

Monday Morning, October 25, 2021

Live Session LI-MoM: AVS Plenary & Awards Session

10:00 am – 3:00 pm EDT (USA)

Moderators: Dan Killelea, Loyola University Chicago, Amy Walker, University of Texas at Dallas, Tim Gessert, Gessert Consulting, LLC

10:00am	LI-MoM-1 Welcome from the AVS President, <u>SUSAN BURKETT</u> , University of Alabama
10:05am	LI-MoM-2 Welcome from the AVS 67 Program Chair, <u>DAN KILLELEA</u> , Loyola University Chicago
10:15am	INVITED: LI-MoM-4 AVS Plenary Lecture: Pump-Probe Experiments with Neutral Matter: A New Approach to the Kinetics of Surface Reactions, <u>ALEC M. WODTKE</u> , Georg-August University of Göttingen and The Max Planck Institute for Biophysical Chemistry, Germany
11:00am	INVITED: LI-MoM-13 2021 Dorothy M. and Earl S. Hoffman Award Scholarship Talk: Formation and Stability of Oxygen Structures on Ag(111) Surfaces, <u>MARIE TURANO</u> ¹ , Loyola University Chicago; L. Juurlink, Leiden University, The Netherlands; E. Jamka, M. Gillum, D. Killelea, Loyola University Chicago
11:15am	INVITED: LI-MoM-16 AVS 2021 Graduate Research Award Talk: Molecular Interactions with Frozen Ice Films: Adsorption, Oxidative Reactivity, and Isotopic Enrichment, <u>MICHELLE BRANN</u> ¹ , S. Sibener, University of Chicago
11:30am	INVITED: LI-MoM-19 2021 AVS Russell and Sigurd Varian Award Talk: Chemically Resolving Metal Supported Regioisomeric Assemblies at the Angstrom Scale using Ultrahigh Vacuum Tip-Enhanced Raman Spectroscopy: Conformations & Interactions, <u>SAYANTAN MAHAPATRA</u> ¹ , J. Schultz, L. Li, N. Jiang, University of Illinois at Chicago
11:45am	INVITED: LI-MoM-22 2021 AVS Graduate Research Award Talk: Investigating Surfaces, Interfaces, and their Impact on Degradation of Polymer Electrolyte Membrane Water Electrolyzers, <u>SARAH F. ZACCARINE</u> ¹ , Colorado School of Mines; M. Shviro, Forschungszentrum Jülich GmbH, Germany; M. Dzara, Colorado School of Mines; M. Carmo, Forschungszentrum Jülich GmbH, Germany; S. Pylypenko, Colorado School of Mines
12:00pm	BREAK
12:15pm	INVITED: LI-MoM-28 AVS 2021 Peter Mark Memorial Award Lecture: Novel MBE Approaches for Atomically Precise Synthesis of “Stubborn” Metal Oxides, <u>BHARAT JALAN</u> ² , Univ. of Minnesota, USA
12:45pm	INVITED: LI-MoM-34 2021 AVS Nellie Yeoh Whetten Award Talk: Efficient Near-Infrared Emission from Lead-Free Ytterbium-Doped Cesium Bismuth Halide Perovskite Thin Films, <u>MINH TRAN</u> ¹ , I. Cleveland, G. Pustorino, E. Aydil, New York University
1:00pm	INVITED: LI-MoM-37 AVS 2021 John Thornton Memorial Award Lecture: Oxide MBE Rocks! Reflections on 35+ Years of Oxide MBE, <u>DARRELL SCHLOM</u> ³ , Cornell University
1:30pm	BREAK
1:45pm	INVITED: LI-MoM-46 2021 AVS Graduate Research Award Talk: Versatile Polymer Nanoparticle Synthesis Using Initiated Chemical Vapor Deposition (iCVD), <u>TREVOR DONADT</u> ¹ , D. Streever, R. Yang, Cornell Univ.
2:00pm	INVITED: LI-MoM-49 2021 Dorothy M. and Earl S. Hoffman Award Scholarship Talk: Tunable Photonics Based on Thin-Film Vanadium Dioxide, <u>CHENGHAO WAN</u> ¹ , University of Wisconsin - Madison; Z. Zhang, Purdue Univ.; D. Woolf, Physical Sciences Inc.; J. Rensberg, M. Hafermann, Friedrich Schiller Univ. Jena, Germany; J. Salman, Y. Xiao, Univ. of Wisconsin - Madison; M. Park, Purdue Univ.; C. Ronning, Friedrich Schiller Univ. Jena, Germany; S. Ramanathan, Purdue University; M. Kats, Univ. of Wisconsin – Madison
2:15pm	INVITED: LI-MoM-52 2021 AVS Dorothy M. and Earl S. Hoffman Award Talk: Strain Engineering of Magnetism and Topological States in Rippled Heusler Membranes, <u>DONGXUE DU</u> ¹ , S. Manzo, C. Zhang, V. Saraswat, University of Wisconsin - Madison; K. Genser, K. Rabe, Rutgers, The State University of New Jersey; P. Voyles, M. Arnold, J. Kawasaki, University of Wisconsin – Madison
2:30pm	INVITED: LI-MoM-55 AVS 2021 Medard W. Welch Award Lecture: Probing and Controlling Excitons in 2D Semiconductors, <u>TONY HEINZ</u> ⁴ , Stanford University and SLAC National Accelerator Laboratory
3:00pm	LI-MoM-61 Closing Remarks and Thank You's, <u>AMY V. WALKER</u> , University of Texas at Dallas

¹ National Student Award Finalist

² Peter Mark Memorial Award Winner

³ John A. Thornton Memorial Award Winner

⁴ Medard W. Welch Award Winner

Tuesday Morning, October 26, 2021

Live Session LI-TuM1 Tuesday Morning Live Session I: New Frontiers in Interfaces Moderators: Ashleigh Baber, James Madison University, Erin Iski, University of Tulsa		Live Session LI-TuM2 Tuesday Morning Live Session II: Current and Emerging Devices Moderators: Adriana Creatore, Eindhoven University of Technology, Netherlands, Sebastian Engelmann, IBM T.J. Watson Research Center	
10:00am	LI-TuM1-1 Welcome and Opening Remarks, <u>ASHLEIGH BABER</u> , James Madison University	LI-TuM2-1 Welcome and Opening Remarks, <u>ADRIANA CREATORE</u> , Eindhoven University of Technology, The Netherlands	
10:05am	INVITED: LI-TuM1-2 Electrochemical Surface Science of Platinum, <u>MARC KOPER</u> , Leiden University, Netherlands	INVITED: LI-TuM2-2 Aluminum Scandium Nitride Microdevices for Next Generation Nonvolatile Memory and Microelectromechanical Systems, <u>TROY OLSSON</u> , University of Pennsylvania	
10:25am	INVITED: LI-TuM1-6 Manipulating Electrochemical Reactions in Van Der Waals Heterostructures, <u>KWABENA BEDIAKO</u> , University of California at Berkeley	INVITED: LI-TuM2-6 Memristive Devices and Arrays as AI Hardware, <u>J. JOSHUA YANG</u> , University of Southern California	
10:45am	INVITED: LI-TuM1-10 Scale-Up Manufacturing Processes for Powders: Pairing Powder Properties to Process, <u>ARRELAINE DAMERON</u> , S. Moulton, J. DuMont, D. Lewis, T. Porcelli, R. Tracy, Forge Nano	INVITED: LI-TuM2-10 Etch Processes for Enabling Next Generation Devices, <u>ERIC MILLER</u> , I. Seshadri, T. Kang, D. Metzler, J. Lee, S. Sieg, S. Engelmann, J. Shearer, J. Arnold, N. Felix, IBM Research Division, Albany, NY	
11:05am	BREAK	BREAK	
11:15am	INVITED: LI-TuM1-16 Batteries at Work: Ambient Pressure Photoelectron Spectroscopy for Lithium Ion Batteries, <u>JULIA MAIBACH</u> , Karlsruhe Institute of Technology (KIT), Institute for Applied Materials (IAM), Germany, <u>I. Källquist</u> , F. Lindgren, M. Hahlin, Uppsala University, Angstrom Laboratory, Sweden;	INVITED: LI-TuM2-16 On the Low Deposition Rate and Ionized Flux Fraction in High Power Impulse Magnetron Sputtering, <u>JON TOMAS GUDMUNDSSON</u> , H. Hajihoseini, University of Iceland; <u>N. Brenning</u> , KTH Royal Institute of Technology, Sweden; <u>M. Rudolph</u> , Leibniz Institute of Surface Engineering (IOM), Germany; <u>M. Raadu</u> , KTH Royal Institute of Technology, Sweden; <u>D. Lundin</u> , Linköping University, Sweden	
11:35am	INVITED: LI-TuM1-20 In-Situ TEM Imaging of Nanoscale Reactions at Solid-Liquid-Gas Interfaces, <u>HAIMEI ZHENG</u> , Lawrence Berkeley National Lab	INVITED: LI-TuM2-20 β -Ga ₂ O ₃ Resonant Micro/Nanoelectromechanical Systems (M/NEMS), <u>XU-QIAN ZHENG</u> , P. Feng, University of Florida	
11:55am	INVITED: LI-TuM1-24 Molecular Processes in Ultra-High Vacuum between the Stars, <u>EWINE VAN DISHOECK</u> , Leiden University, The Netherlands	INVITED: LI-TuM2-24 In-Depth Feasibility Study of Dual Damascene Extension: Patterning, Dielectric Etch and Metallization, <u>XINGHUA SUN</u> , TEL Technology Center, America, LLC; <u>Y. Mignot</u> , IBM Research Division, Albany, NY; <u>C. Cole</u> , <u>E. Liu</u> , TEL Technology Center, America, LLC; <u>J. Church</u> , IBM Research Division, Albany, NY; <u>D. Santos</u> , <u>A. Raley</u> , TEL Technology Center, America, LLC; <u>S. Sieg</u> , IBM Research Division, Albany, NY; <u>P. Biolsi</u> , TEL Technology Center, America, LLC	
12:15pm	LI-TuM1-28 Closing Remarks and Thank You's, <u>ERIN ISKI</u> , University of Tulsa	LI-TuM2-28 Closing Remarks and Thank You's, <u>SEBASTIAN ENGELMANN</u> , IBM T. J. Watson Research Center	

Tuesday Afternoon, October 26, 2021

Live Session LI-TuA1 Tuesday Afternoon Live Session I: Harnessing and Understanding Interfacial Chemistry Moderators: Donna Chen, University of South Carolina Zhenrong Zhang, Baylor University, USA		Live Session LI-TuA2 Tuesday Afternoon Live Session II: Novel Characterization and Modeling Moderators: Mohan Sankaran, University of Illinois at Urbana-Champaign, Dr. Virginia Wheeler, U.S. Naval Research	
12:50pm	LI-TuA1-1 Welcome and Opening Remarks, <u>DONNA CHEN</u> , University of South Carolina	LI-TuA2-1 Welcome and Opening Remarks, <u>GINGER WHEELER</u> , U.S. Naval Research Laboratory	
12:55pm	INVITED: LI-TuA1-2 High-Throughput Computational Screening of Diamond Like Semiconductors and Ordered Vacancy Compounds for Thermoelectrics, <u>ELIF ERTEKIN</u> , Univ. of Illinois <i>J. Xu</i> , Univ. of Illinois at Urbana-Champaign; <i>C. Porter, J. Adamczyk, E. Toberer</i> , Colorado School of Mines	INVITED: LI-TuA2-2 Time-Resolved Photoelectron Spectroscopy of Solar Cell Materials, <u>UTE CAPPEL</u> , KTH - Royal Institute of Technology, Sweden	
1:15pm	INVITED: LI-TuA1-6 Towards a Mechanistic Understanding of Next-Generation Particle Accelerator Materials Growth: Nb Hydride Growth and Suppression and Nb ₃ Sn Formation on (3×1)-O Nb(100), <u>RACHAEL G. FARBER</u> , <i>S. Willson, R. Veit</i> , University of Chicago; <i>N. Sitaraman</i> , Cornell University; <i>A. Hire, R. Hennig</i> , University of Florida; <i>T. Arias</i> , Cornell University; <i>S. Sibener</i> , Univ. of Chicago	INVITED: LI-TuA2-6 Application of a Laboratory-Based Scanning XPS/HAXPES Instrument for the Characterization of Buried Interfaces, <u>KATERYNA ARTYUSHKOVA</u> , <i>J. Mann, J. Newman</i> , Physical Electronics USA; <i>R. Inoue, K. Watanabe, H. Yamazui</i> , ULVAC-PHI, Inc., Japan; <i>A. Vanleenhove, C. Zborowski, T. Conard</i> , IMEC, Belgium	
1:35pm	INVITED: LI-TuA1-10 Phase Formation and Thermal Stability of Reactively and Non-Reactively Sputtered High-Entropy Metal-Sublattice Carbides, <u>ALEXANDER KIRNBAUER</u> , TU Wien, Institute of Materials Science and Technology, Austria; <i>P. Polcik</i> , Plansee Composite Materials GmbH, Germany; <i>P. Mayrhofer</i> , TU Wien, Institute of Materials Science and Technology, Austria	INVITED: LI-TuA2-10 Precise Ion Energy Control With Tailored Waveform Biasing: Determination of Sputter Thresholds as Input for ALE Process Design, <u>NICHOLAS CHITTOCK</u> , <i>S. Balasubramanyam, T. Faraz, Y. Verstappen</i> , Eindhoven University of Technology, Netherlands; <i>M. Verheijen</i> , Eurofins Materials Science, Netherlands; <i>J. Escandon-Lopez, E. Heijdra, W. van Gennip</i> , Prodrive Technologies, Netherlands; <i>E. Kessels, A. Mackus</i> , Eindhoven University of Technology, Netherlands	
1:55pm	BREAK	BREAK	
2:05pm	INVITED: LI-TuA1-16 Electronic Structure and Dynamics of Single Atom Catalysts, <u>NURIA LOPEZ</u> , ICIQ, Spain	INVITED: LI-TuA2-16 Going Beyond Superficial Surface Analysis for Transforming Plants into Value-added Products, <u>ROBYN GOACHER</u> , Materion Corp.	
2:25pm	INVITED: LI-TuA1-20 Methanol Synthesis Pathways for the Selective Conversion of C-H bonds, <u>SANJAYA SENANAYAKE</u> , Brookhaven National Laboratory	INVITED: LI-TuA2-20 Molecular Dynamics Study on Damage Formation in Atomic Layer Etching of Si With Halogen Radicals, <u>ERIN JOY CAPDOS TINACBA</u> , <i>M. Isobe, S. Hamaguchi</i> , Osaka University, Japan	
2:45pm	INVITED: LI-TuA1-24 Building Bridges Between University, National Laboratory, and Industrial Research, <u>ROBERT MCCABE</u> , National Science Foundation	INVITED: LI-TuA2-24 Variable Polarization, External Magnetic Field, and Spin Resolution for Buried Magnetic Materials Studied by Hard X-Ray Photoemission, <u>SHIGENORI UEDA</u> , National Institute for Materials Science, Japan	
3:05pm	LI-TuA1-28 Closing Remarks and Thank You's, <u>ZHENRONG ZHANG</u> , Baylor University	LI-TuA2-28 Closing Remarks and Thank You's, <u>MOHAN SANKARAN</u> , University of Illinois at Urbana-Champaign	

Wednesday Morning, October 27, 2021

Live Session LI-WeM1 Wednesday Morning Live Session I: Recent Advances in Thin Films Moderators: Svitlana Pylypenko, Colorado School of Mines, Angel Yanguas, Argonne National Lab		Live Session LI-WeM2 Wednesday Morning Live Session II: Biological, Environmental Interfaces and New Directions in the AVS Moderators: Sidney Cohen, Weizmann Institute of Science, Israel, Caitlin Howell, University of Maine	
10:00am	LI-WeM1-1 Welcome and Opening Remarks, <u>ANGEL YANGUAS-GIL</u> , Argonne National Lab	LI-WeM2-1 Welcome and Opening Remarks, <u>SIDNEY COHEN</u> , Weizmann Institute of Science, Israel	
10:05am	INVITED: LI-WeM1-2 Metalorganic Vapor-Phase Epitaxy of Gallium (Aluminum) Oxide Thin Films and Heterostructures for High Frequency and Power Electronics, <u>SRIRAM KRISHNAMOORTHY</u> , University of California, Santa Barbara; <i>P. Ranga, A. Bhattacharyya, S. Roy</i> , Electrical and Computer Engineering, The University of Utah	INVITED: LI-WeM2-2 ASSD 2021 Peter M.A. Sherwood Mid-Career Professional Award Talk: Information from complexity - Making Sense of the Mess Created by ToF-SIMS, <u>DANIEL GRAHAM</u> ¹ , University of Washington, Seattle; <i>M. Taylor</i> , Pacific Northwest National Laboratory; <i>L. Gamble</i> , University of Washington, Seattle	
10:25am	INVITED: LI-WeM1-6 Selection Criteria for Small Inhibitor Molecules in Area-Selective Atomic Layer Deposition, <u>MARC MERKX</u> , <i>P. Yu, J. Li</i> , Eindhoven Univ. of Technology, Netherlands; <i>D. Hausmann</i> , Lam Research Corp.; <i>T. Sandoval</i> , Univ. Técnica Federico Santa Mariá, Chile; <i>E. Kessels, A. Mackus</i> , Eindhoven Univ. of Technology, Netherlands	INVITED: LI-WeM2-6 High Throughput Discovery of Novel Antiviral Polymers for Reducing SARS-CoV-2 Surface Transmission and Improving PPE, <u>XUAN XUE</u> , <i>J. Duncan, C. Coleman, J. Ball, C. Alexander, M. Alexander</i> , University of Nottingham, UK	
10:45am	INVITED: LI-WeM1-10 Ligand-Exchange Reactions Using Silane Precursors Containing Different Ligands: Pathways for Selective Thermal Atomic Layer Etching, <u>ANN LII-ROSALES</u> , <i>V. Johnson, A. Cavanagh, S. Sharma, S. George</i> , University of Colorado Boulder	INVITED: LI-WeM2-10 Machine-Learning-Assisted Photonics, <u>ALEXANDRA BOLTASSEVA</u> , <i>Z. Kudyshev, A. Kildishev, V. Shalaev</i> , , Purdue University, USA	
11:05am	BREAK	BREAK	
11:15am	INVITED: LI-WeM1-16 Superconformal Trench Filling With Hf _{1-x} V _x B ₂ Using Two-Precursor Chemical Vapor Deposition, <u>KINSEY CANOVA</u> , <i>Z. Zhang, G. Girolami, J. Abelson</i> , University of Illinois at Urbana Champaign	INVITED: LI-WeM2-16 STM Measurements of Spin-Polarized Currents Carried by the Topological Surface States of SmB ₆ Nanowires, <u>VIDYA MADHAVAN</u> , University of Illinois at Urbana-Champaign	
11:35am	INVITED: LI-WeM1-20 Pyroelectric Heat Detection for <i>In Situ</i> Measurement of ALD Reaction Heat, <u>ASHLEY R. BIELINSKI</u> , <i>E. Sprague-Klein, B. Phelan, A. Martinson</i> , Argonne National Laboratory	INVITED: LI-WeM2-20 Molecular Nanostructures on Metals vs. Graphene: Towards Preserving Functional Properties, <u>MEIKE STÖHR</u> , University of Groningen, Netherlands	
11:55am	INVITED: LI-WeM1-24 pH Sensor Tattoo, <u>KATRIN UNGER</u> , <i>A. Coclite, F. Greco</i> , Graz University of Technology, Austria	INVITED: LI-WeM2-24 BID 2020-2021 Early Career Awardee Talk: Molecular-Level Insights Into Novel Wet Adhesion Systems Found in the Natural World, <u>JOE BAIQ</u> ² , Oregon State University	
12:15pm	LI-WeM1-28 Closing Remarks and Thank You's, <u>SVITLANA PYLYPENKO</u> , Colorado School of Mines	LI-WeM2-28 Closing Remarks and Thank You's, <u>CAITLIN HOWELL</u> , University of Maine	

¹ ASSD 2021 Peter M. A. Sherwood Mid-Career Professional Awardee

² BID 2020-2021 Early Career Researchers Award

Wednesday Afternoon, October 27, 2021

Live Session LI-WeA1 Wednesday Afternoon Live Session I: Controlling Matter at the Ultimate Limits Moderators: Arthur Utz, Tufts University, Eric Joseph, IBM T.J. Watson Research Center		Live Session LI-WeA2 Wednesday Afternoon Live Session II: Stop Worrying and Learn to Enable Quantum Science Moderators: Charles R. Eddy, Jr., Office of Naval Research Global - London, UK, Rachael Myers-Ward, U.S. Naval Research Lab	
12:50pm	LI-WeA1-1 Welcome and Opening Remarks, <u>ERIC JOSEPH</u> , IBM T. J. Watson Research	LI-WeA2-1 Welcome and Opening Remarks, <u>CHARLES R. EDDY, JR.</u> , Office of Naval Research	
12:55pm	INVITED: LI-WeA1-2 The Development of Atomic Layer Processes for Scaling & Future Device Architectures, <u>RUDY WOJTECKI</u> , International Business Machines (IBM) - Almaden Research Center	INVITED: LI-WeA2-2 X-Rays Approaching Neutrons: RIXS with Ultrahigh Resolution and Applied Magnetic Field to Study a Magon-spinon dichotomy in β -Li ₂ IrO ₃ , <u>ALEX FRANO</u> , University of California, San Diego	
1:15pm	INVITED: LI-WeA1-6 Recent Innovations in ToF-Sims and Their Industrial Applications, <u>JULIA ZAKEL</u> , IONTOF GmbH, Germany	INVITED: LI-WeA2-6 X-Ray Spectroscopies With Increased Resolution: Principles and Perspectives, <u>LUCIA AMIDANI</u> , ESRF, France	
1:35pm	INVITED: LI-WeA1-10 Microscopic Visualization of Electron Correlations in TMD Moiré Superlattices, <u>SHAOWEI LI</u> , University of California at San Diego	INVITED: LI-WeA2-10 Exploring Materials, Surface Treatments and Junctions for Superconducting Quantum Circuits, <u>MARTIN SANDBERG</u> , IBM	
1:55pm	BREAK	BREAK	
2:05pm	INVITED: LI-WeA1-16 Characterizing Unconventional Strain and Bending in 2D Materials and Heterostructures with Aberration-Corrected STEM, <u>PINSHANE HUANG</u> , <i>E. Han, J. Yu, C. Lee, D. Luo, A. Khan, T. Santos, S. Kang, W. Zhu, N. Sobh, A. Schleife, B. Clark, E. Ertekin, A. van der Zande</i> , University of Illinois at Urbana-Champaign, USA	INVITED: LI-WeA2-16 Engineering Superconducting Quantum Systems, <u>DONNA RUTH YOST</u> , <i>J. Yoder</i> , MIT Lincoln Laboratory	
2:25pm	INVITED: LI-WeA1-20 Chemistry in Confined Spaces: 2D-Porous Silicates on Metal Supports, <u>J. ANIBAL BOSCOBOINIK</u> , Brookhaven National Laboratory	INVITED: LI-WeA2-20 Micro-Scale Fusion and Neutron Generation from Nanowire Arrays Irradiated With Ultrashort Laser Pulses of Relativistic Intensity, <u>JORGE ROCCA</u> , <i>A. Curtis, C. Calvi</i> , Colorado State University; <i>J. Tinsley</i> , Mission Support and Test Services; <i>S. Wang, R. Hollinger, H. Song</i> , Colorado State University; <i>M. Capeluto</i> , Colorado State University, USA, Universidad de Buenos Aires, Buenos Aires, Argentina; <i>Y. Wang, V. Shlyaptsev</i> , Colorado State University; <i>V. Kaymak, A. Pukhov</i> , Heinrich-Heine-Universität Düsseldorf, Germany	
2:45pm	INVITED: LI-WeA1-24 Basic Science Needs for Transforming Manufacturing Through Atomically Precise Manufacturing, <u>CYNTHIA JENKS</u> , <i>H. Lee</i> , Oak Ridge National Laboratory; <i>J. Lewis</i> , Harvard University	INVITED: LI-WeA2-24 The NIST Quantum Logic Clock and its Vacuum Performance, <u>DAVID LEIBRANDT</u> , NIST-Boulder	
3:05pm	LI-WeA1-28 Closing Remarks and Thank You's, <u>ART UTZ</u> , Tufts University	LI-WeA2-28 Closing Remarks and Thank You's, <u>RACHAEL MYERS-WARD</u> , U.S. Naval Research Laboratory	

2D Materials

Room On Demand - Session 2D-Contributed On Demand

2D Materials Contributed On Demand Session

8:00am

2D-Contributed On Demand-1 Direct Imaging and Interaction Spectroscopy of Atomic-Scale Ripples on MoS₂ via Atomic Force Microscopy, *O. Dagdeviren*, McGill University, Canada; *O. Acikgoz*, University of California Merced; *P. Grütter*, McGill University, Canada; **Mehmet Z. Baykara**, University of California Merced

2D-Contributed On Demand-4 CVD Growth and Characterization of Ferromagnetic Manganese (IV) Selenide-Epitaxial Graphene Heterostructures, *Ihteyaz Aqaeed Avash*, *M. Pedowitz*, *G. Cassuto*, *K. Daniels*, University of Maryland, College Park

2D-Contributed On Demand-7 Room Temperature Chemical Sensors Based on Molybdenum Disulfide Nanoflower/Epitaxial Graphene Heterostructure, *Soaram Kim*, University of Maryland College Park; *J. Park*, Korea Research Institute of Standards and Science, Korea (Republic of); *M. Pedwitz*, *D. Lewis*, University of Maryland College Park; *S. Lee*, The Ohio State University; *B. Uppalapati*, *D. Khan*, *F. Bayram*, *G. Koley*, Clemson University; *S. Kang*, Korea Research Institute of Standards and Science, Korea (Republic of); *K. Daniels*, University of Maryland College Park

2D-Contributed On Demand-10 Structural Characterization of Cobalt Sulfide Sheets Supported on Au(111), *Mahesh Krishna Prabhu*, *I. Groot*, Leiden University, Netherlands

2D-Contributed On Demand-13 Edge Channels of Broken Symmetry Quantum Hall States in Graphene probed by Atomic Force Microscopy, *Sungmin Kim*, *J. Schwenk*, National Institute of Standards and Technology (NIST)/University of Maryland, College Park; *D. Walkup*, National Institute for Science and Technology (NIST); *Y. Zeng*, Columbia University; *F. Ghahari*, National Institute of Standards and Technology (NIST)/University of Maryland, College Park; *S. Le*, National Institute of Standards and Technology (NIST); *M. Slot*, National Institute for Science and Technology (NIST); *J. Berwanger*, University of Regensburg, Germany; *S. Blankenship*, National Institute for Science and Technology (NIST); *F. Giessibl*, University of Regensburg, Germany; *N. Zhitenov*, National Institute for Science and Technology (NIST); *C. Dean*, Columbia University; *J. Stroscio*, National Institute for Science and Technology (NIST)

2D-Contributed On Demand-16 Band Gap Tuning in Lateral Heterostructures of MoSe₂(1-x)S_{2x}-WSe₂(1-x)S_{2x} Ternary Alloys, *Florence Ann Nugera*, *P. Sahoo*, University of South Florida; *Y. Xin*, National High Magnetic Field Laboratory, Florida State University; *H. Gutierrez*, University of South Florida

2D-Contributed On Demand-19 Nonuniform Debye Temperatures in Quasi-One-Dimensional TiS₃ and ZrS₃, *Archit Dhingra*, *P. Dowben*, University of Nebraska-Lincoln, USA

2D-Contributed On Demand-22 3D Spin Polarized – Angle Resolved Photoemission Spectroscopy (SP-ARPES) setup at IMDEA Nanociencia, *Beatriz Muñiz Cano*, *M. Valbuena Martinez*, IMDEA Nanociencia, Spain

2D-Contributed On Demand-25 Tuning Ferromagnetic Properties of Monolayer CrI₃ via Molecular Adsorption, *Jiho Yang*, *B. Shong*, Hongik University, Korea (Republic of)

2D-Contributed On Demand-28 Electron Emission from Quasi-freestanding Bilayer Epitaxial Graphene Microstructures, *Daniel Lewis*, *K. Daniels*, University of Maryland, College Park

2D-Contributed On Demand-31 From Energy Dissipation on Dirac Materials to Intermediate Stages of Hexagonal Boron Nitride Growth, *Anton Tamtögl*, *A. Ruckhofer*, Graz University of Technology, Austria; *N. Avidor*, University of Cambridge, UK; *M. Sacchi*, University of Surrey, UK; *M. Bremholm*, *P. Hofmann*, Aarhus University, Denmark; *G. Benedek*, University of Milano-Bicocca, Italy; *W. Allison*, University of Cambridge, UK

2D-Contributed On Demand-34 Observation of Intra-Unit-Cell Nematic Order in Epitaxial Bilayer FeSe Films on SrTiO₃(001), *Lian Li*, *H. Zhang*, West Virginia University, USA; *M. Weinert*, University of Wisconsin, Milwaukee

2D-Contributed On Demand-37 Phase Dependent-Nanoscale Friction on Two Dimensional Layers, *Dooho Lee*, *H. Lee*, *J. Park*, Korea Advanced Institute of Science and Technology (KAIST) & Institute for Basic Science (IBS), Korea (Republic of)

2D-Contributed On Demand-40 A Full Gap Above the Fermi Level: The Charge Density Wave of Monolayer VS₂, *C. van Efferen*, II. Physikalisches Institut, University of Cologne, Germany; *J. Berges*, Institut für Theoretische Physik, University Bremen, Germany; *J. Hall*, II. Physikalisches Institut, University of Cologne, Germany; *E. van Loon*, Institut für Theoretische Physik, University Bremen, Germany; *S. Kraus*, II. Physikalisches Institut, University of Cologne, Germany; *A. Schobert*, Institut für Theoretische Physik, University Bremen, Germany; *T. Wekking*, *F. Huttman*, *E. Paar*, II. Physikalisches Institut, University of Cologne, Germany; *N. Rothenbach*, Fakultät für Physik und Center für Nanointegration, University Duisburg-Essen, Germany; *K. Ollefs*, Fakultät für Physik und Center für Nanointegration, University Duisburg Essen, Germany; *L. Machado-Arruda*, Institut für Experimentalphysik, FU Berlin, Germany; *N. Brookes*, European Synchrotron Research Facility, France; *G. Schönhoff*, Institut für Theoretische Physik, University Bremen, Germany; *K. Kummer*, European Synchrotron Research Facility, France; *H. Wende*, Fakultät für Physik und Center für Nanointegration, University Duisburg-Essen, Germany; *T. Wehling*, Institut für Theoretische Physik, University Bremen, Germany; **Thomas Michely**, II. Physikalisches Institut, University of Cologne, Germany

2D-Contributed On Demand-43 Ferroelectrics Meet Ionics in the Land of van der Waals, *Petro Maksymovych*, *S. Neumayer*, Oak Ridge National Laboratory; *A. Ohara*, *S. Pantelides*, Vanderbilt University; *N. Balke*, Oak Ridge National Laboratory

2D-Contributed On Demand-46 Multicomponent Monolayer Manipulation Through Successive Ultraviolet Irradiation, *Cynthia Gerber*, University of Connecticut

2D-Contributed On Demand-49 Thermally Induced Complex Reactions Pathways between WS₂ and Au-Ti Substrates, *A. Costine*, University of Virginia, USA; *J. Fonseca Vega*, *J. Robinson*, *C. Cress*, Naval Research Laboratory, USA; **Petra Reinke**, University of Virginia, USA

2D-Contributed On Demand-52 The (Mostly) Unwelcome Guest in 2D Chalcogenides: Native oxidation rates and the effects of oxygen during processing MoS₂, TiS₂, and Zr(S₂Se₂), **Rafael Jaramillo**, Massachusetts Institute of Technology

2D-Contributed On Demand-55 Correlative Analysis Strategies for Transition Metal Dichalcogenides, *Umberto Celano*, IMEC, Belgium

2D-Contributed On Demand-58 Measuring Van der Waals Interactions of Monolayer Materials, *Stanislav Tsoi*, US Naval Research Laboratory; *S. Sivaram*, Sila Nanotechnologies Inc.; *M. Rosenberger*, University of Notre Dame; *K. McCreary*, US Naval Research Laboratory; *H. Chuang*, Nova Research; *B. Jonker*, US Naval Research Laboratory

2D-Contributed On Demand-61 Measuring Surface Phonon Dispersion, *Timo Watjen*, Scientia Omicron, Sweden

2D-Contributed On Demand-64 Two Dimensional TMDs Based Thermo-Electric Devices for Energy Harvesting from Waste Heat, *Sangram Pradhan*, *M. Mbaye*, *M. Behera*, *M. Bahoura*, Norfolk State University

2D-Contributed On Demand-67 Behind the Scenes of Electron Induced Deposition of Amorphous-BN_x on Graphene - A Surface Science Study, *Virginia Boix*, Lund University, Sweden; *C. Struzzi*, MaxIV laboratory, Sweden; *T. Gallo*, *N. Johansson*, *G. D'Acunto*, *Z. Yong*, Lund University, Sweden; *A. Zakharov*, MaxIV laboratory, Sweden; *Z. Li*, Aarhus University, Denmark; *J. Schnadt*, *A. Mikkelsen*, *J. Knudsen*, Lund University, Sweden

2D-Contributed On Demand-70 Formation, Structure and Properties of 2D Silica and Transition Metal Silicates on Gold, *N. Doudin*, *K. Saritas*, *S. Ismail-Beigi*, *Eric Altman*, Yale University

2D-Contributed On Demand-73 Transition Metal -Silicates at the 2-D Limit, *Nassar Doudin*, *K. Saritas*, *S. Ismail-Beigi*, *E. Altman*, Yale University

2D-Contributed On Demand-76 Designing Transition Metal Dichalcogenide Alloys for Photonic Integrated Circuit Applications, *Yifei Li*, *R. Jaramillo*, Massachusetts Institute of Technology

2D-Contributed On Demand-79 Direct Imaging of Optoelectronic Properties at Atomically-Thin Semiconductor-Metal Buried Interface, *Kiyoung Jo*, *P. Kumar*, *S. Anantharaman*, *D. Jariwala*, University of Pennsylvania

2D-Contributed On Demand-82 Two-Dimensional High-Entropy Transition Metal Dichalcogenide Alloys, *Aditya Deshpande*, University of California Los Angeles; *C. Ratsch*, Institute for Pure and Applied Mathematics, UCLA; *C. Ciobanu*, Colorado School of Mines, USA; *S. Kodambaka*, University of California Los Angeles

2D-Contributed On Demand-85 Doping of MoTe₂ via Surface Charge Transfer in Air, *Cristian Ciobanu*, Colorado School of Mines; *G. Stan*, NIST; *S. Likith*, Colorado School of Mines; *A. Rani*, *S. Zhang*, *C. Hacker*, *S. Krylyuk*, *A. Davydov*, NIST

2D-Contributed On Demand-88 Stacking-Dependent Optical Properties in Bilayer WSe₂, *Kathleen McCreary, M. Phillips*, Naval Research Laboratory; *H. Chuang*, NOVA Research; *D. Wickramaratne*, Naval Research Laboratory; *M. Rosenberger*, University of Notre Dame; *C. Hellberg, B. Jonker*, Naval Research Laboratory

2D-Contributed On Demand-91 Small Energy Gap Revealed in CrBr₃ Using Scanning Tunneling Microscopy and Spectroscopy (STM/S), *Dinesh Baral, Z. Fu, A. Zadorozhnyi, R. Dulal, A. Wang, N. Shrestha, U. Erugu, J. Tang, Y. Dahnovsky, J. Tian, T. Chien*, University of Wyoming

2D-Contributed On Demand-94 Electrical Transport Properties of N- and P-Doped Inse: Bulk Crystals Versus Exfoliated Layers, *Zheng Sun*, The George Washington University; *S. Krylyuk*, National Institute of Standards and Technology; *P. Vora*, George Mason University; *M. Zaghloul*, The George Washington University; *A. Davydov*, National Institute of Standards and Technology

2D-Contributed On Demand-97 Electronic Characterization Using Scanning Tunneling Microscopy and Spectroscopy of Solution-Synthesized Graphene Nanoribbons With Functional Groups, *Abigail Berg*, University of Illinois at Urbana-Champaign; *G. Li, A. Sinitskii*, University of Nebraska - Lincoln; *J. Lyding*, University of Illinois at Urbana-Champaign

2D-Contributed On Demand-100 Observation of Electrically Tunable van Hove Singularities in Twisted Bilayer Graphene from NanoARPES, *Ryan Muzzio*, Carnegie Mellon University; *A. Jones, P. Majchrzak, S. Pakdel*, Aarhus University, Denmark; *D. Curcio*, Aarhus University, Denmark; *K. Volckaert, D. Biswas*, Aarhus University, Denmark; *J. Gobbo, S. Singh*, Carnegie Mellon University; *J. Robinson*, Naval Research Laboratory; *K. Watanabe, T. Taniguchi*, National Institute for Materials Science, Japan; *T. Kim, C. Cacho*, Diamond Light Source, UK; *N. Lanata, J. Miwa, P. Hofmann, S. Ulstrup*, Aarhus University, Denmark; *J. Katoch*, Carnegie Mellon University

2D-Contributed On Demand-103 2020 AVS Graduate Research Awardee: Scanning Tunneling Microscopy Studies of Carbon-Based Nanostructures Grown Through Competing on-Surface Interactions and Chemistry, *Jeremy Schultz, N. Jiang*, University of Illinois at Chicago

2D-Contributed On Demand-106 Band Structure and Electronic Properties of Edge-Functionalized Germanene Nanoribbons, *Alexander Goldstone, Q. Li*, George Mason University

2D-Contributed On Demand-109 Non-Enzymatic Electrochemical Sensing of H₂O₂ Based on 2d Tellurene, *sa Dennis, F. Yan, M. Garcia Cervantes, B. Chitara*, North Carolina Central University

2D Materials

Room On Demand - Session 2D-Invited On Demand 2D Materials Invited On Demand Session 8:00am

INVITED: 2D-Invited On Demand-7 Tuning Energy Levels and Energy Flow in Nanomaterials Using the External Environment, *Archana Raja*, Lawrence Berkeley National Laboratory

INVITED: 2D-Invited On Demand-13 Atomic-Scale Study and Engineering of Low-Dimensional Materials, *Jani Kotakoski*, University of Vienna, Austria

INVITED: 2D-Invited On Demand-19 Electronic Structures of Two-Dimensional Topological Materials, *Sung-Kwan Mo*, Lawrence Berkeley National Laboratory

INVITED: 2D-Invited On Demand-25 2020 AVS Medard W. Welch Award Lecture: Chemically Tailoring Interfaces in Two-Dimensional Heterostructures, *Mark Hersam*¹, Northwestern University

INVITED: 2D-Invited On Demand-31 First-Principles Calculations of 2D Materials for Gas Sensing Applications, *Udo Schwingenschlogl*, KAUST, Saudi Arabia

INVITED: 2D-Invited On Demand-37 Modeling the Growth of 2D Crystals: Analytical, Phase-Field and Machine Learning Methods, *Vivek Shenoy*, University of Pennsylvania

Actinides and Rare Earths Focus Topic

Room On Demand - Session AC-Contributed On Demand Actinides and Rare Earths Contributed On Demand Session 8:00am

AC-Contributed On Demand-1 Characterization of Uranium Oxide Corrosion Using a Microfluidic Electrochemical Cell, *Jennifer Yao, E. Buck, S. Tripathi, N. Lahiri, E. Ilton, S. Riechers, D. Reilly*, Pacific Northwest National Laboratory; *S. Chatterjee*, TerraPower LLC; *X. Yu*, Pacific Northwest National Laboratory

AC-Contributed On Demand-4 Observation of Multiple Dirac States in a Magnetic Topological Material EuMg₂Bi₂, *Firoza Kabir*, University of Central Florida; *M. Hosen*, University of Central Florida; *F. Cheenicode-Kabeer, A. Aperis*, Uppsala University, Sweden; *X. Ding*, Idaho National Laboratory; *G. Dhakal, K. Dimitri, C. Sims, S. Regmi, L. Persaud*, University of Central Florida; *K. Gofryk*, Idaho National Laboratory; *P. M. Oppeneer*, Uppsala University, Sweden; *D. Kaczorowski*, Polish Academy of Sciences, Poland; *M. Neupane*, University of Central Florida

AC-Contributed On Demand-10 Tuning Formation of Large Uranium Oxide Cluster Ions from the Surface of Depleted Uranium Under Static Bombardment Using Ga⁺ During ToF-SIMS, *Shohini Sen-Britain, A. Nelson*, Lawrence Livermore National Laboratory

AC-Contributed On Demand-13 Hybridization Effect on the X-Ray Absorption Spectra for Actinide Materials, *W. Chiu*, University of California at Davis; *R. Tutchton*, Los Alamos National Laboratory; *G. Resta*, University of California at Davis; *T. Lin*, Rutgers University; *E. Bauer, F. Ronning*, Los Alamos National Laboratory; *R. Scalettar*, University of California at Davis; *Jian-Xin Zhu*, Los Alamos National Laboratory

AC-Contributed On Demand-16 EXAFS as a Probe of Actinide Oxide Formation in the Tender X-Ray Regime, *James Tobin*, University of Wisconsin-Oshkosh; *S. Nowak*, SLAC National Accelerator Laboratory; *S. Yu*, Lawrence Livermore National Lab; *R. Alonso-Mori, T. Kröll, D. Nordlund, T. Weng, D. Sokaras*, SLAC National Accelerator Laboratory

AC-Contributed On Demand-19 Detection of Covalency in Pu(IV) Materials: Spectroscopic and Computational Tools, *Bianca Schacherl*, Karlsruhe Institute of Technology (KIT), Institute for Nuclear Waste Disposal (INE), Germany; *P. Bagus*, Center for Advanced Scientific Computing and Modeling (CASCAM) Department of Chemistry University of North Texas; *A. Beck*, Karlsruhe Institute of Technology (KIT), Institute for Nuclear Waste Disposal (INE), Germany; *M. Tagliavini*, Heidelberg University, Institute for theoretical physics, Germany; *M. Trumm*, Karlsruhe Institute of Technology (KIT), Institute for Nuclear Waste Disposal (INE), Germany; *M. Haverkort*, Heidelberg University, Institute for theoretical physics, Germany; *T. Vitova*, Karlsruhe Institute of Technology (KIT), Institute for Nuclear Waste Disposal (INE), Germany

AC-Contributed On Demand-22 Interrogating the Surface Chemistry of Nanoscale Uranium Oxides, *Liane Moreau, H. Johnson*, Washington State University

AC-Contributed On Demand-25 Broadening of the XPS Spectra of U Oxides, *C. Nelin*, Consultant; *Paul S. Bagus*, University of North Texas

AC-Contributed On Demand-28 XPS, UPS Study of Pure and Alloyed U Hydrides, *Oleksandra Koloskova, E. Tereshina-Chitrova, M. Paukov*, Charles University, Prague, Czech Republic; *T. Gouder*, European Commission, JRC. Institute for Transuranium Elements, Germany; *J. Kolorenč*, Institute of Physics, Czech Academy of Sciences, Czechia; *L. Havela*, Charles University, Prague, Czech Republic

AC-Contributed On Demand-31 Development of the High-T CDW in REPt₂Si₂, *Volodymyr Buturlim, P. Dolezal*, Charles University, Czechia; *E. Duverger-Nedellec*, Sorbonne Université, France; *A. Andreev*, Institute of Physics of the Czech Academy of Sciences, Czechia; *M. Falkowski*, Institute of Molecular Physics, Poland; *K. Gofryk*, Idaho National Laboratory; *L. Havela*, Charles University, Czech Republic

AC-Contributed On Demand-34 Electronic Structure and Spectroscopy of UH₃ from the LDA+DMFT Perspective, *B. Chatterjee, Jindrich Kolorenc*, Institute of Physics, Czech Academy of Sciences, Prague, Czechia

Actinides and Rare Earths Focus Topic

Room On Demand - Session AC-Invited on Demand Actinides and Rare Earths Invited On Demand Session 8:00am

INVITED: AC-Invited on Demand-7 Identifying Structural Features That Result in Activation and Coupling of Vibrational Modes in Actinyl Materials, *Tori Forbes*, University of Iowa

INVITED: AC-Invited on Demand-13 Sulfur Containing Ligands for Actinide Separations: How Do They Work?, *Jenifer Shafer*, Colorado School of Mines

¹ AVS 2020 Medard W. Welch Awardee

INVITED: AC-Invited on Demand-19 Tracking Uranium Speciation by Synchrotron Spectromicroscopy, *Jesse Ward*, Pacific Northwest National Laboratory

INVITED: AC-Invited on Demand-25 The PreCalc Project: Multiscale Framework for Predicting Morphology of Plutonium Oxide Particles, *Lindsay Roy*, Savannah River National Laboratory

INVITED: AC-Invited on Demand-31 Chemical and Microstructural Analysis of Nuclear Fuels at Nano-Length Scale Using Atom Probe Tomography, *Mukesh Bachhav*, Idaho National Laboratory

INVITED: AC-Invited on Demand-37 Surface Properties of Actinide Dioxides; Crystal Growth and Catalysis, *Enrique Batista*, G. Wang, D. Gonzalez, P. Yang, Los Alamos National Laboratory

Advanced Ion Microscopy and Ion Beam Nano-engineering Focus Topic

Room On Demand - Session HI-Contributed On Demand Advanced Ion Microscopy & Nano-Engineering Contributed On Demand Session

8:00am

HI-Contributed On Demand-1 Applications of the Cesium Low Temperature Ion Source, *Adam Steele*, A. Schwarzkopf, zeroK NanoTech Corporation; *B. Knuffman*, zeroK NanoTech Corporation

HI-Contributed On Demand-7 Focused Nanoscale Machining via the Gas Field Ion Microscope with Laser and Reactive Ion Assist: Joint Experimental and Simulation Investigations, *Jack Lasseter*, P. Rack, University of Tennessee Knoxville

HI-Contributed On Demand-10 Imaging of SARS-CoV-2 infected Vero E6 Cells by Helium Ion Microscopy, *Natalie Frese*, Bielefeld University, Germany; *P. Schmerer*, Justus-Liebig-University Giessen, Germany; *M. Wortmann*, Bielefeld University of Applied Sciences, Germany; *M. Schürmann*, Bielefeld University, Germany; *M. König*, Justus-Liebig-University Giessen, Germany; *M. Westphal*, Bielefeld University, Germany; *F. Weber*, Justus-Liebig-University Giessen, Germany; *H. Sudhoff*, A. Götzhäuser, Bielefeld University, Germany

Advanced Ion Microscopy and Ion Beam Nano-engineering Focus Topic

Room On Demand - Session HI-Invited On Demand Advanced Ion Microscopy & Nano-Engineering Invited On Demand Session

8:00am

INVITED: HI-Invited On Demand-1 Nanoscale Vortex Pinning Structures in High-Temperature Superconductors Created in a Helium Ion Microscope, *Wolfgang Lang*, B. Aichner, University of Vienna, Austria; *M. Karrer*, K. Wurster, Universität Tübingen, Germany; *V. Misko*, Universiteit Antwerpen, Belgium; *K. Mletschnig*, University of Vienna, Austria; *M. Dosmailov*, Al-Farabi Kazakh National University, Kazakhstan; *J. Pedarnig*, University of Linz, Austria; *F. Nori*, RIKEN, Japan; *R. Kleiner*, E. Goldobin, D. Koelle, Universität Tübingen, Germany

INVITED: HI-Invited On Demand-7 Cluster Ion Beams: A New Tool for Characterization and Processing of Organic and Biological Materials, *Jiro Matsuo*, Quantum Science and Engineering Center, Kyoto University, Japan

Advanced Surface Engineering Division

Room On Demand - Session SE-Contributed On Demand Advanced Surface Engineering Contributed On Demand Session

8:00am

SE-Contributed On Demand-1 Electrodeposition of Mn⁺³ Rich Layered δ -Phase MnO₂ Nanofibers on Epitaxial Graphene-Silicon Carbide Heterostructures for Fast Selective Gas Sensing, *Michael Pedowitz*, S. Kim, Department of Electrical and Computer Engineering, University of Maryland, College Park; *B. Uppalapati*, 3Holcomebe Department of Electrical and Computer Engineering, Clemson University, Clemson; *D. Khan*, Holcomebe Department of Electrical and Computer Engineering, Clemson University; *F. Bayram*, G. Koley, Holcomebe Department of Electrical and Computer Engineering, Clemson University, Clemson;; *R. Myers-Ward*, Naval Research Laboratory, USA; *K. Daniels*, Department of Electrical and Computer Engineering, University of Maryland, College Park

SE-Contributed On Demand-4 Fabrication of Hydrogenated Tungsten Carbide Coatings by Reactive Superimposed Hipims-Mf Deposition System: Effect of Target Poisoning Ratio, *B. Lou*, Chang Gung University, Taiwan; *I. Moirangthem*, *Jyh-Wei Lee*, Ming Chi University of Technology, Taiwan

SE-Contributed On Demand-7 In-Situ Raman Approaches for Studying Tribological Surfaces, *Andrey Voevodin*, A. Shirani, E. Cairns, K. Jacques, M. Dockins, A. Killam, S. Aouadi, D. Berman, University of North Texas; *J. Mogonye*, S. Berkibile, DEVCOM Army Research Laboratory

SE-Contributed On Demand-10 Advances in Fatigue Testing of Protective Coatings: A Case Study on Cr-Based Ceramics, *L. Zauner*, R. Hahn, Christian Doppler Laboratory for Surface Engineering of high-performance Components, TU Wien, Austria; *M. Alfreider*, Department of Materials Science, Montanuniversität Leoben, Leoben, Austria; *P. Polcik*, Plansee Composite Materials GmbH, D-86983 Lechbruck am See, Germany; *O. Hunold*, Oerlikon Balzers, Oerlikon Surface Solutions AG, Liechtenstein; *D. Kiener*, Department of Materials Science, Montanuniversität Leoben, Leoben, Austria; *Helmut Riedl*, Christian Doppler Laboratory for Surface Engineering of high-performance Components, TU Wien, Austria

SE-Contributed On Demand-13 Structural, Nanomechanical and Tribological Properties of Plasma Electrolytic Oxide Coatings for Sliding Contact Applications, *Esteban Broitman*, SKF B.V., Netherlands; *J. Dzwonczyk-Mertzanis*, S. Geerts, SKF B.V., Netherlands; *G. Dennis*, SKF Ltd., UK

SE-Contributed On Demand-16 The Struggles to Compare Coatings Hardness by Vickers and Instrumented Nanoindentation Techniques, *Esteban Broitman*, SKF B.V., Netherlands

SE-Contributed On Demand-19 Alloying of Period VI Transition Metal Boride-Based Coatings for Ultra-High Temperature Oxidation Protection, *Thomas Glechner*, R. Hahn, A. Bahr, Christian Doppler Laboratory for Surface Engineering of high-performance Components, TU Wien, Austria; *T. Wojcik*, Institute of Materials Science and Technology, TU Wien, Austria; *M. Weiss*, Institute of Chemical Technologies and Analytics, TU Wien, Austria; *J. Ramm*, O. Hunold, Oerlikon Surface Solutions AG, Liechtenstein; *S. Kolozsvári*, Plansee Composite Materials GmbH, Germany; *H. Riedl*, Christian Doppler Laboratory for Surface Engineering of high-performance Components, TU Wien, Austria

SE-Contributed On Demand-22 Influence of the Nature of the Terminal Group on the Rate of Tribochemical Reaction of Carboxylic Acids on Copper, *Resham Rana*, W. Tysoe, University of Wisconsin Milwaukee

SE-Contributed On Demand-25 Enhanced Oxidation Resistance of Cr₂AlC MAX Phase Coatings through Tailoring of Substrate Microstructure, *Clio Azina*, Materials Chemistry, RWTH Aachen, Germany; *J. Gonzalez-Julian*, Forschungszentrum Jülich GmbH, Germany; *P. Eklund*, Thin Film Physics Division, Linköping University, Sweden; *J. Schneider*, Materials Chemistry, RWTH Aachen, Germany

SE-Contributed On Demand-28 Corrosion Induced Diffusion Pathways in Thin Film Materials Investigated by Atom Probe Tomography, *Oliver E. Hudak*, E. Aschauer, Christian Doppler Laboratory for Surface Engineering of high-performance Components, TU Wien, Austria; *V. Dalbauer*, Department of Materials Science, Friedrich-Alexander-Universität Erlangen-Nürnberg, Germany; *L. Shang*, O. Hunold, M. Arndt, Oerlikon Balzers, Oerlikon Surface Solutions AG, Liechtenstein; *P. Polcik*, Plansee Composite Materials GmbH, Germany; *P. Felfer*, Department of Materials Science, Friedrich-Alexander-Universität Erlangen-Nürnberg, Germany; *H. Riedl*, Christian Doppler Laboratory for Surface Engineering of high-performance Components, TU Wien, Austria

SE-Contributed On Demand-31 Effects of Magnetic Field Strength on the Structure and Properties of non-hydrogenated DLC Coatings Deposited by HiPIMS, *Jianliang Lin*, Southwest Research Institute, San Antonio Texas; *X. Zhang*, Southeast University, China

SE-Contributed On Demand-34 Enhancing the Surface Properties of Polymethyl Methacrylate by TiO₂ Atomic Layer Deposition, *Mina Shahmohammadi*, E. Pensa, H. Bhatia, B. Yang, G. Jursich, C. Takoudis, University of Illinois - Chicago

SE-Contributed On Demand-37 Development and Scale-up of ALD Coatings for Sulfur Tolerant, Long Lifetime Catalyst Powders, *Christopher Gump*, J. Burger, D. Lindblad, G. Rojas, K. Buechler, Forge Nano; *W. McNeary*, National Renewable Energy Laboratory (NREL)

Advanced Surface Engineering Division

Room On Demand - Session SE-Invited On Demand Advanced Surface Engineering Invited On Demand Session 8:00am

INVITED: SE-Invited On Demand-1 Metallic Glass: A Novel and Emerging Coating For Various Industrial Applications, *P. Yiu*, *Jinn P. Chu*, National Taiwan University of Science and Technology, Taiwan

Applied Surface Science Division

Room On Demand - Session AS-Contributed On Demand

Applied Surface Science Contributed On Demand Session 8:00am

AS-Contributed On Demand-1 Peeling the Onion: Argon Cluster Sputtering Reveals the Internal Distribution of Species in Organic Nanoparticles, *Y. Pei, J. Vornig, R. Havelund, D. Cant, Alexander Shard*, National Physical Laboratory, UK

AS-Contributed On Demand-4 Buried Interface and Buried Film Analysis Using Lab-Scale Haxpes Instruments, *Thierry Conard, C. Zborowski, A. Vanleenhove, I. Hoflijk, I. Vaesen, P. van der Heide*, IMEC, Belgium

AS-Contributed On Demand-7 *Non-Destructive Chemical Characterization and Thickness Determination of Layer Stacks by Laboratory-Based Hard X-Ray Photoelectron Spectroscopy*, *Anja Vanleenhove, T. Conard, C. Zborowski, I. Hoflijk, P. van der Heide*, IMEC, Belgium; *K. Artyushkova, D. Watson*, Physical Electronics USA

AS-Contributed On Demand-10 Temperature Dependent Changes in Surface Chemistry of SrTiO₃ Analysed With XPS, Cluster Depth Profiling and Ion Scattering Spectroscopy, *Paul Mack*, Thermo Fisher Scientific, UK

AS-Contributed On Demand-13 LiTaO₃(110) Nano-Bonding with Si-based Materials via Surface Energy Engineering (SEE) and Three Liquid Contact Angle Analysis (3LCAA), *Shefali Prakash, A. Elison, S. Swaminathan, M. Sahal*, Arizona State University; *B. Baker, J. Kintz*, Intel Corporation; *A. Yano*, Texas A&M University; *S. Narayan*, University of Pennsylvania; *A. Brimhall*, Micron Technology; *L. Puglisi, R. Culbertson, N. Herbots*, Arizona State University

AS-Contributed On Demand-16 Understanding *Interphase* Formation in Nano-Bonding™ Of Gaas to Si in Air at T ≤ 220°C via Surface Energy Engineering Based on 3LCAA, IBA, XPS, SAM and TEM, *A. Gurijala, N. Suresh, A. Chow, S. Khanna, M. Sahal*, Arizona State University Physics Department; *S. Ram*, Yale University; *T. Diaz, M. Bertram, C. Cornejo, W. Peng, T. Balasooriya, T. Karcher*, Arizona State University Physics Department; *R. Culbertson*, Arizona State University Physics Department; *K. Kavanaugh*, Simon Fraser University, Canada; *N. Herbots*, Arizona State University Physics Department; *Pranav Penmarcha, S. Jandhyala*, Arizona State University

AS-Contributed On Demand-19 Computed Surface Vibration Modes, IR Absorption and Gibbs Free Energy for LiTaO₃(110) and LiNbO₃(110) Correlation with Surface Energies Measured via 3LCAA, *Mohammed Sahal, A. Elison, S. Prakash, S. Swaminathan, R. Rane, L. Puglisi, B. Baker, R. Culbertson, N. Herbots*, Arizona State University

AS-Contributed On Demand-22 Quantitative Fabric Analysis of Clay Flocs Using Two-Dimensional X-Ray Diffraction, *Tao Jiang, G. Zhang*, UMass Amherst

AS-Contributed On Demand-25 Deep Depth profiling using Gas Cluster SIMS – Micrometer Topography Development and Effects on Depth Resolution, *Shin Muramoto*, NIST; *D. Graham*, University of Washington

AS-Contributed On Demand-28 Effects of Li Deintercalation in the Electronic Structure of Li_xCoO₂ Epitaxial Thin Films, *Elena Salagre*, Dto. Fisica Materia Condensada, Univ Autonoma de Madrid, Spain; *P. Segovia*, Univ Autonoma de Madrid, IFIMAC, Spain; *M. González-Barrio*, Univ. Complutense de Madrid, Spain; *J. Pearson*, University of Maryland; *I. Takeuchi*, University of Maryland; *E. Fuller, A. Talin*, Sandia National Laboratories; *M. Jugovac, P. Moras*, Istituto di Struttura della Materia, Consiglio Nazionale delle Ricerche, Italy; *A. Mascaraque*, Dto. Fisica de Materiales, Fac. Ciencias Físicas, Univ. Complutense de Madrid, Spain; *E. Garcia-Michel*, Univ. Autonoma de Madrid, IFIMAC, Spain

AS-Contributed On Demand-31 Understanding the Effect of Surface Treatment on the Boehmite Scale Formation on Aluminum 6061, *Lyndi Strange, X. Yu, V. Shutthanandan, J. Gao, J. Son, Y. Zhang, R. Prabhakaran, K. Brooks, V. Joshi*, Pacific Northwest National Laboratory

AS-Contributed On Demand-34 Using Polyamide Films Grown by Molecular Layer Deposition (MLD) on Si(111) to Form 3C-SiC Thin Film, *Rustam Amashaev*, Dagestan State University, Russian Federation; *I. Abdulgatov*, Dagestan State University, Russian Federation

AS-Contributed On Demand-37 GaAs/Si Surface Energy Engineering, Modeling, and Nano-Bonding™ for Solar Cells at Low Temperatures ≤ 220°C, *A. Gurijala, P. Penmarcha, S. Jandhyala, M. Sahal, W. Peng, T. Balasooriya, T. Diaz, M. Bertram, C. Cornejo*, Arizona State University; *K. Kavanaugh*, Simon Fraser University; *R. Culbertson, Nicole Herbots*, Arizona State University

AS-Contributed On Demand-40 Surface Characterisation of sp² Carbon Materials – From Graphene to Nuclear Graphite, *Sarah Coultas, J. Counsell, N. Gerrard*, Kratos Analytical Limited, UK; *C. Moffitt*, Kratos Analytical Inc; *C. Blomfield*, Kratos Analytical Limited, UK

AS-Contributed On Demand-43 Understanding the Intrinsic Stability of Solvated Electroactive Ions at Heterogenous Mg Interfaces, *Venkateshkumar Prabhakaran, G. Johnson*, Pacific Northwest National Laboratory; *G. Agarwal, J. Howard, L. Curtis*, Argonne National Laboratory, USA; *L. Soule, S. Wi, K. Hankins, S. Thevuthasan, V. Shutthanandan, Y. Shao, R. Assary, K. Mueller, V. Murugesan*, Pacific Northwest National Laboratory

AS-Contributed On Demand-46 A New SIMS Method to Characterize Hydrogen in Polysilicon Films, *Xuefeng Lin, A. Fucsko, K. Noehring, J. Brown, E. Gabriel, A. Regner, S. York, D. Palsulich*, Corporate Laboratory, Technology Department, Micron Technology, Inc.

AS-Contributed On Demand-49 Crystal Anisotropy in Surface Energy Engineering(See) OF LiTaO₃(110) Piezo-Electric for Low Temperature (< 453 K) Nano-Bonding™ to Si and A-Quartz SiO₂, *S. Prakash, M. Sahal, A. Elison, Shreyash Prakash, B. Baker, S. Narayan, L. Puglisi, R. Culbertson, N. Herbots*, Arizona State University

AS-Contributed On Demand-52 Coincident XPS and Raman Analysis of Drug Composition Phases in a Pain-Killing Tablet, *Paul Mack*, Thermo Fisher Scientific, UK

AS-Contributed On Demand-55 Advancing Multimodal Imaging of the Evolving Interface of Irradiated Materials, *Xiao-Ying Yu, J. Yao, S. Spurgeon, B. Matthews, S. Riechers, Z. Zhu, W. Luscher*, Pacific Northwest National Laboratory

AS-Contributed On Demand-58 Quantum Considerations About the Magic Angle in XPS Equipment, *Alberto Herrera-Gomez*, Cinvestav-Unidad Queretaro, Mexico

AS-Contributed On Demand-61 Optimization and Characterization of Isotopically-Labeled, Epitaxial Fe₂O₃ and Cr₂O₃ for Diffusion Studies, *Tiffany Kaspar, S. Taylor, K. Yano*, Pacific Northwest National Laboratory; *T. Lach*, Oak Ridge National Laboratory; *Y. Zhou*, Pacific Northwest National Laboratory, USA; *Z. Zhu*, Pacific Northwest National Laboratory; *A. Kohnert*, Los Alamos National Laboratory; *E. Still, P. Hosemann*, University of California at Berkeley; *D. Schreiber*, Pacific Northwest National Laboratory

AS-Contributed On Demand-64 Adsorption Study of L-Cysteine Self-Assembled Monolayers on Au (100) Surface by Scanning Tunnelling Microscopy and Ab-Initio Methods, *V. Franco, S. Rodríguez-Sotelo*, Instituto de Física del Litoral (CONICET-UNL), Argentina; *G. Ruano-Sandoval*, Centro Atómico Bariloche (CNEA), Argentina; *M. Passeggi (h)*, Instituto de Física del Litoral (CONICET-UNL), Argentina; *Florencia Calaza*, Instituto de Desarrollo Tecnológico para la Industria Química (CONICET-UNL), Argentina

AS-Contributed On Demand-67 Navigating Disorder in Superconductors Using Atomic-Scale Imaging and Machine Learning, *Petro Maksymovych*, Oak Ridge National Laboratory

AS-Contributed On Demand-70 Overview of JVST A Collection of Guides and Best Practices for XPS, *Don Baer*, Pacific Northwest National Laboratory; *K. Artyushkova*, Physical Electronics USA; *C. Easton*, CSIRO Manufacturing, Australia; *M. Engelhard*, Pacific Northwest National Laboratory; *G. McGuire*, Adámas Nanotechnologies, Inc.,; *A. Shard*, National Physical Laboratory, U.K.

AS-Contributed On Demand-73 Surface Functionalization and Atomic Layer Deposition of Binary Metal Oxides on MoS₂ Surfaces, *Theodosia Gougousi, J. Kropp, C. Ataca*, UMBG

AS-Contributed On Demand-76 Elucidating the Lubrication Mechanism of Ionic Liquid: a Multi-technique, Nanoscale Spectroscopy and Microscopy Study, *Filippo Mangolini, Z. Li, O. Morales-Collazo*, The University of Texas at Austin; *J. Sadowski*, Brookhaven National Laboratory; *H. Celio, A. Dolocan, J. Brennecke*, The University of Texas at Austin

AS-Contributed On Demand-79 Hydrogen Detection by SnO₂-Based Core-Shell Nanowires With Varying Shell Thicknesses Grown by Atomic Layer Deposition, *Muhammad Hamid Raza*, Humboldt-Universität zu Berlin, Germany; *N. Kaur, E. Comini*, University of Brescia, Italy; *N. Pinna*, Humboldt-Universität zu Berlin, Germany

AS-Contributed On Demand-82 X-Ray Absorption Near Edge Structure (XANES) Measurements of Oxides Formed on High Entropy Alloys, *Anil Krishna Battu, B. Gwalani, T. Suntharampillai, A. Devaraj*, Pacific Northwest National Laboratory

AS-Contributed On Demand-85 Laser Desorption Postionization vs. Secondary Ion Mass Spectrometry for Imaging of Organic Biomarkers in Geological Sample, *R. Wickramasinghe, M. Pasterski*, University of Illinois at Chicago; *A. Ievlev, M. Lorenz*, Oak Ridge National Laboratory; *I. Veryovkin, F. Kenig, Luke Hanley*, University of Illinois at Chicago

AS-Contributed On Demand-88 Box Plots: A Simple Graphical Tool for Visualizing Overfitting in Peak Fitting as Demonstrated with X-ray Photoelectron Spectroscopy Data, **Behnam Moeini**, *H. Haack*, Brigham Young University; *N. Fairley*, Casa Software Ltd, UK; *V. Fernandez*, CNRS, Institut des Matériaux Jean Rouxel, IMN, Université de Nantes, France; *T. Gengenbach*, *C. Easton*, Commonwealth Scientific and Industrial Research Organization (CSIRO) Manufacturing, Australia; *M. R. Linford*, Brigham Young University

AS-Contributed On Demand-91 A New Compact Electron Detector for REELS and Elastic Peak Spectroscopy, **Philippe Staib**, Staib Instruments

AS-Contributed On Demand-94 In Situ Spectroscopy Beamline at the Swiss Light Source, **Zbynek Novotny**, University of Zürich & Paul Scherrer Institute, Switzerland

AS-Contributed On Demand-97 The Frequency with which the Elements are Researched and their X-ray Photoelectron Spectroscopy (XPS) Narrow Scans are Shown in the Scientific Literature, *G. Major*, *G. Pinto*, *V. Carver*, Brigham Young University; *C. Easton*, *T. Gengenbach*, CSIRO Materials Science and Engineering, Australia; *W. Skinner*, Future Industries Institute, University of South Australia, Australia; *D. Baer*, Pacific Northwest National Laboratory; *T. Nunney*, Thermo Fisher Scientific, UK; **Matthew Linford**, Brigham Young University

AS-Contributed On Demand-100 Correlative Experimental and Theoretical Investigations of the Interfacial Bond Formation of Ti, Al, and TiAl Thin Films Deposited on Polycarbonate, **Lena Patterer**, *P. Ondracka*, *D. Bogdanovski*, *L. Jende*, *J. Schneider*, RWTH Aachen University, Germany

AS-Contributed On Demand-103 Analysis of XPS Depth-Profile Data Using Maximum Likelihood Reconstruction: Extracting Sample Structure and Sputtering Parameters, **Lev Gelb**, *A. Walker*, University of Texas at Dallas

AS-Contributed On Demand-106 Formation of Black Silicon-Like Nanostructures During Flat-Top Femtosecond Laser Ablation in Atmosphere, **Jason Gross**, *L. Hanley*, University of Illinois at Chicago

AS-Contributed On Demand-109 Laboratory Based Hard X-ray Photoelectron Spectroscopy, **Marcus Lundwall**, Scienta Omicron, Sweden; *B. Giles*, Scienta Omicron

AS-Contributed On Demand-112 Unravelling the Ion-Energy-Dependent Structure Evolution and Its Implications for the Elastic Properties of (v,Al)N Thin Films, **Soheil Karimi Aghda**, Chair of Materials Chemistry (MCh), RWTH Aachen University, Germany; *D. Music*, Department of Materials Science and Applied Mathematics, Malmö University, Sweden; *Y. Unutulmazsoy*, Leibniz Institute of Surface Engineering (IOM), Germany; *H. Sua*, *S. Mráz*, *M. Hans*, Chair of Materials Chemistry (MCh), RWTH Aachen University, Germany; *D. Primetzhofer*, Department of Physics and Astronomy, Uppsala University, Sweden; *A. Anders*, Leibniz Institute of Surface Engineering (IOM), Germany; *J. Schneider*, Chair of Materials Chemistry (MCh), RWTH Aachen University, Germany

AS-Contributed On Demand-115 Monte Carlo Evaluation of Uncertainty in Hurst Exponents Computed from Power Spectral Analysis of Atomic Force Microscopy Images, **Robert Chrostowski**, *Z. Li*, *F. Mangolini*, University of Texas at Austin

AS-Contributed On Demand-118 Spatially Resolved Molecular Compositions and Formation Mechanisms of Insoluble Engine Deposits Uncovered Using 3D OrbisIMS, **Max Edney**, University of Nottingham, UK; *E. Wilmot*, *J. Reid*, *J. Barker*, Innospec Ltd., UK; *M. Alexander*, *C. Snape*, *D. Scurr*, University of Nottingham, UK

AS-Contributed On Demand-121 Nano Gas Cells: Multimodal Surface Analysis of Catalytic Processes at Elevated Pressures and Temperatures, **Burcu Karagoz**, Brookhaven National Laboratory; *J. Carpena-Núñez*, Air Force Research Laboratory; *Y. Zhu*, *D. Zakharov*, Brookhaven National Laboratory; *B. Maruyama*, Air Force Research Laboratory; *D. Stacchiola*, *A. Head*, Brookhaven National Laboratory

AS-Contributed On Demand-124 Plasma Modification of Lab Coat Fabrics for Improved Protective Clothing, **Kimberly Hiyoto**, *E. Fisher*, Colorado State University

AS-Contributed On Demand-127 Lab-Scale Hard X-Ray Photoelectron Spectroscopy (HAXPES): Application to Buried Interfaces in Device Technology, **Pierre-Marie Deleuze**, *E. Martinez*, *O. Renault*, CEA-Leti, France

AS-Contributed On Demand-130 XPS Depth Profiling of Metal-Halide Perovskites, *C. Clark*, Department of Chemical Engineering and Materials Science, University of Minnesota, Minneapolis, MN 55455, USA.; **Jennifer Mann**, *B. Schmidt*, *K. Artyushkova*, *J. Newman*, Physical Electronics, Inc.; *E. Aydil*, New York University; *R. Holmes*, University of Minnesota,

AS-Contributed On Demand-133 Characterization on ALD-functionalized Magnesium Borohydride Materials for Hydrogen Storage, **Margaret A. Fitzgerald**, Colorado School of Mines, Department of Chemistry; *N. Leick*, National Renewable Energy Laboratory; *K. Gross*, H2 Technology Consulting LLC; *S. Christensen*, National Renewable Energy Laboratory; *S. Pylypenko*, Colorado School of Mines, Department of Chemistry

AS-Contributed On Demand-136 Use of Artificial Intelligence Techniques to Automate the Analysis of XAFS spectra, **Jeff Terry**, Illinois Institute of Technology

AS-Contributed On Demand-139 ALD Overcoating for Hydrogenation and Dehydrogenation Catalysts, **Staci Moulton**, Forge Nano

AS-Contributed On Demand-142 The Deterioration Mechanism of Silicone Elastomer during Vacuum Casting of Polyurethane, **Natalie Frese**, Bielefeld University, Germany; *M. Wortmann*, Bielefeld University of Applied Sciences, Germany; *K. Viertel*, Bielefeld University of Applied Sciences,, Germany; *W. Keil*, Paderborn University, Germany; *A. Welle*, Karlsruhe Institute of Technology, Germany; *W. Hachmann*, Bielefeld University, Germany; *C. Schmidt*, Paderborn University, Germany; *B. Hüsgen*, Bielefeld University of Applied Sciences, Germany; *A. Götzhäuser*, Bielefeld University, Germany

AS-Contributed On Demand-145 Oxidation of Amorphous Metal Alloy Surfaces Studied Using Ambient Pressure X-Ray Photoelectron Spectroscopy, **Pedro Alzaga**, Oregon State University and HP Inc.; *J. Diulus*, *R. Addou*, Oregon State University; *W. Stickle*, HP, Inc.; *J. Jenkins*, *G. Herman*, Oregon State University

AS-Contributed On Demand-148 High-Speed Analysis of Spectroscopic Ellipsometry Data Using Deep Learning Methods, **Yifei Li**, Massachusetts Institute of Technology; *H. Yu*, *I. Takeuchi*, University of Maryland, College Park; *R. Jaramillo*, Massachusetts Institute of Technology

AS-Contributed On Demand-151 Optimization of LLZCN/LiPF₆/PEO Solid-state Electrolyte for Energy Storage Application, **Samuel Danquah**, Norfolk State University; *C. Denize*, Norfolk State University; *J. Strimaitis*, *S. Pradhan*, *C. Bonner*, *M. Bahoura*, Norfolk State University

AS-Contributed On Demand-157 Analysis of Thin Film Specimens Using ToF-SIMS Wedge Protocol, A Comparison with Depth Profiling, **Vincent Smentkowski**, *S. Goswami*, GE-GRC; *F. Kollmer*, *J. Zakel*, *H. Arlinghaus*, *D. Rading*, IONTOF GmbH, Germany

AS-Contributed On Demand-160 Setting the Stage: Strain-Directed Metallization of Liquid Metals Using Surface Acoustic Wave Devices on Piezoelectric Substrates, **Brian Rummel**, *L. Miroshnik*, University of New Mexico; *A. Li*, *T. Sinno*, University of Pennsylvania; *G. Balakrishnan*, *S. Han*, University of New Mexico

AS-Contributed On Demand-163 Current Trends in XPS Data Analysis, Including Major Errors and the Most Common Elements and Materials Analyzed, **George Major**, Brigham Young University; *T. Avval*, *B. Moeini*, Brigham Young University; *A. Herrera Gomez*, CINVESTAV-Unidad Querétaro, México; *C. Easton*, *T. Gengenbach*, CSIRO, Australia; *W. Skinner*, Future Industries Institute, University of South Australia, Australia; *D. Baer*, Pacific Northwest National Laboratory; *M. Linford*, Brigham Young University

Applied Surface Science Division

Room On Demand - Session AS-Invited On Demand

Applied Surface Science Invited On Demand Session 8:00am

INVITED: AS-Invited On Demand-1 Hard Targets: Developing Tools for Quantitative HAXPES, **David Cant**, National Physical Laboratory, U.K.

INVITED: AS-Invited On Demand-19 ASSD 2020 Peter M.A. Sherwood Mid-Career Professional Award Talk: Innovations in Biological, Nanoscale, and Nuclear Materials Analysis with SIMS, **Christopher Szakal**, National Institute of Standards and Technology

INVITED: AS-Invited On Demand-25 The Role of Photoelectron Diffraction Effects on the Flat Surface State Bands Close to the Fermi Level: Revisiting the Si(111) 7x7 Surfaces, **María C. Asensio**, Materials Science Institute of Madrid (ICMM), Spanish Scientific Research Council (CSIC), Spain

INVITED: AS-Invited On Demand-37 Hardware and Data Analysis Methods for Integrating TEM and Atom Probe Tomography, **Brian Gorman**, *E. Supple*, *G. Burton*, Colorado School of Mines

INVITED: AS-Invited On Demand-43 High Resolution Angle-Resolved Photoemission Spectroscopy Studies of Quantum Materials, **Inna Vishik**, University of California at Davis

INVITED: AS-Invited On Demand-55 Synergies between Synchrotron and Lab-Based X-Ray Techniques for the Studies of Complex Materials and Interfaces, **Alexander Gray**, Temple University

Atomic Scale Processing Focus Topic Room On Demand - Session AP-Contributed On Demand Atomic Scale Processing Contributed On Demand Session 8:00am

AP-Contributed On Demand-1 Cu₂O Spontaneous Etching By Acetylacetone and Cu Atomic Layer Etching Using Sequential O₂ or O₃ and Acetylacetone Exposures, **Aziz Abdulgatov**, J. Partridge, University of Colorado at Boulder; V. Sharma, C. Dezelah, ASM Microchemistry Ltd., Finland; S. George, University of Colorado at Boulder

AP-Contributed On Demand-4 In-situ Analysis of Surface Reactions for Plasma-Assisted Thermal-Cyclic Atomic Layer Etching of Tantalum Nitride, **Kazunori Shinoda**, Hitachi, Japan; M. Hasegawa, Nagoya University, Japan; H. Hamamura, Hitachi, Japan; K. Maeda, K. Yokogawa, M. Izawa, Hitachi High-Tech, Japan; K. Ishikawa, M. Hori, Nagoya University, Japan

AP-Contributed On Demand-7 A first-principle Investigation of the ALD Selectivity Driving Forces for the Area Deposition of TiO₂, **Yukio Kaneda**, Sony Semiconductor Solutions Corporation, Japan; E. A. Marques, Katholieke Universiteit Leuven, Belgium; S. Armini, A. Delabie, M. van Setten, G. Pourtois, IMEC, Belgium

AP-Contributed On Demand-10 Scaling of InGaZnO to sub-40nm Regime Using Advanced Etch Techniques, **Shreya Kundu**, F. Lazzarino, IMEC, Belgium

AP-Contributed On Demand-13 A Theoretical Investigation Into the Oxidative Etching of Ruthenium, **Neung-Kyung Yu**, B. Shong, Hongik University, Korea (Republic of); J. Lee, W. Kim, Hanyang University, Korea (Republic of)

AP-Contributed On Demand-16 Blocking Thermal Atomic Layer Etching With Removable Etch Stop Layers, **David Zywotko**, University of Colorado Boulder; O. Zandi, J. Faguet, P. Abel, TEL Technology Center, America, LLC; S. George, University of Colorado Boulder

AP-Contributed On Demand-19 Atomic Layer Etching of HfO₂ and ZrO₂ Landing on WS₂ Transition Metal Dichalcogenide, **Jean-Francois de Marneffe**, D. Marinov, imec v.z.w., Belgium; A. Goodyear, Oxford Instruments Plasma Technology, UK; B. Groven, imec v.z.w., Belgium; P. Wyndaele, KU Leuven, Belgium; S. Kundu, imec v.z.w., Belgium; M. Cooke, Oxford Instruments Plasma Technology, UK; S. De Gendt, KU Leuven, Belgium

AP-Contributed On Demand-22 Probing the Selectivity of Area-Selective Spatial ALD + Etch-Back Supercycles for SiO₂ by Low Energy Ion Scattering, **Alfredo Mameli**, TNO-Holst Centre, Netherlands; P. Br ner, IONTOF GmbH, Germany; F. Roozeboom, TNO-Holst Centre, Netherlands; T. Grehl, IONTOF GmbH, Germany; P. Poodt, TNO-Holst Centre, Netherlands

AP-Contributed On Demand-25 CMOS-Compatible Processing of Atomic-Precision Donor Devices, **DeAnna Campbell**, A. Leenheer, E. Anderson, S. Schmucker, J. Ivie, X. Gao, W. Lepkowski, T. Lu, L. Tracy, S. Misra, Sandia National Laboratories

AP-Contributed On Demand-28 Room Temperature Operation of Donor-Based Atomically Precise Devices, **Jeffrey Ivie**, L. Tracy, J. Mendez, S. Gao, E. Anderson, S. Schmucker, D. Campbell, D. Scrymgeour, A. Katzenmeyer, D. Ward, T. Lu, S. Misra, Sandia National Laboratories

AP-Contributed On Demand-31 The Interplay of Diffusion and Size-Dependent Reactivity in Ruthenium Area-Selective Deposition, **Jan-Willem Clerix**, E. Marques, A. Delabie, KU Leuven / imec, Belgium

AP-Contributed On Demand-34 Thermal Atomic Layer Etching of Nickel and Cobalt Using SO₂Cl₂ and P(CH₃)₃, **Jessica Murdzek**, S. George, University of Colorado at Boulder

AP-Contributed On Demand-37 Molecular Mechanisms of Thermal Atomic Layer Etching of Cobalt, Iron, and their Alloys, **Andrew Teplyakov**, University of Delaware

AP-Contributed On Demand-40 Towards Ultraprecise Bipolar 2D devices using Atomic Precision Advanced Manufacturing, **James H.G. Owen**, R. Santini, E. Fuchs, J. Randall, Zyvex Labs; J. Mendez, X. Gao, D. Mamaluy, S. Misra, Sandia National Laboratories

AP-Contributed On Demand-43 Mechanism of Thermal Dry Etching of Metallic Iron Thin Films Using Chlorine and Acetylacetone (acacH), **Mahsa Konh**, A. Teplyakov, University of Delaware

AP-Contributed On Demand-46 Plasma Enhanced Atomic Layer Deposition of Molybdenum Carbonitride Films, **Ian Campbell**, T. Walter, A. Molina, A. Agyaopong, S. Mohnhey, The Pennsylvania State University

AP-Contributed On Demand-49 Thermal Atomic Layer Etching of Al₂O₃ and Aln Using Hf or XeF₂ for Fluorination and BCl₃ for Ligand-Exchange, **Austin Cano**, S. George, University of Colorado at Boulder

AP-Contributed On Demand-55 Mechanisms of Thermal Atomic Layer Etching (ALE) of Metal by β -diketones, **Abdulrahman H. Basher**, Center for Atomic and Molecular Technologies, Osaka University, Osaka, Japan; I. Hamada, Graduate School of Engineering, Osaka University, Osaka, Japan; M. Krstić, Institute of Nanotechnology, Karlsruhe Institute of Technology (KIT), Karlsruhe, Germany; T. Ito, K. Karahashi, Center for Atomic and Molecular Technologies, Osaka University, Osaka, Japan; W. Wenzel, Institute of Nanotechnology, Karlsruhe Institute of Technology (KIT), Karlsruhe, Germany; S. Hamaguchi, Center for Atomic and Molecular Technologies, Osaka University, Osaka, Japan

AP-Contributed On Demand-58 Orthogonal Bottom-up Nanopatterning of TiO₂ on SiO₂ and W on Si-H Using Thermal Atomic Layer Deposition and Etching, **S. Song**, **Jungsik (Justin) Kim**, G. Parsons, North Carolina State University

AP-Contributed On Demand-61 Experimental Study of Metal-Oxides Etch Selectivity, **Hamid Razavi**, University of California at Los Angeles; M. Shen, J. Hoang, T. Lill, Lam Research Corporation; J. Chang, University of California at Los Angeles

Atomic Scale Processing Focus Topic Room On Demand - Session AP-Invited On Demand Atomic Scale Processing Invited On Demand Session 8:00am

INVITED: AP-Invited On Demand-1 In-situ Characterization of the Earliest Stages of Selective ALD Growth and Inhibition, **Alex Martinson**, Argonne National Laboratory

INVITED: AP-Invited On Demand-7 Atomic Layer Processing Using Low-Energy Cluster Beam Irradiation, **Noriaki Toyoda**, University of Hyogo, Japan; K. Uematsu, University of Hyogo, Japan, Afghanistan

INVITED: AP-Invited On Demand-13 The Thinner, The Better - Characterization of Ultra-thin Films by Low Energy Ion Scattering (LEIS), **Thomas Grehl**, P. Br ner, IONTOF GmbH, Germany

INVITED: AP-Invited On Demand-19 Spectroscopic Ellipsometry for Atomic Scale Processing, **Harm Knoops**, Oxford Instruments Plasma Technology, Netherlands

INVITED: AP-Invited On Demand-25 Area-selective Atomic Layer Deposition of Palladium and Atomic Layer Etching of Palladium, **H. Nallan**, X. Yang, B. Coffey, **John Ekerdt**, University of Texas at Austin

INVITED: AP-Invited On Demand-31 Strategies for a Selective Deposition Process Combining Deposition and Etching Steps in a Unique Tool, **Christophe Vall e**, SUNY POLY, Albany; M. Bonvalot, T. Yeghoyan, R. Vallat, M. Jaffal, V. Pesce, LTM - UGA/CNRS, France; A. Chaker, University of Manchester, UK; S. Belachcen, G. Lefevre, B. Pelissier, LTM - UGA/CNRS, France; N. Poss m , R. Gassilloud, CEA/LETI-University Grenoble Alpes, France

INVITED: AP-Invited On Demand-37 Thermal Atomic Layer Etching - An Emerging and Enabling Etching Technology, **Andreas Fischer**, A. Routzahn, R. Gasvoda, P. Lemaire, J. Sims, T. Lill, Lam Research Corporation

INVITED: AP-Invited On Demand-43 Nanoscale Chemical Analysis and Mapping of Atomic Scale Processes via Photo-Induced Force Microscopy, **Sung Park**, D. Nowak, T. Albrecht, Molecular Vista

Biomaterial Interfaces Division Room On Demand - Session BI-Contributed On Demand Biomaterial Interfaces Contributed On Demand Session 8:00am

BI-Contributed On Demand-1 A Mussel Inspired Catechol Polymer: Is It Sticky?, **Laura Mears**, J. Appenroth, M. Valtiner, Vienna University of Technology, Austria

BI-Contributed On Demand-4 Fast, Accurate Blood Analysis Algorithm for X-Ray Fluorescence on Homogeneous Thin Solid Films of Microliter-sized Whole Blood Droplets, **T. Balasooriya**, W. Peng, N. Suresh, A. Gurijala, S. Khanna, A. Chow, M. Sahal, Arizona State University; S. Ram, Yale University; S. Narayan, University of Pennsylvania; Y. Pershad, Stanford University; E. Culbertson, Ronald Reagan UCLA Medical Center; R. Culbertson, N. Herbots, Arizona State University; V. Desai, **Aarush Thinakaran**, MicroDrop Diagnostics, LLC

BI-Contributed On Demand-10 Surface Analysis of Alum Adjuvant for Vaccine Development and Delivery, *G. Guerrini*, University of Siena LAMMB (Biotechnology and Molecular Microbiology Lab), Italy; *J. Banuls Ciscar*, European Commission, Joint Research Centre, Italy; *F. Fumagalli*, European Commission, Joint Research Centre, Italy; *J. Ponti*, *L. Calzolari*, European Commission, Joint Research Centre, Italy; *D. Medaglini*, University of Siena, LAMMB (Biotechnology and Molecular Microbiology Laboratory), Italy; *Giacomo Ceccone*, European Commission, Joint Research Centre, Italy

BI-Contributed On Demand-13 Design for X-ray Fluorescence, X-ray Photoelectron Spectroscopy, and Ion Beam Analysis of Blood Drops solidified as Homogeneous Thin Films for Fast, Small Volume, Accurate Diagnostics, *N. Suresh*, *A. Gurijala*, *S. Khanna*, *A. Chow*, *W. Peng*, *T. Balasooriya*, MicroDrop Diagnostics, LLC; *M. Sahal*, Arizona State University; *L. Puglisi*, SiO2 Innovates, LLC; *E. Culbertson*, MicroDrop Diagnostics, LLC; *N. Herbots*, Arizona State University; *A. Thinakaran*, *Ashwin Suresh*, MicroDrop Diagnostics, LLC

BI-Contributed On Demand-16 Mussel Foot Adhesion: A Fundamental Perspective on Factors Governing Strong Underwater Adhesion, *J. Appenroth*, *L. Mears*, *P. Bilotto*, *A. Imre*, *H. Cheng*, *Markus Valtiner*, Vienna University of Technology, Austria

BI-Contributed On Demand-19 Hand-Held X-ray Fluorescence (XRF) Analysis for Fast, Accurate, Comprehensive Small Volume Blood Diagnostics using Blood Drops Rapidly Solidified into Homogeneous Thin Solid Films, *Thilina Balasooriya*, *W. Peng*, *N. Suresh*, *A. Gurijala*, *M. Sahal*, Arizona State University; *S. Narayan*, University of Pennsylvania; *Y. Pershad*, Stanford University; *E. Culbertson*, UCLA Medical Center; *R. Culbertson*, *N. Herbots*, Arizona State University

BI-Contributed On Demand-22 GCIB-ToF-SIMS Imaging for Lipid Imaging in Planaria, *Lara Gamble*, *D. Graham*, University of Washington, Seattle; *C. Anderton*, *D. Velickovic*, Pacific Northwest National Laboratory; *T. Angerer*, University of Washington, Seattle

BI-Contributed On Demand-25 Studying the Aggregation Effect of Microbes on Mineral Oxide and Synthetic Soil Using ToF-SIMS, *Yuchen Zhang*, *X. Yu*, *J. Son*, Pacific Northwest National Laboratory; *Q. Huang*, *W. Chen*, Huazhong Agricultural University, China

BI-Contributed On Demand-28 Toward Custom Degradation of Silk-Based Biomaterials: Tailoring the Surface Chemistry of Silk Fibroin via Plasma-Based Strategies, *Morgan Hawker*, California State University, Fresno

BI-Contributed On Demand-31 Using Transferrable Graphene-Based Membranes for Spatial and Temporal Control of Cell Cultures, *Keith Whitener*, *D. Haridas*, *W. Lee*, US Naval Research Laboratory; *S. Yoseph*, Howard University; *C. So*, *J. Robinson*, US Naval Research Laboratory

BI-Contributed On Demand-34 Polymeric Thin Films Designed to Direct *Pseudomonas aeruginosa* Iron Scavenging, Biofilm Growth, and Pathogenicity, *Trevor Donadt*, *Y. Wu*, *J. Lang*, *S. Li*, *R. Yang*, Cornell University

BI-Contributed On Demand-37 Hydrogen Peroxide Detection Using Modified Electrochemical Electrodes for the Intestinal Environment, *Santiago Botasini*, *D. Jesner*, *J. Stine*, *R. Ghodssi*, University of Maryland

BI-Contributed On Demand-40 Electrochemical Activation of CNT-coated Carbon Fiber Microelectrodes for Serotonin Sensing, *Jinjing Han*, *S. Botasini*, *A. Chapin*, *R. Ghodssi*, University of Maryland, College Park

BI-Contributed On Demand-43 Grafting-to of Biomimetic Bottlebrush Polymer, *L. Navarro*, *D. French*, *T. Shah*, *Stefan Zauscher*, Duke University

BI-Contributed On Demand-46 Design and Synthesis of Multifunctional Nucleotide Analogue Delivery Vehicles to Combat Cancer, *Y. Yang*, *S. Deshpande*, *A. Chilkoti*, *Stefan Zauscher*, Duke University

BI-Contributed On Demand-52 Structure Determination of Surface Bound Proteins: Are We There Yet?, *David Castner*, University of Washington

BI-Contributed On Demand-55 Chemical Changes On, and Through, The Bacterial Envelope in *E. coli* Mutants Exhibiting Impaired Plasmid Transfer Identified Using Time-of-Flight Secondary Ion Mass Spectrometry, *Kelly Dimovska Nilsson*, University of Gothenburg, Sweden; *M. Palm*, University of Gothenburg, Sweden, Centre for Antibiotic Resistance Research, University of Gothenburg, Sweden; *J. Hood*, *J. Sheriff*, School of Engineering, Newcastle University, UK; *A. Farewell*, Department of Chemistry and Molecular Biology, University of Gothenburg, Sweden, Centre for Antibiotic Resistance Research, University of Gothenburg, Sweden; *J. Fletcher*, University of Gothenburg, Sweden

BI-Contributed On Demand-58 Novel Bio-Inspired Urinary Catheter Reduces Protein Deposition and Incidence of Catheter-Associated Urinary Tract Infections, *Marissa Andersen*, University of Notre Dame; *J. Fong*, University of Maine; *A. LaBella*, *A. Molesan*, University of Notre Dame; *C. Howell*, University of Maine; *A. Flores-Mireles*, University of Notre Dame

BI-Contributed On Demand-61 Deconvolution of 3D OrbiSIMS Biological Datasets via Comprehensive Molecular Formula Prediction, *A. Kotowska*, *M. Edney*, *David Scurr*, University of Nottingham, UK

BI-Contributed On Demand-64 Immiscible Liquid-Coated Filters Resist Biofouling, *Justin Hardcastle*, *D. Regan*, *C. Fong*, University of Maine; *R. Shah*, *S. Hung*, *A. Cihanoglu*, *J. Schiffman*, University of Massachusetts Amherst; *C. Howell*, University of Maine

BI-Contributed On Demand-67 A Graphene-Based Platform for Investigation of Protein Assembly by Infrared Nanospectroscopy, *Xiao Zhao*, *D. Li*, Lawrence Berkeley National Laboratory (LBNL), China; *Y. Lu*, Lawrence Berkeley National Laboratory (LBNL), Taiwan; *P. Ashby*, *M. Salmeron*, Lawrence Berkeley National Laboratory (LBNL)

BI-Contributed On Demand-70 Analysis of Intact Proteins in the 3d Orbisims, *Anna Kotowska*, *G. Trindade*, *P. Williams*, *J. Aylott*, University of Nottingham, UK; *A. Shard*, National Physical Laboratory (NPL), UK; *M. Alexander*, *D. Scurr*, University of Nottingham, UK

BI-Contributed On Demand-73 Cell Instructive Materials for Next Generation Medical Devices: Microtopography Opportunities, *Morgan Alexander*, The University of Nottingham, UK

BI-Contributed On Demand-76 Physical Virology of SARS-CoV-2 Uptake and Adhesion, *S. Kumar*, University of Texas at Austin; *A. Paul*, University of Texas at Austin, Chalmers University of Technology, Sweden; *N. Nehra*, *D. Wang*, *A. Nisar*, *Sapun H. Parekh*, University of Texas at Austin

Biomaterial Interfaces Division

Room On Demand - Session BI-Invited On Demand

Biomaterial Interfaces Invited On Demand Session 8:00am

INVITED: BI-Invited On Demand-1 Ion-Assisted Plasma Polymerization: Surface Engineering of Biomimetic Interface, *Behnam Akhavan*, *M. Bilek*, The University of Sydney, Australia

INVITED: BI-Invited On Demand-7 NanoSIMS Imaging of Cholesterol and Sphingolipids in Cell Membranes, *Mary Kraft*, University of Illinois at Urbana-Champaign

INVITED: BI-Invited On Demand-13 Materials inspired from Catch Bonds and other Biological Adhesion Strategies, *Sinan Ketten*, Northwestern University

INVITED: BI-Invited On Demand-19 Contact Mechanics of Hydrogels, *Yuhang Hu*, Georgia Tech; *Y. Lai*, *D. He*, Georgia Institute of Technology

INVITED: BI-Invited On Demand-25 Understanding the Role of Protein Deposition Associated to Catheter-induced Inflammation in the Development of CAUTI, *M. Andersen*, University of Notre Dame; *J. Fong*, *C. Howell*, University of Maine; *Ana Flores-Mireles*, University of Notre Dame

Biomaterials Plenary Session: Materials and Biology for the Future of Energy and the Environment

Room On Demand - Session BP-Invited On Demand

Biomaterials Plenary Invited On Demand Session 8:00am

INVITED: BP-Invited On Demand-1 Programmable Icosahedral Shell System for Virus Trapping, *Hendrik Dietz*, TU Munich, Germany

INVITED: BP-Invited On Demand-7 Reaction Microenvironments Formed by Bioinspired All-Aqueous Phase Separation, *Christine Keating*, Penn State University

Chemical Analysis and Imaging at Interfaces Focus Topic

Room On Demand - Session CA-Contributed On Demand

Chemical Analysis and Imaging at Interfaces Contributed On Demand Session

8:00am

CA-Contributed On Demand-1 Capturing Charge-Dynamics of Ionic-Liquid Electrolytes Within Energy Storage Devices With Operando X-Ray Photoelectron Spectroscopy, *E. Oz*, Bilkent University, Turkey; *M. Basaran*, Koc University, Turkey; *B. Ulgut*, Bilkent University, Turkey; *C. Kocabas*, Manchester University, UK; *A. Kocabas*, Koc University, Turkey; *Sefik Suzer*, Bilkent University, Turkey

CA-Contributed On Demand-4 Operando Spatiotemporal Potential Mapping of Ionic Liquid Polarization in a Coplanar Electrochemical Device Using Xps and Sem Comparatively, **Sefik Suzer**, Bilkent University, Turkey; **E. Strelcov**, A. Kolmakov, National Institute of Standards and Technology (NIST)

CA-Contributed On Demand-7 Selecting a Water-lean Solvent for CO₂ Capture Using Liquid ToF-SIMS, **Jun Gao**, Y. Zhang, J. Son, Z. Zhu, D. Heldebrant, R. Rousseau, X. Yu, Pacific Northwest National Laboratory

CA-Contributed On Demand-10 Algorithms for Automatic Analysis of Image Based Process Control and Its Implementation from Lab to Fab, **Julien Baderot**, H. Ozdoba, D. Misra, N. Clement, S. Martinez, J. Foucher, POLLEN METROLOGY, France

CA-Contributed On Demand-13 Factors Influencing Surface Carbon Contamination in Ambient-Pressure X-Ray Photoelectron Spectroscopy Experiments, **Nicola' Comini**, Z. Novotny, J. Diulus, University of Zurich, Switzerland; T. Huthwelker, Paul Scherrer Institut, Switzerland; J. Osterwalder, University of Zurich, Switzerland

CA-Contributed On Demand-16 Effects of Electrolytes on the Oxidation and Corrosion of Iron Interfaces Using PM-IRRAS, **Kathryn Perrine**, Michigan Technological University

CA-Contributed On Demand-19 *in situ* XPS for Catalysis; Up to and Above One Bar, **Christopher Goodwin**, Stockholm University, Sweden; P. Loemker, Deutsches Elektronen-Synchrotron, Germany; M. Shipilin, D. Degerman, P. Amann, A. Nilsson, Stockholm University, Sweden

CA-Contributed On Demand-22 Electrically Detected Magnetic Resonance & Near-Zero Field Magnetoresistance in ²⁸Si/²⁸SiO₂, **Elias Frantz**, Penn State University; D. Michalak, Intel Corp.; N. Harmon, University of Evansville; E. Henry, Intel Corp.; M. Flatte, University of Iowa; S. King, J. Clarke, Intel Corp.; P. Lenahan, Penn State University

CA-Contributed On Demand-25 Atomic-Scale Dynamics of Epitaxial Oxide Growth During Cu Oxidation Revealed by in Situ ETEM and DFT, **Meng Li**, M. Curnan, S. House, W. Saidi, J. Yang, University of Pittsburgh

CA-Contributed On Demand-28 Observing Plasma Assisted Processes *in situ* using SEM, **Andrei Kolmakov**, NIST

CA-Contributed On Demand-31 Graphene Encapsulation Platform for Multi-Technique Spectromicroscopy of Biological Cells and Hydrated Objects, C. Arble, NIST-Gaithersburg; H. Guo, Southeast University, Nanjing, China; A. Matruggio, University College London, UK; L. Vaccari, Elettra-Sincrotrone Trieste, Italy; **Andrei Kolmakov**, NIST-Gaithersburg

CA-Contributed On Demand-34 Ultrathin Free-Standing Oxide Membranes for Environmental Spectroscopic Study of Solid-Gas and Solid-Liquid Interface, X. Zhao, Lawrence Berkeley National Laboratory (LBNL), China; Y. Lu, Lawrence Berkeley National Laboratory (LBNL), Taiwan; C. Carlos, Lawrence Berkeley National Laboratory (LBNL), Spain; M. van Spronsen, Diamond Light Source, UK, Netherlands; **Miquel Salmeron**, Lawrence Berkeley National Laboratory (LBNL)

Chemical Analysis and Imaging at Interfaces Focus Topic

Room On Demand - Session CA-Invited On Demand

Chemical Analysis and Imaging at Interfaces Invited On Demand Session

8:00am

INVITED: CA-Invited On Demand-7 Measuring the Depth Profiles of Surfactants, Ions, and Solvent at the Angstrom Scale, X. Zhao, University of Wisconsin - Madison; G. Andersson, Flinders University, Australia; **Gilbert Nathanson**, University of Wisconsin - Madison

INVITED: CA-Invited On Demand-13 In-Situ/Operando Soft X-Ray Spectroscopy Characterization of Chemical Interfaces, Y. Liu, X. Feng, Lawrence Berkeley National Laboratory (LBNL); **Jinghua Guo**, Lawrence Berkeley National Laboratory

INVITED: CA-Invited On Demand-19 Direct-Write Electron Beam Processing of Topologically Complex Functional Nanomaterials using Thermo-Electrically Energized Multiphase Precursor Jets, **Andrei Fedorov**, Georgia Institute of Technology

INVITED: CA-Invited On Demand-25 From Bulk to Constriction: Scaling Analysis of Ionic Transport Through Nanopores and Channels, **Michael Zwolak**, NIST; S. Sahu, University of Colorado at Boulder

Electronic Materials and Photonics Division

Room On Demand - Session EM-Contributed On Demand

Electronic Materials and Photonics Contributed On Demand Session

8:00am

EM-Contributed On Demand-1 Non-Cu Interconnects - A Supply Chain Perspective, **Jimmy Wang**, S. Odunuga, S. Sundararajan, S. Vyas, S. Semproni, S. King, Intel Corporation; W. Bodman, C. Chintakalaya, L. Bejarano, F. Sohail, Arizona State University

EM-Contributed On Demand-4 Designing Transition Metal Doped Lithium Fluoride Composite Cathode Materials For Li-Ion Batteries, **Clifford Denize**, S. Danquah, J. Strimaitis, Center for Materials Research Norfolk State University; C. Bonner, Chemistry Department Norfolk State University and Center for Materials Research Norfolk State University; S. Pradhan, M. Behera, Center for Materials Research Norfolk State University; M. Bahoura, Engineering Department Norfolk State University and Center for Materials Research Norfolk State University

EM-Contributed On Demand-7 Physical Property Improvement of Atomic Layer Deposited Thin-film Interconnects, **Ajit R. Dhamdhere**, B. Nie, H. Cho, H. Kim, Eugenius, Inc.

EM-Contributed On Demand-10 Wafer-Scale Fabrication of Nanostructured Carbon Thin Film-Based Electronic Devices, **Zhigang Xiao**, L. Williams, J. Elam, A. Jones, Q. Yuan, Alabama A&M University

EM-Contributed On Demand-13 Laser Induced Thermal Emission from Nickel Nanowires, **Ana Silva**, Cefitec, Physics Department, FCT, Universidade Nova de Lisboa, Portugal; K. Pedersen, Aalborg University, Denmark

EM-Contributed On Demand-16 Wake up and Endurance of Ferroelectric Hf_{0.5}Zr_{0.5}O₂ on NbN and Nb, **David Henry**, Sandia National Laboratories; S. Fields, University of Virginia; S. Smith, P. Davids, Sandia National Laboratories; J. Ihlefeld, University of Virginia

EM-Contributed On Demand-19 Flexible Transition Metal Dichalcogenide Devices for Environmental Sensors and Energy Harvesting, **Alwin Daus**, K. Nassiri Nazif, S. Vaziri, A. Khan, R. Grady, V. Chen, C. Bailey, H. Lee, C. Koroglu, K. Brenner, K. Schauble, A. Kumar, K. Saraswat, E. Pop, Stanford University

EM-Contributed On Demand-22 2020 AVS Graduate Research Award Talk: Monolithic Integration of Crystalline III-Vs on Amorphous Substrates using a Combination of Epitaxial and Non-epitaxial Methods, **Debarghya Sarkar**¹, R. Kapadia, University of Southern California

EM-Contributed On Demand-25 Evaluation of the Near-Zero Temperature Coefficient of Resistivity (NZ-TCR) of ALD TiSi_xN Films, **Corbin Feit**, S. Berriel, University of Central Florida; A. Dhamdhere, H. Kim, B. Nie, S. Chugh, S. Roth, N. Mukherjee, Eugenius, Inc.; P. Banerjee, University of Central Florida

EM-Contributed On Demand-28 Berry Curvature Memory Through Stacking Transitions in Topological Semimetals, **Jun Xiao**, Stanford University; Y. Wang, UC Berkeley; H. Wang, Texas A&M University; C. Pemmaraju, SLAC National Accelerator Laboratory; S. Wang, UC Berkeley; P. Muscher, E. Sie, C. Nyby, T. Devereaux, Stanford University; X. Qian, Texas A&M University; X. Zhang, UC Berkeley; A. Lindenberg, Stanford University

EM-Contributed On Demand-31 Metal-Semiconductor Contacts to β-Ga₂O₃: Dependence on Metal Work Function and Crystallographic Surface Plane, L. Lyle, K. Jiang, E. Favela, Y. Yao, Carnegie Mellon University, USA; K. Das, North Carolina State University; Z. Galazka, A. Popp, Leibniz Institute for Crystal Growth, Germany; **Lisa Porter**, Carnegie Mellon University, USA

EM-Contributed On Demand-34 Effect of Cobalt Doping on Structural, Magnetic and Ferroelectric Properties of Bismuth Ferrite Thin Films Grown Epitaxially on SrTiO₃ (001), **Chhatra Raj Joshi**, M. Acharya, M. Seikh, The University of Alabama; J. Plombon, U. Alaan, T. Gosavi, Intel Corporation; A. Gupta, The University of Alabama

EM-Contributed On Demand-37 High-Quality Molybdenum Nitride Schottky Diodes to n-Type Gallium Nitride, **Alex Molina**, I. Campbell, T. Walter, A. Agyapong, S. Mohnhey, Pennsylvania State University

EM-Contributed On Demand-40 Area-Selective Deposition/Patterning of Boron Carbide Layers with Atomic Layer Deposition, **Raja Sekhar Bale**, R. Thapa, L. Dorsett, S. Wagner, A. Caruso, Department of Physics and Astronomy, University of Missouri- Kansas City; J. Bielefeld, S. King, Intel Corporation; M. Paquette, Department of Physics and Astronomy, University of Missouri- Kansas City

EM-Contributed On Demand-43 Carbon Nanotube Templated EUV Windows, **Scott Olsen**, D. Allred, S. Turley, R. Vanfleet, Brigham Young University

¹ AVS 2020 Graduate Student Awardee

EM-Contributed On Demand-46 Low Temperature Fabrication of Cathodes for Lithium Thin Film Batteries, **Wyatt Tenhaeff**, University of Rochester

EM-Contributed On Demand-49 Pressure Increases Power Conversion Efficiency and Interlayer Diffusion in Perovskite Solar Cells, **Deborah Oyewole**, *J. Hinojosa-Tamayo, Z. Mutton, O. Oyewole, W. Soboyejo, N. Burnham*, Worcester Polytechnic Institute

EM-Contributed On Demand-52 Enhanced Luminescence of SiO_x/SiO₂ Multilayers Structures Obtained by Sputtering Technique, **Alma Lizet Valdez**, *K. Monfil*, Research Center of Semiconductor Devices, Mexico; *A. Morales*, bNational Institute of Astrophysics, Optics and Electronics, Mexico; *F. Morales*, Center investigated of optics A.C, Mexico; *F. Uribe, J. Luna, Z. Hernández*, Research Center of Semiconductor Devices, Mexico; *A. Muñoz*, Electronics Faculty, Meritorious University Autonomous of Puebla, Mexico

EM-Contributed On Demand-55 Optimized Deposition Conditions of Silicon Rich Nitride Obtained by Lpcvd to Achieve Down-Conversion Effect as UV Absorption Coating on Solar Cells, **Francisco Uribe-González**, *K. Monfil, M. Domínguez*, Research Center of Semiconductor Devices, Meritorious University Autonomous of Puebla, Mexico; *M. Moreno*, National Institute of Astrophysics, Optics and Electronics, Mexico; *A. Muñoz*, Electronics Faculty, Meritorious University Autonomous of Puebla, Mexico; *J. Hernández, A. Salazar*, Research Center of Semiconductor Devices, Meritorious University Autonomous of Puebla, Mexico

EM-Contributed On Demand-58 Interfaces between III-V Semiconductors and High-K Dielectrics: Opposite Requirements for MOSFET, Ferroelectrics, and Resistive Ram Applications, *A. Irish, A. Troian, R. Atle, A. Persson, S. Mamidala, K. Persson, G. D'Acunto, L. Wernersson, M. Borg*, **Rainer Timm**, Lund University, Sweden

EM-Contributed On Demand-61 Atomic Scale Defects Generated by High-Field Gate Stressing in Si/SiO₂ Transistors, **Stephen Moxim**, *F. Sharov*, The Pennsylvania State University; *D. Hughart, G. Haase*, Sandia National Laboratories; *P. Lenahan*, The Pennsylvania State University

EM-Contributed On Demand-64 Ultrafast Switching of FeRh Memristors, **Nicholas A. Blumenschein**, *G. Stephen*, Laboratory for Physical Sciences; *C. Cress, S. LaGasse*, United States Naval Research Laboratory - Electronics Science and Technology Division; *A. Hanbicki*, Laboratory for Physical Sciences; *S. Bennett*, United States Naval Research Laboratory - Materials Science and Technology Division; *A. Friedman*, Laboratory for Physical Sciences

EM-Contributed On Demand-67 Innovative Approach and Study of Transparent Conducting Oxide as Channel Materials for the Fabrication of Thin Film Transistors, **Kelsea Yarbrough**, *S. Pradhan, M. Bahoura*, Norfolk State University

EM-Contributed On Demand-70 Epitaxial Growth of Donor and Acceptor Doped β -Ga₂O₃ by Magnetron Sputter Deposition, **Adetayo Adedeji**, Elizabeth City State University; *J. Lawson, A. Reed, S. Pacley, J. Merrett*, Air Force Research Lab

EM-Contributed On Demand-73 The Synthesis of NbSe₂ by Molecular Beam Epitaxy for Thermomagnetic Energy Conversion, **Peter Litwin**, *S. Akhanda, M. Zebajadi, S. McDonnell*, University of Virginia

EM-Contributed On Demand-76 Scaling of Atomic Layer Deposited Dielectrics on UV-O₃ Functionalized WSe₂, **Maria Gabriela Sales**, University of Virginia; *S. Najmaei*, Army Research Laboratory; *S. McDonnell*, University of Virginia

Electronic Materials and Photonics Division

Room On Demand - Session EM-Invited On Demand

Electronic Materials and Photonics Invited On Demand Session

8:00am

INVITED: EM-Invited On Demand-1 Light Management Strategies for Photovoltaics: Luminescent Concentrators and Passive Cooling for Modules, **Vivian Ferry**, University of Minnesota, USA

INVITED: EM-Invited On Demand-7 Epitaxial Quantum Dots for Quantum Science and Technology, **Sam Carter**, *J. Grim, A. Bracker, M. Yakes, M. Zalalutdinov, C. Kim*, US Naval Research Laboratory; *M. Kim*, KeyW Corporation; *D. Gammon*, US Naval Research Laboratory

INVITED: EM-Invited On Demand-13 Van der Waals and remote epitaxy of complex materials, **Jian Shi**, Rensselaer Polytechnic Institute

INVITED: EM-Invited On Demand-19 Functional Oxide Materials for Silicon Photovoltaics, **Kristopher Davis**, University of Central Florida

INVITED: EM-Invited On Demand-25 Building MOFs from the Gas Phase at the Molecular Level - Active Surfaces by Combining Organics with Inorganics, **Ola Nilsen**, University of Oslo, Norway

INVITED: EM-Invited On Demand-31 2020 AVS Peter Mark Memorial Award Lecture: Efficient Graphene Hot Electron Devices: Electrochemistry and Electron Emission, **Rehan Kapadia**¹, University of Southern California

Exhibitor Technology Spotlight Workshops

Room On Demand - Session EW-On Demand

Exhibitor Technology Spotlight Contributed On Demand 8:00am

EW-On Demand-1 New Developments for Surface Analysis from Thermo Fisher Scientific, **Tim Nunney**, *P. Mack, R. Simpson, H. Tseng*, Thermo Fisher Scientific, UK; *J. Lallo*, Thermo Fisher Scientific

Fundamental Discoveries in Heterogeneous Catalysis Focus Topic

Room On Demand - Session HC-Contributed On Demand

Fundamental Discoveries in Heterogenous Catalysis

Contributed On Demand Session

8:00am

HC-Contributed On Demand-1 Operando Structural Characterization of Co-Promoted MoS₂ Nanoparticles Under Hydrodesulfurization Reaction Conditions Using the Reactor STM, **Mahesh Krishna Prabhu**, Leiden University, The Netherlands; *I. Groot*, Leiden University, Netherlands

HC-Contributed On Demand-4 Understanding Ligand-Directed Heterogeneous Catalysis: When the Dynamically Changing Nature of the Ligand Layer Controls the Hydrogenation Selectivity, **Swetlana Schauermaun**, *C. Schroeder, M. Schmidt*, Kiel University, Germany

HC-Contributed On Demand-7 Derivatization Effect of Cobalt Phthalocyanine on the Catalytic Activity for Carbon Monoxide Reduction, **Yutaro Umejima**, *J. Nakamura*, The University of Electro-Communications (UEC-Tokyo), Japan

HC-Contributed On Demand-10 Surface Characterization and Methane Activation of SnO_x/Cu₂O/Cu(111) Inverse Model Catalysts, **Jindong Kang**, Stony Brook University; *J. Rodriguez*, Brookhaven National Laboratory

HC-Contributed On Demand-13 Crystal Plane Effect of Cu₂O Clusters on the Catalytic Performance of Pt/Cu₂O under CO Oxidation, **Seunghwa Hong**, *H. Choi, D. Kim, J. Park*, Korea Advanced Institute of Science and Technology (KAIST) & Institute for Basic Science (IBS), Korea (Republic of)

HC-Contributed On Demand-16 Catalytic Synergy on PtNi Bimetal Catalysts Driven by Interfacial Intermediate Structure, **Taek-Seung Kim**, Korea Advanced Institute of Science and Technology (KAIST) & Institute for Basic Science (IBS), Korea (Republic of); *J. Kim*, Institute for Basic Science (IBS), Korea (Republic of); *H. Song, D. Kim, J. Park*, Korea Advanced Institute of Science and Technology (KAIST) & Institute for Basic Science (IBS), Korea (Republic of)

HC-Contributed On Demand-19 Reactivity of Butanol on TiO₂/Au(111) Inverse Model Catalysts, **Lyssa Garber**, *A. Galgano, C. Rogers, A. Baber*, James Madison University

HC-Contributed On Demand-22 Surface-Dependent Selectivity of Ethanol With TiO₂ Modified Au(111) Model Catalysts, **Clayton Rogers**, *D. Boyle, M. DePonte, A. Baber*, James Madison University

HC-Contributed On Demand-25 Active Sites and Structural Transformation of NiFeO_x Catalysts during Electrocatalytic Oxygen Evolution Reaction: Effects of Catalyst Loading and Support, **Xingyi Deng**, *D. Kauffman, D. Sorescu*, National Energy Technology Laboratory

HC-Contributed On Demand-28 Activation of O₂ on CeO₂ Nanoparticle Surfaces by Electron Transfer, **M. Brites Helú**, Instituto para el Desarrollo Tecnológico de la Industria Química INTEC (CONICET-UNL), Argentina; *A. Norton*, Department of Chemical Engineering, University of Delaware; *S. Collins*, Instituto para el Desarrollo Tecnológico de la Industria Química INTEC (CONICET-UNL), Argentina; *D. Stacchiola, J. Boscoboinik*, Center for Functional Nanomaterials, Brookhaven National Laboratory; **Florencia Calaza**, Instituto para el Desarrollo Tecnológico de la Industria Química INTEC (CONICET-UNL), Argentina

¹ AVS 2020 Peter Mark Awardee

HC-Contributed On Demand-31 Comparison of Single Rh Adatoms on $\text{Al-Fe}_2\text{O}_3(1\cdot102)$ and $\text{TiO}_2(110)$ Stabilized by Adsorbed Water, *Lena Haager*, F. Kraushofer, TU Wien, Austria; M. Eder, TU München, Germany; A. Rafsanjani-Abbas, G. Franceschi, M. Riva, P. Sombut, M. Atzmüller, M. Schmid, TU Wien, Austria; C. Franchini, Università di Bologna, Italy; U. Diebold, G. Parkinson, TU Wien, Austria

HC-Contributed On Demand-34 Polarons in Single Atom Catalysts: Case Study of $\text{Me}_1=[\text{Au}_1, \text{Pt}_1, \text{Rh}_1]$ on $\text{TiO}_2(110)$, *Panukorn Sombut*, L. Haager, M. Atzmüller, Z. Jakub, TU Wien, Austria; M. Reticioli, University of Vienna, Austria; M. Meier, G. Parkinson, TU Wien, Austria; C. Franchini, University of Vienna, Austria

HC-Contributed On Demand-37 Conformer-Selective Adsorption of 1-Propanol on $\text{Ag}(111)$ from Theoretical Analysis of Experimental Reflection Absorption Infrared Spectra, *Ravi Ranjan*, M. Trenary, University of Illinois at Chicago

HC-Contributed On Demand-40 Ambient-Pressure CO Driven Restructuring of $\text{Cu}(111)$ by Reflection Absorption Infrared Spectroscopy, *Arephin Islam*, University of Illinois at Chicago; C. Kruppe, Intel Corporation; M. Trenary, University of Illinois at Chicago

HC-Contributed On Demand-43 Metal Vapor Adsorption Calorimetry on Clean Surfaces of Oxide and Mixed-Oxide Single Crystals and Powdered Catalyst Support Materials, *Charles T. Campbell*, Z. Mao, W. Zhang, University of Washington, Seattle

HC-Contributed On Demand-46 Sum Is Better Than the Parts: CrCoFeNi High Entropy Alloy as Hydrogen Evolution Catalyst in Acidic Solution, *Frank McKay*, Louisiana State University; Y. Fang, Louisiana State University; O. Kizilkaya, Louisiana State University; P. Singh, Ames Laboratory; D. Johnson, Iowa State University; A. Roy, D. Young, P. Sprunger, J. Flake, W. Shelton, Y. Xu, Louisiana State University

HC-Contributed On Demand-49 The Influence of Palladium on the Hydrogenation of Acetylene on $\text{Ag}(111)$, *David Molina*, M. Muir, M. Abdel-Rahman, M. Trenary, University of Illinois - Chicago

HC-Contributed On Demand-52 In Situ Investigation of the Oxidation of $\text{Cu}(111)$ and Reduction of Cu_2O Doped with Single Pt Atoms, A. Schilling, Tufts University; K. Groden, Washington State University; J. Simonovis, A. Hunt, Brookhaven National Laboratory; R. Hannagan, V. Cinar, Tufts University; J. McEwen, Washington State University; E. Sykes, Tufts University; *Iradwikanari Waluyo*, Brookhaven National Laboratory

HC-Contributed On Demand-55 Kinetics of the Thermal Oxidation of $\text{Ir}(100)$ toward IrO_2 Studied by Ambient-Pressure X-ray Photoelectron Spectroscopy, *Zbynek Novotny*, University of Zürich & Paul Scherrer Institute, Switzerland; B. Tobler, University of Zürich, Switzerland; L. Artiglia, Paul Scherrer Institut, Switzerland; M. Fischer, M. Schreck, Universität Augsburg, Germany; J. Raabe, Paul Scherrer Institut, Switzerland; J. Osterwalder, Universität Zürich, Switzerland

HC-Contributed On Demand-58 A Study of Subsurface Oxygen on $\text{Ag}(111)$ Using Density Functional Theory and Monte Carlo Simulations, *Carson Mize*, University of Tennessee Knoxville; L. Crosby, Joint Institute for Computational Sciences; University of Tennessee Knoxville; S. Isbill, Oak Ridge National Laboratory; S. Roy, University of Tennessee Knoxville

HC-Contributed On Demand-61 Measuring Adhesion Energies and Using them to Bridge the Gaps between Gas-Phase and Liquid-Phase Surface Chemistry, and Between Single-Crystal Metal Surfaces and Metal Nanoparticles, *S. Elizabeth Harman*, G. Ruehl, J. Rumpitz, C. Campbell, University of Washington

HC-Contributed On Demand-64 Carbon Dissolution via Beam Reflectivity Measurements on Nickel Single Crystal Catalysts, *Daniel Tinney*, Tufts University; E. High, Rowland Institute at Harvard; E. Dombrowski, Commonwealth Fusion Systems; L. Joseph, A. Utz, Tufts University

HC-Contributed On Demand-67 Trimetallic Alloys for Enhanced Ethanol Conversion to Hydrogen, *Paul Kress*, Y. Wang, L. Cramer, Tufts University; M. Montemore, Tulane University; E. Sykes, Tufts University

HC-Contributed On Demand-70 Investigating the Alloying Mechanism of $\text{RhCu}(100)$ and $\text{RhCu}(110)$, *Yicheng Wang*, Tufts University; K. Papanikolaou, University College London, UK; R. Hannagan, Tufts University; J. Schumann, M. Stamatakis, University College London, UK; C. Sykes, Tufts University

HC-Contributed On Demand-73 2020 AVS Russell & Sigurd Varian Award Talk: Rhodium Copper Single-Atom Alloys for Selective and Coke-Free C-H Activation, *Ryan Hannagan*¹, E. Sykes, Tufts University

HC-Contributed On Demand-76 Beam Reflectivity Measurements of Ethane Dissociation on High Temperature Nickel Single-Crystal Surfaces, *Molly Powers*, D. Tinney, L. Joseph, A. Utz, Tufts University

HC-Contributed On Demand-79 Elucidating the effect of Oxidation on the Structure and Reactivity of Rhodium Copper Single-Atom Alloys, *Volkann Cinar*, Tufts University; D. Guo, Washington State University; A. Schilling, Seagate Technology; I. Waluyo, Brookhaven National Laboratory; J. McEwen, Washington State University; C. Sykes, Tufts University

HC-Contributed On Demand-82 Investigation of CO oxidation on $\text{Rh}(111)$ with IRRAS, *Elizabeth Jamka*, D. Killelea, Loyola University Chicago

HC-Contributed On Demand-85 Study of the Effects of Co-Adsorbed Water on Acetic Acid Decomposition on Metal Surfaces, *K. Chukwu, Hoan K.K. Nguyen*, L. Arnadottir, Oregon State University

HC-Contributed On Demand-88 Structure and Chemistry of Metal Surfaces at High Oxygen Coverages, *Dan Killelea*, M. Turano, Loyola University Chicago; R. Farber, The University of Chicago; L. Juurlink, Leiden University, Netherlands

HC-Contributed On Demand-91 Surface Science at Atmospheric Pressure: Measuring Intrinsic Kinetics on Metallic Systems, *Eric High*, E. Lee, C. Reece, Rowland Institute at Harvard

HC-Contributed On Demand-94 Catalytic Enhancement Due to Coke Formation: Investigation of the Bimetallic Effect on Carbon Nanotubes Formed during Dry Reforming of Methane, *Carly Byron*, University of Delaware; M. Ferrandon, Argonne National Laboratory, USA; G. Çelik, Middle East Technical University, Turkey; R. McCormick, J. Sloppy, K. Booksh, University of Delaware; M. Delferro, Argonne National Laboratory, USA; C. Ni, A. Teplyakov, University of Delaware

Fundamental Discoveries in Heterogeneous Catalysis Focus Topic

Room On Demand - Session HC-Invited On Demand

Fundamental Discoveries in Heterogeneous Catalysis Invited On Demand Session 8:00am

INVITED: HC-Invited On Demand-1 Low Temperature Selective Alkane Conversion on $\text{IrO}_2(110)$ Surfaces, *Aravind Asthagiri*, The Ohio State University

INVITED: HC-Invited On Demand-7 Alkali-promoted Copper-based Catalysts for CO_2 Activation, W. Liao, Stony Brook University; *Ping Liu*, Brookhaven National Laboratory

INVITED: HC-Invited On Demand-13 Influence of Water on C-O Hydrogenolysis Catalyzed by Ru/TiO_2 , D. Stuck, A. Mahdavi-Shakib, University of Maine; R. Austin, Barnard College; L. Grabow, University of Houston; B. Frederick, Thomas J. Schwartz, University of Maine

INVITED: HC-Invited On Demand-19 Reversible Surface Transformation Enables the Revivification of Mixed Metal Hydroxide Water Oxidation Catalysts, C. Kuai, *Feng Lin*, Virginia Tech

INVITED: HC-Invited On Demand-25 Designed Metal Release from Complex Metal Oxides, *Sara Mason*, University of Iowa

INVITED: HC-Invited On Demand-31 Hydrogenation of CO_2 to Methanol on Metal-Oxide and Metal-Carbide Interfaces, *Jose Rodriguez*, Brookhaven National Laboratory

INVITED: HC-Invited On Demand-37 Chirality Detection of Surface Desorption Products using Photoelectron Circular Dichroism, J. Wega, *Tim Schäfer*, G. Westphal, University Göttingen, Germany

Leaders in Energy and the Environment Focus Topic

Room On Demand - Session LD-Contributed On Demand

Leaders in Energy and the Environment Contributed On Demand Session 8:00am

LD-Contributed On Demand-1 Work Function Reduction of Carbon Nanospikes and the Effects of Contaminants by XPS and UPS, *Arthur Baddorf*, D. Hensley, Oak Ridge National Laboratory; A. Rondinone, Los Alamos National Laboratory

LD-Contributed On Demand-4 Electrochemical Performance of CaFe_2O_4 Synthesized at Multiple Fuel-to-Oxidizer Ratios, *Jacob Strimaitis*, S. Danquah, C. Denize, C. Bonner, S. Pradhan, M. Bahoura, Norfolk State University

LD-Contributed On Demand-7 Modern Devices from Old Materials - Selenium and Selenium-Tellurium Alloys Thin Film Solar Cells, *Ido Hadar*, The Hebrew University of Jerusalem, Israel; T. Song, W. Ke, X. Hu, Z. Luo, V. P. Dravid, M. Kanatzidis, Northwestern University

¹ AVS 2020 Russell and Sigurd Varian Awardee

LD-Contributed On Demand-10 A Combined DRIFTS and Theoretical Study of the Mechanisms of Aldol Condensation of Acetaldehyde on CeO₂(111), **Suman Bhasker-Ranganath**, *M. Rahman*, *C. Zhao*, Louisiana State University; *F. Calaza*, Instituto de Desarrollo Tecnológico para la Industria Química, Argentina; *Z. Wu*, Oak Ridge National Laboratory; *Y. Xu*, Louisiana State University

LD-Contributed On Demand-13 Atomic-Scale Insights Into the Workings of Pt-Based Copper Oxide Single-Atom Catalysts, **Audrey Dannar**, *A. Schilling*, *G. Giannakakis*, *A. Therrien*, *C. Sykes*, Tufts University

Leaders in Energy and the Environment Focus Topic Room On Demand - Session LD-Invited On Demand Leaders in Energy and the Environment Invited On Demand Session 8:00am

INVITED: LD-Invited On Demand-1 Atomic-Scale Imaging of Optically-Active Nanoscale Systems, **Jeffrey R. Guest**, Argonne National Laboratory

INVITED: LD-Invited On Demand-7 Probing Molecule-Substrate Interactions at Angstrom Scale by Ultrahigh Vacuum Tip-Enhanced Raman Spectroscopy, **Nan Jiang**, University of Illinois at Chicago

INVITED: LD-Invited On Demand-13 HAXPES for Device Applications: From the Surface into the Bulk, **Anna Regoutz**, University College London, UK

INVITED: LD-Invited On Demand-19 Nanoparticle Size, Shape, Composition and Support Effects in the Hydrogenation of Carbon Dioxide, **Beatriz Roldan Cuenya**, Fritz-Haber Institute of the Max Planck Society, Germany

Magnetic Interfaces and Nanostructures Division Room On Demand - Session MI-Contributed On Demand Magnetic Interfaces Contributed On Demand Session 8:00am

MI-Contributed On Demand-1 Direct Imaging of the Ac Component of the Pumped Spin Polarization With Element Specificity, **Santa Pile**, *T. Schaffers*, Johannes Kepler University Linz, Austria; *S. Stienen*, Helmholtz-Zentrum Dresden-Rossendorf, Germany; *M. Buchner*, Johannes Kepler University Linz, Austria; *S. Wintz*, Max Planck Institute for Intelligent Systems, Germany; *S. Mayr*, Paul Scherrer Institute, Switzerland; *J. Förster*, Max Planck Institute for Intelligent Systems, Germany; *V. Ney*, Johannes Kepler University Linz, Austria; *R. Narkowicz*, *K. Lenz*, Helmholtz-Zentrum Dresden-Rossendorf, Germany; *M. Weigand*, Helmholtz-Zentrum Berlin, Germany; *H. Ohldag*, Stanford Synchrotron Radiation Laboratory; University of California Santa Cruz; *J. Lindner*, Helmholtz-Zentrum Dresden-Rossendorf, Germany; *A. Ney*, Johannes Kepler University Linz, Austria

MI-Contributed On Demand-4 Breaking Time-Reversal Symmetry at the M Point: Spin Signal from a Surface State on Ti/Ge(111), **Markus Donath**, *P. Eickholt*, *P. Krüger*, *S. Stolwijk*, *A. Schmidt*, Westfälische Wilhelms-Universität Münster, Germany

MI-Contributed On Demand-7 Spin-orbit-induced effects in VLEED experiments from MoS₂/Au(111), **Christoph Angrick**, *A. Henriksen*, *N. Mutzke*, *A. Reimann*, University of Münster, Germany; *M. Ewert*, *L. Buß*, Brandenburg University of Technology Cottbus-Senftenberg, Germany; *J. Falta*, University of Bremen, Germany; *J. Flege*, Brandenburg University of Technology Cottbus-Senftenberg, Germany; *M. Donath*, University of Münster, Germany

MI-Contributed On Demand-10 Direct Observation of Spin Accumulation in Cu Induced by Spin Pumping, **J. Ding**, Argonne National Laboratory; *W. Zhang*, Oakland University; *B. Jungfleisch*, *J. Pearson*, Argonne National Laboratory; **Hendrik Ohldag**, Lawrence Berkeley Lab, University of California, Berkeley; *V. Novosad*, Argonne National Laboratory; *A. Hoffmann*, University of Illinois at Urbana Champaign

MI-Contributed On Demand-13 Spatially Resolved Ferromagnetic Resonance of a Single Fe₃O₄ Nanoparticle Chain Using Scanning Transmission X-Ray Microscopy, **Thomas Feggeler**, *B. Zingsem*, *R. Meckenstock*, University of Duisburg-Essen, Germany; *H. Ohldag*, Lawrence Berkeley National Laboratory (LBNL); *M. Farle*, *H. Wende*, *K. Ollefs*, University of Duisburg-Essen, Germany

MI-Contributed On Demand-16 Scanning NV Magnetometry for Semiconductor Device Analysis, **U. Celano**, IMEC, Belgium; **Peter Rickhaus**, *H. Zhong*, Qnami AG, Switzerland; *F. Ciubotaru*, IMEC, Belgium; *L. Stoleriu*, Alexandru Ioan Cuza University, Romania; *A. Stark*, *F. Favarro de Oliveira*, *M. Munsch*, Qnami AG, Switzerland; *P. Favia*, *M. Korytov*, *P. Van Marcke*, IMEC, Belgium; *P. Maletinsky*, Qnami AG, Switzerland; *C. Adelman*, *P. van der Heide*, IMEC, Belgium

MI-Contributed On Demand-19 Co₂Fe_{1.25}Ge_{0.75}: Single-Phase, Highest Magnetic Moment, Highest Curie Temperature, **Shambhu KC**, *R. Mahat*, The University of Alabama; *S. Regmi*, University of Alabama; *J. Law*, The University of Alabama; *V. Franco*, Universidad de Sevilla, Spain; *G. Mankey*, *W. Butler*, *A. Gupta*, *P. LeClair*, The University of Alabama

MI-Contributed On Demand-22 Defects in Magnetic Weyl Semimetal Co₃Sn₂S₂, **Zheng Gai**, *Q. Zou*, *M. Fu*, *L. Zhang*, Oak Ridge National Laboratory; *R. Xue*, University of Tennessee Knoxville; *J. Yan*, Oak Ridge National Laboratory; *M. David*, University of Tennessee Knoxville; *M. Yoon*, Oak Ridge National Laboratory, USA

MI-Contributed On Demand-25 Optimizing Magneto-Elastic Coupling in Multilayer FeGa/NiFe Thin Films for Magneto-electric Applications, **Adrian Acosta**, *J. Chang*, UCLA

MI-Contributed On Demand-28 Large Temperature Dependent Spin Torque Efficiency in Antiferromagnetic FeRh, **Jonathan Gibbons**, University of Illinois at Urbana Champaign; *T. Dohi*, Tohoku University, Japan; *H. Saglam*, Yale University; *J. Pearson*, Materials Science Division, Argonne National Laboratory; *S. Fukami*, Tohoku University, Japan; *A. Hoffmann*, University of Illinois at Urbana Champaign

MI-Contributed On Demand-31 Effect of Sn Doping on Surface States of Bi₂Se₃ Thin Films, **Jennifer DeMell**, *G. Stephen*, Laboratory for Physical Sciences; *I. Naumov*, Howard University; *S. Tyagi*, University of Maryland, College Park; *O. Vail*, Army Research Laboratory; *M. Dreyer*, University of Maryland, College Park; *R. Butera*, *A. Hanbicki*, Laboratory for Physical Sciences; *P. Taylor*, Army Research Laboratory; *I. Mayergoyz*, University of Maryland, College Park; *P. Dev*, Howard University; *A. Friedman*, Laboratory for Physical Sciences

MI-Contributed On Demand-34 Control of Domain Wall Patterning and Anomalous Response Functions in Ferrimagnetic Spinel, **Lazar Kish**, University of Illinois at Urbana-Champaign; *A. Thaler*, Oak Ridge National Laboratory; *M. Lee*, Los Alamos National Laboratory; *A. Zakrzewski*, University of Illinois at Urbana-Champaign; *D. Reig-i-Plessis*, University of British Columbia, Canada; *B. Wolin*, *X. Wang*, University of Illinois at Urbana-Champaign; *K. Littrell*, Oak Ridge National Laboratory; *R. Budakian*, University of Waterloo, Canada; *H. Zhou*, University of Tennessee Knoxville; *Z. Gai*, *M. Frontzek*, Oak Ridge National Laboratory; *V. Zapf*, Los Alamos National Laboratory; *A. Aczel*, *L. DeBeer-Schmitt*, Oak Ridge National Laboratory; *G. MacDougall*, University of Illinois at Urbana-Champaign

MI-Contributed On Demand-37 Anomalous Hall Effect in Heterostructures Based on MnBi₂Te₄ Grown by MBE, **Seul-Ki Bac**, *L. Riney*, *J. Wang*, University of Notre Dame; *K. Koller*, Saint Mary's College; *X. Liu*, *M. Zhukovsky*, *T. Orlova*, *M. Dobrowolska*, *J. Furdyna*, *B. Assaf*, University of Notre Dame

MI-Contributed On Demand-40 Magnetic Transition Behavior of Epitaxial Fe₄₇Rh₄₇Pd₆ Films, **Gary Mankey**, University of Alabama; *H. Sato*, Tohoku University, Japan; *N. Pachaari*, Intel; *S. Keshavarz*, University of Alabama; *H. Lee*, Trinity College Dublin, Ireland; *P. LeClair*, University of Alabama; *O. Mryasov*, Department of Physics and Astronomy

MI-Contributed On Demand-43 The Critical Role of Checkerboard Spin Fluctuations in High-Tc Single Layer Iron Chalcogenide Superconductors, **Qiang Zou**, *H. Zhang*, West Virginia University; *T. Shishidou*, *M. Weinert*, University of Wisconsin Milwaukee; *L. Li*, West Virginia University

MI-Contributed On Demand-46 Magnetic Anisotropy in a Single Crystal Antiferromagnetic Thin Film, **Saima Siddiqui**, University of Illinois at Urbana Champaign; *J. Pearson*, Argonne National Laboratory; *A. Hoffmann*, University of Illinois at Urbana-Champaign

Magnetic Interfaces and Nanostructures Division Room On Demand - Session MI-Invited On Demand Magnetic Interfaces Invited On Demand Session 8:00am

INVITED: MI-Invited On Demand-1 From Spin Spirals to Spin Glasses - Imaging Complex Magnetism on the Atomic Scale, **Daniel Wegner**, Radboud University, Nijmegen, Netherlands

INVITED: MI-Invited On Demand-7 Magnetic Exchange and Anisotropy in Perpendicular Magnetic Tunnel Junction Nanopillars: Experiment and Micromagnetic Modeling, **Jamileh Beik Mohamadi**, Loyola University New Orleans; *A. Kent*, New York University

INVITED: MI-Invited On Demand-13 Utilizing Vacuum States Above Surfaces for Imaging and Manipulation of Atomic-Scale Magnetism, **Anika Schlenhoff**, University of Hamburg, Germany

INVITED: MI-Invited On Demand-19 Magnetism in Topological Crystalline Insulator Heterostructures, **Badih Assaf**, University of Notre Dame

INVITED: MI-Invited On Demand-25 Moving Toward Antiferromagnetic Straintronics, **Michelle Jamer**, United States Naval Academy

INVITED: MI-Invited On Demand-31 A Two-Dimensional Atomically-Thin Manganese Gallium Nitride Magnetic Monolayer, *Y. Ma*, Ohio University; *D. Hunt*, GlyA, CAC-CNEA and Consejo Nacional de Investigaciones Científicas y Técnicas - CONICET, Argentina; *K. Meng*, The Ohio State University; *T. Erickson*, Ohio University; *F. Yang*, The Ohio State University; *M. Barral*, *V. Ferrari*, GlyA, CAC-CNEA and Consejo Nacional de Investigaciones Científicas y Técnicas - CONICET, Argentina; **Arthur R. Smith**, Ohio University

INVITED: MI-Invited On Demand-37 Topological Multiferroics, *Sinéad Griffin*, Lawrence Berkeley Lab, University of California, Berkeley

Manufacturing Science and Technology Group

Room On Demand - Session MS-Contributed On Demand

Manufacturing Science and Technology Contributed On Demand Session

8:00am

MS-Contributed On Demand-1 Machine Learning and Simulation Assistant Technology to Facilitate 3d Memory Analysis of Cross Section Sem Images, *M. Bryan*, *J. Foucher*, **Julien Baderot**, POLLEN Metrology, France

MS-Contributed On Demand-4 Atomic-Precision Position Error Correction for Dopant-Array Quantum Devices, **James H.G. Owen**, *E. Fuchs*, *M. Haq*, *J. Randall*, Zyvex Labs

Manufacturing Science and Technology Group

Room On Demand - Session MS-Invited On Demand

Manufacturing Science and Technology Invited On Demand Session

8:00am

INVITED: MS-Invited On Demand-1 Control of Plasma and Surface Reactions for Atomically Precise Device Fabrication, **Tetsuya Tatsumi**, Sony Semiconductor Solutions Corporation, Japan

INVITED: MS-Invited On Demand-13 Ion Tunable Electronic Materials Systems for Neuromorphic Computing, **Alec Talin**, Sandia National Laboratories

INVITED: MS-Invited On Demand-19 Digital Electronics at the Atomic Scale, **Shashank Misra**, Sandia National Laboratories, USA

INVITED: MS-Invited On Demand-25 Extending Semiconductor Patterning Into the Next Decade, **Michael Lercel**, ASML

Materials and Processes for Quantum Information Science

Focus Topic

Room On Demand - Session QS-Contributed On Demand

Materials and Processes for Quantum Information Science Contributed On Demand Session

8:00am

QS-Contributed On Demand-1 Power and Temperature Dependence of High Q Superconducting Resonators, **Ashish Alexander**, *C. Weddle*, *C. J. Richardson*, Laboratory for Physical Sciences, University of Maryland, College Park, MD

QS-Contributed On Demand-4 A Density-Functional Theory Study of the Al/AIO_x/Al Tunnel Junction, **Chang-Eun Kim**, *K. Ray*, *V. Lordi*, Lawrence Livermore National Laboratory

QS-Contributed On Demand-7 A Cold Atom Interferometry Sensor Platform Based on Diffractive Optics and Integrated Photonics, *J. Lee*, *R. Ding*, *H. McGuinness*, *J. Christensen*, *R. Rosenthal*, Sandia National Laboratories, USA; *G. Biedermann*, University of Oklahoma; *S. Kemme*, *D. Gillund*, *A. Ison*, *G. Hoth*, *B. Little*, *D. De Smet*, *C. Walker*, *A. Kodigala*, *M. Gehl*, *E. Skogen*, *M. Eichenfield*, *A. Lentine*, **Peter Schwindt**, Sandia National Laboratories, USA

QS-Contributed On Demand-10 Observation of the Two-Photon Transition and Bloch-Siegert Shift of the Electrically Detected Magnetic Resonance Spectrum of Interface Defects in 4H-SiC Metal-Oxide-Semiconductor Field-Effect Transistors, **James P. Ashton**, *P. Lenahan*, The Pennsylvania State University

QS-Contributed On Demand-13 Tunable Filters and Parametric Amplifiers from NbTiN Transmission Line Resonators, **R.M. Lewis**, *W. Kindel*, *L. Tracy*, *C. Harris*, *T. Lu*, *D. Luhman*, Sandia National Laboratories, USA

QS-Contributed On Demand-16 Nv Center Generation by Electron Beam Excited Plasma, **Akihito Saeki**, *A. Chikamoto*, Meijo University Graduate School, Japan; *P. Abraha*, Meijo University, Japan

QS-Contributed On Demand-19 Strain-Induced Interdiffusion in III-V Compound Semiconductors for Quantum Structure Formation, **Leonid Miroshnik**, Chemical & Biological Engineering, University of New Mexico; *B. Rummel*, Nanoscience & Microsystems Engineering, University of New Mexico; *A. Li*, Chemical & Biomolecular Engineering, University of Pennsylvania; *G. Balakrishnan*, Center for High Technology Materials, University of New Mexico; *T. Sinno*, Chemical & Biomolecular Engineering, University of Pennsylvania; *S. Han*, Nanoscience & Microsystems Engineering, University of New Mexico

Materials and Processes for Quantum Information Science

Focus Topic

Room On Demand - Session QS-Invited on Demand

Materials and Processes for Quantum Information Science Invited On Demand Session

8:00am

INVITED: QS-Invited on Demand-1 Quantum Matter, Simulation, and Clock, *Jun Ye*, JILA and University of Colorado Boulder

INVITED: QS-Invited on Demand-7 Photonic Interfaces for Ion-trap Quantum Computers, **Tracy Northup**, University of Innsbruck, Austria

INVITED: QS-Invited on Demand-13 Empowering Quantum Photonics with Nanoplasmonics and Machine Learning, **Vladimir Shalaev**, *A. Boltasseva*, Purdue University

INVITED: QS-Invited on Demand-19 Engineering Silicon Qubits at the Atomic Scale, **Sven Rogge**, University of New South Wales, Australia

INVITED: QS-Invited on Demand-25 Reproducible Superconducting Circuits for Quantum Information Processors, **Eric Zhang**, IBM T. J. Watson Research Center

INVITED: QS-Invited on Demand-31 Materials Loss Measurements Using Superconducting Microwave Resonators, **Corey Rae McRae**, NIST Boulder / CU Boulder

INVITED: QS-Invited on Demand-37 Organic Color Center: A New Class of Quantum Materials, **Han Htoon**, Los Alamos National Laboratory

MEMS and NEMS Group

Room On Demand - Session MN-Contributed On Demand

MEMS and NEMS Contributed On Demand Session

8:00am

MN-Contributed On Demand-1 Observation of Tunable Opto-Mechanical Responsivity in Two-Dimensional Semiconducting Nanoelectromechanical Resonators, **Jiankai Zhu**, University of Electronic Science and Technology of China; *P. Zhang*, Shanghai Jiao Tong University, China; *J. Li*, *B. Xu*, *S. Wu*, *F. Xiao*, *Y. Liang*, *T. Wen*, *F. Wang*, University of Electronic Science and Technology of China; *R. Yang*, Shanghai Jiao Tong University, China; *Z. Wang*, University of Electronic Science and Technology of China

MN-Contributed On Demand-4 Improving Signal-to-Noise Ratio and Noise Matching in AIN NEMS Resonators Using Parametric Amplification, **Tahmid Kaisar**, *J. Lee*, *P. X.-L. Feng*, University of Florida

MN-Contributed On Demand-7 MoTe₂ NEMS Resonator for Near-Infrared Light Detection, **S M Enamul Hoque Yousuf**, *X. Zheng*, *P. Feng*, University of Florida, Gainesville

MN-Contributed On Demand-10 Interposer Fabrication with Heterogeneous Integration of Multi-Project Wafer Die for Mid-Volume RF Microsystems, **Mieko Hirabayashi**, *S. Lepkowski*, *S. Herrera*, *C. Nordquist*, *C. Gibson*, *A. Ruyack*, *J. McDow*, *A. Hollowell*, *M. Jordan*, Sandia National Labs

MN-Contributed On Demand-13 Scaling Copper Deposition in Through-silicon Vias from Die Level to Wafer Level Plating, **Jessica McDow**, *R. Schmitt*, *M. Hirabayashi*, *E. Baca*, *J. McClain*, *L. Menk*, *A. Hollowell*, *M. Jordan*, Sandia National Laboratories

MN-Contributed On Demand-16 Device Fabrication Process for Controlled RF Plasma Breakdown, **Sergio Herrera**, *A. Ruyack*, *M. Jordan*, *C. Moore*, *G. Hummel*, *M. Ballance*, *A. Bingham*, *A. Schiess*, *C. Gibson*, *C. Nordquist*, Sandia National Labs

MN-Contributed On Demand-19 Resonant Motion and Frequency Tuning in Nano-Electromechanical Devices Based on Two-Dimensional Semiconductor WSe₂, **Yachun Liang**, *J. Zhu*, *F. Xiao*, *S. Wu*, *C. Jiao*, *Z. Wang*, University of Electronic Science and Technology of China

MN-Contributed On Demand-22 Observation of Temperature Coefficient of Frequency (TCf) Reversalin Bismuth Oxyiodide (BiOI) Vibrating Nanomechanical Resonators, **Fei Xiao**, S. Wu, J. Zhu, Y. Liang, C. Jiao, S. Pei, Z. Wang, University of Electronic Science and Technology of China

MN-Contributed On Demand-25 Gate-Switchable Bistable Nanomechanical Resonators Based on Two-dimensional Molybdenum Sulfide, **Chenyin Jiao**, B. Xu, J. Zhu, F. Xiao, Y. Liang, J. Chen, S. Pei, J. Xia, Z. Wang, University of Electronic Science and Technology of China

MN-Contributed On Demand-28 Thermally Released Spring-Loaded Platform for Capsule Based Drug Delivery and Sensing, **Joshua Levy**, J. Stine, L. Beardslee, R. Ghodssi, University of Maryland, College Park

MN-Contributed On Demand-31 Sidewall Nanochannel Fabrication Using Membrane Projection Lithography and Metal Assisted Chemical Etching, **Tong Dang**, University of Pennsylvania; R. Chaudhary, ETH Zurich, Switzerland; N. Xie, University of Washington; G. Kim, G. Watson, University of Pennsylvania

MN-Contributed On Demand-34 On-Demand Reconfigurable Transmission Grating for Neutron and X-ray Interferometry, **Sarah M. Robinson**, National Institute of Standards and Technology (NIST)/ University of Maryland, College Park; R. Murphy, K. Weigandt, D. Hussey, N. Klimov, National Institute of Standards and Technology (NIST)

MN-Contributed On Demand-37 QCM Study of Tribotronic Control in Ionic Liquids and Nanoparticle Suspensions, **Caitlin Seed**, B. Acharya, J. Krim, North Carolina State University

MEMS and NEMS Group

Room On Demand - Session MN-Invited On Demand

MEMS and NEMS Invited On Demand Session

8:00am

INVITED: MN-Invited On Demand-1 Printed and Biodegradable Sensors for Real-Time High-Spatial Density Monitoring of Soil Conditions, **Gregory Whiting**, Y. Sui, M. Atreya, G. Marinick, J. Nielson, A. Gopalakrishnan, University of Colorado Boulder; R. Khosla, S. Dahal, W. Yilma, Colorado State University; A. Arias, C. Baumbauer, M. Payne, D. Wong, P. Goodrich, University of California Berkeley

INVITED: MN-Invited On Demand-7 Chip-scale Atomic Devices, **John Kitching**, NIST

INVITED: MN-Invited On Demand-13 Towards Eliminating Friction and Wear in Micro-Machines to Macroscale Mechanical Systems, **Anirudha Sumant**, Argonne National Laboratory

INVITED: MN-Invited On Demand-19 Visualization of Nanoscale Contact by in situ AFM-TEM Experiments: Sliding-Dependent Adhesion of Si, and Wear at the Interface MoS₂-MoS₂ Interface, **Robert Carpick**, University of Pennsylvania

Nanoscale Science and Technology Division

Room On Demand - Session NS-Contributed On Demand

Nanoscale Science and Technology Contributed On Demand Session

8:00am

NS-Contributed On Demand-1 Precision Control of Cavity Quantum Electrodynamics in Space-Time with fsTHz-STM, **Likun Wang**, Y. Xia, W. Ho, University of California Irvine

NS-Contributed On Demand-4 RF Plasma for the Facile Fabrication of Bio-Functional Polymeric Nanoparticles, **Laura Haidar**, University of Sydney, Australia

NS-Contributed On Demand-7 Mechanical Size Effect of Nanoconfined Polymer Films, **Guorui Wang**, F. Najafi, K. Ho, M. Hamidinejad, T. Cui, G. Walker, C. Singh, T. Filleter, University of Toronto, Canada

NS-Contributed On Demand-10 In-Plane Mechanical Properties of 2D Hybrid Organic-Inorganic Perovskites Nanosheets by AFM Nanoindentation, **Dayun Kim**, Texas A&M University; E. Vasileiadou, I. Spanopoulos, M. Kanatzidis, Northwestern University; Q. Tu, Texas A&M University

NS-Contributed On Demand-13 How does Humidity affect the Mechanical Behavior of Halide Perovskites?, **Isaac Buchine**, Bar-Ilan University, Israel; I. Goldian, S. Cohen, D. Cahen, Weizmann Institute of Science, Israel

NS-Contributed On Demand-16 Ultrathin, Stress-Free, Doubly-Clamped Nanomechanical Resonator, **Jian Zhou**, N. Moldovan, L. Stan, H. Cai, D. Czaplewski, D. López, Argonne National Laboratory

NS-Contributed On Demand-19 Thermal Activation of Nanoscale Wear, **W. Wang**, Southwest Jiaotong University, China; D. Dietzel, **Andre Schirmeisen**, Justus-Liebig University Giessen, Germany

NS-Contributed On Demand-22 Reduction in Contact Time of Bouncing Droplets on Compact Nanostructured Superhydrophobic Surfaces, **Lin Wang**, Department of Materials Science and Engineering, Materials Research Institute, The Pennsylvania State University, University Park; T. Wong, Department of Mechanical Engineering, Materials Research Institute, The Pennsylvania State University, University Park

NS-Contributed On Demand-25 Efforts of Interlayer Interaction on van der Waals Heterostructure Nanomechanical Resonators, **Wen Sui**, J. Lee, P. Feng, University of Florida

NS-Contributed On Demand-28 Intrinsic and Interfacial Fatigue of Graphene, **Teng Cui**, T. Filleter, University of Toronto, Canada

NS-Contributed On Demand-31 Atomic-Scale Visualization of Electron-Pair Fluids and Crystals, **Xiaolong Liu**, Y. Chong, Cornell University; R. Sharma, University of Maryland College Park; J. Davis, Cornell University/University of Oxford/University College Cork

NS-Contributed On Demand-34 High-Speed Scanning Tunneling Spectroscopy, **Hamed Alemansour**, S. Moheimani, University of Texas at Dallas; J. Owen, J. Randall, E. Fuchs, Zyvex Labs

NS-Contributed On Demand-37 Phonon Polaritons in New Materials for Nanophotonic Applications, **Vanessa Breslin**, D. Ratchford, U.S. Naval Research Laboratory; A. Giles, Quantitative Scientific Solutions, LLC; A. Dunkelberger, J. Owrutsky, U.S. Naval Research Laboratory

NS-Contributed On Demand-40 Nanoscale Chemical Analysis of Heterogeneous Amphiphilic Surfaces via Photo-Induced Force Microscopy, **Derek Nowak**, P. O'Reilly, Molecular Vista; J. Benda, C. Gu, D. Webster, North Dakota State University; S. Park, Molecular Vista

NS-Contributed On Demand-43 Controlled Electron-Induced Fabrication of Metallic Nanostructures on 1nm Thick Carbon Nanomembranes, **C. Preischl**, Friedrich-Alexander Universität Erlangen-Nürnberg, Germany; **Linh Hoang Le**, Universität Bielefeld, Germany; E. Bilgilişoy, Friedrich-Alexander Universität Erlangen-Nürnberg, Germany; F. Vollnhals, Friedrich-Alexander Universität Erlangen-Nürnberg, Germany; A. Götzhäuser, Universität Bielefeld, Germany; H. Marbach, Friedrich-Alexander Universität Erlangen-Nürnberg, Germany

NS-Contributed On Demand-46 Fully Motorized, Tip-Scanning AFM With Photothermal Excitation for Improved Imaging and Cell Measurement Methods, **Jonathan Adams**, C. Bippes, L. Howald, S. Fricker, P. Frederix, P. van Schendel, H. Gunstheimer, L. Gonzalez, G. König, Nanosurf AG, Switzerland; G. Fläschner, ETH Zurich, Switzerland; D. Ziegler, Nanosurf AG, Switzerland

NS-Contributed On Demand-49 Effect of the Surroundings on the Controlled Manipulation of Individual Phenyl Groups, **Omur Dagdeviren**, C. Zhou, E. Altman, U. Schwarz, Yale University

NS-Contributed On Demand-52 Atomic-Scale Study of the Degradation Process on Single-Crystal Perovskite Surfaces: From Ultra-High Vacuum to Ambient Pressures, **Joong Il Jake Choi**, Center for Nanomaterials and Chemical Reactions, IBS, Republic of Korea; M. Khan, School of Electrical Engineering, KAIST, Republic of Korea; Z. Hawash, Energy Materials and Surface Sciences Unit, OIST, Japan; K. Kim, Beamline Research Division, Pohang Accelerator Laboratory (PAL), POSTECH, Republic of Korea; H. Lee, Department of Chemistry, KAIST, Republic of Korea; L. Ono, Y. Qi, Energy Materials and Surface Sciences Unit, OIST, Japan; Y. Kim, School of Electrical Engineering, KAIST, Republic of Korea; J. Park, Center for Nanomaterials and Chemical Reactions, IBS, and Department of Chemistry, KAIST, Republic of Korea

NS-Contributed On Demand-55 Correlative Imaging With Chemical Identification and Mechanical Mapping at the Nanometer Scale, **Shuiqing Hu**, M. Wagner, W. Wang, H. Mittel, C. Su, Bruker Nano Surfaces Inc

NS-Contributed On Demand-58 High-Speed Scanning Ion Conductance Microscopy (SICM) for Imaging Cellular Process, **Georg Fantner**, S. Leitao, B. Drake, V. Navikas, A. Radenovic, EPFL, Switzerland

NS-Contributed On Demand-61 Metasurface Lens Efficiency Improvement using Genetic Algorithm with Evolutionary Optimization, **David Czaplewski**, Argonne National Laboratory, USA; H. Cai, New York University; S. Srinivasan, A. Martinson, Argonne National Lab; D. Gosztola, Argonne National Laboratory, USA; L. Stan, T. Loeffler, S. Sankaranarayanan, Argonne National Laboratory; D. Lopez, national institute of Standards and Technology

NS-Contributed On Demand-64 THz Dynamics of Correlated Excitations in Moiré Superlattice, **Jun Xiao**, C. Xia, A. Lindenberg, Stanford University

NS-Contributed On Demand-67 Combined Scanning Gate Microscopy and Light Excitation Measurements on Semiconductor Nanowires, **Yen-Po Liu**, J. Fast, Y. Chen, M. Kumar, Lund University, Sweden; R. Zhe, DESY, Germany; R. Timm, A. Burke, H. Linke, A. Mikkelsen, Lund University, Sweden

NS-Contributed On Demand-70 Ultralow Friction of Magnetene, a non-van der Waals 2D Material, **Peter Serles**, University of Toronto, Canada; A. Puthirath, Rice University; S. Yadav, C. Veer Singh, University of Toronto, Canada; P. Ajayan, Rice University; T. Filleter, University of Toronto, Canada

NS-Contributed On Demand-73 Nano-Mechanical Characterization of Organic Micro-Inclusions in Flint, **Sidney Cohen**, I. Rosenhek-Goldian, Weizmann Institute of Science, Israel; T. Corrales, Technical University Federico Santa Maria, Brazil; F. Natalio, Weizmann Institute of Science, Israel; A. Cernescu, Neaspec, Germany

NS-Contributed On Demand-76 Mechanical Properties of Fibrillar Materials: The Role of H-Bond Formation in Amyloid Peptides, **Irit Rosenhek-Goldian**, N. Aggarwal, D. Eliaz, H. Cohen, S. Cohen, A. Kozell, T. Mason, U. Shimanovich, Weizmann Institute of Science, Israel

NS-Contributed On Demand-79 A Novel Experimental Method for Characterising Nano Insulating Materials (NIM) And Infill Gases, **Ofasa Abunumah**, P. Ogunlode, E. Gobina, The Robert Gordon University, UK

NS-Contributed On Demand-82 Realizing Gapped Surface States in the Magnetic Topological Insulator $\text{MnBi}_{2-x}\text{Sb}_x\text{Te}_4$, **Wonhee Ko**, Oak Ridge National Laboratory; M. Kolmer, Ames Laboratory; J. Yan, A. Pham, M. Fu, Oak Ridge National Laboratory; F. Luepke, Forschungszentrum Jülich GmbH, Germany; S. Okamoto, P. Ganesh, Z. Gai, A. Li, Oak Ridge National Laboratory

NS-Contributed On Demand-85 Statistical Detection of Josephson, Andreev, and Single Quasiparticle Currents in Scanning Tunneling Microscopy, **Wonhee Ko**, E. Dumitrescu, P. Maksymovych, Oak Ridge National Laboratory

NS-Contributed On Demand-88 Nanomaterial Adhesion Depends on Specific-Ion Effects Within Common Reservoir Fluids, **H. Chen**, Aramco Services Company - Boston; S. Eichmann, Aramco Services Company - Houston; **Nancy Burnham**, Worcester Polytechnic Institute

NS-Contributed On Demand-91 Walking the Plank: Solar Cell Nanowire Arrays Probed *in situ* by Surface Potential Microscopy, **Austin Irish**, L. Hrachowina, R. Timm, Lund University, Sweden

NS-Contributed On Demand-94 Probing Interfacial Properties of Iron Oxide Thin Films on Noble Metal Substrate by Scanning Tunneling Microscopy, **Dairong Liu**, J. Schultz, University of Illinois at Chicago; S. Mahapatra, University of Illinois at Chicago, India; N. Jiang, University of Illinois at Chicago, China

NS-Contributed On Demand-97 Room Temperature Spin Transport in Cd_3As_2 , **Gregory Stephen**, A. Hanbicki, Laboratory for Physical Sciences; T. Schumann, University of California at Santa Barbara; J. Robinson, Naval Research Laboratory; M. Goyal, University of California at Santa Barbara; S. Stemmer, University of California Santa Barbara; A. Friedman, Laboratory for Physical Sciences

NS-Contributed On Demand-100 Reconstructing the Intrinsic Potential Energy Landscape of Interfacial Interactions With Thermally Modulated Force Spectroscopy, **Alan Liu**, T. Sulchek, Georgia Institute of Technology

NS-Contributed On Demand-103 Open-Loop Amplitude-Modulation Kelvin Probe Force Microscopy Implemented in Single-Pass Peakforce Tapping Mode, **Gheorghe Stan**, P. Nambodiri, National Institute of Standards and Technology

NS-Contributed On Demand-106 Strain-modulated Electronic Properties in Epitaxial FeSn Thin Films on $\text{SrTiO}_3(111)$, **Huimin Zhang**, Q. Zou, West Virginia University, USA; M. Weinert, University of Wisconsin, Milwaukee; L. Li, West Virginia University, USA

NS-Contributed On Demand-109 Structure-Function of PC Surfactants, **Nir Kampf**, W. Lin, J. Klein, Weizmann Institute of Science, Israel

NS-Contributed On Demand-112 Selective Work Function Metal Etch Enabling Multi-Vt Patterning for High Performance Stacked Nanosheet Devices, **Curtis Durfee**, IBM Research; S. Kal, TEL; M. Bhuiyan, S. Pancharatnam, IBM Research; M. Flaugh, I. Otto, TEL; H. Zhou, M. Belyansky, IBM Research; A. Mosden, TEL; N. Loubet, L. Meli, IBM Research; P. Biolsi, TEL; B. Haran, IBM Research

NS-Contributed On Demand-115 Cooperative Effects in DNA Nanofabrication, **J. Majikes**, P. Patrone, A. Kearsley, National Institute of Standard and Technology; M. Zwolak, National Institute of Science and Technology; **J. Alexander Liddle**, National Institute of Standard and Technology

Nanoscale Science and Technology Division

Room On Demand - Session NS-Invited On Demand

Nanoscale Science and Technology Invited On Demand Session 8:00am

INVITED: NS-Invited On Demand-1 Engineering Quantum Forces and Torques, **Jeremy Munday**, University of California, Davis

INVITED: NS-Invited On Demand-13 Visualizing Inside of 3D Self-Organizing Systems by 3D-AFM, **Takeshi Fukuma**, Kanazawa University, Japan

INVITED: NS-Invited On Demand-19 Tackling Instabilities in Hybrid Perovskites from the Macro- to the Nanoscale, **Marina Leite**, University of California at Davis

INVITED: NS-Invited On Demand-31 Programming Assembly of 3D Nanoscale Systems, **Oleg Gang**, Columbia University

INVITED: NS-Invited On Demand-37 Nanoelectronic Devices and Architectures for Energy-Efficient Computing, **An Chen**, IBM Almaden Research Center

Nanoscale Science and Technology Plenary Session

Room On Demand - Session NP-Invited On Demand

Nanoscale Science and Technology Plenary Invited On Demand Session 8:00am

INVITED: NP-Invited On Demand-1 Atom-Defined Silicon Circuit Elements For Fast, Low Power Computing, **Robert Walkow**, University of Alberta and The National Institute for Nanotechnology, Canada

INVITED: NP-Invited On Demand-7 Seeing the Hidden Interface: Revealing Nanoscale Mechanisms of Contact, Adhesion, and Friction by *in situ* Experiments, **Robert Carpick**, University of Pennsylvania

New Trends in Structural Electronic Characterization of Materials, Interfaces, and Surfaces Using Synchrotron and FEL Based Light Sources Focus Topic

Room On Demand - Session LS-Contributed On Demand

New Trends in Structural Electronic Characterization of Materials, Interfaces, and Surfaces Using Synchrotron and FEL Based Radiation Sources Contributed On Demand Session 8:00am

LS-Contributed On Demand-1 Resolving Interfacial Electronic Structure in Thin Film Heterostructures using Resonant X-ray Reflectometry, **Ryan Need**, University of Florida

LS-Contributed On Demand-4 HAXPES Study of Surface/Interface Effects Induced by Heavy Alkali Post Deposition Treatment of $(\text{Ag,Cu})(\text{In,Ga})\text{se}_2$ Thin Film Solar Cell Absorbers, **Natalia Martin**, Uppsala University, Sweden; T. Törndahl, Uppsala University, Sweden; K. Simonov, Department of Materials and Process Development Swerim AB, Sweden; H. Rensmo, C. Platzer-Björkman, Uppsala University, Sweden

LS-Contributed On Demand-7 Surface Action Spectroscopy With Inert Gas Messenger Atoms, **Hans-Joachim Freund**, Fritz Haber Institute of the Max Planck Society, Germany

LS-Contributed On Demand-13 X-ray Magnetic Linear Dichroism Studies of Electrical Switching of Antiferromagnetic Order in $\alpha\text{-Fe}_2\text{O}_3$ Epitaxial Films, **Egecan Cogulu**, N. Statuto, New York University; Y. Cheng, Department of Physics, Ohio State University; S. Yu, F. Yang, Ohio State University; R. Chopdekar, H. Ohldag, Advanced Light Source, Lawrence Berkeley National Laboratories; A. Kent, New York University

LS-Contributed On Demand-16 Probing Interfacial Ferromagnetism in Oxide Superlattices Using Depth Resolved X-Ray Spectroscopic and Scattering Techniques, **Jay Paudel**, Temple University; M. Terilli, Rutgers University; I. Vobornik, P. Orgiani, G. Panaccione, CNR-IOM, TASC Laboratory, Italy; C. Klewe, P. Shafer, Advanced Light Source, LBNL; V. Stracov, Swiss Light Source, PSI, Switzerland; J. Chakhalian, Rutgers University; A. Gray, Temple University

New Trends in Structural Electronic Characterization of Materials, Interfaces, and Surfaces Using Synchrotron and FEL Based Light Sources Focus Topic Room On Demand - Session LS-Invited On Demand New Trends in Structural Electronic Characterization of Materials, Interfaces, and Surfaces Using Synchrotron and FEL Based Radiation Sources Invited On Demand Session 8:00am

INVITED: LS-Invited On Demand-1 Soft X-ray Resonant Inelastic Scattering (RIXS) to Study the Magnetic and Electronic Properties of Materials, **Nicholas Brookes**, ESRF, France

INVITED: LS-Invited On Demand-7 Bulk and Interface Hard-X-ray Bandmapping with Spin Resolution Combining Full-field Momentum Imaging with ToF-recording, **Gerd Schönhense**, Johannes Gutenberg University of Mainz, Germany

INVITED: LS-Invited On Demand-13 My Adventures with Synchrotrons: From Discovering New Types of Magnetism to Helping NASA, **Mikel Holcomb**, West Virginia University, USA

INVITED: LS-Invited On Demand-19 Extending Time-Resolved X-Ray Diffraction using Coherence, **Mark Sutton**, McGill University, Canada

Plasma Science and Technology Division Room On Demand - Session PS-Contributed On Demand Plasma Science and Technology Contributed On Demand Session 8:00am

PS-Contributed On Demand-1 Forming Protection Layers Using SiCl₄ Plasma for Highly Selective Etching, **Miyako Matsui**, Hitachi Ltd., Japan; **K. Kuwahara**, Hitachi High-Tech Corp., Japan

PS-Contributed On Demand-4 Focus Ring Erosion During Plasma Etching: Consequences of Dielectric Constant*, **Xifeng Wang**, University of Michigan; **H. Lee**, **S. Shim**, **S. Nam**, Samsung Electronics Ltd., Korea (Republic of); **M. Kushner**, University of Michigan

PS-Contributed On Demand-7 Improving Estimation Accuracy of Film Thickness Using Machine Learning for End Point Detection in Dry Etching, **T. Okamoto**, **Soichiro Eto**, Hitachi Ltd., Japan; **S. Nakamoto**, **K. Fukuchi**, **R. Asakura**, Hitachi High-Tech Corp., Japan

PS-Contributed On Demand-10 Floating Wire Assisted Plasma With Vapor Injection of Liquid Mixtures for Etching Titanium Compounds, **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

PS-Contributed On Demand-13 Plasma Based ASD for EUV Resist Defectivity Reduction and Process Window Improvement, **Jennifer Church**, IBM Research Division, Albany, NY; **K. Lutker-Lee**, TEL Technology Center, America, LLC; **L. Meli**, **E. Miller**, IBM Research Division, Albany, NY; **A. Raley**, TEL Technology Center, America, LLC

PS-Contributed On Demand-16 Extreme Contact Hole Shrink for BEOL Connectivity, **Filip Schleicher**, **S. Paolillo**, **S. Decoster**, **C. Wu**, **V. Vega Gonzalez**, **F. Lazzarino**, IMEC, Belgium

PS-Contributed On Demand-19 Direct Metal Etch of Molybdenum and Ruthenium: Patterning Challenges for N3 and Beyond, **Stefan Decoster**, **S. Kundo**, **F. Lazzarino**, IMEC, Belgium; **E. Camerotto**, LAM Research, Belgium

PS-Contributed On Demand-22 High Aspect Ratio Supervia Dual Damascene Etch for iN5 and Beyond, **Harinarayanan Puliylalil**, IMEC, Leuven, Belgium; **Y. Feurprier**, **N. Oikawa**, Tokyo Electron Miyagi Ltd., Japan; **V. Vega Gonzalez**, **B. Briggs**, **D. Montero**, **F. Lazzarino**, **Z. Tokei**, IMEC, Leuven, Belgium; **S. Nakamura**, **S. Tahara**, **K. Kumar**, Tokyo Electron Miyagi Ltd., Japan

PS-Contributed On Demand-25 Impacts of Different Carrier Wafers during Cl₂ Inductively Coupled Plasma Etching on the GaN Surface and the Al₂O₃/Gan Interface, **Thibaut Meyer**, **S. Boubenia**, **C. Petit-Etienne**, **B. Salem**, **E. Pargon**, CNRS-LTM, Université Grenoble Alpes, France

PS-Contributed On Demand-28 Wireless Retarding Field Analyzer for Ion Energy Distribution Measurements in Plasma Processes, **David Gahan**, Impedans Ltd, Ireland

PS-Contributed On Demand-31 Characterisation of N-Based Plasma-Functionalised Microporous Activated Carbon and Macroporous Cordierite Monoliths for Improved CO₂ Adsorption, **Madhuwanthi Buddhadasa**, Université Libre de Bruxelles, Belgium; **Y. Ali Gómez Rueda**, **B. Verougstraete**, Vrije Universiteit Brussel, Belgium; **T. Doneux**, Université Libre de Bruxelles, Belgium; **J. Denayer**, Vrije Universiteit Brussel, Belgium; **F. Reniers**, Université Libre de Bruxelles, Belgium

PS-Contributed On Demand-34 Insights Into the Plasma Catalytic Decomposition of Methane: Role of Atomic O and Surface Species, **Yudong Li**, University of Maryland College Park; **J. Jiang**, University of Minnesota; **M. Hinshelwood**, University of Maryland College Park; **P. Bruggeman**, University of Minnesota; **G. Oehrlein**, University of Maryland College Park

PS-Contributed On Demand-37 Plasmonic Nitridation of Silicon Surface via Plasma-Induced Wavelength-Mixed Gold Nanoparticle Excitation, **Takeshi Kitajima**, **K. Watanabe**, **M. Miyake**, **T. Nakano**, National Defense Academy, Japan

PS-Contributed On Demand-40 Low-Temperature Deposition Technology of High-Quality and Low-Stress SiO₂ and SiN Films for Photonics Devices Using ECR Plasma, **Masamitsu Toramaru**, **Y. Jin**, Japan Steel Works, LTD., Japan; **k. Mori**, **H. Torii**, **T. Mashita**, JSW AFTY Corp., Japan

PS-Contributed On Demand-43 Automatic Etching-Recipe Optimization in Si Etching with Self-Aligned Quadruple Patterning Masks for Productivity Enhancement by Transfer Learning, **Naoto Takano**, **H. Nakada**, **T. Ohmori**, Hitachi, Ltd. Research & Development Group, Japan

PS-Contributed On Demand-46 Plasma Etch Solutions for Defect Reduction in Ultra-Thin Photoresist, **Jihun Park**, Sungkyunkwan University (SKKU), Korea (Republic of); **S. Kim**, Samsung Electronics, Korea (Republic of); **G. Yeom**, Sungkyunkwan University (SKKU), Korea (Republic of)

PS-Contributed On Demand-49 Design of Organosilicon Nano-Membrane at Atmospheric Pressure With a Glow Discharge and New Applications for Electrochemical Devices, **Jacopo Profili**, CHU de Québec-Université Laval Research Centre, Canada; **M. Beauchemin**, **S. Rousselot**, Université de Montréal, Canada; **L. Martinu**, Polytechnique Montréal, Canada; **M. Dollé**, **L. Stafford**, Université de Montréal, Canada

PS-Contributed On Demand-52 Optimization Process for the Fabrication of Ultra-Low Loss PECVD Silicon Nitride-on-Insulator Waveguides, **Yannick Bleu**, **C. Petit-Etienne**, **L. Youssef**, Univ. Grenoble Alpes, CNRS, CEA/LETI-Minatec, Grenoble INP, LTM, France; **J. Faugier-Tovar**, **Q. Wilmart**, Univ. Grenoble Alpes, CEA, LETI, France; **E. Pargon**, Univ. Grenoble Alpes, CNRS, CEA/LETI-Minatec, Grenoble INP, LTM, France

PS-Contributed On Demand-55 RF Hollow Cathode Discharge: Particle-in-Cell/Monte Carlo Simulation, **Kallol Bera**, **X. Li**, **A. Verma**, **S. Ganta**, **S. Rauf**, Applied Materials, Inc.

PS-Contributed On Demand-58 Determination of Recombination Coefficients for Hydrogen, Oxygen and Nitrogen Gasses via in-Situ Radical Probe System, **Dren Qerimi**, University of Illinois at Urbana-Champaign; **D. Ruzic**, **G. Panici**, **A. Jain**, **D. Jacobson**, University of Illinois at Urbana-Champaign, USA

PS-Contributed On Demand-61 Sheath Model for Electromagnetic Simulation of Capacitively Coupled Plasma, **Xiaopu Li**, **A. Verma**, **S. Ganta**, **K. Bera**, **S. Rauf**, Applied Materials, Inc.

PS-Contributed On Demand-64 Characterization of Reversed Arc Hydrocarbon Plasma in Material Synthesis, **Vladimir Gorokhovskiy**, Nano-Product Engineering, LLC, Univ. of Colorado

PS-Contributed On Demand-67 Molecular Analysis of Plasma-Induced Germination Improvement of Rice Seeds With High-Temperature Stress Damage, **Kazunori Koga**, **Y. Ishibashi**, Kyushu University, Japan; **C. Suriyasak**, Kyushu University, Japan, Thailand; **T. Okumura**, **H. Tanaka**, Kyushu University, Japan; **P. Attri**, Kyushu University, Japan, India; **K. Matsuo**, **D. Yamashita**, **N. Itagaki**, **K. Kamataki**, **M. Shiratani**, Kyushu University, Japan

PS-Contributed On Demand-70 As-grown Crystalline β -Ga₂O₃ Films Obtained at Low Temperatures via in Situ Atomic Layer-by-layer Plasma Processing, **Saidjafarzoda Ilhom**, **A. Mohammad**, **D. Shukla**, **J. Grasso**, **B. Willis**, **A. Okyay**, **N. Biyikli**, University of Connecticut

PS-Contributed On Demand-73 Computational Optimization and Reduced Order Modeling of Plasma Chemistry in Fluid Plasma Models, **Sathya S Ganta**, **X. Li**, **K. Bera**, **S. Rauf**, Applied Materials, Inc.

PS-Contributed On Demand-76 Fluorocarbon Plasma Erosion Behavior of Heraeus Black Quartz, **Mark Stamminger**, Heraeus Quarzglas GmbH & Co. KG, Germany; **K. Noesges**, **T. Mussenbrack**, Ruhr University Bochum, Germany; **A. Goetzendorfer**, **B. Weisenseel**, Heraeus Quarzglas GmbH & Co. KG, Germany

PS-Contributed On Demand-79 Surface and Plasma Characterization of a Self-Limited Two Step Etch Process for SiN Spacer Etching Applications, **Nicolas A. Loubet**, LTM-CNRS, France; **C. Jenny**, STMicroelectronics, France; **C. Petit-Etienne**, **E. Pargon**, LTM-CNRS, France

PS-Contributed On Demand-82 Molecular Dynamics Study on Multi-Steps Plasma-Assisted Atomic Layer Etching of Silicon Nitride, **Jomar Tercero**, University of the Philippines; **A. Hirata**, Sony Semiconductor Solutions Corporation, Japan; **M. Isobe**, Osaka University, Japan; **M. Fukasawa**, Sony Semiconductor Solutions Corporation, Japan; **M. Vasquez**, University of the Philippines; **S. Hamaguchi**, Osaka University, Japan

PS-Contributed On Demand-85 Two-Dimensional Particle-in-Cell Modeling of Low Pressure, High Voltage Capacitively Coupled Ar Plasmas, **Amanda Lietz**, Sandia National Laboratories; **P. Tian**, **J. Kenney**, **S. Rauf**, Applied Materials, Inc.; **M. Hopkins**, Sandia National Laboratories

PS-Contributed On Demand-88 Modeling Capacitively Coupled Plasmas With Nanosecond Pulsed Bias Voltages, **Amanda Lietz**, Sandia National Laboratories; **J. Prager**, Eagle Harbor Technologies; **M. Hopkins**, Sandia National Laboratories

PS-Contributed On Demand-91 Microplasma-Assisted Atomic Layer Deposition and Etching Free Patterning of Ga₂O₃ Film with Enhanced DUV Photoresponse, **Jinhong Kim**, **A. Micronov**, University of Illinois at Urbana Champaign; **D. Sievers**, University of Illinois Urbana Champaign; **S. Park**, University of Illinois at Urbana Champaign; **J. Eden**, University of Illinois Urbana Champaign

PS-Contributed On Demand-94 A Mechanistic Approach to Tune Plasma Sintering Parameters for Enhancing Connectivity of Printed Nanoparticles, **Nazli Turan**, **M. Saeidi-Javash**, **Y. Zhang**, **D. Go**, University of Notre Dame

PS-Contributed On Demand-97 Molecular Beam Mass Spectrometry to Measure Absolute Densities of Ions, Vibrationally and Electronically Excited Species in Atmospheric Pressure Plasmas, **Jingkai Jiang**, **Y. Aranda Gonzalvo**, **P. Bruggeman**, University of Minnesota

PS-Contributed On Demand-100 EUV Induced Formation of Hydrogen Plasmas at Low Pressure, **Tugba Piskin**, University of Michigan; **H. Lee**, **S. Nam**, Samsung Electronics Co., Inc., Korea (Republic of); **M. Kushner**, University of Michigan

PS-Contributed On Demand-103 Molecular Dynamics Simulation of Oxide-Nitride Layer Etching by Fluorocarbon Plasmas, **Charisse Marie Cagomoc**, **M. Isobe**, **S. Hamaguchi**, Osaka University, Japan; **E. Hudson**, Lam Research Corporation

PS-Contributed On Demand-106 Improving the Hydrophilic Properties of Pet Textiles Using Atmospheric Dbd and RF Plasma Torch, **Annaelle Demaude**, Université libre de Bruxelles, Belgium; **R. Inturri**, Fidia Pharma, Italy; **C. Satriano**, University of Catania, Italy; **P. Leroy**, IONICS Surface Technologies, Belgium; **F. Reniers**, Université libre de Bruxelles, Belgium

PS-Contributed On Demand-109 One-Step Synthesis of Chemically Patterned Thin Films via Immobilization of Plasma Filaments in an AP-DBD, **Annaëlle Demaude**, Université libre de Bruxelles, Belgium; **K. Baert**, Vrije Universiteit Brussel, Belgium; **D. Petitjean**, **E. Goormaghtigh**, Université Libre de Bruxelles, Belgium; **T. Hauffman**, Vrije Universiteit Brussel, Belgium; **M. Gordon**, University of California Santa Barbara; **F. Reniers**, Université Libre de Bruxelles, Belgium

PS-Contributed On Demand-112 Control of the process environment for HfO₂-based RRAM device formation, **Hiroyuki Miyazoe**, IBM T.J. Watson Research Center; **D. Koty**, TEL Technology Center, America, LLC; **H. Yan**, **N. Gong**, **M. Hopstaken**, **E. Cartier**, **J. Ott**, IBM T.J. Watson Research Center; **Q. Yang**, **A. Mosden**, TEL Technology Center, America, LLC; **T. Ando**, **S. Engelmann**, **E. Joseph**, IBM T.J. Watson Research Center

PS-Contributed On Demand-115 III-V/Ge Heterostructure Plasma Etching and Passivation With a Single Plasma Process for Low-Damage Multijunction Solar Cell Fabrication, **Mathieu de Lafontaine**, Laboratoire des Technologies de la Microélectronique, CNRS-LTM, France, Canada; **E. Pargon**, **G. Gay**, **C. Petit-Etienne**, Laboratoire des Technologies de la Microélectronique, CNRS-LTM, France; **J. Barnes**, **N. Rochat**, CEA, LETI, MINATEC Campus, France; **M. Volatier**, **A. Jaouad**, **S. Fafard**, **V. Aimez**, **M. Darnon**, Laboratoire Nanotechnologies Nanosystèmes (LN2) - CNRS UMI-3463 Institut Interdisciplinaire d'Innovation Technologique (3IT), Université de Sherbrooke, Canada

PS-Contributed On Demand-118 Process-induced Damage in GST Etch, **Luxherta Buzi**, **J. Papalia**, **H. Miyazoe**, IBM; **H. Cheng**, Macronix International Co; **M. Hopstaken**, **R. Bruce**, **S. Engelmann**, IBM

PS-Contributed On Demand-121 Double Curling Probe Method for in-situ Monitoring of Electron Density and Film Thickness for Application, **Daisuke Ogawa**, **H. Sugai**, **K. Nakamura**, Chubu University, Japan

PS-Contributed On Demand-124 Low Energy, High Flux Density Ion Assisted E-Beam Evaporation Using a Tunable and Robust Rf Plasma Ion Source, **M. Reilly**, **R. Viswan**, **David Douglass**, Denton Vacuum, LLC

PS-Contributed On Demand-127 Etch Behavior of Post-Copper Metals, **John Arnold**, IBM Research Division, Albany, NY; **N. Joy**, TEL Technology Center, America, LLC; **H. Miyazoe**, IBM Research Division, T.J. Watson Research Center; **C. Park**, **A. Simon**, IBM Research Division, Albany, NY; **C. Cabral**, **H. Yan**, **F. Stellari**, IBM Research Division, T.J. Watson Research Center; **S. Rogalskyj**, TEL Technology Center, America, LLC; **E. Richardson**, TEL Technology Center of America; **A. Raley**, TEL Technology Center, America, LLC; **S. Engelmann**, IBM Research Division, T.J. Watson Research Center

PS-Contributed On Demand-130 Radical Flux Control using a Dual Exhaust System during Reactive Ion Beam Etching (RIBE) Process, **Doo San Kim**, **Y. Jang**, **Y. Kim**, **H. Gil**, **G. Yeom**, Sungkyunkwan University, Korea (Republic of)

PS-Contributed On Demand-133 Inactivation of Human Coronavirus in Circulating Air Flows Using a Multielectrode Dbd Setup, **A. Demaude**, **Delphine Merche**, **D. Petitjean**, **M. Depessemier**, **E. Silberberg**, **A. Op De Beeck**, **F. Reniers**, Université libre de Bruxelles, Belgium

PS-Contributed On Demand-136 Insertion Characteristics of Plasma Nitrided Suture Needle in Long Incision, **Takao Yamauchi**, Meijo University Graduate School, Japan; **P. Abraha**, Meijo University, Japan

PS-Contributed On Demand-139 Investigation of CHM Etching with Additive Gas, **Kathryn Maier**, **L. Kovatch**, **Y. Ishii**, Hitachi High Technologies America Inc.

PS-Contributed On Demand-142 Effect of Synchronously and Asynchronously Pulsed Ar/Cl₂ Inductively Coupled Plasmas on Si Trench Formation, **Heeju Kim**, **G. Yeom**, **L. Wen**, **J. Hong**, **W. Jang**, **S. Namgoong**, Sungkyunkwan University (SKKU), Korea (Republic of)

PS-Contributed On Demand-145 Two-Dimensional Particle-in-Cell Simulation for Spatial Nonuniformity of Ion Energy and Angle Distributions in Dual-Frequency Capacitively Coupled Ar Plasmas, **Ji Hyun Shin**, **C. Kim**, **G. Park**, **H. Kim**, **H. Lee**, Pusan National University, Korea (Republic of)

PS-Contributed On Demand-148 Plasma Induced Disproportionation of Nitrogen in a DC Plasma-Electrolysis System Operated in N₂ at Atmospheric Pressure, **C. Pattyn**, Université libre de Bruxelles, Belgium, France; **Nicolas Maira**, Université libre de Bruxelles, Belgium, Italy; **A. Remy**, **F. Reniers**, Université libre de Bruxelles, Belgium

PS-Contributed On Demand-151 The Role of Plasma Properties in Plasma Enhanced Atomic Layer Epitaxy, **Scott Walton**, **D. Boris**, **V. Wheeler**, **N. Nepal**, Naval Research Laboratory; **S. Rosenberg**, **J. Avila**, **J. Woodward**, **V. Anderson**, ASEE; **C. Eddy, Jr.**, Naval Research Laboratory

PS-Contributed On Demand-154 Area Selective Plasma Enhanced Chemical Vapor Deposition of Silicon Using a Fluorinated Precursor, **Ghewa Akiki**, LPICM-CNRS, Ecole Polytechnique, Institut Polytechnique de Paris, France; **S. Filonovich**, TOTAL GRP, France; **M. Bouttemy**, **M. Fregnaud**, Institut Lavoisier de Versailles, UMR CNRS 8180, Université de Versailles-St-Quentin, France; **I. Florea**, **P. Bulkin**, **E. Johnson**, LPICM-CNRS, Ecole Polytechnique, Institut Polytechnique de Paris, France

PS-Contributed On Demand-157 Driving Frequency and Ozone as Key Parameters for Nitrogen Oxidation by a Dielectric Barrier Discharge in an N₂-O₂ Mixture, **Antoine Remy**, Université libre de Bruxelles, Belgium; **N. De Geyter**, Ghent University, Belgium; **F. Reniers**, Université libre de Bruxelles, Belgium

PS-Contributed On Demand-160 Are Atmospheric Plasmas Environmental Friendly? A Case Study, **R. De Cruyenaere**, Université libre de Bruxelles, Belgium; **N. Vandencastele**, CPI Plasma, France; **W. Achten**, **Francois Reniers**, Université libre de Bruxelles, Belgium

PS-Contributed On Demand-163 Spatio-Temporal Characterization of a Pulsed DC Atmospheric Pressure Plasma Jet Interacting With Substrates, **Michael Johnson**, National Research Council; **D. Boris**, **T. Petrova**, **S. Walton**, Naval Research Laboratory, USA

PS-Contributed On Demand-166 Modulation of Synergy in Metal ALE: Film Composition Effects, **Nathan Marchack**, **E. David**, **D. Kazem**, **B. To**, **M. Hopstaken**, **S. Engelmann**, IBM Research Division, T.J. Watson Research Center

PS-Contributed On Demand-169 Bridging the Gap Between Plasma Spectroscopy and Catalytic Analysis: A Study on CO₂ Methanation, **Lucas Quintana**, **E. Fisher**, Colorado State University

PS-Contributed On Demand-172 A Low-Cost Atmospheric Pressure Plasma Apparatus to Depyrogenate Delicate Materials in a Sealed Environment, **Naman Bhatt**, **D. Trosan**, North Carolina State University; **J. Brier-Jones**, Loma Linda University, Karamedica, Inc.; **J. Pecoraro**, North Carolina State University; **J. Smallwood**, Loma Linda University; **A. Crofton**, Case Western Reserve University, Karamedica Inc.; **S. Hudson**, North Carolina State University, Karamedica; **W. Kirsch**, Loma Linda University, Karamedica, Inc.; **K. Stapelmann**, **S. Shannon**, North Carolina State University

PS-Contributed On Demand-175 Two-Dimensional Inductive Coupled Plasma Remote Source Modeling and Experimental Validation With Different Gas Mixtures, **Abhra Roy**, ESI Group; *L. Zhang, Y. Yang, S. Ma*, Mattson Technology, Inc.

PS-Contributed On Demand-178 Etching Characteristics of Low-K SiCOH Thin Films Deposited by Plasma Enhanced Chemical Vapor Deposition Using Tetrakis(Trimethylsilyloxy)Silane Precursor, **Jacob Comeaux**, *W. Wirth, S. Jang*, University of Louisiana at Lafayette

PS-Contributed On Demand-181 Enhancing the Far Ultra-Violet Optical Properties of Aluminum Mirrors with a Plasma Based Approach to Oxide Removal and Fluorine Passivation, **David Boris**, U. S. Naval Research Laboratory; *L. Rodriguez de Marcos*, Catholic University of America; *A. Kozen, S. Rosenberg*, ASEE Postdoctoral Fellow; *J. del Hoyo, J. Richardson, E. Wollack, M. Quijada*, NASA Goddard Space Flight Center; *S. Walton*, U. S. Naval Research Laboratory

PS-Contributed On Demand-184 Spatially Localized Etching using a Novel, Mask-free and Contactless Plasma Patterning Technique, **Erik V. Johnson**, *J. Wang, M. Ghosh, R. Leal, P. Bulkin, P. Roca i Cabarrocas*, LPICM-CNRS, Ecole Polytechnique, Institut Polytechnique de Paris , France; *S. Filonovich*, Total GRP, France

PS-Contributed On Demand-187 Effects of Outside Circuit on Capacitively Coupled Plasma Based on 1D Circuit Modeling and Experiments, **Yuhua Xiao**, North Carolina State University; *S. Nam, H. Lee, J. Lee*, Samsung, Korea (Republic of); *S. Shannon*, North Carolina State University

PS-Contributed On Demand-190 Characterization and Spatially Resolved Analysis of an Open Channel Microfluidic Substrate for Atmospheric Plasmas, **Josh Morsell**, *S. Shannon*, North Carolina State University; *J. Jiang, P. Bruggeman*, University of Minnesota

PS-Contributed On Demand-193 Construction of a Surrogate Model of a Plasma Processing System by Machine Learning, **Masakazu Ichikawa**, *K. Ikuse*, Osaka University, Japan; *K. Chen*, National Yang Ming Chiao Tung University, Taiwan; *J. Wu*, National Yang Ming Chiao Tung University , Taiwan; *S. Hamaguchi*, Osaka University, Japan

PS-Contributed On Demand-196 Incorporating Electronegative Feedback Mechanisms in a Global Plasma Circuit Model for Pulsed Power Delivery, **Carl Smith**, North Carolina State University; *S. Nam, K. Bae, J. Lee*, Samsung Mechatronics R&D Center, Korea (Republic of); *S. Shannon*, North Carolina State University

PS-Contributed On Demand-199 Comparative Study of Low Damage Plasma Etching Processes on the Integrity of AlGaIn Layers Integrated in GaN HEMT During Gate Opening, **Oleh FESIENKO**, *C. Petit-Etienne*, University Grenoble Alpes, LTM, CNRS, France; *M. Darnon, A. Soltani, H. Maher*, Université de Sherbrooke, LN2, CNRS UMI-3463, Canada; *E. Pargon*, University Grenoble Alpes, LTM, CNRS, France

PS-Contributed On Demand-202 Two-Dimensional Particle-in-Cell Simulation of Local and Nonlocal Electron Kinetics in Capacitively Coupled Plasmas, **Hwan Ho Kim**, *C. Kim, J. Shin, H. Lee*, Pusan National University, Korea (Republic of)

PS-Contributed On Demand-205 Characterization of Plasma-Thermal Cu ALE Processes and Etch Products, **Xia (Gary) Sang**, *J. Martinez, L. Bouchard, E. Carter*, *J. Chang*, University of California at Los Angeles

Plasma Science and Technology Division

Room On Demand - Session PS-Invited On Demand

Plasma Science and Technology Invited On Demand Session 8:00am

INVITED: PS-Invited On Demand-1 Control of Interface Layers for Selective Atomic Layer Etching, **Takayoshi Tsutsumi**, Nagoya University, Japan; *R. Vervuurt*, ASM, Japan; *N. Kobayashi, M. Hori*, Nagoya University, Japan

INVITED: PS-Invited On Demand-7 Current Modeling and Simulation Challenges of Low-Temperature Plasmas, **Anne Bourdon**, LPP, CNRS, Ecole Polytechnique, France

INVITED: PS-Invited On Demand-13 Plasma-Substrate Interaction in the Case of Atmospheric Pressure Plasmas, **Ana Sobota**, Eindhoven University of Technology, Netherlands; *O. van Rooij*, Eindhoven University of Technology, Afghanistan; *M. Hofmans, O. Guaitella, A. Bourdon*, Ecole Polytechnique, Afghanistan; *P. Viegas*, Dutch Institute for Fundamental Energy Research (DIFFER), Afghanistan

INVITED: PS-Invited On Demand-19 Recent Advances in Plasma Processing for the Creation of Tunable Biofunctional Surfaces and Interfaces, **Marcela Bilek**, *B. Akhavan, C. Tran, R. Walia, E. Kosobrodova*, University of Sydney, Australia; *A. Kondyurin*, university of Sydney, Australia; *C. Lotz, G. Yeo*, University of Sydney, Australia

INVITED: PS-Invited On Demand-31 Linear Hollow Cathode Plasma Source and the Deposition of Silicon Oxide Materials, **John Chambers**, AGC; *E. Michel, G. Arnoult*, AGC, Belgium

INVITED: PS-Invited On Demand-37 CO₂ Conversion in Microwave Plasma: Can We Bring It to an Industrial Scale?, **Floran Peeters**, Dutch Institute for Fundamental Energy Research, Netherlands

INVITED: PS-Invited On Demand-43 2021 AVS PSTD Young Investigator Award Talk: Plasma Treatment on SiGe for Improvement of Interface Trap Density by Inducing Si Segregation, **Yohei Ishii**¹, Hitachi High-Tech America, Inc.; *R. Sugano*, Hitachi, Ltd., Japan; *Y. Lee, W. Wu*, Taiwan Semiconductor Research Institute, Taiwan; *H. Ishimura*, Hitachi High-Tech Taiwan Corp., Taiwan; *K. Maeda, M. Miura*, Hitachi High-Tech Corp., Japan

INVITED: PS-Invited On Demand-55 Going Mobile: Design, Optimization, and Scaleup of Plasma Reactors for Treatment of Pfas-Containing Ion Exchange Brine, **Selma Mededovic Thagard**, Clarkson University

INVITED: PS-Invited On Demand-61 Plasma Process Requirements for Emerging Memories, **Nicole Saulnier**, *I. Saraf, A. Dutta, K. Brew, S. Mehta, P. Jamison, O. van der Straten, I. Ok, S. Seo, C. Silvestre, C. Yang, M. Rizzolo, S. Choi, H. Chen*, IBM Research Division, Albany, NY; *P. Adusumilli*, IBM Research Division, T.J. Watson Research Center; *J. Arnold*, IBM Research Division, Albany, NY; *D. Edelstein*, IBM Research Division, T.J. Watson Research Center; *J. Slaughter*, IBM Research Division, Albany, NY; *T. Ando*, IBM Research Division, T.J. Watson Research Center; *A. Sebastian*, IBM Research GmbH, Zurich Research Laboratory

Smart Multifunctional Materials for Nanomedicine Focus Topic

Room On Demand - Session SM-On Demand

Smart Multifunctional Materials for Nanomedicine

Contributed On Demand Session

8:00am

SM-On Demand-1 Cisplatin-Loaded Palladium Nanoparticles for Cancer Nanomedicine, *L. Cucci, A. Bellissima*, University of Catania, Italy; *T. Marzo, D. La Mendola*, University of Pisa, Italy; *V. Notarstefano, E. Giorgini*, Polytechnic University of Marche, Italy; *Cristina Satriano*, University of Catania, Italy

SM-On Demand-4 A Multifunctional Plasmonic Nanoplatfrom of Hyaluronan-Decorated Nanoparticles Fabricated by Atmospheric Plasma for Angiogenic and Antibacterial Applications, *V. Caruso*, University of Catania, Italy; *D. Merche, J. Baneton, A. Ozkan*, Université libre de Bruxelles, Belgium; *L. Cucci*, University of Catania, Italy; *R. Inturri, G. Galizia*, Fidia Farmaceutici S.p.A, Italy; *S. Godet, L. Malet, F. Reniers*, Université libre de Bruxelles, Belgium; *S. Vaccaro*, Fidia Farmaceutici S.p.A., Italy; *Cristina Satriano*, University of Catania, Italy

SM-On Demand-7 Angiogenin-Functionalized Gold Nanoparticles-Graphene Oxide Nanohybrids for Wound Care Application, *L. Cucci, L. Riela*, University of Catania, Italy; *O. Hansson*, University of Gothenburg, Sweden; *T. Marzo*, University of Pisa, Italy; *C. Satriano*, University of Catania, Italy; *Diego La Mendola*, University of Pisa, Italy

SM-On Demand-10 Hyaluronan-Metal Gold Nanoparticle Hybrids for Targeted Tumour Cell Therapy and Antibacterial Applications, **Vanessa Sanfilippo**, *L. Cucci, V. Caruso*, University of Catania, Italy; *R. Inturri, L. Messina, S. Vaccaro*, Fidia Farmaceutici S.p.A., Italy; *T. Fontaine, A. Demaude, F. Reniers*, Université libre de Bruxelles, Belgium; *C. Satriano*, University of Catania, Italy

Spectroscopic Ellipsometry Focus Topic

Room On Demand - Session EL-Contributed On Demand

Spectroscopic Ellipsometry Contributed On Demand Session 8:00am

EL-Contributed On Demand-1 One-Pot Microwaved Synthesized Luminescent Carbon Quantum Dots From Various Citrus Fruit, *T. Gunawansa, Sangram Pradhan, M. Bahoura*, Norfolk State University

EL-Contributed On Demand-4 Sub-Surface Imaging of Atomically-Thin Semiconductors Beneath Dielectrics Based on Optical Standing Wave Using Photoelectron Emission Microscopy With Deep-Ultraviolet Photoexcitation, **Taisuke Ohta**, *M. Berg*, Sandia National Laboratories; *F. Liu*, Los Alamos National Laboratory; *S. Smith, G. Copeland, C. Chan*, Sandia National Laboratories; *A. Mohite*, Rice University; *T. Beechem*, Sandia National Laboratories

¹ PSTD Young Investigator Award

EL-Contributed On Demand-7 A Comparison of Mueller Matrix Spectroscopic Ellipsometry Based Scatterometry With Cd-Small Angle X-Ray Scattering for Measurement of Feature Size, Shape and Dimension for Nanowire Fet Test Structures, **Alain Diebold**, M. Korde, SUNY Polytechnic Institute; R. Kline, National Institute of Standards and Technology; D. Sunday, National Institute of Standards and Technology (NIST); N. Keller, A. Antonelli, ONTO Innovation

EL-Contributed On Demand-10 Optical Constants of GaSbBi as a Function of Bi Content and Temperature, **John H. McElearney**, K. Grossklau, S. Lenney, M. Stevens, T. Vandervelde, Tufts University

EL-Contributed On Demand-13 A Machine Learning Approach to Thickness Prediction from In Situ Spectroscopic Ellipsometry Data for Atomic Layer Deposition Processes, **S. Novia Berriel**, University of Central Florida; A. Arunachalam, University of Texas at Dallas; C. Feit, U. Kumar, S. Seal, University of Central Florida; K. Basu, University of Texas at Dallas; P. Banerjee, University of Central Florida

EL-Contributed On Demand-16 Photonic Crystals with a Narrow-Band Defect for the Infrared Spectral Range, **V. Paige Stinson**, S. Park, M. McLamb, University of North Carolina at Charlotte; D. Childers, US Conec, Ltd.; T. Hofmann, University of North Carolina at Charlotte

Surface Science Division

Room On Demand - Session SS-Contributed On Demand Surface Science Contributed On Demand Session 8:00am

SS-Contributed On Demand-1 Development of Low Thermal Budget Si Epitaxy and High-K/Metal Gate Stack for Atomically Precise Electronic Devices, **Evan M. Anderson**, D. Campbell, J. Ivie, S. Schmucker, P. Lu, X. Gao, L. Tracy, R. Arghavani, E. Bussmann, A. Baczewski, T. Lu, D. Ward, S. Misra, Sandia National Laboratories

SS-Contributed On Demand-4 Mechanisms of Electrocatalytic Reduction of N_2 at Vanadium and Cobalt Oxynitride Surfaces: Impacts of Metal Oxophilicity and π -Backbonding, **Adaeze Osonkie**, A. Ganesan, P. Chukwunenye, F. Anwar, I. Rashed, F. D'Souza, T. Cundari, J. Kelber, University of North Texas

SS-Contributed On Demand-7 Advanced Thermoporometry Characterization of Disordered Mesoporous Materials, **Henry R. N. B. Enniful**, D. Schneider, R. Kohns, D. Enke, R. Valiullin, Leipzig University, Germany

SS-Contributed On Demand-10 Electrical Resistance Response of a ZnO Single-Crystalline Substrate to Trace Ethanol Under Pulsed Air Jet Irradiation, **Taku Suzuki**, Y. Adachi, T. Ohgaki, I. Sakaguchi, National Institute for Materials Science, Japan; N. Nakamura, H. Ohashi, A. Aimi, K. Fujimoto, Tokyo University of Science, Japan

SS-Contributed On Demand-13 Elucidate 3D Structure of PM2.5 Aerosol Particles using ToF-SIMS, **Zihua Zhu**, Y. Zhou, Environmental Molecular Sciences Laboratory, Pacific Northwest National Laboratory, Richland, WA, 99354, USA; F. Mei, Atmospheric Science and Global Change Division, Pacific Northwest National Laboratory, Richland, WA, 99354, USA

SS-Contributed On Demand-16 Facet-Dependent Study of the Interaction of Water Vapor With Fe_2O_3 at Near Ambient Conditions, **Nabajit Lahiri**, D. Song, M. Zong, X. Huang, X. Zhang, Pacific Northwest National Laboratory; K. Stoerzinger, P. Adiga, Q. Carvalho, Oregon State University; M. Blum, Lawrence Berkeley National Laboratory; K. Rosso, Pacific Northwest National Laboratory

SS-Contributed On Demand-19 Influence of Geometric Disorder on Fluid Phase Transitions in Disordered Mesoporous Solids, **Henry R. N. B. Enniful**, D. Schneider, D. Enke, R. Valiullin, Leipzig University, Germany

SS-Contributed On Demand-22 Use of Ultra Thin Atomic Layer Deposited Capping Layers to Increase Stability in Thermally Processed Metalcone Thin Films, **Vamseedhara Vemuri**, N. Strandwitz, Lehigh University

SS-Contributed On Demand-25 In-Situ Visualization of Surface Plasmon-Driven Hot Carrier Generation With Photoconductive AFM, **Hyunhwa Lee**, K. Song, Institute for Basic Science (IBS), Korea (Republic of); M. Lee, Inha University, Korea (Republic of); J. Park, Institute for Basic Science (IBS), Korea (Republic of)

SS-Contributed On Demand-28 Impact of Hot Hole Transport on Photocatalytic Activity in Au Nanoprisms/p-Gan under Water Splitting Reaction, **Kyungjae Song**, Korea Advanced Institute of Science and Technology (KAIST) & Institute for Basic Science (IBS), Korea (Republic of); H. Lee, Institute for Basic Science (IBS), Korea (Republic of); M. Lee, Inha university, Korea (Republic of); J. Park, Korea Advanced Institute of Science and Technology (KAIST) & Institute for Basic Science (IBS), Korea (Republic of)

SS-Contributed On Demand-31 Observation of Atomic-scale Gliding Effect on Hydrophilic Surfaces at High Humidity, **Tae Won Go**, Korea Advanced Institute of Science and Technology (KAIST) & Institute for Basic Science (IBS), Korea (Republic of); H. Lee, J. Kim, Institute for Basic Science (IBS), Korea (Republic of); D. Lee, J. Park, Korea Advanced Institute of Science and Technology (KAIST) & Institute for Basic Science (IBS), Korea (Republic of)

SS-Contributed On Demand-34 Pt/Ag/TiO₂ Plasmonic Nanodiode for Extraction of Surface Plasmon-Driven Chemicurrent, **Mincheol Kang**, B. Jeon, Y. Park, Korea Advanced Institute of Science and Technology (KAIST) & Institute for Basic Science (IBS), Korea (Republic of); H. Lee, Institute for Basic Science (IBS), Korea (Republic of); J. Park, Korea Advanced Institute of Science and Technology (KAIST) & Institute for Basic Science (IBS), Korea (Republic of)

SS-Contributed On Demand-37 Disruption of Small Alcohol Intermolecular Interactions at Defect Sites on Au(111), **E. Maxwell**, L. Garber, J. Baker, C. Rogers, H. Kaleem, **Ashleigh Baber**, James Madison University

SS-Contributed On Demand-40 Interaction of Amino Acids on Au(111) as Studied with EC-STM: From Islands to Magic Fingers, **K. P. S. Boyd**, E. Cook, M. Paszkowiak, **Erin Iski**, The University of Tulsa

SS-Contributed On Demand-43 Resonant ARPES Reveals the Origin of the 2DEG in SrTiO₃ and SrTiO₃ Heterostructure, **Jessica McChesney**, X. Yan, H. Hong, D. Fong, Argonne National Laboratory

SS-Contributed On Demand-46 Self-selective Formation of Organized 1D and 2D GaBi Structures on Crystal-phase Modulated GaAs Nanowires, **Yi Liu**, R. Timm, S. Benter, Lund University, Sweden; E. Young, University of California at Santa Barbara; S. Lehmann, K. Dick, Lund University, Sweden; C. Palmström, University of California at Santa Barbara; A. Mikkelsen, Lund University, Sweden

SS-Contributed On Demand-49 Growth and Morphology of Well-ordered Metal Doped-CeO_x(111) Interfaces, **L. Du**, E. Ginting, **Jing Zhou**, Department of Chemistry, University of Wyoming

SS-Contributed On Demand-52 STM and XPS Studies of Co Nanoparticles on Reducible CeO₂(111) Thin Films, **Jing Zhou**, L. Du, University of Wyoming

SS-Contributed On Demand-55 Electronic Structure of a Carbon Dot Monolayer on TiO₂(110), **Jan Eric Beckord**, M. Hengsberger, University of Zurich, Switzerland; A. Cannizzo, University of Bern, Switzerland; J. Osterwalder, University of Zurich, Switzerland

SS-Contributed On Demand-58 UHV Growth and Characterization of Ga₂O₃ on Cu₂O (111), **Mert Taskin**, T. Kälin, C. Hanisch, J. Osterwalder, University of Zurich, Switzerland

SS-Contributed On Demand-61 Tracking the Ultrafast Dynamics of Surface Photoinduced Reactions on Amorphous Surfaces With Time, Mass, and Energy Resolution, **Mihai Vaida**, University of Central Florida

SS-Contributed On Demand-64 Investigating the Effect of Sn Vapor Deposition Parameters on Nb-Sn-O Coordination on a Highly-Ordered Oxidized Nb(100) Substrate, **Sarah Willson**, R. Farber, S. Sibener, University of Chicago

SS-Contributed On Demand-67 Reactions of Boron-containing Molecules with H- and Cl-terminated Si(100), **Dhamelyz Silva Quinones**, A. Teplyakov, University of Delaware; R. Butera, Laboratory for Physical Sciences; G. Wang, Sandia National Laboratories

SS-Contributed On Demand-70 2020 AVS Dorothy M. and Earl S. Hoffman Scholarship Award Talk: Ru Precursors for Photoassisted Chemical Vapor Deposition: Comparison of Allyl and Diene Complexes, **Christopher Brewer**¹, N. Sheehan, University of Florida; B. Salazar, University of Texas at Dallas; J. Herrera, University of Florida; A. Walker, University of Texas at Dallas; L. McElwee-White, University of Florida

SS-Contributed On Demand-73 Thermal Atomic Layer Etching of CoFeB Alloy Thin Films Using Chlorine and Acetylacetone (acacH), **Mahsa Konh**, A. Teplyakov, University of Delaware

SS-Contributed On Demand-76 Following the Microscopic Pathways to Energy Dissipation and Adsorption in Molecule-Metal Surface Encounter, **Igor Rahinov**, The Open University of Israel; D. Borodin, University of Göttingen, Germany; P. Shirhatti, Tata Institute of Fundamental Research, India; M. Huang, University of New Mexico; A. Kandratsenka, Max Planck Institute for Biophysical Chemistry, Germany; D. Auerbach, Max Planck Institute for Biophysical Chemistry; T. Zhong, Max Planck Institute for Biophysical Chemistry, Germany; H. Guo, University of New Mexico; D. Schwarzer, Max Planck Institute for Biophysical Chemistry, Germany; T. Kltsopoulos, A. Wodtke, University of Göttingen, Germany

¹ AVS 2020 Dorothy M. and Earl S. Hoffman Scholarship Awardee

SS-Contributed On Demand-79 In Situ Observations of Graphene Growth on Liquid Copper, *Irene Groot*, Leiden University, The Netherlands

SS-Contributed On Demand-82 Laser-Photoemission Electron Microscopy — Deciphering the Morphology of Semi-Crystalline Polymer Films, *Falk Niefind*, Physical Measurement Laboratory, National Institute of Standards and Technology (NIST); *S. Mannsfeld*, Technische Universität Dresden, Germany; *S. Karande*, *A. Kahnt*, *B. Abel*, Leibniz Institute of Surface Engineering (IOM), Germany

SS-Contributed On Demand-85 Thermal Oxidation of Ru(0001) to RuO₂ Studied With Ambient Pressure X-ray Photoelectron Spectroscopy, *J. Trey Diulus*, *Z. Novotny*, *B. Tobler*, University of Zurich, Switzerland; *L. Artiglia*, *J. Raabe*, Paul Scherrer Institute, Switzerland; *J. Osterwalder*, University of Zurich, Switzerland

SS-Contributed On Demand-88 STM Study of Ag Encapsulation of Pd Islands on Ag(111), *Buddhika Alupotha Gedara*, *M. Muir*, *M. Trenary*, University of Illinois at Chicago

SS-Contributed On Demand-91 An Xps Study of the Interaction between the Uranyl Ion and Oligoarginine Peptide, *Esha Mishra*, *C. Schultz*, University of Nebraska - Lincoln; *P. Dowben*, University of Nebraska–Lincoln; *R. Lai*, University of Nebraska - Lincoln

SS-Contributed On Demand-94 Surface Stability, Phonon Band Structure, and Vibrational Dynamics of the Nb(100) Surface Oxide Reconstruction, *Alison McMillan*, *C. Thompson*, *J. Graham*, University of Chicago; *M. Kelley*, Cornell University; *S. Willson*, *R. Farber*, University of Chicago; *T. Arias*, Cornell University; *S. Sibener*, University of Chicago

SS-Contributed On Demand-97 Evidence of a Surface to Bulk Core Level Shift in CoFe₂O₄ Thin Films Grown on Al₂O₃, *Arjun Subedi*, *Y. Yun*, *D. Yang*, *X. Xu*, *P. Dowben*, University of Nebraska-Lincoln

SS-Contributed On Demand-100 Chemistry of Titanium Deposition Precursors for Area-Selective Deposition on Functionalized Silicon, *Tyler Parke*, *D. Silva-Quinones*, University of Delaware; *G. Wang*, Sandia National Laboratories, USA; *A. Teplyakov*, University of Delaware

SS-Contributed On Demand-103 GRISU — Bonds in Focus, *David Rath*, *J. Pavelec*, *G. Parkinson*, *M. Schmid*, *U. Diebold*, TU Wien, Austria

SS-Contributed On Demand-106 RRKM Treatment of HCl Dissociative Chemisorption on Au(111): Reactive Dampening through Inefficient Translational Coupling and an Active Surface, *Mark Bernard*, *I. Harrison*, University of Virginia

SS-Contributed On Demand-109 Fast Diffusive Behavior of Pb on Ge(111) at Low Temperatures During Island Formation, *Andrew Kim*, *E. Baum*, *S. Chiang*, University of California at Davis; *M. Tringides*, Ames Laboratory, Iowa State University; *V. Stroup*, *D. Le*, *A. Childs*, *T. Rahman*, University of Central Florida

SS-Contributed On Demand-112 Selective Catalytic Chemistry at Rhodium (II) Nodes in Bimetallic Metal–Organic Frameworks, *Deependra Shakya*, *D. Chen*, *O. Ejegbavwo*, *N. Shustova*, University of South Carolina; *K. Vogiatzis*, University of Tennessee Knoxville; *A. Frenkel*, Stony Brook University/Brookhaven National Laboratory; *S. Senanayake*, Brookhaven National Laboratory; *A. Brandt*, University of South Carolina; *A. Ebrahim*, Stony Brook University/Brookhaven National Laboratory

SS-Contributed On Demand-115 Electron Stimulated Desorption from Ethane Condensed on Rare Gas Surfaces, *Sramana Kundu*, *M. Schaible*, *T. Orlando*, Georgia Institute of Technology, USA

SS-Contributed On Demand-118 Investigation of the Initial Stages of Iron Surface Oxidation and Corrosion at the Liquid/Solid and Gas/Solid Interface Using *in situ* Surface Spectroscopy, *Chathura de Alwis*, *M. Trought*, Michigan Technological University; *S. Nemsak*, Advanced Light Source, Lawrence Berkeley National Laboratory; *K. Perrine*, Michigan Technological University

SS-Contributed On Demand-121 STM Studies of Alkanethiolate Reactivity with Atomic H as a Function of Temperature & Chain Length, *Sarah Brown*, *J. Saylor*, *S. Sibener*, University of Chicago

SS-Contributed On Demand-124 Surface Chemistry of 2-Propanol on SnO₂(101) Studied Using Ambient-Pressure X-Ray Photoelectron Spectroscopy, *Jessica Jenkins*, *R. Elzein*, *R. Addou*, *G. Herman*, Oregon State University

SS-Contributed On Demand-127 Bi-Induced Shape Change of Homoepitaxial InAs(110) Surface Structure, *Brandon Carter*, *J. Millunchick*, University of Michigan

SS-Contributed On Demand-130 Patterned and Graded ALD Coatings for Imaging and Spectroscopy Applications, *April Jewell*, *J. Hennessy*, *S. Nikzad*, Jet Propulsion Laboratory

SS-Contributed On Demand-133 Beyond the Ligand Exchange Model – Time Resolved ALD of HfO₂ on InAs Thermal Oxide, *Giulio D'Acunto*, *P. Shayesteh*, *F. Rehman*, Lund University, Synchrotron Radiation Research, Sweden; *E. Kokkonen*, MAX IV Laboratory, Lund University, Sweden; *R. Timm*, *J. Schnadt*, Lund University, Synchrotron Radiation Research, Sweden

SS-Contributed On Demand-136 The Roles of Subsurface Hydrogen and Adsorption of Water on Ni(111), *Maxwell Gillum*, *M. Turano*, *E. Jamka*, *D. Killelea*, Loyola University Chicago

SS-Contributed On Demand-139 Oxidation of Sn at the Cluster-Support Interface: Sn and Pt-Sn Clusters on TiO₂(110), *Sumit Beniwal*, University of South Carolina; *W. Chai*, University of Texas at Austin; *K. Metavaryuth*, *T. Maddumapatabandi*, *D. Shakya*, University of South Carolina; *G. Henkelman*, University of Texas at Austin; *D. Chen*, University of South Carolina

SS-Contributed On Demand-142 Excited State Relaxation Dynamics in HOPG Using Pump-Probe Momentum Microscopy in the Perturbative Limit, *Sergii Chernov*, *J. Bakalis*, *A. Kunin*, *C. Corder*, *P. Zhao*, Stony Brook University; *M. White*, Brookhaven National Laboratory; *G. Schönhense*, Johannes Gutenberg-Universität Mainz, Germany; *T. Allison*, Stony Brook University

SS-Contributed On Demand-145 C-H Bond Dissociation of Methane on Rh(111): Remarkable Activity of Step Sites, *Xingyu Wang*, *I. Harrison*, University of Virginia

Surface Science Division

Room On Demand - Session SS-Invited On Demand

Surface Science Invited On Demand Session 8:00am

INVITED: SS-Invited On Demand-1 Halide Ion Mobility in Metal Halide Perovskites and its Impact on Photovoltaic Performance, *Prashant Kamat*, University of Notre Dame

INVITED: SS-Invited On Demand-7 Chemistry and Hydrogen Bonding Environment at Environmental Surfaces as Seen by X-ray Photoelectron and Electron Yield NEXAFS Spectroscopies, *Markus Ammann*, Paul Scherrer Institut, Switzerland

INVITED: SS-Invited On Demand-13 Thin Film Growth One Step at a Time: Unravelling Mechanisms in Atomic Layer Deposition, *Stacey Bent*, Stanford University

INVITED: SS-Invited On Demand-19 Interaction of Small Heteroatomic Organic Compounds with Ceria, *Ye Xu*, Louisiana State University

Thin Films Division

Room On Demand - Session TF-Contributed On Demand

Thin Film Contributed On Demand Session 8:00am

TF-Contributed On Demand-1 Improved Impedance Spectroscopy Model of Interfaces for CZTSe Ge Bi-Layers Solar Cells, *Sanghyun Lee*, Indiana State University; *K. Price*, Morehead State University; *E. Saucedo*, Catalonia Institute for Energy Research, Spain

TF-Contributed On Demand-4 Atomic Layer Deposition for Enhanced Reactivity, Stability, and Sulfur Tolerance of Biomass Conversion Catalysts, *Wilson McNeary*, National Renewable Energy Laboratory; *K. Unocick*, Oak Ridge National Laboratory; *G. Lahti*, *S. Tacey*, *C. Farberow*, *M. Griffin*, National Renewable Energy Laboratory; *E. Wegener*, Argonne National Laboratory; *K. Van Allsburg*, National Renewable Energy Laboratory; *A. Dameron*, *K. Buechler*, Forge Nano; *D. Vardon*, National Renewable Energy Laboratory

TF-Contributed On Demand-7 Molecular Layer Deposition of All-Organic Polymer Films on Particles for Pharmaceutical Applications, *Tyler J Myers*, *S. George*, University of Colorado Boulder

TF-Contributed On Demand-10 40 Years of Kraut Valence Band Offset Measurements: The Good, The Bad, and The Ugly, *Sean King*, Intel Corporation; *M. Paquette*, University of Missouri - Kansas City

TF-Contributed On Demand-13 Covalently Crosslinked Organic Network Thin Films for Robust Surface Modification, *Junjie Zhao*, Zhejiang University, China

TF-Contributed On Demand-16 Highly Conductive Nanograting-Nanohole Structures with Tunable and Dual-Band Spectral Transparency, *Yanfeng Wang*, Tsinghua University, China; *H. Chong*, *I. Choi*, University of Georgia; *Z. Zhang*, Tsinghua University, China; *Y. Zhao*, University of Georgia, China

TF-Contributed On Demand-19 Rapid TiN Nucleation using Electron-Enhanced Atomic Layer Deposition (EE-ALD) with a Reactive Background Gas, **Zachary Sobell**, A. Cavanagh, S. George, University of Colorado at Boulder

TF-Contributed On Demand-22 Structural and Chemical Evaluation of $\text{Sc}_x\text{Al}_{1-x}\text{N}$ -GaN Heterostructures Grown by Molecular Beam Epitaxy, **Joseph Casamento**, H. Lee, C. S. Chang, Cornell University; M. F. Besser, Ames Laboratory; T. Maeda, D. A. Muller, H. Xing, D. Jena, Cornell University

TF-Contributed On Demand-25 Deposition of Large-Grained Polycrystalline Aluminum Nitride at Low Temperature via Bias-Enhanced Atomic Layer Annealing, **Aaron McLeod**, S. Ueda, A. Kummel, UC San Diego

TF-Contributed On Demand-28 Exploiting Fixed Charge to Control Schottky Barrier Height in $\text{Si}|\text{Al}_2\text{O}_3|\text{MoO}_x$ -Based Tunnel Diodes, **Ben Garland**, B. Davis, N. Strandwitz, Lehigh University

TF-Contributed On Demand-31 Development of Reusable Hydrogel for Fabric-based Bioelectrodes via initiated Chemical Vapor Deposition (iCVD), **S. Zohreh Homayounfar**, S. Rostaminia, A. Kiaghadi, D. Ganesan, T. Andrew, University of Massachusetts Amherst

TF-Contributed On Demand-34 On Achieving Single-Phase Crystalline Gallium Oxide Thin Films at Low Thermal Budgets, **Elham Rafie Borujeny**, K. Cadien, University of Alberta, Canada

TF-Contributed On Demand-37 Gallium Oxynitride Thin Films with Tunable Properties for Electronic and Photonic Applications, **Elham Rafie Borujeny**, K. Cadien, University of Alberta, Canada

TF-Contributed On Demand-40 Atomic Layer Deposited Metal Oxide Bilayers for Metal-Insulator-Semiconductor Photovoltaics, **Benjamin Davis**, N. Strandwitz, Lehigh University

TF-Contributed On Demand-43 Fabrication of Nanoscale Multilayered Thin-Film Thermoelectric Materials and Devices, **Lauren Williams**, A. Henderson, R. Miller, B. Whitaker, R. Glenn, Z. Xiao, Alabama A&M University

TF-Contributed On Demand-46 Influence of Gold Layer Thickness on the Metal-Induced Crystallization Behavior of Ge Thin Films, **Narin Sunthornpan**, K. Kimura, K. Kyuno, Shibaura Institute of Technology, Japan

TF-Contributed On Demand-49 *In Situ* Reflection High Energy Electron Diffraction in Atomic Layer Deposition for Monitoring Epitaxial Transformations, **Alexandra Howzen**, N. Strandwitz, Lehigh University

TF-Contributed On Demand-52 Sputter Deposition of Al_3Sc Films for Microelectronics Fabrication, **Giovanni Esteves**, J. Bischoff, T. Young, M. Henry, P. Kotula, Sandia National Laboratory

TF-Contributed On Demand-55 Vertical Heterostructures of Two-Dimensional Transition Metal Chalcogenides by Atomic Layer Deposition, **Saravana Balaji Basuvalingam**, M. Bloodgood, M. Verheijen, W. Kessels, A. Bol, Eindhoven University of Technology, The Netherlands

TF-Contributed On Demand-58 Multi-Stimuli Responsive Nanorods for Artificial Skin Applications, **Taher Abu Ali**, Graz university of Technology, Joanneum Research Forschungsgesellschaft mbH, Austria; K. Unger, Graz University of Technology, Austria; B. Stadlober, Joanneum Research Forschungsgesellschaft mbH, Austria; A. Coclite, Graz University of Technology, Austria

TF-Contributed On Demand-61 Towards Area-Selective Deposition: Nucleation and Initial Growth of ZnO During Plasma-Enhanced ALD on Polymer Thin Films, **Lisanne Demelius**, A. Coclite, K. Unger, Graz University of Technology, Austria

TF-Contributed On Demand-64 Process Optimization in Atomic Layer Deposition Using Machine Learning, **Jeffrey Elam**, A. Yanguas-Gil, Argonne National Laboratory; S. Letourneau, A. Mane, N. Paulson, A. Lancaster, Argonne National Laboratory, USA; S. Abuomar, Lewis University

TF-Contributed On Demand-67 Influence of Precursor Density and Conversion Time on Vapor Deposited Oriented ZIF-8 Thin Films, **Marianne Kr  uter**, Graz University of Technology, Austria

TF-Contributed On Demand-70 Modeling the Coalescence and Morphology as a Function of the Nucleation and Growth Rates, **D. LaFollette**, **Kinsey Canova**, Z. Zhang, J. Abelson, University of Illinois at Urbana-Champaign

TF-Contributed On Demand-73 Tunable ALD Infiltration into Ultra-High-Aspect-Ratio Aerogels Enabled by Process Modeling for High-Temperature Solar Thermal Applications, **Andrew J. Gayle**, Z. Berquist, Y. Chen, A. Hill, J. Hoffman, A. Bielinski, A. Lenert, N. Dasgupta, University of Michigan, Ann Arbor

TF-Contributed On Demand-76 Ethanolamines as Bath Additive in Copper Electroless Deposition: Effect on Film Adhesion and Nanowire Formation, **Jevalyne Vienes**, A. Walker, University of Texas at Dallas

TF-Contributed On Demand-79 Plasma Enhanced Atomic Layer Deposition of WO_x Using a Wide Temperature Stability Precursor, **Kamesh Mullapudi**, K. Holden, J. Peterson, Oregon State University; R. Kanjolia, D. Moser, C. Dezelah, EMD Performance Materials; J. Conley Jr., Oregon State University

TF-Contributed On Demand-82 Molecular Layer Deposition of Phosphane-Ene Polymer Films, **Sean Barry**, Carleton University, Canada; P. Ragogna, University of Western Ontario, Canada; P. Gordon, Carleton University, Canada; C. McGuiness, Solvay

TF-Contributed On Demand-85 Atomic Layer Deposition of HfO_2 on SiO_2 : Evidence for a Bimolecular Reaction Mechanism in the Initial Metal Half-Cycle, **P. Shayesteh**, Lund University, Sweden; R. Tsyshevsky, University of Maryland; A. Head, Brookhaven National Laboratory; J. Gallet, Sorbonne Universit   and Synchrotron SOLEIL, France; F. Bournel, F. Rochet, Sorbonne Universit  , France; M. Kukla, University of Maryland; **Joachim Schnadt**, Lund University, Sweden

TF-Contributed On Demand-88 Feature Scale Model to Investigate Aspect Ratio Dependency of Si_xN_y Atomic Layer Deposition using Si_2Cl_6 and NH_3 , **Evrin Salmaz**, University of Texas at Austin; S. Ryu, J. Uh, Samsung Electronics, Korea (Republic of); L. Raja, University of Texas at Austin

TF-Contributed On Demand-91 Nucleation and Growth of Thermal ALD Au Films - Towards Coalescence of Ultrathin Films, **Benjamin Greenberg**, J. Avila, J. Woodward, N. Nepal, B. Feigelson, V. Wheeler, U.S. Naval Research Laboratory

TF-Contributed On Demand-94 Modification of Mesoporous Thin Films by Atomic Layer Deposition for the Fabrications of Electrocatalysts for Oxygen Evolution Reaction, **M. Raza**, Humboldt University Berlin, Germany; M. Frish, R. Kraehnert, Technical University of Berlin, Germany; **Nicola Pinna**, Humboldt University Berlin, Germany

TF-Contributed On Demand-97 Optimization of 1D Core-Shell Heterostructures for Gas Sensing, **Nicola Pinna**, M. Raza, Humboldt University Berlin, Germany

TF-Contributed On Demand-100 ALD-based Nanolayers for Germanium Surface Passivation, **Willem-Jan Berghuis**, R. Theeuwes, B. Macco, E. Kessels, Eindhoven University of Technology, Netherlands

TF-Contributed On Demand-103 The Effect Growth Conditions on the Phase Composition and Microstructure of Gallium Oxide Thin Films Deposited Using MOCVD, **J. Tang**, **Kunyao Jiang**, A. Park, L. Gu, R. Davis, L. Porter, Carnegie Mellon University, USA

TF-Contributed On Demand-106 Temporal Evolution of Electrical Contact Resistance Observed via Improved Conductive Atomic Force Microscopy, **Saima Sumaiya**, M. Baykara, M. Vazirisereshk, R. Chen, A. Martini, University of California Merced

TF-Contributed On Demand-109 Advances in Plasma-Enhanced Atomic Layer Deposition of Ga_2O_3 and $(\text{Al}_x\text{Ga}_{1-x})_2\text{O}_3$ Films, **Virginia Wheeler**, N. Nepal, S. Qadri, J. Avila, B. Downey, V. Gokhale, A. Lang, R. Stroud, D. Meyer, Naval Research Laboratory

TF-Contributed On Demand-112 Structure Related Investigations and Fracture Resistance of Ti-Mo-B Thin Films, **Christoph Fuger**, A. Hirle, R. Hahn, CDL-SEC, TU Wien, Austria; M. Weiss, Institute of Chemical Technologies and Analytics, TU Wien, Austria; O. Hunold, Oerlikon Balzers, Oerlikon Surface Solutions AG, Liechtenstein; P. Polcik, Plansee Composite Materials GmbH, Germany; H. Riedl, CDL-SEC, TU Wien, Austria

TF-Contributed On Demand-115 2D MoS_2 Layers Synthesized by ALD as Diffusion Barriers in Interconnects, **Sanne Deijkers**, A. de Jong, Eindhoven University of Technology, Netherlands; H. Sprey, J. Maes, ASM, Belgium; E. Kessels, A. Bol, A. Mackus, Eindhoven University of Technology, Netherlands

TF-Contributed On Demand-118 Polarization Sensitive Characterization of 2D Metasurfaces Fabricated by Direct Laser Writing, **Michael McLamb**, University of North Carolina at Charlotte; Y. Li, University of Chicago; P. Stinson, S. Park, G. Boreman, T. Hofmann, University of North Carolina at Charlotte

TF-Contributed On Demand-121 Reciprocal Plasmonic Metasurfaces for the Detection of Ambient Changes Induced by Atomic Layer Deposition, **Michael McLamb**, University of North Carolina at Charlotte; Y. Li, University of Chicago; P. Stinson, S. Park, University of North Carolina at Charlotte; J. Lentz, Air Force Research Laboratory; T. Hofmann, University of North Carolina at Charlotte

TF-Contributed On Demand-124 Effect of Film Composition and Structure on the Photocatalytic Activity of Metal Oxide Atomic Layer Deposition Thin Films, **Halil Akylidiz**, S. Islam, S. Ozkan, Bursa Uludag University, Turkey

TF-Contributed On Demand-127 Effect of Heat and Plasma Treatment on Carborane Self-Assembled Monolayers (SAMs) on Copper, **Rupak Thapa**, L. Dorsett, S. Malik, R. Bale, S. Wagner, D. Bailey, A. Caruso, University of Missouri-Kansas City; J. Bielefeld, S. King, Intel Corporation; M. Paquette, University of Missouri-Kansas City

TF-Contributed On Demand-130 Challenges in the Fabrication of Good Quality Bismuth Ferrite Films by Chemical Vapor Deposition, **Mahendra Acharya**, C. Joshi, University of Alabama; T. Gosavi, U. Alaán, J. Plombon, Intel Corporation; A. Gupta, University of Alabama

TF-Contributed On Demand-133 Study and evaluation of a MASn₃ Perovskite/CZTS solar cell using Numerical Simulation (SCAPS-1D), **Ana Cecilia Piñon Reyes**, BUAP, Mexico

TF-Contributed On Demand-136 Analysis and Testing of Nanocrystalline Diamond Thin Film Failure During H- Stripping, **Leo Saturday**, University of Tennessee Knoxville; L. Wilson, C. Luck, J. Fowlkes, Oak Ridge National Laboratory; P. Rack, University of Tennessee Knoxville; N. Evans, Oak Ridge National Laboratory

TF-Contributed On Demand-139 Surface Functionalization of Nanoporous Carbon Fibers by Vapor Phase Methods for CO₂ Capture, **Stephan Prünte**, G. van Straaten, Eindhoven University of Technology, Netherlands; D. van Eyck, O. Diaz-Morales, J. van Dijk, H. de Neve, Carbyon, Netherlands; M. Creatore, Eindhoven University of Technology, Netherlands

TF-Contributed On Demand-142 Redox-Active Polymer Thin Films by MLD for Enhanced Electrochemical Desalination, **Matthias Young**, Q. Wyatt, R. Gettler, N. Paranamana, T. White, X. He, University of Missouri-Columbia

TF-Contributed On Demand-145 Smoothing Surface Roughness Using Al₂O₃ Atomic Layer Deposition, T. Myers, University of Colorado Boulder; J. Throckmorton, T. Hatwar, R. Borrelli, M. O'Sullivan, L3Harris Space & Airborne Systems; **Steven George**, University of Colorado Boulder

TF-Contributed On Demand-148 Sliding Properties of a-C:H Coated CFRP on a Metallic Surface, **Akira Chikamoto**, Meijo University Graduate School, Japan; P. Abraha, Meijo University, Japan

TF-Contributed On Demand-151 Tungsten Infiltration of CNT Forests by ALD for Micro-Scale X-Ray Collimators, **Chase Vanfleet**, R. Cass, R. Vanfleet, R. Davis, R. Vanfleet, Brigham Young University

TF-Contributed On Demand-154 Using *In Situ* Electrical Conductance Measurements to Study Mechanisms and Wall Effects During Vapor Phase Infiltration (VPI) Doping of Semiconducting Polymers, **Kristina Malinowski**, S. Gregory, J. Wooding, Y. Li, O. Hvidsten, A. Jungreis, M. Losego, Georgia Institute of Technology

TF-Contributed On Demand-157 Combinatorial Cu_xNi_{1-x} Thin Film Catalysts for Layer Number Control in CVD Grown Graphene, **Sumeer Khanna**, University of Tennessee Knoxville; M. Stanford, I. Vlasiouk, General Graphene Corporation; P. Rack, University of Tennessee, Oak Ridge National Laboratory

TF-Contributed On Demand-160 Molecular Layer Deposition on Nanofiltration Supports for High Performance Desalination Membranes with Tunable Performance, **Brian Welch**, O. McIntee, T. Myers, A. Greenberg, V. Bright, S. George, University of Colorado at Boulder

TF-Contributed On Demand-163 Insight into Film Growth Mechanisms in Polyurea Molecular Layer Deposition Using New and Combined Precursors, **Rachel Nye**, S. Wang, G. Parsons, North Carolina State University

TF-Contributed On Demand-166 2020 AVS Dorothy M. and Earl S. Hoffman Award Talk: Sorption and Desorption of TMA During Vapor Phase Infiltration Into Polystyrene and Poly(Methyl Methacrylate) Thin Films, **Emily McGuinness**¹, C. Leng, M. Losego, Georgia Institute of Technology, USA

TF-Contributed On Demand-169 Experimental Study of Plasma-Enhanced Atomic Layer Deposition of SiN on GeSbTe, **Hamid Razavi**, University of California at Los Angeles; M. Shen, J. Hoang, T. Lill, Lam Research Corporation; J. Chang, University of California at Los Angeles

TF-Contributed On Demand-172 A Machine-Learnt Volatility Model for the Rapid Selection of Precursors for Deposition and Etch, **Simon Elliott**, Schrödinger, Ireland; A. Chandrasinghe, A. Chandrasekaran, Y. An, M. Halls, Schrödinger

TF-Contributed On Demand-175 Gas Bubble and Blister Formation in Sputtered Thin Film Cadmium Selenide, **Rachael Greenhalgh**, P. Hatton, V. Kornienko, A. Abbas, P. Goddard, R. Smith, J. Bowers, M. Walls, Loughborough University, UK

TF-Contributed On Demand-178 Chemical Bath Deposition of Cux and Snx on Functionalized Self-Assembled Monolayers, **Tania Estrada**, A. Walker, University of Texas at Dallas

TF-Contributed On Demand-181 Formation of Conformal Ge₂Sb₂Te₅ Film by ALD and Tellurization of Ge-Sb Film for Three-Dimensional Phase-Change Random-Access Memory Applications, **Kwonyoung Kim**, Y. Kim, O. Kim, W. Lee, Sejong University, Korea (Republic of)

TF-Contributed On Demand-184 About the Importance of Purge Time in Molecular Layer Deposition of Alucone Films, **Hardik Jain**, P. Poedt, Holst Centre / TNO, Netherlands

TF-Contributed On Demand-187 Nucleation Behavior in Laminar ALD Film Stacks, K. Holden, A. Valdivia, J. Conley, Jr., **Shane Witsell**, Oregon State University

TF-Contributed On Demand-190 Flexible Low-K SiCOH Thin Films Deposited by Plasma Enhanced Chemical Vapor Deposition of Tetrakis(Trimethylsilyloxy)Silane Precursor, **William Wirth**, S. Jang, J. Comeaux, University of Louisiana at Lafayette

TF-Contributed On Demand-193 Low-Temperature Atomic Layer N-Type Si-Doping of GaN via Plasma-Assisted ALD, **Deepa Shukla**, N. Biyikli, University of Connecticut

TF-Contributed On Demand-196 Investigating the Phase Separation Dynamics and Magneto-Plasmonic Properties in A_xCo_{1-x} Films and Nanoparticles for Magnetically Enhanced Photothermal Cancer Therapies, **Reece Emery**, D. Garfinkel, G. Pakeltis, N. Tang, D. Gilbert, University of Tennessee Knoxville; P. Rack, University of Tennessee, Oak Ridge National Laboratory

TF-Contributed On Demand-199 Structural and Magnetic Properties of NCuZn Ferrite Films Prepared by Sputtering, **Roni Paul**, J. Abu-Qahouq, S. Kotru, The University of Alabama

TF-Contributed On Demand-202 Adaptation of Environmentally-Optimized Structural Factors from White Beetle Scales for Enhancing Light Scattering in Synthetic Fibrous Films, **Bokyoung Park**, S. Han, S. Han, University of New Mexico; I. Um, Kyungpook National University, Korea (Republic of)

TF-Contributed On Demand-205 Halogenated Polymer Thin Film with Ultra-High Refractive Index, **Ni Huo**, W. Tenhaeff, University of Rochester

TF-Contributed On Demand-208 Epitaxial Growth of Chalcogenide Perovskite Thin Films by MBE, **Ida Sadeghi**, K. Ye, M. Xu, J. LeBeau, R. Jaramillo, MIT

TF-Contributed On Demand-211 Study the Structural, Optical, Electro-Thermal Properties of Oxygen Dependent Growth Ga Doped ZnO Thin Films for Transparent Heater Applications, **Jasmine Beckford**, M. Behera, S. Pradhan, M. Bahoura, Norfolk State University

TF-Contributed On Demand-214 Molybdenum Cobalt Sulfide Thin Films for Water Splitting Applications, **Lee Kendall**, G. Zangari, S. McDonnell, University of Virginia

Thin Films Division

Room On Demand - Session TF-Invited On Demand

Thin Film Invited On Demand Session

8:00am

INVITED: TF-Invited On Demand-1 Inherent Selective Atomic Layer Deposition Strategies and its Applications, **Rong Chen**, Huazhong University of Science and Technology, China

INVITED: TF-Invited On Demand-7 Free-Standing Nanoengineered Functional Oxides Thin Films, P. Salles, I. Caño, ICMAB-CSIC, Spain; R. Guzman, School of Physical Sciences and CAS Key Laboratory of Vacuum Physics; University of Chinese Academy of Sciences, China; W. Zhou, School of Physical Sciences and CAS Key Laboratory of Vacuum Physics, University of Chinese Academy of Sciences, China; **Mariona Coll**, ICMAB-CSIC, Spain

INVITED: TF-Invited On Demand-13 A Comparative Study on the Heteroleptic Ti Precursors for ALD of TiO₂: DFT Calculations and ALD Experiments, H. Kim, R. Hidayat, S. Kim, J. Kim, Y. Choi, **Won-Jun Lee**, Sejong University, Korea (Republic of)

INVITED: TF-Invited On Demand-19 Refractive Index Control of Highly Anisotropic 2D Materials, J. Caldwell, **Mingze He**, Vanderbilt University

INVITED: TF-Invited On Demand-25 Microscopic Mechanisms and Applications for Remote Epitaxy of Ili-vs and Heusler Compounds, **Jason Kawasaki**, University of Wisconsin - Madison

¹ AVS 2020 Dorothy M. and Earl S. Hoffman Awardee

Undergraduate Poster Session

Room On Demand - Session OD-UP On Demand

Undergraduate Poster Session On Demand

8:00am

OD-UP On Demand-1 Evaluating Hydrophobic Recovery of Nitrogen Plasma Treated Silk Fibroin Films, *Chase Lenert-Mondou, M. Hawker*, California State University, Fresno

OD-UP On Demand-4 Examining the Impact of BHT Inhibitor on the Microstructure of Spun-Cast Nanoporous Films of PMMA, *Sadie Flag, T. Knippenberg, B. Augustine*, High Point University

OD-UP On Demand-7 Polymer Directed Synthesis of NiO/C for Supercapacitor Electrode, *Manzili Kokayi, B. Bastakoti*, North Carolina A&T State University

OD-UP On Demand-10 Insight Into the Formation, Desorption, and Structural Effects of Subsurface Oxygen on Ag(111) Using a Lattice-Gas Model and Monte Carlo Simulations, *Elizabeth Lander, C. Mize, L. Crosby, S. Roy*, University of Tennessee Knoxville

OD-UP On Demand-13 Vapor Phase Synthesis and Characterization of Single and Few Layers of MoS₂, *Sabrina Jackson, NCA&T; O. Ayanbajo, S. Shendokar, S. Aravamudan, NCA&T*

OD-UP On Demand-16 Characterization of Ru-ZrO₂ Water Splitting Catalyst, *Paul Bean, P. Godbold, S. Zhang*, University of Virginia

OD-UP On Demand-19 Extreme Atomic-Scale Surface Roughening: Amino Acids on Ag on Au(111), *Emily Cook, K. Boyd, J. Phillips, M. Paszkowiak, E. Iski*, University of Tulsa

OD-UP On Demand-22 Examining Internal Temperatures of Nitrogen-Containing Plasmas to Understand the Gas-Catalyst Interface, *Melanie Fouts, J. Blechle*, Wilkes University

OD-UP On Demand-25 Oxygen-Induced Surface Reconstructions on curved-Ag(111), *Faith Lewis, D. Killelea*, Loyola University Chicago

OD-UP On Demand-28 Water Adsorption on Curved Ag Surfaces, *Christina Grytsyshyn, D. Killelea*, Loyola University Chicago

OD-UP On Demand-31 Crystal Growth and Magnetic Properties of MgCr₂O₄, *Ajeya Dixon, S. Karna, D. Temple*, Norfolk State University

OD-UP On Demand-34 Single Crystal Growth of Bi₂CuO₄ Using the Optical Floating Zone Technique, *Tekiyah Robinson, S. Karna, D. Temple*, Norfolk State University

OD-UP On Demand-37 Characterization of Triple Cation, Mixed Halide Perovskites in Deposited in Near-Ambient Conditions, *Samuel Candelario Torres, North Carolina Central University; N. Edwards, North Carolina Central University; M. Wu, North Carolina Central University*

Vacuum Technology Division

Room On Demand - Session VT-Contributed On Demand

Vacuum Technology Contributed On Demand Session

8:00am

VT-Contributed On Demand-1 Study on Copper Thermal Spray Coating to Mitigate Electron Cloud Effect in SuperKEKB, *Mulee Yao, SOKENDAI, Taiwan; Y. Suetsugu, K. Shibata, H. Hisamatsu, T. Ishibashi, S. Terui, KEK, Japan*

VT-Contributed On Demand-4 NIST on a Chip: Photonic and Quantum-Based Sensors for Metrology and Beyond, *Jay Hendricks, NIST*

VT-Contributed On Demand-7 Improving Temperature Uniformity of Stainless-Steel Components in Thin Film Processing Equipment, *Sudarshan Natarajan, D. Sabens, A. Murugaiah, Momenive Technologies*

VT-Contributed On Demand-10 Particle Tracing the ISO Gauge, *Martin Wüest, F. Scuderi, INFICON Ltd., Liechtenstein; B. Jenninger, A. Stöltzel, P. Kucharski, CERN, Switzerland; O. Teodoro, R. Silva, N. Bundaleski, Nova School of Sciences and Technology, CEFITEC, Portugal; C. Illgen, Physikalisch-Technische Bundesanstalt, Germany; J. Šetina, Institute of Metals and Technology, Slovenia; K. Jousten, M. Bernien, Physikalisch-Technische Bundesanstalt, Germany; F. Boineau, Laboratoire national de métrologie et d'essais, France; M. Vičar, Czech Metrology Institute, Czechia*

VT-Contributed On Demand-13 Three-Dimensional Analysis and Design Assessment of the Mast-U Double Beamline Cryogenic Pumping System, *Xueli Luo, S. Hanke, Karlsruhe Institute of Technology, Institute for Technical Physics, 76021 Karlsruhe, Germany; A. Shepherd, Culham Centre for Fusion Energy, Abingdon, Oxfordshire, OX14 3DB, United Kingdom; C. Day, Karlsruhe Institute of Technology, Institute for Technical Physics, 76021 Karlsruhe, Germany*

VT-Contributed On Demand-16 Cost Description and Characterisation of Gases used in immiscible gas Enhanced Oil Recovery processes (IGEOR), *Ofasa Abunumah, P. Ogunlode, E. Gobina, The Robert Gordon University, UK*

VT-Contributed On Demand-19 Vacuum level Sensing Using Optical Refractive Index, *Kevin Douglass, J. Ricker, NIST*

VT-Contributed On Demand-22 Simulation of the Operation of an Ion Pump, *Tiziano Isoardi, P. Manassero, L. Bonmassar, Agilent Technologies, Italy*

VT-Contributed On Demand-25 Experimental Characterization of a NEG Pump of Novel Size - A Step to its Application in the DEMO Neutral Beam Injectors, *Stefan Hanke, C. Day, T. Giegerich, X. Luo, Karlsruhe Institute of Technology (KIT), Germany; F. Siviero, M. Mura, A. Ferrara, E. Maccallini, P. Manini, SAES Getters, Italy; E. Sartori, M. Siragusa, P. Sonato, Consorzio RFX, Italy*

VT-Contributed On Demand-28 Shenzhen Synchrotron Radiation Facility Project, *Dongbai Sun, G. Liu, R. Si, Y. Cui, B. Yang, Z. Zhou, Institute of Advanced Science Facilities, Shenzhen, China*

VT-Contributed On Demand-34 Progress Towards 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 (NIST)*

VT-Contributed On Demand-37 NIST's New Flowmeter for the Extremely-High Vacuum, *Stephen Eckel, D. Barker, J. Fedchak, E. Newsome, J. Scherschligt, R. Vest, NIST*

VT-Contributed On Demand-40 Jefferson Lab Injector Beamline Upgrade, *Marcy Stutzman, Thomas Jefferson National Accelerator Facility*

VT-Contributed On Demand-43 Gas Transmission Rate of Elastomer Seal With a Divided Back-Up Ring Seal, *Masaharu Miki, Y. Miki, EM Technical Lab Inc., Japan*

VT-Contributed On Demand-46 Thermal Evaluation of a Fixed Length Optical Cavity Pressure Standard, *Jacob Ricker, J. Hendricks, K. Douglass, NIST*

VT-Contributed On Demand-49 Stability of Bakeable Capacitance Diaphragm Gauges, *Julia Scherschligt, D. Barker, S. Eckel, J. Fedchak, E. Newsome, NIST*

VT-Contributed On Demand-52 Outgassing of A36 Carbon Steel Vacuum Chambers, *James Fedchak, J. Scherschligt, NIST-Gaithersburg*

VT-Contributed On Demand-55 An in-Situ and in-Vivo Characterization Facility for Ion-Gas-Neutral Interactions With Surfaces (IGNIS-2) Under Fusion-Relevant Vacuum Conditions, *Ethan Kunz, C. Jaramillo, H. Schamis, M. Parsons, S. Kolecki, M. Fredd, C. Smith, M. Nieto, J. Allain, Pennsylvania State University*

Vacuum Technology Division

Room On Demand - Session VT-Invited On Demand

Vacuum Technology Invited On Demand Session

8:00am

INVITED: VT-Invited On Demand-1 Small Diameter NEG Coated Vacuum Chambers by Copper Electroforming, *Lucia Lain Amador, CERN, Switzerland*

INVITED: VT-Invited On Demand-7 Vacuum Technology for Fusion Research, *Christian Day, Karlsruhe Institute of Technology (KIT), Germany*

INVITED: VT-Invited On Demand-13 Innovations in Gauges and Gas Analysis, *U. Bergner, VACOM, Vakuum Komponenten & Messtechnik GmbH, Germany; Klaus Bergner, VACOM Vakuum Komponenten & Messtechnik GmbH, Germany*

INVITED: VT-Invited On Demand-19 Quality and Regulatory Issues for Vacuum Technology in Nuclear Power Plants, *Charles Smith, US ITER / ORNL; A. Buckley, US ITER*

INVITED: VT-Invited On Demand-25 Progress in the Construction of the ITER Vacuum System and Advancement in Vacuum Technologies for Fusion, *Robert J.H. Pearce, I. Banerjee, ITER Organization, France; J. Benet, Fusion for Energy, Spain; B. Boussier, J. Buckerfield, ITER Organization, France; F. Canadell, Fusion for Energy, Spain; F. Chitu, A. Cobalt, M. Dremel, S. Giors, G. Godia, S. Hughes, E. Quinn, ITER Organization, France; C. Smith, US ITER Project; A. Teissier, Fusion for Energy, Spain; D. Williamson, US ITER Project; L. Worth, ITER Organization, France*

INVITED: VT-Invited On Demand-31 Overview of the Outgassing Behavior of Metals, Polymers and Ceramics, *Katharina Battes, C. Day, V. Hauer*, Karlsruhe Institute of Technology (KIT), Germany

INVITED: VT-Invited On Demand-37 SynRad and MolFlow for Vacuum Analysis of CERN, *Marton Ady, R. Kersevan, P. Baehr*, CERN, Switzerland

INVITED: VT-Invited On Demand-43 Next Generation Synchrotron Light Source: Vacuum System of the 3 GeV Electron Storage Ring at MAX IV Laboratory, *Marek Grabski*, Max IV Laboratory, Sweden

INVITED: VT-Invited On Demand-49 Vacuum Technology of Hyperloop, *Tom Kammermeier*, Leybold GmbH, Germany; *D. Corcoran*, Leybold USA Inc.; *S. Rosenstraeter*, Leybold GmbH, Germany

INVITED: VT-Invited On Demand-55 Latest Developments and Uses of Neg Technology in Fusion Energy Applications, *Enrico Maccallini, P. Manini, M. Urbano, F. Siviero, L. Caruso, A. Ferrara, M. Mura*, SAES Getters SpA, Italy; *M. Siragusa, E. Sartori, P. Sonato*, CONSORZIO RFX, Italy; *G. Motojima, T. Murase, S. Masuzaki, T. Morisaki*, NIFS, Japan; *C. Day, S. Hanke*, KIT, Germany