Cunge***, LTM/CNRS-UJF, France*; S. Younesni,* STMicroelectronics/CNRS-LTM France*; N. Loubet, M. Kogelschatz, E. Pargon, C. Petit-Etienne, O. Joubert, E. Despiau-Pujo, N. Sadeghi,* CNRS-LTM, Université Grenoble Alpes, France |
| 8:40am | **PS1+MS+SS-FrM-2** Efficient Parametric Nonlinear Model Reduction of Low Temperature Plasma Applications, ***Abhishek Verma***, Applied Materials Inc.*; K. Bera, S. Rauf,* Applied Materials, Inc. | |
| 9:00am | **PS1+MS+SS-FrM-3** Novel Approaches to Generate Missing Data for Plasma Chemistry Modelling , ***Sebastian Mohr***, Quantemol Ltd., UK*; M. Hanicinec, A. Owens, J. Tennyson,* University College London, UK | **PS2+SE-FrM-3** Hole Transport Properties of Nickel Oxide Films Grown via Hollow-Cathode Plasma-Assisted Atomic Layer Deposition, *S. Ilhom, A. Mohammad, M. Niemiec, D. Zacharzewski, P. Chardavoyne, S. Abdari,* ***Necmi Biyikli***, University of Connecticut |
| 9:20am | **PS1+MS+SS-FrM-4** Particle-in-Cell Modeling of Electron-Beam Generated Low Electron Temperature Plasma, ***Shahid Rauf***, Applied Materials, Inc.*; D. Sydorenko,* University of Alberta, Canada*; S. Jubin, W. Villafana, S. Ethier, A. Khrabrov, I. Kaganovich,* Princeton University Plasma Physics Lab | **PS2+SE-FrM-4** In-Situ Measurement of Electron Emission Yield at Silicon Surfaces in Ar/CF4 Plasmas, ***Mark Sobolewski***, NIST |
| 9:40am | **PS1+MS+SS-FrM-5** Modeling Edge Effects in Wafer Etching with VSim, ***Daniel Main****, J. Cary, T. Jenkins,* Tech-X Corporation | **PS2+SE-FrM-5** Plasma Characterization: Radical Recombination Sensor Based on Dual Probe Thermopile Heat Flux Sensors, ***Johannes Velthuis***, TNO Science and Industry, the Netherlands |
| 10:00am | **PS1+MS+SS-FrM-6** A Study on Dielectric Material Etching in Cryogenic Process Based on Atomistic Simulation, ***Junghwan Um***, Yonsei University, Korea*; S. Cho,* Samsung Electronics Co., Inc., Republic of Korea*; K. Kang,* Yonsei University, Korea | **PS2+SE-FrM-6** Dielectric Toroidal Plasma Sources for Improved Plasma Resistance, ***Ilya Pokidov***, MKS Instruments |
| 10:20am | **PS1+MS+SS-FrM-7** Machine Learning Based Model for a RF Hollow Cathode Discharge, *K, Bera, A. Verma,* ***Sathya Ganta,*** *S. Rauf,* Applied Materials, Inc. | **INVITED: PS2+SE-FrM-7** What We Still Won't Know About Plasmas in Simple Diatomic Gases- or Using a DC Glow Discharge in Pure $O_2$ as an Ideal Test-Bed for Experimental Validation of Models, ***Jean-Paul Booth***[1], LPP-CNRS, France |
| 10:40am | **PS1+MS+SS-FrM-8** Molecular Dynamics Simulations of Plasma-Enhanced Atomic Layer Etching of Silicon Nitride Using Hydrofluorocarbon and Oxygen Plasmas, ***Jomar Tercero***, Osaka University, Japan*; A. Hirata,* Sony Semiconductor Solutions Corporation, Japan*; M. Isobe, K. Karahashi,* Osaka University, Japan*; M. Fukasawa,* Sony Semiconductor Solutions Corporation, Japan*; S. Hamaguchi,* Osaka University, Japan | |
| 11:00am | **PS1+MS+SS-FrM-9** Understanding Plasma Etch Mechanism of Low-k Materials Under Low Temperature Substrates with Fluorine-Based Precursors, ***Daniel Santos***, Tokyo Electron America*; C. Vallee,* SUNY Polytechnic Institute, Albany*; P. Wang,* Tokyo Electron America | **PS2+SE-FrM-9** Voltage and Sheath Dynamics in Electropositive Capacitively Coupled Plasmas with Focus Ring and External Circuit, ***Yuhua Xiao****, J. Brandon, J. Morsell,* NCSU*; S. Nam, J. Lee,* Samsung Electronics Co., Inc., Republic of Korea*; S. Shannon,* NCSU |
| 11:20am | **PS1+MS+SS-FrM-10** Plasma-Assisted Atomic Layer Etching of Silicon Nitride with Unfragmented Fluorocarbons, ***Chon Hei Lam****, M. Carruth,* University of Texas at Austin*; Z. Chen, J. Blakeney, P. Ventzek, S. Sridhar,* Tokyo Electron America Inc.*; J. Ekerdt,* University of Texas at Austin | **PS2+SE-FrM-10** Time Resolved Diagnostics of a Silver HiPIMS Discharge, ***Zachary Jeckell****, D. Barlaz, R. Ganesan, D. Kapelyan, K. Martin,* University of Illinois at Urbana Champaign*; W. Huber, B. Jurczyk,* Starfire Industries LLC*; D. Ruzic,* University of Illinois at Urbana Champaign |
| 11:40am | **PS1+MS+SS-FrM-11** Time Resolved Ion Energy Distribution in Pulsed Inductively Coupled Argon Plasma with/without DC Bias, ***Zhiying Chen****, J. Blakeney, M. Carruth, P. Ventzek,* Tokyo Electron America Inc. | **PS2+SE-FrM-11** Title: Curling Probe Analysis for Practical Measurement of Electron Density, ***Daisuke Ogawa****, K. Nakamura, H. Sugai,* Chubu University, Japan |

[1] **2019 PSTD Plasma Prize Winner**

**Room 316**

8:20am

**Thin Films Division**
**Session TF1+PS-FrM**
**Plasma, PVD and HIPIMS Processes for Emerging and Advanced Materials**
**Moderators:**
**Joe Becker**, Kurt J. Lesker Company,
**Christophe Vallee**, SUNY College of Nanoscale Science and Engineering

8:40am **TF1+PS-FrM-2** Growth of c-axis Textured AlN PVD Film on a 2D-$MoS_2$ Seed Layer, ***Julien Patouillard,*** STMicroelectronics, France*; E. Blanquet, A. Mantoux,* SIMaP, CNRS, University Grenoble Alpes, France*; F. Gianesello,* STMicroelectronics, France*; M. Bernard, S. Cadot, R. Gassilloud, C. Raynaud,* Commissariat à L'énergie Atomique, France

9:00am **TF1+PS-FrM-3** Synthesis and Hardness of Thin-Film High-Entropy Transition Metal Ceramics, ***Nathaniel McIlwaine,*** The Pennsylvania State University*; M. Hossain,* Pacific Northwest National Lab*; J. Maria,* The Pennsylvania State University

9:20am **TF1+PS-FrM-4** Structural Evolution and Thermoelectric Properties of Flexible $Mg_2Sn$ Films Prepared by Magnetron Co-sputtering, ***Sara Kim****, S. Kang, N. Kim,* Chosun University, Republic of Korea

9:40am

10:00am **INVITED: TF2+EM-FrM-6** AlGaN, An Enabling Ultra-Wide Bandgap Semiconductor, ***Dolar Khachariya,*** Adroit Materials*; M. Breckenridge, D. Szymanski, S. Stein,* North Carolina State University*; W. Mecouch,* Adroit Materials*; Y. Guan, P. Bagheri, S. Rathkanthiwar,* North Carolina State University*; P. Reddy, R. Kirste, S. Mita, B. Moody, J. Tweedie,* Adroit Materials*; K. Sierakowski, M. Boćkowski,* Institute of High-Pressure Physics, Poland*; E. Kohn, S. Pavlidis, R. Collazo, Z. Sitar,* North Carolina State University

10:20am

**Thin Films Division**
**Session TF2+EM-FrM**
**Wide and Ultra-Wide Bandgap Thin Films: Advances in Deposition and Novel Materials**
**Moderators:**
**Christophe Vallee**, SUNY College of Nanoscale Science and Engineering,
**Virginia Wheeler**, U.S. Naval Research Laboratory

10:40am **TF2+EM-FrM-8** CVD of Crystalline and Amorphous $sp^2$-BN Thin Films on Different Orientations of $Al_2O_3$, *S. Sharma,* Linköping Univ., IFM, Thin Film Physics Div., Sweden*; **Laurent Souqui,*** University of Illinois at Urbana-Champaign*; H. Pedersen,* Linköping University, IFM, Sweden*; H. Högberg,* Linköping Univ., IFM, Thin Film Physics Div., Sweden

11:00am **TF2+EM-FrM-9** Investigating SiC/Graphene/SiC(0001) Remote Epitaxy Using Hot-wall CVD, ***Daniel J. Pennachio,*** US Naval Research Laboratory*; J. Hajzus,* ASEE Postdoctoral Fellow at US Naval Research Laboratory*; A. Lang,* US Naval Research Laboratory*; R. Stroud,* Former employee of US Naval Research Laboratory*; R. Myers-Ward,* US Naval Research Laboratory

11:20am **TF2+EM-FrM-10** Sputter Deposition of III-N Thin Films, ***Joshua Nordlander,*** The Pennsylvania State University*; Z. Sitar,* North Carolina State University*; J. Maria,* The Pennsylvania State University

11:40am **TF2+EM-FrM-11** Thickness Dependent Properties of Ferroelectric Boron-Substituted Aluminum Nitride Thin Films, ***John Hayden****, J. Nordlander, W. Zhu, S. Trolier-McKinstry, J. Maria,* Pennsylvania State University

# Friday Morning, November 11, 2022

| | **Advanced Surface Engineering Division**<br>**Room 317 - Session SE+MN+PS-FrM**<br>**Nanostructured and Multifunctional Thin Films and Coatings II**<br>**Moderators: Jyh-Wei Lee**, Ming Chi Univ of Technology, Taiwan<br>**Filippo Mangolini**, The University of Texas at Austin | **Radiation Effects on Materials Focus Topic**<br>**Room 318 - Session RE+AS-FrM**<br>**Materials Analysis and Characterization with Radiation**<br>**Moderators:**<br>**Scott Dubowsky**, University of Illinois at Urbana-Champaign,<br>**Camilo Jaramillo-Correa**, Pennsylvania State University |
|---|---|---|
| 8:20am | **INVITED: SE+MN+PS-FrM-1** New Challenges and Opportunities for Hard and Superhard Coatings, ***Aharon Inspektor,*** Carnegie Mellon University | **INVITED: RE+AS-FrM-1** Characterization of Materials and Surfaces with Various Types of Radiation, ***Zachary Robinson,*** SUNY Brockport |
| 8:40am | | |
| 9:00am | **SE+MN+PS-FrM-3** Insights Into the Formation and Characterization of Boron Nitride Thin Films Prepared by Pulsed DC Magnetron Sputtering, ***Rebecca Janknecht,*** TU Wien, Austria; *P. Polcik,* Plansee Composite Materials GmbH, Germany; *P. Mayrhofer,* TU Wien, Austria | **RE+AS-FrM-3** High-Energy (MeV), Heavy Ion Irradiation of Chalcogenide Phase Change Thin Films, ***David Adams,*** *E. Lang, T. Clark, C. Sobczak, E. Scott, J. Custer,* Sandia National Labs; *T. Beechem,* Purdue University; *K. Hattar, M. Kalaswad, M. Rodriguez,* Sandia National Labs |
| 9:20am | | **INVITED: RE+AS-FrM-4** Multiwavelength Raman Microscopy Used to Characterize Surfaces for Plasma-Wall Interaction Study in Tokamaks, ***Cedric Pardanaud,*** *C. Martin, P. Roubin,* Aix-Marseille University / CNRS, France |
| 9:40am | | |
| 10:00am | | **INVITED: RE+AS-FrM-6** In Situ Optical Characterization of High Temperature Defect Kinetics in Mixed-Conducting Oxide Films, ***Nicola Perry,*** University of Illinois, Urbana-Champaign |
| 10:20am | | |
| 10:40am | | **INVITED: RE+AS-FrM-8** Exploring the Effects of Radiation on Planetary Surfaces through the Analysis of Experimental Analogs and Returned Samples from the Moon and Asteroids, ***Michelle Thompson,*** Purdue University |
| 11:00am | | |
| 11:20am | | **INVITED: RE+AS-FrM-10** Ground-Based Space Environmental Testing of Materials and Components for Spacecraft Mission Assurance, ***Sven Bilén,*** *J. McTernan, C. Zawaski,* The Pennsylvania State University |
| 11:40am | | |

| | **Surface Science Division**<br>**Room 319 - Session SS1+AS+HC-FrM**<br>**Oxide Surface Structure and Reactivity**<br>**Moderators: Andrew Gellman**, Carnegie Mellon University, **Zhenrong Zhan**, Baylor University | **Surface Science Division**<br>**Room 320 - Session SS2+CA+AS-FrM**<br>**Environmental, Atmospheric and Astronomical Surfaces**<br>**Moderators: Kathryn Perrine**, Michigan Technological Univ., **Xiao-Ying Yu**, Oak Ridge National Laboratory, USA |
|---|---|---|
| 8:20am | **SS1+AS+HC-FrM-1** Operando Photoluminescence Microscopy Study of Photoreduction of Resazurin on $Tio_2$ Microcrystals, ***Hao Zhu***, *Z. Zhang, W. Lu, B. Birmingham,* Baylor University | **INVITED: SS2+CA+AS-FrM-1** Combining Synchrotron X-ray and SFG Spectroscopy Techniques to Illuminate Aqueous Interfaces, *S. Nayak, R. Kumal, A. Carr,* Argonne National Laboratory, USA*; S. Lee,* Argonne National Laboratory*;* ***Ahmet Uysal****,* Argonne National Laboratory, USA |
| 8:40am | **SS1+AS+HC-FrM-2** Unraveling Surface Structures of Ga-Promoted Transition Metal Catalysts in $CO_2$ Hydrogenation, ***Si Woo Lee****, M. Lopez Luna, S. Shaikhutdinov, B. Roldan Cuenya,* Fritz Haber Institute of the Max Planck Society, Germany | |
| 9:00am | **INVITED: SS1+AS+HC-FrM-3** Stabilization of Active Cu Sites on Oxide Surfaces, ***Dario Stacchiola****,* Brookhaven National Laboratory | **INVITED: SS2+CA+AS-FrM-3** X-Ray Studies of Extractant and Lanthanide Ion Ordering at Liquid Interfaces Relevant to Solvent Extraction, ***Mark Schlossman****,* University of Illinois at Chicago |
| 9:20am | | |
| 9:40am | **SS1+AS+HC-FrM-5** An optimized IRAS Setup to Investigate Adsorbates on Metal-Oxide Single Crystals, ***David Rath****, J. Pavelec, U. Diebold, M. Schmid, G. Parkinson,* TU Wien, Austria | **SS2+CA+AS-FrM-5** Probing Surface Chemistry in Complex Environments: Water Disinfectants and Ionic Solutions at the Air/Liquid/Iron Interface, ***Kathryn Perrine****,* Michigan Technological University |
| 10:00am | **SS1+AS+HC-FrM-6** Photochemical Fluorination of $TiO_2$(110), ***Melissa Hines****, W. DeBenedetti, Q. Zhu, M. Hasany, D. Somaratne,* Cornell University | **SS2+CA+AS-FrM-6** The Surface Chemistry of Martian Mineral AnalogsDuring Triboelectric Charging in Sand Storms, ***Mikkel Bregnhøj****, T. Weidner, K. Finster,* Aarhus University, Denmark |
| 10:20am | **SS1+AS+HC-FrM-** Surface Structures of $La_{0.8}Sr_{0.2}MnO_3$ (001) Thin Films, ***Erik Rheinfrank****, M. Brunthaler, G. Franceschi, M. Schmid, U. Diebold, M. Riva,* Institute of Applied Physics, TU Wien, Austria | **INVITED: SS2+CA+AS-FrM-7** Unraveling Water Formation on Planetary and Astrophysical Bodies: The Role of Surface Science, *T. M. Orlando,* ***Brant Jones,*** Georgia Institute of Technology |
| 10:40am | **SS1+AS+HC-FrM-8** Adsorption of Organophosphate Nerve Agent VX on the (101) Surface of Anatase Titanium Dioxide, ***Gloria Bazargan****,* NRC Research Associate, U.S. Naval Research Laboratory*; I. Schweigert, D. Gunlycke,* Chemistry Division, U.S. Naval Research Laboratory | |
| 11:00am | | |
| 11:20am | | |

| | Room 301-302 | |
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| 8:20am | **Welcome and Introductions** | **AVS Quantum Workshop**<br>**Session AQS-FrM**<br>**AVS Quantum Science Workshop**<br>**Moderators:**<br>**Charles R. Eddy, Jr.**, Office of Naval Research Global - London, UK<br>**Rachael Myers-Ward,** U.S. Naval Research Laboratory |
| 8:40am | **INVITED: AQS-FrM-2** Electronic Excitations of Defects in Semiconductors – First-Principles Simulations and Quantum Embedding, ***André Schleife***, University of Illinois | |
| 9:00am | | |
| 9:20am | **INVITED: AQS-FrM-4** Following Enzymatic Reactions with Quantum Light, ***Marco Barbieri***, Universita Roma Tre, Italy | |
| 9:40am | | |
| 10:00am | **BREAK** | |
| 10:20am | **INVITED: AQS-FrM-7** Running Quantum Circuits on a Neutral Atom Quantum Computer, ***Mark Saffman***, University of Wisconsin-Madison and ColdQuanta | |
| 10:40am | | |
| 11:00am | **INVITED: AQS-FrM-9** Unitary Coupled Cluster Ansatz as an Efficient Way to Perform Electronic Structure Calculations, ***Jim Freericks***, Georgetown University | |
| 11:20am | | |
| 11:40am | **AQS-FrM-11** AQS Panel Discussion, | |
| 12:00pm | | |
| 12:20pm | **AVS Quantum Workshop Closing Remarks** | |

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