Technical & Exhibitor Program

Technical & Poster Sessions • Exhibits • Professional Development Workshops • Tutorials • Short Courses

AVS 62ND INTERNATIONAL SYMPOSIUM & EXHIBITION

October 18-23, 2015 | San Jose, California

SAN JOSE CONVENTION CENTER

EXHIBIT HALL EVENTS & ACTIVITIES:

Ask the Experts • Daily Raffles • FREE Wireless Internet • FREE Coffee Breaks & Lunches
Career Center • Art Zone Contest • AVS Store • Exhibitors & Manufacturers Technology Spotlights
Thursday Exhibit Finale • AVS Membership & Publications Booths

Registration & Housing Online: www.avs.org
Housing Deadline: Sept. 25, 2015
Early Registration Deadline: Sept. 28, 2015

EXHIBIT HOURS:

Tuesday, October 20:	*10:00 a.m. - 5:00 p.m.*
Wednesday, October 21:	*10:00 a.m. - 4:30 p.m.*
Thursday, October 22:	*10:00 a.m. - 2:30 p.m.*

Start using the AVS 62 App
Username: your e-mail address
Password: AVS62

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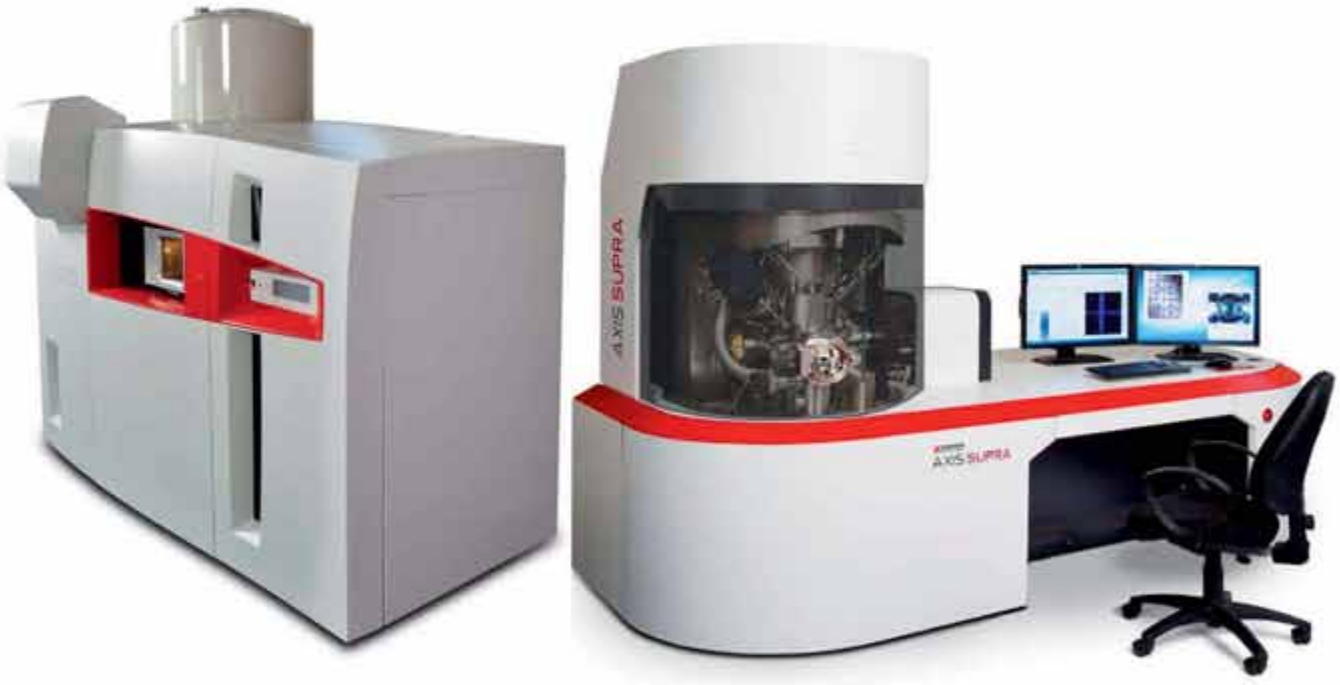

For live demonstrations of the AXIS Supra or AXIS Nova controlled by ESCApe software visit booth 615

www.kratos.com

Greetings

On behalf of the AVS community, we welcome you to San Jose, California, and the AVS 62nd International Symposium & Exhibition (AVS 62). We wish you a productive and stimulating week filled with new insights, as well as discussions with colleagues old and new.

We are fortunate to have ***Dr. Robert Chau,*** Director of Transistor Research and Nanotechnology in the Technology and Manufacturing Group at Intel Corporation, kick off the Symposium with a Plenary Lecture on **"Electronic Materials Research and Development for Future Computation and System-On-Chip Applications."** This topic is appropriate because we are in the heart of Silicon Valley and because so much of the surface, materials, processing, and interface research that will be presented at the meeting is motivated by applications. We are also fortunate to have as an integral part of our meeting the ***AIP Industrial Physics Forum*** on **"Mesoscale Science and Technology of Materials and Metamaterials."** Several of the divisions and focus topics are running sessions to complement the all-invited IPF sessions. The other topics that will be featured this week are 2D Materials, Additive Manufacturing, Materials Characterization in the Semiconductor Industry, Selective Deposition as an Enabler of Self-Alignment, In situ Spectroscopy and Microscopy, Helium Ion Microscopy, Scanning Probe Microscopy, Spectroscopic Ellipsometry, Actinides and Rare Earths, Atom Probe Tomography, Novel Trends in Synchrotron and FEL-Based Analysis, Energy Frontiers, Accelerating Materials Discovery for Global Competitiveness, Tribology, and Surface Modification of Materials by Plasmas for Medicine. These topics complement our traditional strong core on fundamental surface science and interfacial phenomena, applied surface science, surface engineering, micro- and nano-electronics and photonics, nanometer science and technology, manufacturing science and technology, thin films, plasma science and technology, micro- and nano-electromechanical systems, electronic and magnetic materials, biomaterials, and vacuum science and technology.

This year marks the **30th Anniversary of the AVS Applied Surface Science Division** and there are several invited talks scheduled to recognize that milestone. Apropos of our location, as well as the 50th Anniversary of Moore's Law, there are technical sessions and a panel discussion to gain different perspectives on the question ***"More Moore or More than Moore?,"*** which will guide much of the development in the integrated circuit industry in the near future. Other special sessions are planned including one on the U.S. National Labs User Facilities. We are running 16+ parallel sessions each day incorporating over 1,300 oral and poster presentations where we can debate some of the themes that will be presented during the meeting. There is a comprehensive equipment and product exhibit where the latest vacuum technology is on display that makes cutting edge science possible. Overviews of the state-of-the-art on topics that align with the AVS divisions will be presented in the special Highlight Seminar organized by the International Union for Vacuum Science, Technique, and Applications on Friday morning.

Thank you for participating and contributing to AVS 62. We also extend a heartfelt thank you to the dedicated volunteers who invested their time and energy to put together the technical program and the exceptional staff at AVS who have outdone themselves again in assembling a program and exhibition second to none.

Do you know the way to San Jose?

Anthony J. Muscat
2015 Program Chair
University of Arizona

Lisa M. Porter
2015 Program Vice-Chair
Carnegie Mellon University

TABLE OF CONTENTS

SYMPOSIUM

San Jose Convention Center
150 West San Carlos Street
San Jose, CA 95113

HQ HOTEL

San Jose Downtown Marriott
301 South Market Street,
San Jose, CA 95113

AVS NATIONAL OFFICE

125 Maiden Lane, 15th Floor
New York, NY 10038
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avsnyc@avs.org www.avs.org

SYMPOSIUM REGISTRATION HOURS

Sun.	2:00 p.m. to 6:00 p.m.	Wed.	7:30 a.m. to 5:00 p.m.
Mon.	7:30 a.m. to 5:00 p.m.	Thurs.	7:30 a.m. to 5:00 p.m.
Tues.	7:00 a.m. to 5:00 p.m.	Fri.	7:30 a.m. to 10:00 a.m.

SHORT COURSE REGISTRATION HOURS

Sun.	2:00 p.m. to 6:00 p.m.	Wed.	7:30 a.m. to 5:00 p.m.
Mon.	7:30 a.m. to 5:00 p.m.	Thurs.	7:30 a.m. to 5:00 p.m.
Tues	7:00 a.m. to 5:00 p.m.	Fri.	7:30 a.m. to 10:00 a.m.

SYMPOSIUM REGISTRATION FEES

	Pre-registration (Pre-Paid)	Registration (On-Site)
Member***	$645.00	$780.00
Non-Member**	$765.00	$925.00
Student Member*** *	$215.00	$265.00
Student Non-Member** *	$255.00	$310.00
Early Career Member*** *	$325.00	$395.00
Early Career Non-Member** *	$385.00	$465.00
Technical Specialist Member	$310.00	$375.00
Technical Specialist Non-Mem	$355.00	$430.00
One Day	$385.00	$465.00
Two Day	$670.00	$830.00
Exhibits Only	Free	$20.00

Pre-registration deadline: September 28, 2015
AVS tax ID Number: 04-2392373

*A bonafide full-time university student must present student I.D. Part-time students don't qualify for a student rate. If your highest degree is within 5 years you may register as an Early Career.

**Non-member registration inludes a complimentary 2016 AVS membership— report to the AVS Booth 839

***Full Week, Student, Early Career & Technical Specialist member registration fee INCLUDES your 2016 membership renewal dues. For more information report to the AVS Booth 839.

EXHIBIT HOURS

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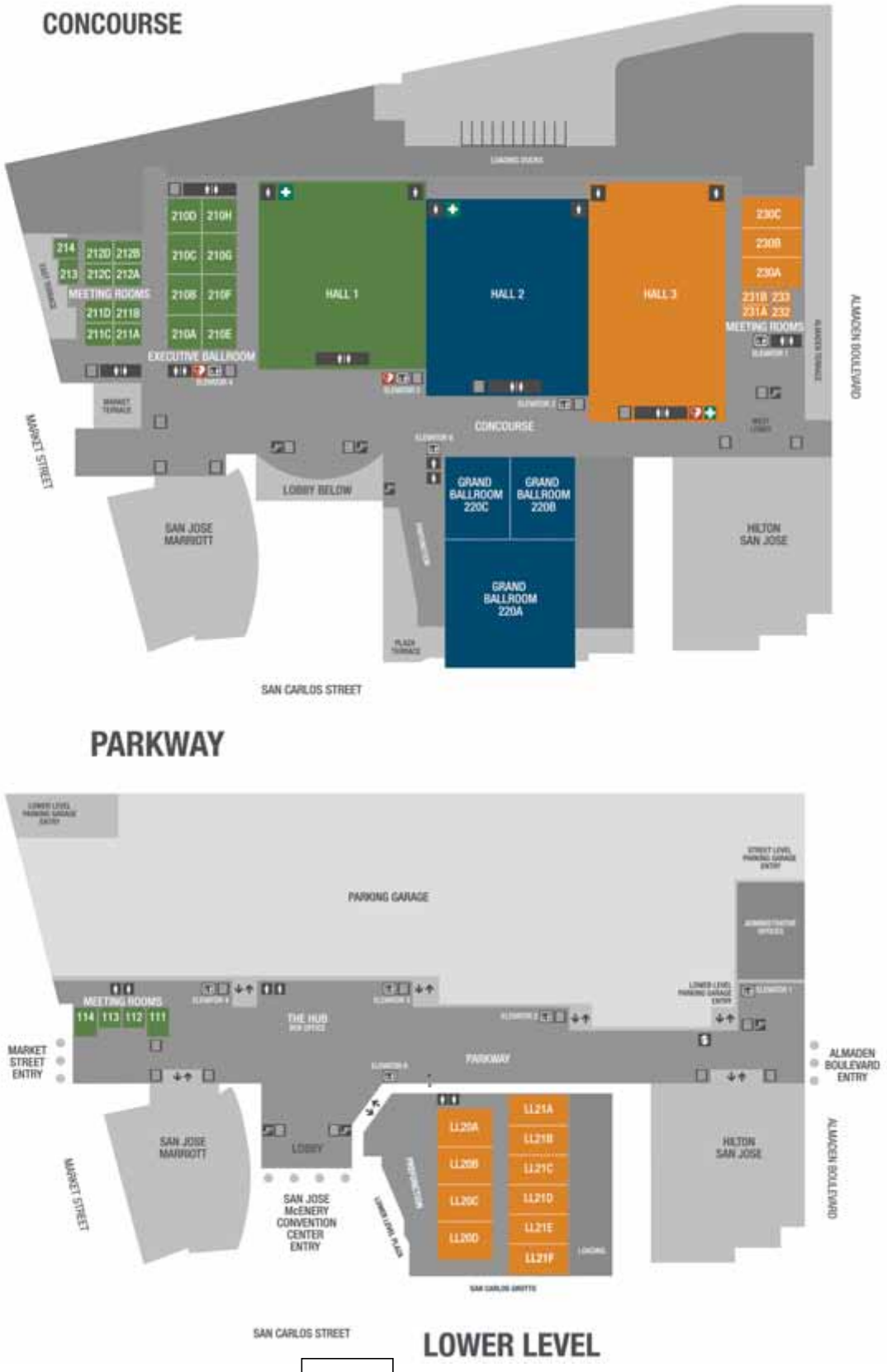
OFFICE LOCATIONS

Symposium Registration	Concourse 1
Short Course Registration	Concourse 1
Staff Offfice/Press	Concourse 1
AVS Store	Exhibit Hall Booth 839
Career Center	Exhibit Hall Booth 126
Publications Booth	Exhibit Hall Booth 838
Presenters Preview	213

SAN JOSE CONVENTION CENTER

OVERALL FLOOR PLAN



Room/ Day	111	112	113	114	210A	210B	210E	210F	211A	211B
SuA										
MoM	TF+ Self-Assembled Monolayers, Layer-by-Layer, etc.	SA Imaging & Nanodiff. (8:20-10:00) & Novel Insights in Corr. Mtls, Org. Mtls & 2D Solids (10:40 am -12:00 pm)	SS+ Synthesis, Structure and Character-ization of Oxides	MG+ Development of Novel Materials	PS+ Atmospheric Pressure Plasma Processing I	PS Advanced FEOL/Gate Etching	EM+ More Moore! Materials and Processes to Extend CMOS Another Decade	IPF+ Mats for Ener. Gener. & Stor. (8:20-10:20) & Meso- scale Phen in Biosci I (10:40-12:00)	EM+ Rectenna Solar Cells, MIM Diodes, and Oxide Interfaces	EN+ Solar Cells I
MoA	TF+ ALD, CVD, MLD, and PLD on Special Materials	SA New Insights in Corr. Mtls, Organic Mtls and 2D Solids	SS Organics and Ionic Liquids: Surf., Layers, Interfaces and Chirality	MG+ Design and Discovery (Bio and Other Interfaces)	PS Plasma Diagnostics, Sensors and Control I	PS+ Directed Self Assembly and Plasma Synthesis of Novel Materials	EM+ More Moore! II	IPF+ Mesoscale Phenom in the Biosci II (2:20-3:40) & Meta-mtls (3:40-5:40)	EM+ MIM Diodes, Functional Oxides, and TFTs	EN+ Solar Cells II
TuM	TF+ ALD for Alternative Devices	SS+ Nanostructures, Nano-plasmonics and Surface Reactions	SS+ Mech. Insight of Surface Reactions: Catalysis, ALD, etc. - I	MC Character-ization of 3D structures	PS+ Plasmas for Medicine and Biological Applications	PS Advanced BEOL/ Interconnect Etching	EM Beyond CMOS: Materials and Devices for a Post CMOS Era	IPF+ Degrad. Sci (8:00-10:00) & Electro-chemistry from Nano to Meso (11:00-12:20)	MN+ Multi. Phen & Int in Mic/Nano Syst (8:00-10:00) & Opt. MEMS/ NEMS, Pho, & Quant. Nano (11:00-12:20)	EN+ Photocatalysis
TuL										
TuA	TF ALD for Emerging Applications	SS+ Photocatalysis, Photo-chemistry, and Chirality at Surfaces	SS+ Mechanistic Insight of Surf. Reactions: Catalysis, ALD, etc. - II	MS Working with National Labs and User Facilities	PS1 Novel Materials and Etch Chemistry	PS2 Plasma Modeling	EM+ More than Moore: Novel Approaches for Inc. Integrated Functionality	IPF+ Frontiers in Physics	MN+ BioMEMS/ NEMS, Wearable & Implantable Devices	EN+ Batteries and Super-capacitors
TuP										
WeM	TF+ ALD for Energy	SS Environ. Inter, Ambient Surf., In-Operando Studies, & Adsorption on 2D Materials	SS+ Nano-structures: Growth Reactivity & Catalysis	TF+ ALD Surface Reactions and Precursors	PS+ Atomic Layer Etching (ALE) and Low-Damage Processes I	PS+ Plasma Diagnostics, Sensors and Control II	EM Beyond CMOS: Resistive Switching Devices		MN+ Emerg Matls & Fab Tech. toward Scalable & Additive Nanomanu-facturing I	AM+ Materials, Designs, and Applications of Additive Manufacturing
WeL										
WeA	TF+ CV Infiltration Methods & Energ & Thermal Prop. of Thin Films	SS+ Surf Dynamcs, Non-Adiabati-city, and Single Molecule Phenomena	SS+ Metals, Alloys & Oxides: Reactivity and Catalysis	TF+ Thin Films for Biological and Biomedical Applications	PS+ Plasma Deposition and Plasma Assisted ALD	PS+ Plasma Surface Interactions	EM Interconnects: Meth. & Matls for Removing Connect Constraints	HI GFIS Based Nano-structuring	MN+ Emerg Matls & Fab Tech toward Scalable & Additive Nanomanufact uring II	IS+ In situ Imaging of Liquids using Microfluidics
ThM	TF+ Thin Film: Growth and Charac, Optical & Synch Char I	EL+ Spect Ellipsometry: Novel Apps and Theoretical Approaches	SS+ Semiconductor Surfaces and Interfaces - I	TF+ Plasma ALD and Nano-applications	PS+ Plasma Processing for 2D Materials	MN Atomic Layer Nanostructures and 2D NEMS	EM+ III-N Nitrides for Optoelectronic Applications	SD+ Fundamentals of Selective Deposition	AM+ Tech Enabled by Additive Manuf/Future of Additive Manufacturing	HI+ FIB Tech (08:00-10:00)/Fund of Helium Ion Micro (11:00-12:20)
ThA	TF+ Thin Film: Growth & Char, Optical & Synchrotron Character-ization II	EL+ Optical Char of Nanostructures and Metamaterials	SS+ Atom Modeling of Surf Phen & Semicond Surfaces & Interfaces - II	TF+ Thin Film Permeation Barriers and Membranes	PS Plasma Sources	PS+ Advanced Ion Implantation and Plasma Doping	EM+ III-N Nitrides II	SD+ Process Develop for Selective Dep & Self-aligned Patterning	AM+ Additive Fabrication for Electronic Devices and Systems	HI+ Imaging and Milling with He and Ne Ion Beams
ThP										
FrM	TF+ Thin Films for Light Trap., Plasmonic, & Magnetic Applications				PS+ Atmospheric Pressure Plasma Processing II	PS+ Atomic Layer Etching (ALE) & Low-Damage Processes II				

at a Glance

211C	211D	212A	212B	212C	212D	230A	230B	Hall 1	Hall 3
	BP Biomaterials Plenary Session								
IS+ Fundamental Studies of Surf Chem of Single Crystal & Nanomaterials under Reaction Conditions	BI+ Characterization of Biological and Biomaterials Surfaces (1)	SE+ Nanostructured Thin Films and Coatings	NS Nanotools and Nanodevices	2D+ 2D Materials: Growth and Fabrication	AS QSA: Obtain Quant. Info in the Face of Matl Complexity & Morph Influences	AP+ Atom Probe Tomography of Nanomaterials	VT Vacuum Measurement, Calibration, and Primary Standards		
IS+ Amb Press X-ray Photo Spect Stud for Cat. & Energy Matls in Gas Phase	BI+ Character-ization of Biological and Biomaterials Surfaces (2)	SE+ Thin Film Tech for Energy Storage, Conversion and Harvesting	NS+ Optical Spectroscopy at the Nanoscale	2D+ 2D Materials: Devices and Applications	AS Practical Surface Analysis I: Interpretation Challenges	AP+ Current & New Research Fields for App of Atom Probe Tomography	VT Extreme High Vacuum		
IS+ In-situ Studies of Solid-liquid Interfaces	AP+ New Applications of Atom Probe Tomography	SE+ Atmospheric Pressure Plasmas, CVD and Other Deposition Methods	NS+ Nanoscale Imaging and Materials Character-ization	2D+ Optical and Optoelectronic Properties of 2D Materials	AS+ Chemical/Molecular Info from Sub-micron Features and Materials	MI Oxides, Fluorides, and Spin Structures	VT Vacuum Suitcases and Particulate Control	EW Exhibitor Technology Spotlight Session	
								EW Exhibitor Technology Spotlight Session	
IS+ Environmental TEM Studies for Catalytic and Energy Materials	BI Cells and Micro-organisms at Surfaces	SE+ Pulsed Plasmas in Surface Engineering	NS+ Nanophotonics, Plasmonics, and Energy	2D+ Electronic and Magnetic Properties of 2D Materials	AS+ Challenges in the Char of Polymer/Organic /Biological Systems	MI+ Spin Currents, Spin Textures and Hybrid Magnetic Structures	VT Gas Dynamics and Modeling, Pumping and Outgassing	EW Exhibitor Technology Spotlight Session	
									POSTER SESSIONS BI, EM, EN, IS, MC, MI, MS, NS, SE, SS, VT
IS+ In-situ Studies Using X-ray Absorp Spect & Vib. Spect for Catal & Energy Materials	BI Biomolecules at Interfaces	SP+ Advances in Scanning Probe Microscopy	NS Nanodiamond for Optical and Biomedical Applications	2D+ Mechanical and Thermal Properties of 2D Materials	AS Pract. Surface Anal. II: Inf of Samp Prep & Novel Sample Prep Tech	AC+ Magnetism, Complex & Supercond in the Actinides & Rare Earths	VT Accelerator and Large Vacuum Systems	EW Exhibitor Technology Spotlight Session	
								EW Exhibitor Technology Spotlight Session	
EM+ Surface and Interface Challenges in Wide Bandgap Materials	BI Biophysics, Membranes and Nanoscale Biological Interfaces	SP+ Probing Electronic and Transport Properties	NS+ Nanoscale Catalysis and Surface Chemistry	2D+ Dopants and Defects in 2D Materials	AS+ Characterization of Buried Interfaces	AC+ Chemistry and Physics of the Actinides and Rare Earths	VT Vacuum Quality and Partial Pressure Analysis		
EM Interconnects II	SM+ Plasma Processing of Biomaterials	SP+ Probing Chemical Reactions at the Nanoscale	NS+ Nanopatterning and Nanolithography /Nanoscale Mechanics	2D+ Emergent 2D Materials	AS Pract Surf Anal. III: Multi-tech Prob solving & Struct-prop Correlations	AC+ Nuclear Power and Waste Remediation	TR+ Nanolubricants and Coatings		
EM+ Materials for Light Management	SM+ Plasma Processing of Biomaterials and Biological Systems	SP+ Probing Material Growth on the Surface		2D+ Heterostructures of 2D Materials	AS+ Advances in 2D Chemical Mapping and Data Analysis		TR+ Molecular Origins of Friction		
									POSTER SESSIONS 2D, AC, AM, AS, EL, PS, SM, SP, TF, TR
EM+ Nanoparticles for Electronics and Photonics		SP+ Probe-Sample Interactions		2D+ Surf Chem of 2D Materials: Funct, Membranes, Sensors	IUVSTA Highlights Seminar		TR+ Nanoscale Wear and Biotribology		

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Advanced Surface Engineering (SE)

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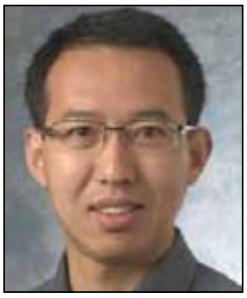
Applied Surface Science (AS)

Graham Leggett
Biomaterial Interfaces & Bio Plenary (BI/BP)

Sean King
Electronic Materials & Processing (EM)

Greg Sculczewski
Magnetic Interfaces & Nanostructures (MI)



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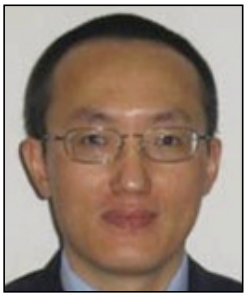
Energy Frontiers (EN)


Xiao-Ying Yu, Franklin Tao, and Stephen Nonnenmann
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Materials Characterization Semiconductor Industry (MC)

Petra Rudolf
Novel Trends in Synchrotron and FEL-based Analysis (SA)

An-Ping Li
Scanning Probe Microscopy (SP)

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Selective Deposition As an Enabler of Self-Alignment (SD)

Tino Hofmann
Spectroscopic Ellipsometry (EL)

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Fedchak, James, National Institute of Standards and Technology (NIST)
Arnold, Paul, Brooks Automation, Inc., Granville-Phillips Products
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Martinez, Ted SLAC National Accelerator Laboatory
Hendricks, Jay, National Institute of Standards and Technology
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Peacock, Neil, MKS Instruments
Stutzman, Marcy, Thomas Jefferson National Accelerator Facility
Wang, Lily, Los Alamos National Laboratory
Wuest, Martin, INFICON Ltd., Liechtenstein

2D Materials Focus Topic
Co-Chair: Bolotin, Kirill, Vanderbilt Univ.
Co-Chair: Gunlycke, Daniel, Naval Research Lab.
Co-Chair: Oleynik, Ivan, University of South Florida
Borunda, Mario, Oklahoma State Univ.
Castellanos Gomez, Andres, Delft University of Technology
Chhowalla, Manish, Rutgers University
Feng, Philip, Case Western Reserve Univ.
Lau, ChunNing (Jeanie), University of California, Riverside
Lay, Marcus, The Cooper Union for the Advancement of Science and Art
Le Lay, Guy, Aix-Marseille Univ., France
Ohta, Taisuke, Sandia National Labs
Osgood, Richard, Columbia University
Osterwalder, Juerg, Univ. of Zurich, Switzerland
Park, Jiwoong, Cornell University
Reinke, Petra, University of Virginia
Schuller, Jon, UC Santa Barbara
Xu, Xiaodong, University of Washington

Accelerating Materials Discovery for Global Competitiveness Focus Topic
Chair: Rahman, Talat, University of Central Florida
Co-Chair: Madsen, Lynnette, National Science Foundation (NSF)
Alexander, Morgan, University of Nottingham, UK
Colombo, Luigi, Texas Instruments
de Leeuw, Nora, University College London, UK
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Fischer, Peter, Lawrence Berkeley National Lab.
Jones, Sean, OSTP/NSF
Mueller, Tim, Johns Hopkins University
Rogers, Bridget R., Vanderbilt University
Soukhojak, Andrey, The Dow Chemical Company
Warren, James, National Institute of Standards and Technology (NIST)

Actinides and Rare Earths Focus Topic
Chair: Tobin, James, Lawrence Livermore Natl. Lab.
Bagus, Paul, University of North Texas
Booth, Corwin, Lawrence Berkeley National Lab.
Durakiewicz, Tomasz, Los Alamos National Lab.
Geeson, David, AWE, UK
Havela, Ladislav, Charles University, Czech Republic
Petit, Leon, Daresbury Laboratory, UK
Szakal, Christopher, National Institute of Standards and Technology (NIST)
Szulczewski, Greg, University of Alabama

Additive Manufacturing/3D Printing Focus Topic
Co-Chair: Smentkowski, Vincent, General Electric Global Research Center
Co-Chair: Svedberg, Erik B., The Natl. Academies
Dekker, Carl, Met-L-Flo Inc.
Dong, Xia, Eli Lilly and Company
Fitz-Gerald, James, University of Virginia
Ghita, Oana, Univ. of Exeter, UK of Great Britain and Northern Ireland
Orringer, Neal, 3D Systems
Rogers, Bridget R., Vanderbilt University
Whiting, Gregory, Palo Alto Research Ctr

Atom Probe Tomography Focus Topic
Chair: Devaraj, Arun, Pacific Northwest National Lab.
Bagot, Paul, Oxford University, UK
Cairney, Julie, Univ. of Sydney, Australia
Perea, Daniel, Pacific Northwest National Laboratory
Prosa, Ty, CAMECA
Thevuthasan, Suntharampillai, Qatar Environ. and Energy Res. Institute, Qatar
Vurpillot, Francois, Univ. of Rouen, France

Energy Frontiers Focus Topic
Chair: Baxter, Jason, Drexel University
Aydil, Eray, University of Minnesota
Bent, Stacey, Stanford University
Filler, Michael, Georgia Institute of Tech.
Hinkle, Christopher, Univ. of Texas at Dallas
Ohlhausen, James A. (Tony), Sandia National Labs.
Ramana, Chintalapalle, Univ. of Texas at El Paso
Stueber, Michael, Karlsruhe Institute of Technology, Germany
Wei, David, University of Florida

Helium Ion Microscopy Focus Topic
Chair: Hlawacek, Gregor, Helmholtz-Zentrum Dresden – Rossendorf, Germany
Co-Chair: Gölzhäuser, Armin, Univ. of Bielefeld, Germany
Livengood, Richard, Intel Corporation
Notte, John A., Carl Zeiss Microscopy

***In Situ* Spectroscopy and Microscopy Focus Topic**
Co-Chair: Nonnenmann, Stephen, University of Massachusetts – Amherst
Co-Chair: Tao, Franklin (Feng), Univ. of Notre Dame
Co-Chair: Yang, Judith, Univ. of Pittsburgh
Co-Chair: Yu, Xiao-Ying, Pacific Northwest National Laboratory

IPF on Mesoscale Science and Technology of Materials and Metamaterials (IPF)
Co-Chair: Ludeke, Rudy, IBM Emeritus
Co-Chair: Rogers, Bridget R., Vanderbilt University
Murday, James, University of Southern California

Materials Characterization in the Semiconductor Industry Focus Topic
Chair: van der Heide, Paul, GLOBALFOUNDRIES
Co-Chair: Diebold, Alain, SUNY College of Nanoscale Science and Engineering

Novel Trends in Synchrotron and FEL-Based Analysis Focus Topic
Chair: Rudolf, Petra, University of Groningen, The Netherlands
Dürr, Herrmann, Stanford University
Mårtensson, Nils, Uppsala University, Sweden

Scanning Probe Microscopy Focus Topic
Chair: Li, An-Ping, ORNL
Co-Chair: Allen, Stephanie, Univ. of Nottingham, UK
Co-Chair: de Lozanne, Alex, Univ. of Texas at Austin
Co-Chair: Kim, Tae-Hwan, Pohang Univ. of Science and Tech., Republic of Korea
Co-Chair: Nogami, Jun, Univ. of Toronto, Canada
Co-Chair: Ventrice, Jr., Carl, Univ. at Albany-SUNY

Selective Deposition as an Enabler of Self-Alignment Focus Topic
Chair: Clendenning, Scott, Intel
Chabal, Yves, University of Texas at Dallas
Fischer, Pamela, ASM
Ma, Paul, Applied Materials, Inc.
Parsons, Gregory, North Carolina State Univ.
Smythe, John, Micron Technology

Spectroscopic Ellipsometry Focus Topic
Chair: Hofmann, Tino, Univ. of Nebraska-Lincoln
Aspnes, David, North Carolina State Univ
Creatore, Mariadriana, Eindhoven University of Technology, Netherlands
Diebold, Alain, SUNY College of Nanoscale Science and Engineering
Dong, Xia, Eli Lilly and Company
Filler, Michael, Georgia Institute of Tech.
Fujiwara, Hiroyuki, Gifu Univ., Japan
Hilfiker, James, J.A. Woollam Co., Inc.
Hingerl, Kurt, University Linz, Austria
Liu, Shiyuan, Huazhong University of Science and Technology, China
Losurdo, Maria, University Bari, Italy
Schubert, Mathias, University of Nebraska-Lincoln
van der Heide, Paul, GLOBALFOUNDRIES
Wormeester, Herbert, University of Twente, Netherlands
Zollner, Stefan, New Mexico State Univ.

Surface Modification of Materials by Plasmas for Medical Purposes Focus Topic
Chair: Hamaguchi, Satoshi, Osaka University, Japan
Arefi-Khonsari, Farzaneh, l'université Pierre et Marie Curie, France
Graves, David, Univ. of California, Berkeley
Joseph, Eric A., IBM Research Division, T.J. Watson Research Center
Leggett, Graham, Univ. of Sheffield, UK
O'Connell, Deborah, Univ. of York, UK
Pacholski, Michaeleen, The Dow Chemical Company

Tribology Focus Topic
Chair: Schall, J. David, Oakland Univ.
Argibay, Nicolas, Sandia National Labs.
Irving, Douglas, North Carolina State Univ.
Jacobs, Tevis, University of Pittsburgh
Mangolini, Filippo, University of Pennsylvania

Exhibitor Technology Spotlight
Chair: DeGennaro, Jeannette, AVS

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Biointer*phases*
Editorial Assistant – NC Office

GENERAL INFORMATION

AVS 62 Mobile App!

The AVS 62 App allows all Symposium registrants to: review the technical program and abstracts, plus exhibition, meetings/special events, and other travel and logistical details, create a personal schedule, send messages to other event attendees, capture and upload event photos, receive daily event notifications, access the AVS publications and technical libraries and more!

Simply download the app at: http://avs62.quickmobile.mobi/

Your username is your email address and your password is AVS62

Please contact AVS62app@avs.org should you need any assistance using the App

EXCITING 2015 EVENTS

Welcome Mixer for Attendees & Exhibitors

Sponsored by AIP Journal of Applied Physics

The Welcome Mixer will take place on Monday, October 19, from 5:30 p.m.–7:30 p.m. The Mixer is a casual gathering where attendees and exhibitors can enjoy some refreshments and spend time together prior to the opening of the Exhibit Hall.

AVS Membership Booth and Store – Booth 839

Official AVS logo items including polos, graphic tees, the ever popular "No Vacuum " shirt, as well as other merchandise will be available for purchase throughout the week. Learn about the advantages and benefits of AVS membership and find out how to get more involved in AVS events and activities.

AVS Career Center – Booth 126

Looking for a position or seeking qualified candidates for a job opening? If so, please register at the AVS Career Center located in the Exhibit Hall.

AVS Publications – Booth 838

Come meet with the AVS journal editors, find out how to submit a manuscript and learn about exciting developments in all AVS journals.

Art Zone – Booth 1033

Sponsored by Duniway Stockroom

See the entries in the 2015 art contest and vote for your favorites. Winners will take home cash prizes! To enter the contest, stop by the Staff Office (Concourse 1) for further information.

Exhibit Hall Refreshment Breaks

Visit the Exhibit Hall during the morning and afternoon technical session breaks. There will always be something special being offered in the Hall.

Complimentary Lunches in the Exhibit Hall

Sponsored by Specs

Full week attendees who pay for a full week registration (Full, Student, Early Career, Technical Specialists, and Exhibitors) will receive three free lunch vouchers redeemable on Tuesday, Wednesday and Thursday for lunch concessions located in the Exhibit Hall. Stop by the Exhibit Hall between 12:20–2:20 p.m. to grab a bite to eat and network with exhibitors and fellow colleagues. Free lunch for everyone at the Exhbit Finale on Thursday.

AVS Raffle Zone – Booth 1027

Be sure to enter your raffle tickets to participate in the daily raffles being held Tuesday–Thursday in the Exhibit Hall Raffle Zone! Thanks to our generous sponsors we have some really exciting prizes this year.

Ask The Experts – Booth 439

Sponsored and Supported by MKS Instruments, SAES Getters and Kimball Physics

Join the A.T.E. team of experts in the stage area of the Exhibit Hall on Tuesday at 10:20 a.m. for a special vacuum technology session. The presentation will include a primer on the principles of vacuum technology including: vacuum generation, gas flow and pressure measurement along with discussion of the most interesting questions and challenges raised by the AVS audience throughout the years. Learn the differences between direct and indirect pressure measurement. Understand the advantages of thermal versus pressure based mass flow controllers. If you are new to the vacuum industry or are interested in hearing what your colleagues are doing with vacuum technology this is a great opportunity to learn some new and interesting tricks.

Students and Early Career Members

The Professional Leadership is sponsoring some special events/ sessions. Please see pages 26–31 for further information.

Free Caricature– Booth 339

Sponsored by R.D. Mathis

Visit Booth 733 in the Exhibit Hall to get your ticket validated for a free caricature!

Free Photo – Booth 339

Sponsored by Shimadzu Scientific Instruments

Visit Booth 615 in the Exhibit Hall to get your ticket validated for a free photo!

Special AVS 62 Registration Benefit

The Optical Society of America (OSA) Meeting, Frontiers in Optics, will be held at the Fairmont San Jose, 170 S. Market Street, San Jose, CA, during the same week as the AVS Symposium. As an added AVS Registration benefit, OSA will be allowing AVS registrants (wearing their AVS badge) into their Exhibition located in the Imperial Ballroom during their show hours:

Tuesday, October 20: 9:30 am – 4:00 pm

Wednesday, October 21: 9:30 am – 2:00 pm

A full list of exhibitors may be found at the following link:

http://www.expocad.com/host/fx/osa/15fio65/default.html?var=1227

Symposium Registration Cancellation Policy

All cancellations must be sent in writing to Yvonne Towse by **September 28, 2015** (yvonne@avs.org) for a full refund less $100 or $50 for Students, Early Career, Technical Specialist, One Day cancellation fee. There will be a 50% refund issued between September 29–October 9, 2015 and no refunds issued for no shows. Please not that all refunds will be processed within 30 days following the meeting.

Terms & Conditions

You will be charged for all registrations received.

- A $20 fee will be charged for all returned checks.
- No Purchase Orders will be accepted.

All registration fees are NON-TRANSFERABLE.

All cancellations must be sent to Yvonne Towse (yvonne@avs.org) by **October 9, 2015** (see refund policy above).

All cancellations and refunds will be processed after the close of the meeting.

- Children must be accompanied by a parent or a guardian during exhibit hours. Under no circumstances are children under the age of 12 (including infants and toddlers) permitted on the exhibit floor.

Symposium Lost Badge Policy

We will be imposing a $20 fee for a replacement badge so please remember to bring your badge and keep it in a safe place throughout the week.

YOU MUST HAVE YOUR BADGE AND BADGE HOLDER TO GAIN ADMISSION TO THE TECHNICAL SESSIONS AND EXHIBITION.

AVS Membership Renewal Feature

The 2016 membership renewal dues will be included within the symposium registration fees for all Full, Student, Early Career, and Technical Specialist members. No further action will be required and 2016 membership will take effect on January 1, 2016. Any questions, see Angela Klink at the AVS Store (Booth 839) or via email (angela@avs.org).

Manuscript Publication Information

Journal of Vacuum Science & Technology A & B

Biointer*phases*

Authors are invited to submit an article to *JVST A*, *JVST B* or Biointer*phases* on the topic of their presentation/poster given at the AVS International Symposium. Articles can be submitted anytime between the abstract submission deadline and the end of the year. Please indicate in the cover letter that the article is based on a talk or poster given at the AVS Symposium. Articles can be submitted to *JVST A*, *JVST B*, or Biointer*phases* depending on the topic. You can find easy to use templates and instructions for authors at http://scitation.aip.org/content/avs/journal/jvsta/info/authors, http://scitation.aip.org/content/avs/journal/jvstb/info/authors, http://scitation.aip.org/content/avs/journal/bip/info/about.

For more information, stop by the AVS Publications Booth 838 in the Exhibit Hall during the week of the Symposium or contact:

Nancy Schultheis
AVS Publications Office
Caller Box 13994
100 Park Drive, Suite 105
Research Triangle Park, NC 27709
919-361-2787 Fax: 919-361-1378
Email: publications@avs.org

Complimentary AVS Membership Offer

If you have paid the Full, Student, Early Career, or Technical nonmember registration fee, you will receive a complimentary AVS electronic membership for 2016. For more information, stop by AVS Booth 839 in the Exhibit Hall during the week of the Symposium or contact Angela Klink (angela@avs.org).

Recording Equipment Policy

The use of video recording equipment, cameras, or audio equipment at any AVS International Symposium, Short Course, or Topical Conference is prohibited without prior written approval of AVS.

Anyone in violation of these policies will be removed from the premises immediately. AVS reserves the right to reproduce, by any means selected, any or all of these presentations and materials.

Internet Access E-mail Pavilion – *Booth 238*

Sponsored by Specs Surface Nano Analysis, Inc.

Whether you want to check your email, check in for your flight, print your boarding pass or find a local restaurant you are welcome to visit Booth 238 in the exhibit hall for free internet access.

Additional Notes

AVS will be providing PCs (laptops) in all session rooms in addition to switchboxes which should allow for a quick and easy transition between presentations. All authors are encouraged to visit the Presenters Preview Room to test the equipment prior to their presentation.

GENERAL INFORMATION

Hotel Reservations

AVS is pleased to offer special rates at two San Jose hotels—San Jose Downtown Marriott (Headquarters) and the Hilton San Jose Hotels.

Keep in mind that reserving a room in this convention block helps AVS meet its financial commitments to the host city and retain lower registration fees as well as a high quality conference with the features and services you are accustomed too. ***Reservations*** *(Opens: July 6, 2015; Closes: September 25, 2015)*

Hotel	Room Rates	Parking
San Jose Downtown Marriott 301 South Market St. San Jose, CA 95113	Single/Double: $195	Valet Parking (in and out privileges): $31 per day
Hilton San Jose 300 Almaden Blvd. San Jose, CA 95110	Single/Double: $195	Self-Parking: $24 per day Valet Parking: $44 per day

Reservation Cancellation for Attendees

Reservations can be cancelled without penalty up to 72 hours prior to the day of arrival. NOTE: Failure to arrive on your confirmed arrival date will result in one night's room & tax charged to the credit card provided and your entire reservation will be cancelled. Cancellations can be made via the web-site or via email, avs@experient-inc.com until 5:00 pm EST on September 25, 2015. Please contact the hotel directly after September 29, 2015 for all cancellations and changes. The hotel may not have record of your reservation if you call prior to September 29, 2015.

Reservation Cancellation for Exhibitors

Due to hotel stipulations, a minimum number of blocked rooms must be utilized by the AVS; therefore, the final day to cancel your reservation without penalty is 5:00 p.m. EST on September 1, 2015. Reservations cancelled AFTER 5:00 p.m. EST on September 1, 2015, will be assessed a cancellation fee equal to one night's room & tax per reservation. NOTE: This charge is in addition to any hotel charges you may incur. You are also subject to your individual hotel's cancellation policy. Hotel requires cancellation of 72 hours prior to the day of arrival. Failure to arrive on your confirmed arrival date will result in one night's room & tax charged by the hotel to the credit card provided and your entire reservation will be cancelled. Cancellations can be made via the web site or via email, avs@experient-inc.com until 5:00 pm EST on September 25, 2015. Please contact the hotel directly after September 29, 2015 for all cancellations and changes. The hotel may not have record of your reservation if you call prior to September 29, 2015.

Airports

Norman Y. Mineta San Jose International Airport (SJC)
Three (3) miles from the San Jose McEnery Convention Center

Directions to Marriott Downtown Hotel: Take Hwy CA-87 South (Guadalupe Parkway). Exit on Park Avenue. Turn left on Park Avenue. Turn right on Market Street. The hotel is one block ahead, on the corner of Market & San Carlos Street.

Taxi Ride: $20 each direction.

Shuttle Ride: Book online using http://groups.supershuttle.com/avs.html

Oakland International Airport (OAK)
Thirty-six (36) miles from the San Jose McEnery Convention Center

Directions to Marriott Downtown Hotel: Take I-880 South. Exit Coleman Avenue. Coleman turns into Market Street. Keep going South on Market Street. The hotel is on the corner of Market Street and San Carlos Street.

Taxi Ride: $120 each direction

Shuttle Ride: Book online using http://groups.supershuttle.com/avs.html

San Francisco International Airport (SFO)
Thirty-six (36) miles from the San Jose McEnery Convention Center

Directions to Marriott Downtown Hotel: Take US-101 South, Take CA-87 South (Guadalupe Parkway). Exit Park Avenue. Turn left on Park Avenue. Turn right on Market Street. The hotel is one block ahead, on the corner of Market Street and San Carlos Street.

Taxi Ride: $120 each direction

Shuttle Ride: Book online using http://groups.supershuttle.com/avs.html

Transportation

Light Rail

Light Rail service drops right off in front of the San Jose Convention Center:

Single Fare: $2-$4

Light Rail Map: http://www.vta.org/getting-around/interactive-light-rail-map

Parking

Convention Center Parking Lot: $20

Climate

San Jose, like most of the Bay Area, has a subtropical Mediterranean climate. San Jose has an average of 301 days of sunshine and an annual mean temperature of 60.5 °F. It lies inland, surrounded on three sides by mountains, and does not front the Pacific Ocean like San Francisco. Because of this, the city is somewhat more sheltered from rain, giving it a semiarid feel. The monthly daily average temperature ranges from around 50 °F in December and January to around 70 °F in July and August.

FLASH NETWORKING SESSIONS

Biomaterial Interfaces Division
Tuesday, October 20, 2015, 6:00 – 6:40 pm, Room 211D

6:00 pm	**BI-TuP1** Simple Method Toward Lignin Based Surface Coatings, **PATRICK BURCH**, P.B. MESSERSMITH, University of California at Berkeley
6:03 pm	**BI-TuP2** Characterising Hydrogel Chemistry Through Low Temperature ToF-SIMS, **MICHAEL TAYLOR**, D. SCURR, The University of Nottingham, UK, M. LUTOLF, Ecole Polytechnique Fédérale de Lausanne (EPFL), Swtizerland, L. BUTTERY, M. ZELZER, M.R. ALEXANDER, The University of Nottingham, UK
6:06 pm	**BI-TuP3** Molecular-Level Insights into the Wet Adhesion Mechanisms of the Lady Beetle (*Cocinella septempunctata*), **JAMES FOWLER**, Oregon State University, J. FRANZ, Max Planck Institute for Polymer Research, Germany, S. GORB, University of Kiel, Germany, T. WEIDNER, Max Planck Institute for Polymer Research, Germany, J.E. BAIO, Oregon State University
6:09 pm	**BI-TuP4** Flash Networking Poster: Numerical Simulation of an Atmospheric Pressure RF-Driven Plasma Needle and Heat Transfer to Adjacent Human Skin using COMSOL, **MAXIMILIAN SCHROEDER**, Technische Universität Dresden, Germany
6:12 pm	**BI-TuP5** Structured Noble Metal Nanosurfaces for Biosensing and Bioanalysis (1): Controlling Galvanic Displacement Reaction for Creation of Silver Nanostructures, **SHINGO YONEDA**, Toyo University, Japan, T. OKAMOTO, RIKEN, Japan, H. VIEKER, A. BEYER, A. GÖLZHÄUSER, Bielefeld University, Germany, H. TAKEI, Toyo University, Japan
6:15 pm	**BI-TuP9** Flash Networking Poster: Gold Nanoparticle-Delivered RNA Genetic Control Devices, **MICHAEL NEWTON**, J.M. CAROTHERS, D.G. CASTNER, University of Washington
6:18 pm	**BI-TuP10** Effect of Synthesis Parameters on Structural Properties of Hydroxyapatite Nanofibers using the Hydrothermal Method, **NESTOR EFRÉN MENDEZ LOZANO**, UNAM, Mexico, R.R. VELÁZQUEZ CASTILLO, UAQ, Mexico, E.M. RIVERA MUÑOZ, UNAM, Mexico, A. MANZANO RAMÍREZ, CINVESTAV-Queretaro, Mexico, M.A. OCAMPO MORTERA, L.M. APÁTIGA CASTRO, UNAM, Mexico
6:21 pm	**BI-TuP11** Exhaled Breath Analysis of Ammonia Gas using Colorimetric Attenuated Total Reflectance Spectroscopy, **MARIAANTOANETA BRATESCU**, K. ISAWA, Nagoya University, Japan, T. KIGUCHI, Shibaura Institute of Technology, Japan, O.L. LI, N. SAITO, Nagoya University, Japan
6:24 pm	**BI-TuP12** Structured Noble Metal Nanosurfaces for Biosensing and Bioanalysis (3): Surface-Enhanced Fluorescence Detection with Cap-shaped Silver Nanoparticles, **MIKI EBISAWA**, T. KAWAKAMI, H. TAKEI, Toyo University, Japan
6:27 pm	**BI-TuP13** Structured Noble Metal Nanosurfaces for Biosensing and Bioanalysis (2): Localized Surface Plasmon Resonance Sensor Operating in the Near-IR Regime, **TAKUMI MIYASHITA**, N. BESSHO, Toyo University, Japan, T. OKAMOTO, Riken, Japan, H. VIEKER, A. BEYER, A. GÖLZHÄUSER, Bielefeld University, Germany, H. TAKEI, Toyo University, Japan
6:30 pm	**BI-TuP14** Exploration of Conformational Changes of Nucleic Acids as a Function of Interactions with Histone-mimic Nanoparticles using All-atom Simulations, **YAROSLAVA YINGLING**, J.A. NASH, North Carolina State University
6:30 pm	**BI-TuP16** Chiral Legos: Enantioselective Assemblies of Tryptophan on Cu(111), B. KIRALY, A. MANNIX, M.C. HERSAM, Northwestern University, **NATHAN GUISINGER**, Argonne National Laboratory
6:33 pm	**BI-TuP17** Nanoscale Structures in Live Cells Visualized through High Resolution Imaging and Mechanical Property Mapping, **BEDE PITTENGER**, Bruker, H. SCHILLERS, Univ. Muenster, A. SLADE, J. SHAW, S. HU, I. MEDALSY, T. MUELLER, Bruker
6:40-8:30 pm	**Biomaterial Interfaces Poster Session, Hall 3**

Thin Films Division
Thursday, October 22, 2015, 5:20 – 5:30 pm, Room 114

5:20 pm	**TF-ThP25** Surface Characterization and Luminescent Properties of Pulsed Laser Deposited Dysprosium-Doped Rare-Earth Oxyorthosilicates Thin Films, **MARTIN NTWAEABORWA**, S.N. OGUGUA, H.C. SWART, University of the Free State, South Africa
5:25 pm	**TF-ThP26** Selective Atomic Layer Deposition for Electrically Connecting Graphene Flakes, **CHANYUAN LIU**, X. HAN, W. BAO, A.J. PEARSE, L. HU, G.W. RUBLOFF, University of Maryland, College Park
6:00-8:00 pm	**Thin Films Division Poster Session, Hall 3**

WOMEN IN AVS BREAKFAST

Tuesday, October 20, 7:00–9:00 AM
San Jose Marriott, Salon III

Network with your colleagues at the inaugural Women in AVS Breakfast and listen to speaker Dr. Sue V. Rosser, Provost and Vice President for Academic Affairs at San Francisco State University, give a presentation titled "Breaking into the Lab: Engineering Progress for Women in Science." Men and women are welcome to attend. The cost is $25 and tickets may be purchased with your meeting registration.

Sue V. Rosser, San Francisco State University

"Breaking into the Lab: Engineering Progress for Women in Science"

During the last three decades, the overall percentage of women receiving degrees in STEM fields has sharply increased in the United States, but the data mask wide variance among fields. The data from the responses and interviews of over 450 current women scientists, some junior and some about ten to twenty years younger than I, document that although the pipeline of women in most STEM fields has increased substantially, many of the same issues for women in science and engineering persist today. Although perhaps the obstacles appear to be slightly different or the experiences are expressed using different language than they were thirty years ago, many basic issues remain unchanged. Because of legal changes, colleagues may not express their opinions as directly; overt sexual harassment from a supervisor has become less frequent yet the structures of institutions and science make junior women question whether they can balance career and family. Time management, isolation, lack of camaraderie, poor mentoring, issues for dual career couples, as well as gaining credibility and respectability from colleagues and superiors in science remain as problems. Sexual harassment and gender discrimination still occur all too frequently. Data from interviews of current scientists in response to the questions about why there are so few women scientists, especially at elite research institutions, reveal what happens to successful women as they become senior and consider going into administration, and whether women are excluded from leading edge work in commercialization of science and technology transfer. Since the focus of scientific research, both globally and in the U.S., has shifted from basic to applied research and innovation, the dearth of women receiving patents suggests a possible new twenty-first century face on the old story of women's exclusion from the leading edge of science. Exclusion of women from commercialization of science and patenting hurts women's career advancement and deprives society of women's creative ideas for new and useful products.

pacsurf 2016

Pacific Rim Symposium on Surfaces, Coatings & Interfaces

December 11-15, 2016, Kohala Coast, Hawaii

Hapuna Beach Prince Hotel

This conference is being organized by AVS (United States) with a Steering Committee composed of representatives from Australia, Canada, Chile, China, Japan, Korea, Mexico, New Zealand, Singapore, and Taiwan. Symposium attendees will interact during morning and evening sessions that will include plenary, invited, and contributed presentations.

The main topics for PacSurf 2016 will be focused on the latest advances in **Biomaterial Interfaces**, **Biomaterial Surfaces & Interfaces**, **Energy Harvesting & Storage**, **Nanomaterials**, and **Thin Films**. We will have morning and evening technical sessions with the afternoons free for other activities and discussions.

Energy Harvesting & Storage | Biomaterial Interfaces
Nanomaterials | Thin Films

Program Chair & Scientific Advisory Board:

General Chair: Dave Castner
Program Chair: Charles R. "Chip" Eddy, Jr.

Advisory Committee:

Australia: Sally McArthur
Canada: Adam Hitchcock
Chile: TBD
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Korea: TBD
Mexico: Alberto Herrera Gómez
New Zealand: Duncan McGillivray
Singapore: Sam Zhang
Taiwan: Jinn P. Chu
United States: Joe Greene

SAVE THE DATE

Call for Abstract Details Coming May 2016
Abstract Submission Deadline: August 5, 2016

Watch for details in early 2016 at **www.pacsurf.org**.

AVS®

AVS Technical Library

The AVS Technical Library has a New Mobile Optimized Format with Improved Indexing and Search Capabilities. View Titles all at Once or Sort by Title, Session/Track, or Search by Author

The AVS Technical Library contains a complete index of complimentary resources available on **MyAVS** to AVS Members when they login at www.avs.org.

Presentations on Demand - Audio-synchronized slides from AVS & other sponsored conferences:

- AVS International Symposium & Exhibition: AVS 61 (2014), AVS 60 (2013), AVS 59 (2012)
- AVS International Conference on Atomic Layer Deposition: ALD 2015, ALD 2013, ALD 2012, ALD 2011

Educational & Technical Resources - Monographs, books, videos, buyers guide, recommended practices, & more.

Stop by the AVS Membership Booth 839

Tuesday-Thursday in the Exhibit Hall to demo the Technical Library portal

What Members Are Saying...

"Presentations on Demand provides the ability to view talks I could not attend at the symposium, it also allows me to go back and capture details I missed. Colleagues who were not able to attend the symposium are viewing the presentations at their convenience!"
–Vincent S. Smentkowski, General Electric GRC

"As a Professor, I find this a great way to share cutting edge research on a variety of topics with both students and colleagues on the fly. Given the use of electronic classrooms today, this has been a seamless partnership to a live lecture experience. The quality of the talks and the ability to tailor your selection, when you want to view it is a great feature."
–James Fitz-Gerald, Univ. of Virginia

Download the AVS 62 Mobile App Now!

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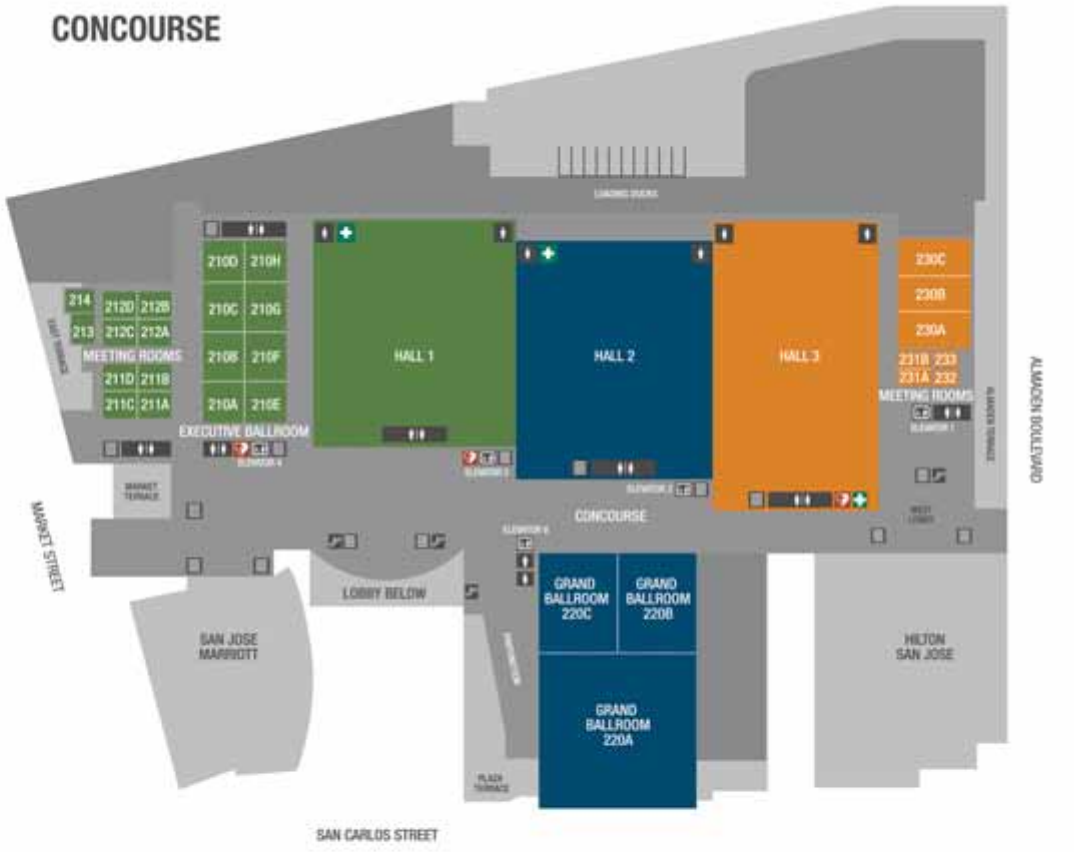
SAN JOSE CONVENTION CENTER

OVERALL FLOOR PLAN



SAN JOSE MARRIOTT HOTEL

AVS Short Course Registration Form

October 19-23, 2015
San Jose Convention Center
San Jose, California

For each course you wish to attend, please circle the cost listed to the right of the course name. For onsite registration, please add a $50 per course surcharge to your registration total.

Courses	**(Regular/Student)**
Vacuum and Equipment Technology :	
Fundamentals of Vacuum Technology, **10/19–22**	$1,495/$400
Partial Pressure Analysis, **10/22**	$575/$100
Vacuum Vessel Engineering, **10/19**	$575/$100
Vacuum and Cryogen Safety, **10/20**	$575/$100
Materials Characterization:	
X-ray Photoelectron Spectroscopy (XPS or ESCA) & Auger Electron Spectroscopy (AES), **10/19 (Part I)**	$575/$100
Focused Ion Beams (FIB) and Secondary Ion Mass Spectrometry (SIMS), **10/20 (Part II)**	$575/$100
Major Analytical Techniques other than XPS, AES, FIB, SIMS, **10/21 (Part III)**	$575/$100
Comprehensive Course on Surface Analysis and Depth Profiling by XPS or ESCA, AES, FIB & SIMS, and other Major Techniques, **10/19-21 (Parts I,II,III)**	$1,300/$300
***(2) Day Comprehensive Course Option Discount (select any 2 of the 3 parts from the above options)*	$850/$200
Materials Processing:	
Atomic Layer Deposition; Basic Principles, Characterizations and Applications, **10/22**	$575/$100
Plasma-Enhanced CVD: Fundamentals, Techniques, and Applications, **10/21**	$575/$100
Plasma Etching and RIE: The Fundamentals, **10/20**	$575/$100
Plasma Etching and RIE: The Fundamentals and Applications, **10/20-21**	$850/$200
Sputter Deposition, **10/19**	$675/$100
Thin Film Nucleation, Growth and Microstructural Evolution, **10/22**	$575/$100

Subtotal:
2015 AVS member's discount
subtract $75 from the subtotal: _____
Multi-course discount (3 or more courses)
subtract $300 from the subtotal: _____
For onsite registration add $50 per course
($25 per course for students) to your total: _____

Total enclosed: _____

Full time students may register at a discounted rate of $100 per day for any course (except for the tutorials). Please note, some courses include a supplemental textbook, however, as a student registrant the textbook is not included with your registration

Payment Information:
❑ Check enclosed (payable to AVS, 110 Yellowstone Dr., Ste. 120, Chico, CA 95973—**AVS tax ID# 04-2392373**)

❑ Cash/Travelers Check

Charge My: ❑ MasterCard ❑ VISA ❑ AMEX

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Card Number:_____

Exp. Date:_____ CCID#:_____

Signature:_____

Registration Information

Name:_____

Title:_____

Company:_____

Address:_____

Mail Stop:_____

City:_____ State:_____ Zip Code:_____

Country:_____ Province:_____

Phone:_____ Fax:_____

E-mail:_____

❑ Check here if you are a full time student (12 or more credits)

Advisor Name:_____

Advisor E-mail:_____

AVS Tutorials	**(Regular/Student)**
Practical Introduction to Synchrotron Science, 10/18	$100/$35
Introduction to Atom Probe Tomography, 10/18	$100/$35

For more information and to register for these tutorials, please visit http://www.avs.org/Symposium/Tutorials

CAREER CENTER and JOB FAIR

The AVS Professional Leadership Committee continues to host the onsite AVS Career Center, ***open to all attendees***, at the International Symposium for the purpose of connecting job seekers with potential employers. The goal is to facilitate contact and networking *during* the Conference.

In addition, in an attempt to create more opportunities for employers to find qualified applicants for job openings and for qualified applicants to have more opportunities to learn about potential employers there will be a Job Fair during the AVS 62nd International Symposium and Exhibition October 18–23, 2015 in San Jose, CA.

As a participating company you can post your job(s) on the bulletin board, display any pertinent company information, interact throughout the day with individuals interested in your company and still host interviews in a semi-private interview room. *Greater exposure is guaranteed!*

Résumés will be available electronically for employers to review and interview appointments will be scheduled via e-mail messaging. Regular services provided will include collecting job postings/résumés, complete timecards, scheduling/coordinating interviews and providing a message board. Interviews may be scheduled Tuesday through Friday (Friday interviews will be at a location TBD between the Employers and Applicants as necessary).

EMPLOYERS:

***Job Fair Registration ($500):** Includes 1 skirted table (6' x 2') with 2 chairs, 1 or more job postings on the Career Center bulletin board, and one electronic copy of the résumés on file; ability to review résumés electronically and host interviews in a semi-private room during the job fair. The Career Center will be a carpeted area within the exhibit hall. **Must register by September 21, 2015**.
Register via the Exhibit "Booth" Registration

***Career Center Registration (FREE prior to 10/5; *$50 After 10/5*):** Includes 1 or more job postings on the Career Center bulletin board and ability to review résumés electronically and host interviews in a semi-private room during the job fair.

Résumé Files Only ($150): After the Symposium you will receive an electronic copy of all job seeker résumés/CVs.

Job Posting(s) Only (FREE): Includes 1 or more job postings on the Career Center bulletin board.

***SPECIAL ONLINE OFFER** – Employers who register for the AVS 62 Job Fair or post a job AND conduct interviews onsite will receive free 30-day online job posting(s) plus a free upgrade to "Featured Job" between October 1–31, 2015 (a $725 value) — code provided after registration.

POTENTIAL EMPLOYERS:

- Job Fair Registration (for Table top space) due by **September 21, 2015**
- Career Center Registration (Employers) due by **October 9** (or bring 2 copies of each job posting onsite)
- ***NEW!** **Include "Job Posting Type" (Industry, Academia, Government/Laboratory, or Non-profit)***
- Complete a time card at beginning of the week at the Career Center Registration area
- Check for messages from interested applicants (regularly each day)
- ***Review Résumés ELECTRONICALLY!!***
- Reply to messages (i.e. interview, regrets, etc.)
- Schedule/conduct interviews (onsite and informal)

AVS Career Center Online Registration and Information:

http://www.avs.org/Symposium/Career-Center

For questions please contact
Heather Korff, heather@avs.org
530-896-0477

JOB SEEKERS:

- ***NEW!** **Include on your résumé: Program #, day, time, and location if you are giving a talk***
- E-mail your résumé by ***October 9 (OR bring copy on a flash drive)***
- Complete a time card at beginning of the week at the Career Center Registration area
- Review job boards daily
- Leave messages for employers/check e-mail for interview appointments ***(frequently each day)***
- Be available for onsite/informal interviews
- Bring EXTRA, clean copies of your résumé to hand out as needed

Advance Submission Deadlines:

Job Fair Table:	**September 21, 2015**
Job Postings:	**October 9, 2015**
Résumés/CVs:	**October 9, 2015**

Your résumé will be included in an electronic file available for review by potential employers. When you leave a message slip of interest for an employer, you will receive an e-mail message if they wish to schedule an interview. *It is important to check your e-mail often each day so you do not miss any interview opportunities.*

Hours/Location October 18–22, 2015

Sunday	**2:00 pm – 6:00 pm**	**Career Center Registration Area**
Monday	**7:30 am – 5:00 pm**	**Career Center Registration Area**
Tuesday	**10:00 am – 5:00 pm**	**Exhibit Hall, Booth #126**
Wednesday	**10:00 am – 4:30 pm**	**Exhibit Hall, Booth #126**
Thursday	**10:00 am – 2:30 pm**	**Exhibit Hall, Booth #126**
Thursday	**2:30 pm – 5:00 pm**	**Career Center Registration Area**

Advance job postings/résumés may be emailed to: heather@avs.org

For additional career resources, visit the AVS Online Career Center at: http://careers.avs.org

Questions: 301-209-3189; jobs@avs.org

Biomaterial Interfaces Division Plenary Session and Reception

Sunday, October 18, 2015, 3:00–6:00 p.m., Room 211 D, San Jose Convention Center

The Biomaterials Interfaces program kicks off with the now traditional Biomaterials Plenary Session. This year we are pleased to have presentations from three eminent scientists and engineers who have made important contributions to our field. Suzie Pun develops bio-inspired materials to advance drug delivery and molecular imaging technologies, in areas including cancer therapy, the central nervous system and cell therapy. She strives to achieve this goal by integrating techniques from engineering, chemistry, and cell biology. Jacob Israelachvili has made seminal contributions to our understanding of intermolecular and surface forces in complex fluids, biological and materials systems. Philip Messersmith has made important contributions in a broad swathe of biomaterials science, encompassing adhesion, functional coatings, regenerative medicine, drug delivery and nanomedicine. The session will close with the opportunity for further discussions and networking at our traditional industry sponsored Plenary Reception.

Electronic Materials and Processing Division Panel Discussion: "Moore's Law and the Future of the Semiconductor Industry"

Tuesday, October, 20, 2015, 4:00 p.m., Room 210 E, San Jose Convention Center

The AVS Electronic Materials and Processing Division (EMPD), Plasma Science and Technology Division (PSTD), and MEMS and NEMS Technology Group (MN) are pleased to co-sponsor an engaging discussion of opportunities in the semiconductor and nanoelectronics industry over the next decade. Though some may say that an inevitable slowdown in Moore's Law scaling will be disastrous for the industry, we feel that that there is no shortage of compelling challenges and opportunities both in support of continued scaling, and in developing revolutionary technologies completely orthogonal to traditional CMOS scaling. We have assembled a panel of highly respected industry professionals who will provide their insights into the future of semiconductor technology from several different perspectives. There will be abundant time for the panelists to field questions from the audience. We expect this panel discussion to be informative, lively, engaging, and most of all, fun.

Panelists:

Andrew Kummel – UCSD *[Moderator]*

John Arnold – IBM ❖ Bill Bottoms – 3MTS ❖ Rick Gottscho – Lam Research

Andrea Lati – VLSI Research ❖ Kurt Petersen – KP MEMS

Electronic Materials and Processing Division Industrial Forum Careers at Lam Research

Tuesday, October 20, 2015, 6:30 p.m., Room 210 E, San Jose Convention Center

Sponsored by Lam Research Corporation

The Electronic Materials and Processing Division (EMPD) will host an industrial forum for those interested in learning about career opportunities in the semiconductor industry. These talks are aimed at introducing graduate students and post-doctoral researchers to some of the technical hurdles that the industry faces. Following the talks, there will be a question and answer period as well as informal discussions with the presenters. Dr. Gary McGuire will moderate the forum.

Following a session on Nanoparticles for Electronic Materials, this forum will provide an open dialogue between an industrial liaison and young scientists and engineers. Dr. Nerissa Draeger will describe Lam Research Corporation, its technical thrusts as well as challenges, its products, future directions, and career opportunities.

Thin Film Division/Harper Award TED-talk Competition (Invite Only)

Monday, October 19, 2015, 7:30 p.m., Room 111, San Jose Convention Center

This special session is attendance restricted to only students who are authors on an abstract presented in a TFD sponsored or TFD-co-sponsored session. Beer and pizza will be supplied.

The four finalists are Bart Macco, Eindhoven University of Technology, Antonio Bighetti Mei, University of Illinois at Urbana-Champaign, Junjie Zhao, North Carolina State University, Pengyuan Zheng, Rensselaer Polytechnic Institute

The four finalists for the Harper Award will present their work along the lines of a TED-talk, with 15 minutes to make their presentation. These talks will be judged and critiqued in real time for both their content as well as presentation quality and originality by a judging panel of TFD members in the role of execs and potential employers. Following the talks, the Harper Award winner for the best overall presentation will be announced.

ASTM-E42/ASSD Joint Workshop: "When is 'perfect' the enemy of 'good enough'? Maintaining perspective in surface analysis"

Tuesday, October 20, 2015, 8:00 p.m., Salon IV, San Jose Downtown Marriott Hotel

Moderator: **Chris Szakal**

Speakers: **Dick Brundle, John Grant, Vin Smentkowski**

How accurate is accurate enough? Knowing when a result will be sufficiently achieved in a practical time frame is the analyst's continual challenge. Often, the only guide is the experience of the analyst in both the analytical technique and the materials of interest. None of us wants to "miss the forest for the trees", but we are often presented with samples about which very little is known. Our panel of experienced experts will share guidance on general approaches to achieving the necessary, sometimes at the expense of the perfect. Our panel will discuss real-world applications of a variety of surface analysis methods, including how to balance available resources with schedule pressure and information gaps based on understanding of available technical resources, including international standards.

Surface Science Morton M. Traum Presentation

Thursday, October 22, 2015, 12:30 p.m., Room 113, San Jose Convention Center

The Tuesday Evening Poster Session features presentations by the Mort Traum Student Award Finalists. The Morton M. Traum Surface Science Student Award will be presented for the best student poster presented in the poster session sponsored or jointly sponsored by the Surface Science (SS) Division at the AVS International Symposia. The 2015 Winner will be announced in the Traum Student Award Ceremony.

PROFESSIONAL LEADERSHIP

AVS attendees welcome at all Professional Leadership Committee sponsored events
Admission is free to all events.

Professional Leadership Committee 2015: Susan Burkett, Heather Canavan, Charles "Chip" Eddy Jr., Mikel “Micky” Holcomb, Dori Jurado Heather Korff, Sean Jones, Kevin Robbie, Bridget Rogers

AVS-62 CAREER CENTER & JOB FAIR

The AVS Professional Leadership Committee will be hosting the AVS Career Center, ***open to all attendees***, at the International Symposium for the purpose of connecting job seekers with potential employers. The goal is to facilitate contact and networking during the Conference. In addition, there will be a **Job Fair** during the AVS 62nd International Symposium and Exhibition.

Employers seeking qualified candidates can register for the Job Fair, provide job postings, purchase electronic resume files, and conduct onsite interviews. **Job seekers** can submit a resume, meet, and interview with potential employers. To take advantage of this service, please visit the following website for more information and submission deadlines.

AVS Onsite Career Center: http://www.avs.org/Symposium/Career-Center

Sunday, October 18, 2015 (Open to AVS attendees)	
2:00 pm-6:00 pm	Career Center (Registration Area): submit resumes and job postings for **Job Fair**
5:30 pm-6:30 pm	Tutorial on Entrepreneurship (210 E Convention Center)

Monday, October 19, 2015 (Open to AVS attendees)	
7:30 am-5:00 pm	Career Center (Registration Area): submit resumes and job postings for **Job Fair**
1:15 pm-2:00 pm	AVS Writer’s Workshop & Lunch (210 E Convention Center)

Tuesday, October 20, 2015 (Open to AVS attendees)	
10:00 am-5:00 pm	Career Center (Exhibit Hall--Booth #126): **Job Fair**
12:30 pm-2:00 pm	Job Information Forum & Lunch (210 E Convention Center)
2:40 pm & 6:30 pm	Working with National Labs and User Facilities session & poster session (114 Convention Center at 2:40 pm & Hall 3 Convention Center at 6:30 pm)

Wednesday, October 21, 2015 (Open to AVS attendees)	
10:00 am-4:30 pm	Career Center (Exhibit Hall--Booth #126): **Job Fair**
12:30 pm-2:00 pm	Federal Funding Town Hall & Lunch (210 E Convention Center)

Thursday, October 22, 2015 (Open to AVS attendees)	
10:00 am-5:00 pm	Career Center (Exhibit Hall--Booth #126 10:00-2:30, Registration Area 2:30-5:00)

210 E Convention Center

Everyone registered for the AVS conference is welcome – no additional cost or registration required. Come join the discussion!

Sunday, October 18, 2015 (Open to AVS attendees)	
2:00 pm-6:00 pm	Career Center (Registration Area): submit resumes and job postings for **Job Fair**
5:30 pm-6:30 pm	Tutorial on Entrepreneurship (210 E Convention Center)

Entrepreneurship

Everyone Welcome – Come join the discussion!

Organizer/Moderator: Mikel "Micky" Holcomb, West Virginia University
Sponsor: AVS Professional Leadership Committee

Why Get Involved with Commercialization?

Matthew Scullin, Founder & CEO, Alphabet Energy, Inc. is one of the world's leading experts in the fields of waste heat recovery and thermoelectric product development. He has combined innovations in the fields of product marketing and "lean" business practices with expertise in semiconductor manufacturing, power generation technology, and industrial energy equipment. Matt's background includes positions at General Motors and IBM, as well as involvement in venture capital, and is currently on the Board of the Heat is Power Association. He holds a B.S. from the University of Pennsylvania, along with an M.S. and a Ph.D. from UC Berkeley. At Berkeley, he was advised by former ARPA-E head, Arun Majumdar. In addition to 12 issued and pending patents, Matt has published multiple papers and conference proceedings. In 2012, he was named to Forbes 30 Under 30 and in 2014, Alphabet Energy was recognized as a 2014 World Economic Forum Technology Pioneer and as a 2015 IHS Energy CERAWeek Energy Innovation Pioneer.

6:15-6:30 pm **Discussion / Question & Answer Session**

210 E Convention Center

Everyone registered for the AVS conference is welcome –
no additional cost or registration required. Come join the discussion!

Monday, October 19, 2015 (Open to AVS attendees)	
7:30 am–5:00 pm	Career Center (Registration Area): submit resumes and job postings for **Job Fair**
1:15 pm–2:00 pm	Lunch with the Editors: AVS Writer's Workshop (210 E Convention Center)

Lunch with the Editors: AVS Writer's Workshop

Lunch is provided for attendees!

Organizer/Moderator: Susan L. Burkett, The University of Alabama
Sponsor: AVS Professional Leadership Committee

Wonder how the technical publication process works?
Want to know what editors look for in a quality submission?
Want an edge in getting published?

Dr. Eray Aydil,
Editor-in-Chief of AVS Journals

Dr. Phil Szuromi,
Senior Editor of Science

210 E Convention Center

Everyone registered for the AVS conference is welcome –
no additional fee or registration required. Come join the discussion!

Tuesday, October 20, 2015 (Open to AVS attendees)	
10:00 am-5:00 pm	Career Center (Exhibit Hall--Booth #126): **Job Fair**
12:30 pm-2:00 pm	Job Information Forum & Lunch (210 E Convention Center)
2:40 pm & 6:30 pm	Working with National Labs and User Facilities & poster session (114 Convention Center at 2:40 pm & Hall 3 Convention Center at 6:30 pm)

Job Information Forum & Lunch

12:30 pm – 2:00 pm, Lunch is provided for attendees!

Organizer/Moderator: Heather Canavan, The University of New Mexico
Sponsor: AVS Professional Leadership Committee

Want to know more about starting a successful career? Not sure whether industry, academia, or government should be the next step?

Three speakers provide an overview of their career pathways, what they look for when evaluating job applicants, how they made their career choices, and what it takes to succeed.

Invited Speakers Include:

From Industry and Technical Publishing
Dr. Michelle Adams-Hughes
Senior Scientist/Engineer, Family Care R&D Process- PD
Procter & Gamble

From Academia
Prof. Joe Baio
Assistant Professor, Department of Chemical, Biological and Environmental Engineering
Oregon State University

From a National Laboratory
Dr. Xiao-Ying Yu
Scientist, Atmospheric Measurement & Data Sciences
Pacific Northwest National Laboratory

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114 Convention Center

Everyone registered for the AVS conference is welcome.

Tuesday, October 20, 2015 (Open to AVS attendees)	
10:00 am-5:00 pm	Career Center (Exhibit Hall--Booth #126): **Job Fair**
2:40 pm & 6:30 pm	Working with National Labs and User Facilities & poster session (114 Convention Center at 2:40 pm & Hall 3 Convention Center at 6:30 pm)

Working with National Labs and Other User Facilities

Organizer/Moderator: Bridget Rogers, Vanderbilt University and Chip Eddy, Naval Research Lab
Sponsors: AVS Professional Leadership Committee & the Manufacturing Science & Technology Group

Have you ever wondered how you might be able to work with researchers at government laboratories? What facilities are available that might help you with your research? What are the costs associated with using these facilities?

Come to the session **Working with National Labs and User Facilities** to learn the answers to these questions and give your research an advantage. Representatives from Government Labs and User Facilities will give short presentations about their capabilities, facilities, and how to gain access to them. The discussion will continue at the Tuesday Poster session where attendees can engage in extended discussions with the presenters at their poster.

Schedule:

2:40 PM	M. Skvarla, Research Opportunities at Cornell Nanoscale Science and Technology Facility
3:00 PM	V. Luciani, The CNST NanoFab at NIST is Open for Business
3:20 PM	B. Brough, The Molecular Foundry: A Knowledge-Based User Facility for Nanoscience
4:20 PM	T. Gessert, The National Renewable Energy Lab – Research Activities and Opportunities
4:40 PM	K. C. Gregar, User Opportunities at Argonne National Lab Center for Nanoscale Materials
5:00 PM	D. Baer, Using EMSL Capabilities to Advance Research, Pacific Northwest National Lab
5:20 PM	Panel Discussion

210 E Convention Center

Everyone registered for the AVS conference is welcome – no additional fee or registration required. Come join the discussion!

Wednesday, October 21, 2015 (Open to AVS attendees)

10 am-4:30 pm	Career Center (Exhibit Hall--Booth #126): **Job Fair**
12:30 pm-2:00 pm	Federal Funding Town Hall & Lunch (210 E Convention Center)

Federal Funding Town Hall & Lunch

12:30 pm – 2:00 pm, Lunch is provided for all attendees!

Organizer/Moderator: Sean Jones, National Science Foundation
Sponsor: AVS Professional Leadership Committee

Key Leaders from several federal agencies will provide insight into their funding priorities and will field questions from the audience. This is an event you will not want to miss!

Invited Speakers Include:

Dr. Charles Ying, Program Director, Division of Materials Research, Electronic and Photonic Materials, National Science Foundation

Dr. Joycelyn S. Harrison, Program Manager; Aerospace, Chemical and Material Sciences Directorate, Air Force Office of Scientific Research

Dr. Rosemarie Hunziker (via Webex), Program Director, Division of Discovery Science & Technology, National Institute of Biomedical Imaging and Bioengineering, National Institutes of Health

Why I am an AVS Member

Members choose AVS not only because it is important to their professional development, but for the networking opportunities it provides, as well as a high level of camaraderie they enjoy at our meetings and events. The interdisciplinary nature of AVS offers the opportunity for very unique collaborations in many different areas of science and technology. In addition, AVS encourages your participation in Society leadership roles, offering easy entry into our committees, divisions, and technical groups.

Divisions

- Advanced Surface Engineering
- Applied Surface Science
- Biomaterial Interfaces
- Electronic Materials and Processing
- Magnetic Interfaces and Nanostructures
- Nanometer-Scale Science and Technology
- Plasma Science and Technology
- Surface Science
- Thin Film
- Vacuum Technology

Technical Groups

- Manufacturing Science and Technology
- MEMS and NEMS

Committees

Make a difference in the science and technology community, and consider joining an AVS Committee. Opportunities to assist with everything from preserving AVS History to recommending financial investments to forming governmental policy, legislation, and programs that have a direct bearing on the well-being of the science community and AVS in particular are available.

Regional Chapters

- Delaware Valley
- Florida
- Hudson Mohawk
- Michigan
- Mid-Atlantic
- Minnesota
- New England
- New Mexico
- Northern California
- Ohio
- Pacific Northwest
- Prairie
- Rocky Mountain
- Southern California
- Tennessee Valley
- Texas
- Western Pennsylvania

International Chapters & Affiliates

- Israel Vacuum Society
- St. Lawrence AVS
- Taiwan AVS

Student Chapters

Student Chapters provide university students tailored opportunities for career and professional development.

- College of Nanoscale Science & Engineering
- Dallas Metroplex
- Northwestern University
- Rensselaer Polytechnic Institute
- UCLA
- University of Alabama at Tuscaloosa
- University of Central Florida
- University of Florida
- University of Illinois at Urbana-Champaign
- University of Washington

GET INVOLVED

www.avs.org

Stop by the Membership Booth 839 Tuesday-Thursday in the Exhibit Hall to learn about your AVS membership benefits and how to get involved.

Enhance Your Career

Take advantage of FREE career enhancement opportunities through the online career center and at AVS meetings

Need training? Take short courses at discounted registration rates

Have expertise? Teach a short course or develop a webinar or other educational/technical resources

Check out our Technical Library for Presentations on Demand, books, monographs, videos, & more

Expand Your Network

Attend AVS meetings at discounted registration rates

Submit an abstract to make an oral or poster presentation

Become active in a Division or Technical Group and participate on their Program Committee

Champion a Focus Topic or Topical Conference

Volunteer to moderate a session

Develop Your Leadership Skills

"Becoming an officer in an AVS division has been a tremendous benefit to my professional life. I am surrounded by inspirational and committed colleagues, and I am in closer contact with the latest developments in my field and the researchers making them happen."

Brian Borovsky, St. Olaf College,
AVS Nanoscale Science and Technology Division Secretary

Gain Recognition

"Feeling connected to the larger scientific community is very important. An award is the nicest kind of connection, saying that your work is appreciated by your peers."

Jerry Tersoff, IBM T.J. Watson Research Center,
AVS Medard W. Welch Award Winner

Broaden & Share Your Knowledge

"Publishing in AVS journals provides us with excellent visibility for our work, rapid publication times, and the prestige of being associated with one of the world's leading scientific societies. AVS publications are a great avenue for showcasing your best technical work."

Steve Pearton, Univ. Florida

APSIT GROUP INSURANCE PROGRAM:

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Visit the AVS STORE

Selling AVS Apparel and Logo Items Year Round

AVS Apparel & Logo Items

Visit the AVS Store at **Booth 839**

Tuesday: 10:00 a.m. - 5:00 p.m.

Wednesday: 10:00 a.m. - 4:30 p.m.

Thursday: 10:00 a.m. - 2:30 p.m.

Shop Online at www.avs.org

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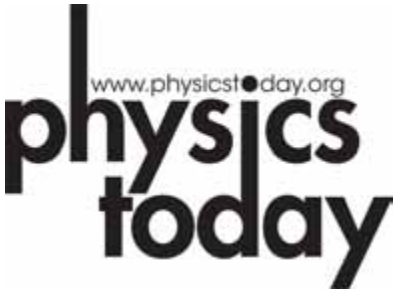

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- **Pfeiffer Vacuum Technology**
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- **Plasmaterials Inc**
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- **Precision Plus Vacuum Parts**
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- **SPI Supplies**
- **Staib Instruments, Inc.**
- **Super Conductor Materials Inc**
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AVS 35TH ANNUAL 5K RUN

Wednesday, October 21, 2015
San Jose, California

WHEN: Wed., October 21, 2015, 6:30 am. Check the Run Booth for specific starting time details.

REGISTRATION: $30 entry fee includes **run t-shirt**, **race number**, and **awards**. SVE Timing will professionally time this year's race. **Register Sunday-Tuesday** at the Run Registration Desk (Concourse 1, San Jose Convention Center).

DETAILS & AWARDS: This year's course is an "out & back" along the Guadalupe River Trail. The start and finish line will be near the Children's Discovery Museum, which is ~two blocks from the San Jose Convention Center. The awards ceremony will be held at the Run registration area on Wednesday at noon.

Don't forget to put together a team to compete in our **CORPORATE RACE** and **DIVISIONS & GROUPS RACE**. Each team representing a corporate entity (university, research organization, manufacturer, etc.) or Division/Group must have at least 3 team members to qualify. Times are handicapped by age & sex.

Run Director: Bridget Rogers (bridget_rogers@avs.org)

Sponsored by

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MEDARD W. WELCH AWARDEES

1970 Erwin W. Mueller
1971 Gottfried K. Wehner
1972 Kenneth C.D. Hickman
1973 Lawrence A. Harris
1974 Homer D. Hagstrum
1975 Paul A. Redhead
1976 Leslie Holland
1977 Charles B. Duke
1978 Georg H. Hass
1979 Gert Ehrlich
1981 Harrison E. Farnsworth
1983 H.H. Wieder
1984 William S. Spicer
1985 Theodore E. Madey
1986 Harald Ibach
1987 Mark J. Cardillo
1988 Peter Sigmund
1989 Robert Gomer
1990 Jerry M. Woodall
1991 Max Lagally
1992 Ernst Bauer
1993 George Comsa
1994 John Yates, Jr.
1995 Gerhard Ertl
1996 Peter J. Feibelman
1997 Phaedon Avouris
1998 David E. Aspnes
1999 John H. Weaver
2000 D. Phillip Woodruff
2001 E. Ward Plummer
2002 Buddy Ratner
2003 Matthias Scheffler
2004 Rudolf M. Tromp
2005 Charles S. Fadley
2006 John C. Hemminger
2007 Jerry Tersoff
2008 Miquel Salmeron
2009 Robert J. Hamers
2010 Mark J. Kushner
2011 Wilson Ho
2012 Yves Chabal
2013 Chris G. Van de Walle
2014 Patricia A. Thiel
2015 Charles T. Campbell

GAEDE-LANGMUIR AWARDEES

1978 Pierre V. Auger
1980 Daniel Alpert
1982 Alfred H. Sommer
1984 Alfred Benninghoven
1986 Rointan F. Bunshah
1988 Alfred Y. Cho
1988 John R. Arthur, Jr.
1990 Francois M. d'Heurle
1992 Russell D. Young
1994 Robert J. Celotta
1994 Daniel T. Pierce
1996 Gerald J. Lapeyre
1998 Paul D. Palmberg
2000 Gary W. Rubloff
2002 Cristoforo Benvenuti
2004 Kunio Takayanagi
2006 Leonard J. Brillson
2008 Daniel Auerbach
2010 Gerald Lucovsky
2012 Dietrich Menzel
2014 Hans-Joachim Freund

ALBERT NERKEN AWARDEES

1985 John L. Vossen
1986 Donald J. Santeler
1987 Marsbed Hablanian
1988 Stanley L. Milora
1989 Charles D. Wagner
1989 Martin P. Seah
1990 J. Peter Hobson
1991 Harold R. Kaufman
1992 Paolo della Porta
1993 John O'Hanlon
1994 Hajime Ishimaru
1995 Donald Mattox
1996 William R. Wheeler
1997 John C. Helmer
1998 Peter J. Clarke
1999 Paul Holloway
2000 John T. Grant
2001 Cedric Powell
2002 David J. Harra
2003 Peter B. Barna
2004 Johan K. Fremerey
2005 Christopher R. Brundle
2006 Siegfried Hofmann
2007 Richard J. Colton
2008 Seizo Morita
2009 Donald R. Baer
2010 Fan Ren
2011 John E. Rowe
2012 Sven Tougaard
2013 Howard A. Padmore
2014 Gary E. McGuire
2014 Olga A. Shenderova

JOHN A. THORNTON MEMORIAL AWARDEES AND LECTURES

1989 Eric Kay
1990 Maurice Francombe
1991 Joseph E. Greene
1992 Thomas R. Anthony
1993 John W. Coburn
1993 Harold F. Winters
1994 David Hoffman
1995 Jan-Eric Sundgren
1997 James M.E. Harper
1999 Timothy Coutts
2001 Samuel D. Bader
2003 William D. Sproul
2005 Stan Veprek
2007 Stephen J. Pearton
2009 Frances A. Houle
2011 Vincent M. Donnelly
2013 Ivan Petrov
2015 Alfred Grill

PETER MARK AWARDEES

1980 Christopher R. Brundle
1981 Lawrence L. Kazmerski
1982 Charles M. Magee
1983 D. James Chadi
1984 Barbara J. Garrison
1985 Franz J. Himpsel
1986 Richard A. Gottscho
1987 Raymond T. Tung
1988 Jerry D. Tersoff
1989 Randall M. Feenstra
1990 Stephen M. Rossnagel
1991 William J. Kaiser
1993 Robert Hamers
1994 Marjorie Olmstead
1995 Emily Carter
1996 Brian E. Bent
1997 Brian Swartzentruber
1998 David G. Cahill
1999 Eray S. Aydil
2000 Stacey F. Bent
2001 Eli Rotenberg
2002 Rachel S. Goldman
2003 Charles H. Ahn
2004 Kathryn W. Guarini
2005 Jane P. Chang
2006 Mark C. Hersam
2007 W.M.M. Kessels
2008 Sergei Kalinin
2009 Beatriz Roldan Cuenya
2010 Arutiun Ehiasarian
2011 Mohan Sankaran
2012 E. Charles H. Sykes
2013 Daniel Gunlycke
2014 Joshua Zide
2015 Petro Maksymovych

AVS AWARD WINNERS

HONORARY MEMBERSHIP

1959 Rudy A. Koehler
1963 Benjamin B. Dayton
1967 Daniel Alpert
1968 Luther E. Preuss
1981 Leonard C. Beavis
1981 N. Rey Whetten
1982 Charles B. Duke
1984 J. Roger Young
1985 Kai Siegbahn
1986 Manfred S. Kaminsky
1988 Jack H. Singleton
1991 John W. Coburn
1991 J. Lyn Provo
1992 Marsbed Hablanian
1996 Howard Patton
1997 Paul Holloway
1997 William D. Westwood
1998 Collin Alexander
1999 Donna Bakale Sherwin
1999 James S. Murday
2000 Lawrence L. Kazmerski
2001 Robert Willis
2003 H. Frederick Dylla
2003 Gary E. McGuire
2004 Arthur O. Fuente, Jr.
2004 J.W. Rogers, Jr.
2005 Gerald Lucovsky
2006 Alvin Czanderna
2007 Paula J. Grunthaner
2008 Eric Kay
2009 Rudolf Ludeke
2009 William D. Sproul
2011 Robert A. Childs
2012 Cedric Powell
2013 David Castner
2013 Stephen M. Rossnagel
2014 John N. Russell, Jr.

JOHN L. VOSSEN MEMORIAL AWARDEES

1997 Robert Shaner
1998 Hasan Fakhruddin
1999 Chris Ann Slye
2000 Charles J. Miltenberger
2001 Paul Lulai
2002 Toni L. Evans
2004 Jacqueline G. Kane

GEORGE T. HANYO AWARDEES

1997 Mark Engelhard
1998 David A. Lubelski
1999 Robert A. Childs
2001 John E. Bultman
2003 Ernest A. Sammann
2004 Richard E. Muller
2006 Jeffrey D. Kelley
2010 Arthur W. Ellis
2011 Jonathan Koch
2012 Percy Zahl
2013 Steven R. Blankenship
2014 Ewald E. Chaban
2015 Marc D. Landry

DOROTHY M. AND EARL S. HOFFMAN AWARDEES

2003 Kenneth Bratland (Univ. of Illinois at Urbana-Champaign)
2004 Michael Filler (Stanford University)
2005 Michael Zellner (University of Delaware)
2006 Xingyi Deng (Harvard University)
2007 Thomas Mullen (Pennsylvania State University)
2008 Gregory Rutter (Georgia Institute of Technology)
2009 Juan Carlos Rodriguez-Reyes (University of Delaware)
2010 Esther Amstad (ETH Zurich, Switzerland)
2011 Kangkang Wang(Ohio University)
2012 Davide Sangiovanni (Linkoping University)
2013 Zhu Liang (University of Illinois at Chicago)
2014 Jingjing Qiu (University of Florida)

NELLIE YEOH WHETTEN AWARDEES

1990 Jani C. Ingram (University of Arizona)
1991 Lucia Markert (University of Illinois)
1992 Hope Michelson (IBM Almaden Research Center)
1993 Laura Tedder (University of California, San Diego)
1994 Monica Katiyar (University of Illinois)
1995 Cynthia Kelchner (Iowa State University)
1996 Tracey E. Caldwell (University of California, Davis)
1997 Catherine Labelle (Massachusetts Institute of Technology)
1998 Jennifer S. Hovis (University of Wisconsin)
1999 Nerissa Taylor (University of Illinois)
2000 Jennifer E. Gerbi (University of Illinois)
2001 Tanhong Cai (Iowa State University)
2002 Lyudmila Goncharova (Rutgers University)
2003 Meredith L. Anderson (Carnegie Mellon University)
2004 Wensha Yang (University of Wisconsin, Madison)
2005 Natalia Farkas (University of Akron)
2006 Jessica Hilton (University of Minnesota)
2007 Andrea Munro (University of Washington)
2008 Brittany Nelson-Cheeseman (University of California, Berkeley)
2009 Sarah Bishop (University of California, San Diego)
2010 Xiaoyu Wang (University of Wisconsin, Madison)
2011 Sondra Hellstrom (Stanford University)
2012 Nour Nijem (University of Texas, Dallas)
2013 Indira Seshadri (Rensselaer Polytechnic Institute)
2014 Jiechang Hou (University of Pennsylvania)

AVS RUSSELL AND SIGURD VARIAN AWARDEES

1983 J.S. Villarubia (Cornell University)
1984 Kenneth T.Y. Kung (MIT)
1985 Anne L. Testoni (Northwestern University)
1986 Jingguang G. Chen (University of Pittsburgh)
1987 Joanne R. Levine (Northwestern University)
1988 Christopher E. Aumann (University of Wisconsin)
1989 Brian S. Swartzentruber (University of Wisconsin)
1990 Guangquan Lu (University of California, San Diego)
1991 Michael Flatte (University of California, Santa Barbara)
1992 Rex Ramsier (University of Pittsburgh)
1993 Daniel Kelly (University of California, Santa Barbara)
1994 Britt Turkot (University of Illinois)
1995 Robert Carpick (University of California, Berkeley)
1996 Kevin Robbie (University of Alberta)
1997 Kimberly S. Turner (Cornell University)
1998 John S. Lewis, III (University of Florida)
1999 Sanjit Singh Dang (University of Illinois, Chicago)
2000 Michelle L. Steen (Colorado State University)
2001 Jianwei Dong (University of Minnesota)
2002 Wei Tan (University of Illinois)
2003 John R. Kitchin (University of Delaware)
2004 Vassil Antonov (Univ. of Illinois at Urbana-Champaign)
2005 Liam Pingree (Northwestern University)
2006 Gregory Ten Eyck (Rensselaer Polytechnic Institute)
2007 H. Lee Mosbacker (Ohio State University)
2008 Erik Wallen (Linkoping University)
2009 Sudhakar Shet (New Jersey Institute of Technology/NREL)
2010 Christine Tan (Cornell University)
2011 David A. Siegel (University of California, Berkeley)
2012 April Jewell (Tufts University)
2013 Jason Kawasaki (University of California, Santa Barbara)
2014 Deep Jariwala, Northwestern University


AVS
Awards Ceremony & Reception
AVS 62nd Annual Awards Ceremony
Wednesday, October 21, 2015
Celebrate with AVS awardees in
Room 210 G of the San Jose Convention Center
at 6:30 p.m.
Complete details available at www.avs.org

AVS AWARDS

AWARDS CEREMONY & RECEPTION

The AVS Awards Ceremony will be held on Wednesday, October 21, 2015 at 6:30 p.m. in a Ballroom of the San Jose Convention Center to be followed immediately by an Awards Reception. This year, AVS honors the following awardees:

Charles T. Campbell, Medard W. Welch Award

Alfred Grill, John A. Thornton Memorial Award and Lecture

Petro Maksymovych, Peter Mark Award

Marc D. Landry, George T. Hanyo Award

The newly elected AVS Fellows

The 2015 AVS National Student Award Finalists

MEDARD W. WELCH AWARD

The Medard W. Welch Award was established in 1969 to commemorate the pioneering efforts of M.W. Welch in founding and supporting AVS. It is presented to recognize and encourage outstanding research in the fields of interest to AVS. The award consists of a cash award, a medal, a plaque, and an honorary lectureship at a regular session of the International Symposium.

CHARLES T. CAMPBELL

"Medard W. Welch Award Lecture – "Thermodynamics and Kinetics of Elementary Reaction Steps on Late Transition Metal Catalysts,

Wednesday, 4:20 pm, Room 113

Prof. Charles T. Campbell, University of Washington, "for seminal contributions to determining accurate adsorption energetics and for developing key concepts for the analysis of important catalytic reactions"

Charles T. Campbell is the Rabinovitch Endowed Chair in Chemistry at the University of Washington, where he is also Adjunct Professor of Chemical Engineering and of Physics. He has coauthored of over 300 publications and two patents on surface chemistry, catalysis, physical chemistry and biosensing, with over 17,000 citations and an h-index of 68. He is an elected Fellow of both the ACS and the AAAS, and an elected Member of the Washington State Academy of Sciences. He received the Arthur W. Adamson Award of the ACS and the ACS Award for Colloid or Surface Chemistry, the Gerhard Ertl Lecture Award, the Robert Burwell Award/Lectureship of the North American Catalysis Society, the Ipatieff Lectureship at Northwestern University and an Alexander von Humboldt Research Award. He served as Editor-in-Chief of *Surface Science* for ten years. He now serves as Editor-in-Chief of S*urface Science Reports,* and on editorial boards for the *Journal of Physical Chemistry*, *Catalysis Reviews*, *Catalysis Letters* and *Topics in Catalysis.*

Campbell received his BS in Chemical Engineering at the University of Texas in 1975 and his PhD in Chemistry there in 1979 under the guidance of Prof. J. Michael White. He then did postdoctoral research in Munich, Germany with Prof. Gerhard Ertl (winner of the 2007 Nobel Prize in Chemistry), supported by postdoctoral fellowships from the National Science Foundation and the Alexander von Humboldt Foundation. Before the University of Washington, he worked at Los Alamos National Labs (1981–1985) and Indiana University (1986–1989). He has served as the main research advisor for over 35 postdocs, 30 PhD students, and 50 undergraduate students.

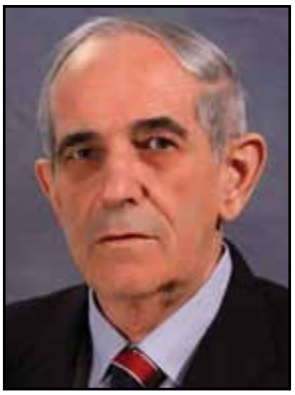
Campbell is perhaps best known for his use of surface analytical methods to clarify catalytic reaction mechanisms on solid surfaces, and structure–function relationships in catalytic materials. He also helped develop several methods for characterizing surface reactions. He developed the world's most sensitive adsorption microcalorimeters for studying well-defined surfaces, and applied them to measure the energetics of elementary surface reactions of importance in catalysis and metal adsorption and adhesion to oxide supports. By combining careful surface structural control of model catalysts, detailed surface characterization and challenging catalytic rate measurements, often at high pressures on single crystals, he helped to uncovered many mechanistic details of industrially-important catalytic reactions, including CO oxidation, ethylene epoxidation, water-gas shift, methanol synthesis, and various hydrocarbon conversion reactions. His experimental studies of catalyst poisons and promoters, bimetallic surfaces and metal nanoparticles on oxide surfaces included many first-time observations of phenomena that soon became well-known as fundamental effects in surface chemistry.

He introduced the 'degree of rate control', a widely-used mathematical method for analyzing microkinetic models to determine which adsorbates' and transition states' energies most critically control catalytic activity and selectivity. It is the basis for his fast new method for computational screening of catalytic materials.

His methods for quantitative analysis of adsorption kinetics using surface plasmon resonance are widely used. He applied them to the first measurements of sticking probabilities under liquid solutions and high-throughput methods for studying biomolecule binding in micro-array format.

JOHN A. THORNTON MEMORIAL AWARD AND LECTURE

The John A. Thornton Memorial Award and Lecture was established in 1989 as a memorial to Dr. John A. Thornton for his devotion to science, his singular contributions to the generation and study of thin films, his effectiveness as an educator, and his unfailing humility, which won him the uncommon esteem and affections of his colleagues. It is presented to recognize outstanding research or technological innovation in the areas of interest to AVS, with emphasis on the fields of thin films, plasma processing, and related topics. The award is conferred biennially. It consists of a cash award, a plaque, and an honorary lectureship at a regular session of the International Symposium.



ALFRED GRILL

"John A. Thornton Memorial Award and Lecture – PECVD Low and Ultralow Dielectric Constant Materials: From Invention and Research to Products"

Thursday, 8:00 am, Room 211C

Dr. Alfred Grill, IBM T.J. Watson Research Center, "for seminal contributions to the invention, development and implementation of the PECVD low-k and ultralow-k dielectrics for ULSI interconnects, enabling continued wire scaling beyond the 90 nm node"

Alfred Grill is an IBM Fellow at the IBM T.J. Watson Research Center in Yorktown Heights, NY. He received his Ph.D. in Applied Physics from the Hebrew University in Israel. After doing postdoc studies at the Ruhr Universitat Bochum in Germany and the University of British Columbia in Canada, Dr. Grill joined the Materials Engineering Department of the Ben-Gurion University (BGU) in Israel, where he reached the positions of full professor and Chair of the Department. During his tenure at BGU he spent sabbaticals at NASA-Lewis (now Glenn) Research Center, Cleveland, OH and at IBM T.J. Watson Research Center, Yorktown Heights, NY. He then moved to IBM Research as a regular employee.

Dr. Grill has authored and coauthored more than 330 publications cited 14663 times with an h-index of 61, published the book "Cold Plasma in Materials fabrication: From Fundamentals to

Applications" and co-edited 3 conference proceedings. He is an inventor and co-inventor of 161 US issued patents and was recognized as the 2011 Inventor of the year by the Eastern New York Intellectual Property Law Association. Alfred is a Member of the National Academy of Engineering and a MRS Fellow.

During a career of more than 40 years, Dr. Grill has investigated the synthesis and properties of materials covering the entire gamut from semiconductors to insulators, to oxides and metals, to the study of two dimensional materials such as graphite. He has studied among others the crystal growth and properties of magnetic ferrites, modeling solidification of metals, ferroelectric materials and their contacts to silicon. Dr. Grill is an expert in plasma assisted chemical vapor deposition (PECVD) of thin films and his main interests are in the development and fundamental studies of new electronic materials and their implementation in manufactured products. He made his strongest scientific and technical impacts in the areas of diamond-like carbon (DLC) and of low-k and ultralow-k dielectrics for in-chip interconnects, especially the ground-breaking, pivotal impacts to the interconnect dielectrics.

In the 1990s, Dr. Grill developed DLC films and studied their tribological and chemical properties developing processes leading to their implementation as protective coating for thin film magnetic storage disks and the thin film magnetic read/write heads of the hard disk drives (HDD). His patented DLC inventions have been used across the magnetic storage industry.

Since 1997 Dr. Grill's research has focused on the development and implementation of interconnect dielectrics for ULSI microprocessors and he made seminal contributions in this field. Using his expertise in PECVD materials, he invented in 1998 the PECVD deposited organosilicate SiCOH dielectrics with low-k values which have been successfully integrated by the entire semiconductor industry into reliable microprocessors at the 90 nm technology node and beyond, replacing SiO2 as the interconnect insulator. He then extended his innovations to porous pSiCOH ultralow-k dielectrics with further reduced dielectric constant for the subsequent technology nodes. His crucial and fundamental inventions and development of the SiCOH and pSiCOH materials have lead them to become the industry standard for interconnect dielectrics and enabled the extension of Moore's law into nanoscale.

PETER MARK MEMORIAL AWARD

The Peter Mark Memorial Award was established in 1979 in memory of Dr. Peter Mark who served as Editor of the *Journal of Vacuum Science and Technology* from 1975 to 1979. The award is presented to a young scientist or engineer (35 years of age or under) for outstanding theoretical or experimental work, at least part of which must have been published in an AVS Journal. The award consists of a cash award, a plaque, and an honorary lectureship at a regular session of the International Symposium.

PETRO MAKSYMOVYCH

"Peter Mark Memorial Award Lecture – Taking Control of the Nanoscale with Scanning Programming Microscopy"

Monday, 9:00 am, Room 212B

Dr. Petro Maksymovych, Oak Ridge National Laboratory, "for high level frontier chemical and physical contributions to nanoscience"

Petro Maksymovych is a Research Staff Member at the Center for Nanophase Materials Sciences at the Oak Ridge National Laboratory. Petro received his BS in Physical Chemistry from the Kiev Taras Shevchenko University in Ukraine. He earned his Ph.D. in Physical Chemistry at the University of Pittsburgh, Surface Science Center under the supervision of Prof. John T. Yates, Jr. His thesis work focused on molecular-level understanding of chemical reactions on solid surfaces, revealing organometallic chemistry as the guiding motif for chemisorption and self-assembly of ubiquitously used organosulfur molecules on noble metal surfaces. For this contribution he was awarded a 2006 AVS Morton Traum Award.

After completing his Ph.D., Petro received a Eugene P. Wigner Fellowship from the Oak Ridge National Laboratory, to pursue nanoscale electron transport in ternary oxides, including ferroelectric perovskites and colossal magnetoresistive compounds. His work has revealed polarization-controlled electron transport mechanisms in electric-field switchable solid-state materials, such as ferroelectric oxides, and a novel and almost universally applicable mechanism for electrochemical and electronic phase transformations in complex oxides with pressure-gradients. He continues to investigate reversible hot-electron reactions on metal surfaces enabled by proximity and crowding effects in molecular assemblies, and most recently the emergence of complex correlated electron properties in organic solids. He developed several new scanning probe microscopy techniques, most notably a deterministic methodology for analysis of thermopower and temperature gradients in tunneling and point-contact junctions that can be used to probe thermoelectric materials, electron and thermal transport at the nanoscale.

Non-thermal chemical reactions in molecular and solid-state materials occur within the "pre-breakdown" regime of large electric and mechanical stress fields. The control over such reactions will advance atomic manipulation techniques beyond well-characterized surfaces and onto chemical pathways with large activation barriers, thereby allowing for deterministic control of realistic materials for electronic and energy applications. Controlled electronic excitation exhibits often surprising chemical reactions that are not accessible by thermal activation, paving the path toward electron catalysis. Petro was awarded the ORNL Early Career and Director's Awards for Scientific Accomplishment in 2011 for his work on nanoscale ferroelectric oxides. He organized several symposia on oxide electronics for the Materials Research Society. He has authored over 60 peer-reviewed publications, several book chapters and patents.

GEORGE T. HANYO AWARD

The George T. Hanyo Award was established in 1996 by the Kurt J. Lesker Company in the memory of George T. Hanyo, a highly skilled, long-time employee of the company. The award is presented to recognize outstanding performance in technical support of research or development in areas of interest to AVS. It recognizes valuable contributions made by persons outside normal professional circles. Typical nominees should have received mention in the "Acknowledgments" sections of the published papers but, with the possible exception of papers describing new apparatus or procedures, would rarely have been authors or co-authors. The award consists of a cash award and a plaque setting forth the reasons for the award.

MARC D. LANDRY

Marc D. Landry, National Renewable Energy Laboratory, "for continued, longstanding, and enthusiastic technical support of the research efforts at NREL by design, fabrication, installation and repair of vacuum-based growth, deposition, processing, and measurement tools primarily for photovoltaic R&D"

Marc Landry graduated from Woonsocket (R.I.) High School in 1973 and began a plumbing apprenticeship shortly thereafter. He was introduced to the world of vacuum technology in 1977 after joining C.I. Hayes, in Cranston, R.I., inventors of graphite lined, high tempera-

ture vacuum heat treating and carburizing furnaces. During his 7 years working as a construction mechanic, he learned the skills and techniques required in the machine building trades, such as welding and brazing, steel fabrication, industrial vacuum technology (tooth-rattling Stokes and Kinney piston pumps), Roots and diffusion pumps and gauging, as well as hydraulic, pneumatic and process gas systems design, fabrication and assembly.

In 1984, Marc moved to Boulder, Colorado. Marc's transition to the world of high tech came while employed for two years as a sales engineer for Vacuum Inc., under the tutelage of Ted VanVorous, co-inventor of the planar magnetron sputtering cathode. During that time, Marc spent considerable time visiting the national labs of the western states, supplying vacuum equipment for research on a diverse variety of technologies, such as chemical lasers, semiconductor processing equipment, metal lined vacuum furnaces, and sold piston, rotary vane, cryogenic and turbo pumps, vacuum feedthroughs, leak detection, CF flanges and chambers, and pump fluids. He also serviced and modified vacuum welding chambers, sputtering cathodes, and many other vacuum related systems.

In January of 1987, Marc joined a small amorphous silicon thin film startup, Glasstech Solar, Inc. ("GSI"), whose business model was to commercialize the production of a-Si:H solar modules on glass. Marc's skills soon allowed him to lead the R&D systems division of GSI, designing and assembling multi chamber UHV Plasma Enhanced CVD systems used for research on many different thin film devices.

Marc's skills in plumbing allowed him to become an expert in designing and fabricating complex gas delivery and vacuum pumping systems and becoming an early adopter of orbital tube welding technology. His experience as a sales engineer led him to become director of sales and marketing for GSI, (which today is First Solar). Marc traveled the world installing systems built at GSI.

In 1993, Marc joined The National Renewable Energy Labs in Golden, Colorado as a Master Research Technician, where he transitioned into the world of silicon crystal growth, designing new experimental systems and upgrading FZ and CZ crystal growth systems, as well as many new experimental projects. Marc's familiarity with the local Colorado vacuum industry helped launch the former GE PrimeStar thin film CdTe startup. Marc has been an advocate at NREL of transitioning many old oil sealed vacuum pumps and systems to modern dry pump technology.

As a senior member of the Engineering and Informatics Group at NREL, Marc is responsible for mentoring the next generation of technicians as well as continuing to work on many UHV, CVD, and PVD deposition and diagnostic tools such as RBS, XPS, and other related material science techniques.

While at NREL, Marc has been involved in many aspects of research on all of the various solar PV technologies, such as GaAs, CdTe, CIGS, thin film and bulk silicon, MBE, TCO research, and toxic and pyrophoric gas delivery systems and components. Marc has 1 patent for solar breeder reactor technology.

In 2014, Marc received a Graduate Certificate in the Business of Renewable Energy from the University of Colorado, and conducts informative tours of the PV areas of NREL.

Marc is an expert telemark skier, and he and his wife of 31 years, Susan Early, and teenage daughter, Helen, enjoy rafting on the rivers of the West. Marc has also been a part-time fitness instructor at NREL for more than 20 years, and is an accomplished finger-style and blues guitarist and singer, performing regularly in Boulder County, Colorado.

AVS GRADUATE STUDENT AWARDS

2015 NATIONAL STUDENT AWARD FINALISTS

There are five (5) top-level named Graduate Student Awards and four (3) Graduate Research Awards, described below. The recipients of these awards are determined after a general competition with all the graduate research applicants and a presentation to the Awards Committee at the International Symposium.

The finalists are:

Wei Bao, University of California, Berkeley
Elena Maria Echeverria Mora, University of Nebraska-Lincoln
Leeya Engel, Tel Aviv University
Andrada-Oana Mandru, Ohio University
Antonio R. Bighetti Mei, University of Illinois, Urbana-Champaign
Luan Nguyen, University of Kansas
Holly Walen, Iowa State University
Jiayu Wan, University of Maryland, College Park

RUSSELL AND SIGURD VARIAN AWARD

The Russell and Sigurd Varian Award was established in 1982 to commemorate the pioneering work of Russell and Sigurd Varian. It is presented to recognize and encourage excellence in graduate studies in the sciences and technologies of interest to AVS. The award is supported by Varian, Inc. It consists of a cash award, a certificate, and reimbursed travel support to attend the International Symposium.

NELLIE YEOH WHETTEN AWARD

The Nellie Yeoh Whetten Award was established in 1989, in the spirit of Nellie Yeoh Whetten, to recognize and encourage excellence by women in graduate studies in the sciences and technologies of interest to AVS. A fund to support the award was established by Timothy J. Whetten, friends and family of Nellie Yeoh Whetten, and AVS. The award consists of a cash award, a certificate, and reimbursed travel support to attend the International Symposium.

DOROTHY M. AND EARL S. HOFFMAN AWARD

The Dorothy M. and Earl S. Hoffman Award was established in 2002 to recognize and encourage excellence in graduate studies in the sciences and technologies of interest to AVS. It is funded by a bequest from Dorothy M. Hoffman, who was president of AVS in 1974 and held other positions of responsibility in the Society. The award consists of a cash award, a certificate, and reimbursed travel support to attend the International Symposium.

DOROTHY M. AND EARL S. HOFFMAN SCHOLARSHIPS

The Dorothy M. and Earl S. Hoffman Scholarships were established in 2002 to recognize and encourage excellence in graduate studies in the sciences and technologies of interest to AVS. They are funded by a bequest from Dorothy M. Hoffman. The scholarships consist of a cash award, a certificate, and reimbursed travel support to attend the International Symposium.

GRADUATE RESEARCH AWARDS

The Graduate Research Awards were established in 1984 to recognize and encourage excellence in graduate studies in the sciences and technologies of interest to AVS. Each consists of a cash award, a certificate, and reimbursed travel support to attend the International Symposium.

AVS FELLOWS

The membership level designated "Fellow of the Society" was established in 1993 to recognize members who have made sustained and outstanding scientific and technical contributions in areas of interest to AVS. These contributions can be in research, engineering, technical advancement, academic education or managerial leadership. This is a prestigious membership level to which members are elected. AVS Fellows receive a certificate.

2015 AVS FELLOWS

Alison Baski, Virginia Commonwealth University
Charles "Chip" R. Eddy, Jr., US Naval Research Lab
Lara J. Gamble, University of Washington
Reza Ghodssi, University of Maryland
Aubrey T. Hanbicki, US Naval Research Lab
Jay Hendricks, NIST
Kerry W. Hipps, Washington State University
Sergei V. Kalinin, Oak Ridge National Lab
Michael Stueber, Karlsruhe Institute of Technology
Amy V. Walker, University of Texas at Dallas

DIVISION AWARDS

Morton M. Traum Surface Science Division Student Award

The Surface Science Student Award was initiated in 1981. Morton M. Traum, then chair of the Surface Science Division, was the prime motivator in establishing the award. After Mort's untimely death on 1 December 1982, the Executive Committee of the Surface Science Division renamed the award in his memory. The Morton M. Traum Surface Science Division Student Award is presented annually for the best student paper based on work leading to a Ph.D thesis. The papers are judged on technical content and quality of presentation.

The 2015 winner will be announced in the Traum Student Award Ceremony, to be held on Thursday, October 22 at 12:30 p.m. in Room 113 of the San Jose Convention Center.

Past Winners:

1981	Eric Stuve	1990	Benjamin Wiegand	1999	Jongin Hahn	2008	Jeibin Sun
1982	Steven Gates	1991	David Peale	2000	Anders Carlsson	2009	Qing Hua
1983	Ann Smith	1992	Chaochin Su	2001	Jeppe Vang Lauritsen	2010	Heather Tierney
1984	Hans Gossman	1993	Anna Swan	2002	Seth B. Darling	2011	David Siegel
1985	Duane Outka	1994	Bert M. Müller	2003	Marcel A. Wall	2012	April Jewell
1986	Greg Sitz	1995	Frank Zimmermann	2004	Emrah Ozensoy	2013	Xiaofeng Feng
1987	Michael Henderson	1996	Joseph Carpinelli	2005	Jan Haubrich	2014	Feng Zhang
1988	Jeff Hanson	1997	Barry Stipe	2006	Petro Maksymovych		
1989	Yunong (Neal) Yang	1998	Alexander Bogicevic	2007	Bogdan Diaconescu		

John Coburn and Harold Winters Student Award in Plasma Science and Technology

In 1994, the Plasma Science and Technology Division established the Coburn and Winters Award in honor of John Coburn and Harold Winters. Coburn and Winters have made pioneering contributions to the field of plasma science, especially in plasma processing and plasma-surface interactions. Their work has provided inspiration for countless students entering the field of plasma science and enhanced the experiences of students by both example and mentorship. The Coburn-Winters Award winner winner will be announced on Thursday, October 22nd during the afternoon break.

Past Winners:

1994	Bruce Kellerman	2000	Siva Kanakasabapathy	2006	Lin Xu	2012	Joe Lee
1995	Not Given	2001	Nicholas Fuller	2007	Joydeep Guha	2013	Rohan Chaukulkar
1996	Jane Chang	2002	Lin Sha	2008	Emile Despiau-Pujo	2014	Bastien Bruneau
1997	Mikhail Malyshev	2003	Jan Benedikt	2009	Yang Yang		
1998	Catherine Labelle	2004	Jun Belen	2010	Bhavin Jariwala		
1999	Erwin Kessels	2005	Joseph Végh	2011	Harald B. Profijt		

Leo M. Falicov Student Award

The Leo M. Falicov Student Award has been established in memory of Prof. Leo M. Falicov to recognize outstanding research performed by a graduate student in areas of interest to the Magnetic Interfaces and Nanostructures Division. Finalists will be selected on the basis of abstract submission, and will each receive an award upon attending the AVS 62nd International Symposium and Exhibition and presenting their paper in an oral session. The Best Student Paper Award winner will be selected on the basis of the oral presentation, considering quality of research and clarity of presentation.

Past Winners:

1999	W.H. Rippard	2004	Maria Torija	2008	Zhuhua Cai	2013	Jason Kawasaki
2000	R.D. Portugal	2005	Jessica Hilton	2009	Wei Han	2013	Kaida Yang
2001	D.B. Schultz	2006	Randy Dumas	2010	Kangkang Wang	2014	Henry Wortelen
2002	E.L. Biizdaca	2007	David Wisbey	2011	Juan Colon-Santana		
2003	Tiffany Kaspar	2007	John Strachan	2012	Chloe Baldasseroni		

DIVISION AWARDS

Paul H. Holloway Young Investigator Award

The Thin Film Division is pleased to announce Cunjian Yu, of the University of Houston as the 2015 awardee of the Paul H. Holloway Young Investigator Award. Professor Yu has been given the award for his pioneering contributions to the fields of flexible/stretchable/wearable electronics, sensors, and energy storage.

This award is named after Prof. Paul H. Holloway of the University of Florida who has a distinguished and continuing career of scholarship and service to AVS. The nominee is a young scientist or engineer who has contributed outstanding theoretical and experimental work in an area important to the Thin Film Division of AVS. The nominee's Ph.D. or equivalent degree must have been earned less than 7 years prior to January 1 of the award year. The award consists of a cash prize, a certificate citing the accomplishments of the recipient, and an honorary lecture at one of the TFD oral sessions at the International Symposium.

Past Winners:

2009 Suneel Kodambaka, UCLA
2010 O. Martin Ntwaaborwa, Univ. of the Free State, South Africa
2011 Sumit Agarwal, Colorado School of Mines
2012 Franklin Tao, University of Notre Dame
2013 Per Eklund, Linköping University
2014 Andrea Illiberi, Dutch Inst for Applied Scientifc Res (TNO)

Nanometer-scale Science and Technology Division Awards Competition for Graduate Students and Postdocs

The Nanometer-scale Science and Technology Division (NSTD) Graduate Student and Postdoctoral Awards bring recognition to outstanding work by early-career scientists giving oral presentations in NSTD sessions at AVS International Symposia. In addition to presenting their work in the standard NSTD sessions, finalists also make brief presentations at the NSTD Awards Competition. This public special event is held at noon on Wednesday of the symposium in the same room as the standard NSTD sessions. The winners will be selected based on the quality of the talk, the responses to questions, and the level of the research. Winners in the graduate student and postdoctoral categories are announced at the close of the competition.

Postdoctoral Award Winner:

2014 Keith Brown, Northwestern University

Graduate Student Award Winners:

2002 Jeremy Steinshinder
2003 Cheol-Soo Yang
2004 Qiguang Li
2005 Kiu-Yuen Tse
2006 Tracie Colburn
2006 Dirk Weber
2007 Jacob Palmer
2008 Qing Hua Wang, Northwestern University
2009 Mehmet Baykara, Yale University
2010 Farzad Behafarid, Univ Central Florida
2011 Justice Alaboson, Northwestern University
2012 David Reid, University of Central Florida
2013 Cédric Barroo, Université Libre de Bruxelles
2014 Deep Jariwala, Northwestern University

Nanotechnology Recognition Award

The Nanotechnology Recognition Award recognizes members of NSTD for outstanding scientific and technical contributions in the science of nanometer-scale structures, technology transfer involving nanometer-scale structures, and/or the promotion and dissemination of knowledge and development in these areas. The Award will be presented before the recipient's talk at the AVS International Symposium. The 2015 Awardee is Dr. Meyya Meyyapan, Chief Scientist for Exploration Technology at the NASA Ames Research Center.

Past Winners:

2001 Nancy Burnham, Worcester Polytechnic Inst.
2004 Harold Craighead, Cornell University
2009 Joseph Stroscio, NIST
2010 Roland Wiesendanger, Univ of Hamburg
2011 Phaedon Avouris, IBM Yorktown Heights
2012 Fleming Besenbacher, Aarhus University
2013 Joseph Lyding, University of Illinois
2014 Dawn A. Bonnell, University of Pennsylvania

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EXHIBIT HALL EVENTS

The AVS Exhibition offers a vibrant display of the latest products and services available in the industry. Visit the exhibitors to see innovative technology and learn how our vendors can assist in your research efforts.

Technology Spotlight Sessions take place during session breaks where the hottest technology is introduced by our exhibitors. A variety of other activities take place in the exhibit hall including free caricatures, photo booth, Black Jack Tournament, raffles, career center, e-mail pavilion, free coffee, lunches and much more.

FREE EXHIBIT HALL ATTRACTIONS

AVS Career Center
AVS Membership & Education Booth
AVS Publications
Free Morning Coffee
Free Lunch & Afternoon Refreshments
Technology Spotlight Sessions
Art Zone Display & Competition
Daily Raffle Drawings
AVS Store: Gifts/Souvenirs/Books and More
Ask The Experts - Vacuum Technology
E-Mail Pavilion with printing capabilities
Free Caricatures
BlackJack Tournament
Foosball Tournament

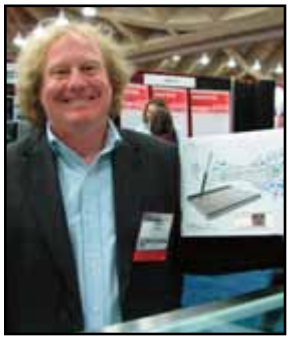
Join us !

EXHIBIT FINALE

THURSDAY 12:20 PM - 2:20PM

EVENTS:

- Free Lunch & Refreshments
- Art Contest Prize Winners
- Raffle Drawings
- Foosball Championship
- Black Jack Tournament Finale
- Caricatures & Photo Booth



Double Down BlackJack Tournament

Foosball Tournament

EXHIBIT SCHEDULE

Oct. 20	Tuesday	10am - 5:00pm
Oct. 21	Wednesday	10am - 4:30pm
Oct. 22	Thursday	10am - 2:30pm

EXHIBITING COMPANIES

Bold listings reflect our Sponsors and Corporate Members

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941	A&N Corporation
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1032	**Agilent Technologies, Vacuum Products Division**
423	**AIP Publishing**
520	**AJA International, Inc.**
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836	**American Institute of Physics**
427	Anasys Instruments
734	Applied Surface Technologies
321	Applied Vacuum Technology, LLC.
741	Arradiance
726	**Asylum Research an Oxford Instruments Company**
815	AT&M Six Nine Materials Co., Ltd.
414	Atlas Technologies
439	AVS - Ask The Experts
1033	AVS Art Zone / Contest
1023	AVS BlackJack Tournament
126	AVS Career Center
238	AVS E-Mail Pavilion
116	AVS Exhibitor Technology Sessions
342	AVS Foosball Tournament
1028	AVS Future Sites
838	AVS Publications
1027	AVS Raffle Zone
339	AVS Special Events Booth 1
1032	AVS Special Events Booth 1
839	AVS Store & Membership
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738	Extrel
634	Film Sense
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821	Hiden Analytical, Inc.
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429	Horiba Scientific
915	Huntington Mechanical Labs
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532	Intlvac Thin Films
621	**ION-TOF USA**
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929	**Kashiyama-USA Inc.**
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817	**Kimball Physics Inc.**
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325	nanoRANCH
621	NanoScan AG
637	NiCoForm, Inc.
916	NIST
940	NIST/CNST
820	Nonsequitur Technologies
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1031	Osaka Vacuum USA, Inc.
724	Oxford Instruments
1026	Oxford Instruments - Industrial
938	Park Systems
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528	**PHPK Technologies**
415	**Physical Electronics**
132	**Physics Today (Exhibitor Lounge)**
320	Phytron, Inc.
1012	Plasma Sensors
828	**Plasmaterials, Inc.**
626	Precision Ceramics USA, Inc.
534	**Precision Plus Vacuum Parts**
434	Prevac sp. z o.o.
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433	**RBD Instruments, Inc.**
913	Refining Systems
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811	**RHK Technology Inc.**
1010	Ricor-USA, Inc.
540	Rocky Mountain Vacuum Tech., Inc.
335	**SAES Group**
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832	**Semicore Equipment, Inc.**
1038	Seren Industrial Power Systems, Inc.
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EXHIBITOR TECHNOLOGY SPOTLIGHT SESSIONS

Stage Area of Exhibit Hall (Booth 116) • San Jose Convention Center

20-minute interactive presentations scheduled during the technical session breaks in the Stage Area of the exhibit hall. Gain insight to the latest products and services offered by the exhibitors that benefit everyone including technicians, engineers and scientists as well as fellow manufacturers.

Free Admission

TUESDAY, October 20th

10:20am **Ask The Experts - Vacuum Technology**
Principles of vacuum technology including: vacuum generation, gas flow and pressure measurement
Presenter: The AVS Ask The Experts Team of Volunteers lead by Gerardo Alejandro Brucker from MKS Granville-Phillips Division

10:40am **Nanonics**
The Nano Probe Station for Your 2D Characterization Needs: The First Low Temperature MultiProbe SPM-NSOM System Integrated with Raman
Presenter: Aaron Lewis

12:40pm **Thermo Fisher Scientific, UK**
The Latest Developments in Surface Analysis from Thermo Fisher Scientific
Presenter: Tim Nunney

1:00pm **SPECS Surface Nano Analysis GmbH, Germany**
EnviroESCA – The Revolution of a Method
Presenter: Andreas Thissen

1:20pm **Kratos Analytical**
Latest Developments in XPS and Related Methods from Kratos Analytical
Presenter: Chris Blomfield

1:40pm **Physical Electronics**
What's New from PHysical Electronics
Presenter: Scott Bryan

2:00pm **Asylum Research, an Oxford Instruments Company**
AFM of Thin Films for Nanomechanical, Nanoelectrical, and Electromechanical Characterization
Presenter: Amir Moshar

4:00pm **CS Clean Systems, Inc.**
High Efficiency, High Capacity and Economical "Point of Use" Gas Abatement
Presenter: D.K. Prasad

WEDNESDAY, October 21th

10:20am **Kurt J. Lesker Company**
New and Ongoing Developments in Thin Film Deposition from the Kurt J. Lesker Company®
Presenter: Sean Armstrong

10:40am **RASIRC**
H2O2 Gas: Revolutionary new molecule for ALD
Presenter: Jeffrey Spiegelman

12:40pm **SPI Supplies**
Wet Cell II for Analysis at the Liquid Vacuum Interface
Presenter: Junhang Luo

1:00pm **DuPont™ Kalrez®**
Relative Permeation Performance of O-ring Seals Using DuPont Test Methodology
Presenter: Mark Heller

1:20pm **NiCoForm**
Advances in Bellows Electroforming
Presenter: Berl Stein

1:40pm **PREVAC sp. z o.o., Poland**
Prevac's Solutions for Helium Temperature Sample Manipulation and Related Sample Transferring Systems
Presenter: Adam Dziwoki

2:00pm **Yield Engineering Systems, Inc.**
Variations on Vacuum Baking for MEMS Processing
Presenter: William Moffatt

ASK THE EXPERTS !!!!!!

Troubleshooting Mysteries? Contamination Problems?
System Configuration Questions? Just want to make your vacuum better?

What's the best gauge for the 10-11 Torr Range?	How do I detect a Virtual Leak?	What is my RGA telling me?	How do I control / eliminate water?

Problems with troubleshooting, process control, contamination or just want to bounce an idea off other people in the vacuum field? Maybe all our years of experience, successes and failures can help point you in the right direction or spark an idea! An unbiased, open forum with the desire to solve vacuum related issues. Come chat with us at Booth 439.

Who are we?? We are volunteers of the AVS Vacuum Technology Division and our goal is to help you solve problems and understand the intricacies of vacuum technology.

Special session in the Stage Area of the Exhibit Hall on Tuesday at 10:20am:

The session will include a primer on the principles of vacuum technology including: vacuum generation, gas flow and pressure measurement. Learn the differences between direct and indirect pressure measurement. Understand the advantages of thermal versus pressure based mass flow controllers. If you are new to the vacuum industry or are interested in hearing what your colleagues are doing with vacuum technology this is a great opportunity to learn some new and interesting tricks.

Ask the Experts!... Exhibit Hall Booth #439

Sponsored by Kimball Physics, SAES Getters & MKS Instruments
Hosted by the AVS Vacuum Technology Division

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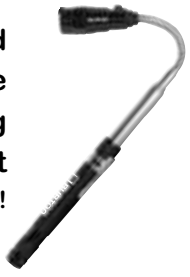

Archives and online discussion forum year round at www.avs.org/forum.aspx

Exhibit Hall • Booth 439

AVS 62nd International Symposium & Exhibition

San Jose, California

Tuesday Evening Poster Session

Tuesday, October 20, 6:30 p.m. to 8:30 p.m.
San Jose Convention Center, Hall 3

A very special event has been arranged at the Tuesday Evening Poster Session.

Enjoy Food, Drinks, and Great Science!

This special event is hosted by AVS and generously sponsored by MKS.

Don't miss this special event!

Sponsored by MKS

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Technology for Productivity

SYMPOSIUM PLENARY LECTURE

"Electronic Materials Research and Development for Future Computation and System-on-Chip Applications"

Monday, October 19, 2015, 12:15 p.m., Room 210G
San Jose Convention Center

Robert S. Chau, Intel Senior Fellow, Technology and Manufacturing Group, Co-director, Components Research

Robert S. Chau is an Intel Senior Fellow and co-director of Components Research in the Technology and Manufacturing Group at Intel Corporation. Chau is responsible for Intel's research efforts, including internal research and external collaborations, to enable future process technology options for Intel's technology development organizations. Prior to his current role, Chau was director of Transistor Research and Nanotechnology in the Components Research organization.

Chau joined Intel in 1989, became an Intel Fellow in 2000 and an Intel Senior Fellow in 2005. During his career at Intel he developed nine generations of Intel gate dielectrics, including the high-K/metal-gate, along with many transistor innovations and process technologies used in various Intel manufacturing processes and microprocessor products. He also introduced many new process modules and novel device nanotechnologies for Intel's future logic and SoC processes.

Chau has earned 7 Intel Achievement Awards, including one for the research and development of Intel's 22nm Tri-Gate transistor technology. He was the co-recipient of the 2008 SEMI Award for North America for the development of Intel's 90nm strained silicon technology, and the 2008 EDN (Electronics Design, Strategy, News) "Innovator of the Year" award for the development of Intel's 45nm high-k metal gate transistor technology. Chau received the 2012 IEEE Jun-ichi Nishizawa Medal for "sustained leadership in developing innovative transistor technologies for advanced logic products."

Chau received his bachelor's and master's degrees and Ph.D. in electrical engineering from The Ohio State University. He holds more than 300 issued U.S. patents and has been elected an IEEE Fellow. In April 2010 he was recognized by the newspaper *The Oregonian* as the most prolific inventor in the State of Oregon. He was the recipient of the 2015 Intel Inventor of the Year award. In 2013, Chau was elected a member of the U.S. National Academy of Engineering.

TECHNICAL PROGRAM

The AVS 62nd International Symposium & Exhibition will be held at the San Jose Convention Center, San Jose, CA, October 18–23, 2015. Once again our technical program is second to none, providing cutting-edge content over a very broad range of diverse yet complementary topics. Brief summaries of each program theme are provided below, with the full schedule of oral and poster presentations following them. Symposium presenters represent the best and brightest from academia, industry, & government research labs around the world. The end result is a program that consists of over 150 oral sessions, more than 1,300 talks, over 300 invited speakers and two evenings of poster sessions. Start filling your week's schedule with must-see, career enhancing sessions.

EXHIBITS

This year's exhibition showcases equipment and instrumentation needed to perform cutting edge research presented in our technical program. Visit the exhibit hall to speak to experts representing the very best in components, systems, instrumentation, services and consumables. The exhibit hall will be open Tuesday through Thursday, October 20–22. There are many attractions in the exhibit hall, including Technology Spotlight Sessions, Career Center, Vacuum Technology Division's "Ask The Experts", the AVS Membership & Store, E-Mail Pavilion, Photo Booth, Free Caricatures, Art Zone/Contest, Free morning coffee, refreshments, lunches, daily raffles and much more!

SHORT COURSES AND TUTORIALS

The San Jose Convention Center will be the site for the short course program and tutorials where courses on a variety of topics will be offered. These courses and tutorials will run concurrently with the AVS Symposium.

TECHNICAL PROGRAM

ADVANCED SURFACE ENGINEERING

The program of the Advanced Surface Engineering Division (SE) addresses both scientists and technologists who are interested in new thin film materials and emerging technologies to prepare them, in their characterization and their practical use. Four oral sessions and a poster session provide a well balanced mix of fundamentals and applications of surface engineering. The sessions address the basics and use of atmospheric pressure plasmas, chemical vapour deposition and other deposition methods, innovations in pulsed plasmas in surface engineering, new developments in nanostructured thin films and coatings, and thin film technologies for energy storage, conversion and harvesting. Presentations on novel coating materials, new processes for their synthesis, as well as on new approaches to their design and modelling, process diagnostics and growth control, and, property characterizations will be given, offering a huge diversity of recent developments in surface engineering, represented by academics, scientists, and technicians from various disciplines and with outstanding expertise. The program starts on Monday morning with a session on Atmospheric Pressure Plasmas, CVD and other deposition methods. This session is co-sponsored by the Plasma Science and Technology Division (PS) and the Focus Topic on Surface Modification of Materials by Plasmas for Medical Purposes (SM). Professor Ladislav Bardos from the Angstrom Laboratory at Uppsala University, Sweden, will review in an invited talk the technique and potential of atmospheric plasmas in liquids. A session on Monday afternoon is dedicated to Pulsed Plasmas in Surface Engineering. It is co-sponsored by the Plasma Science and Technology Division (PS). Professor Jaroslav Vlcek from the University of West Bohemia in Plzen, Czech Republic, will present in an invited lecture both fundamentals and applications of reactive high-power impulse magnetron sputtering and pulsed magnetron co-sputtering of multifunctional films. The program will be continued on Tuesday morning with a session on Nanostructured Thin Films and Coatings. This session is co-sponsored by the Nanometer-scale Science and Technology Division (NS), the Applied Surface Science Division (AS), and the Tribology Focus Topic (TR). Professor Paul Mayrhofer from the Vienna University of Technology, Austria, will present an invited talk on atomistic guided development of hard coatings and thin films for severe applications. On Tuesday afternoon, a session will be held on Thin Films Technologies for Energy Storage, Conversion and Harvesting. This session is co-sponsored by the Electronic Materials and Processing Division (EM) and the Energy Frontiers Focus Topic (EN). An invited lecture will be given by Professor Bruce Clemens from Stanford University, California; he will speak about laser liftoff of single crystal GaAs thin films and energy conversion devices. The SE program will be completed by a poster session on Tuesday evening.

CODE	SESSION
SE+AS+NS+TR-MoM	Nanostructured Thin Films and Coatings *Paul Mayrhofer, Vienna Univ. of Technology, Austria*
SE+EM+EN-MoA	Thin Film Technologies for Energy Storage, Conversion and Harvesting *Bruce Clemens, Stanford University*
SE+PS+SM-TuM	Atmospheric Pressure Plasmas, CVD and Other Deposition Methods *Ladislav Bardos, Uppsala Univ., Sweden*
SE+PS-TuA	Pulsed Plasmas in Surface Engineering *Jaroslav Vlcek, University of West Bohemia, Czech Republic*
SE-TuP	Advanced Surface Engineering Poster Session

APPLIED SURFACE SCIENCE

The Applied Surface Science Division (ASSD) provides a forum for research in the preparation, modification, characterization, and utilization of surfaces in practical applications. Areas of interest range from nanoscience, polymers, and semiconductor processing to forensic science and biotechnology. The Division has long been the premier gathering place for the global surface analysis community.

This year we mark the 30th Anniversary of the founding of our division with a technical program that both celebrates historical milestones while also addressing characterization challenges that remain outstanding and/or are critical to scientific discovery. Sessions are built around a "Top 30" list of Breakthroughs, Challenges, Memorable Interactions, and Trends that will be displayed in poster form at the entrance to the ASSD session room. Members are encouraged to add historical photos of themselves and colleagues to the poster!

Sessions on various aspects of Practical Surface Analysis, including Multiple Technique Approaches, Sample Preparation, and Interpretation, will include invited talks by those who helped set the standards and protocols we use today, as well as invited talks by researchers such as Dario Stacchiola, who are shedding new light on classic problems like catalysis with new technique approaches. Sessions on Sub-Micron Feature Analysis and Chemical Mapping will include invited talks by Olga Ovchinnikova on the combination of SPM technology with molecular spectroscopies, and Barry Wise on new and continuing developments in multivariate analysis of chemical mapping data. A session on Challenges in Characterization of Polymer/Organic/

Biological Samples provides an opportunity to celebrate the introduction of ToF-SIMS and the impact this technique has had and continues to have in this area. A session devoted to Buried Interfaces will show how traditional cross-sectional analysis and elemental depth profiling have morphed into molecular depth profiling and correlated 3D imaging techniques. As a strongly characterization-centered division, ASSD is contributing to Focus Topics in Scanning Probe Microscopy, Synchrotron-based Analysis, Spectroscopic Ellipsometry, Helium Ion Microscopy, In-Situ Spectroscopy, and Tribology.

All are welcome to attend the Tuesday evening ASSD business meeting, which will feature brief capsule presentations by our student award finalists, as well as a panel discussion sponsored by the ASTM-E42 Committee on Surface Analysis on the topic "When is 'Perfect' the Enemy of 'Good'?" A special part of our Tuesday business meeting will be devoted to honoring our division founder, Cedric Powell.

CODE	SESSION
AS-MoM	Quantitative Surface Analysis: Obtaining Quantitative Information in the Face of Material Complexity and Morphology Influences *John Grant, University of Dayton* *Robert Opila, University of Delaware*
AS-MoA	Practical Surface Analysis I: Interpretation Challenges *Kateryna Artyushkova, Univ. of New Mexico* *James Castle, University of Surrey, UK*
AS+NS-TuM	Chemical/Molecular Information from Sub-micron Features and Materials *Christopher Brundle, C R Brundle and Asociates* *Olga Ovchinnikova, Oak Ridge National Lab.*
AS+BI-TuA	Challenges in the Characterization of Polymer/Organic/ Biological Systems *Ian Gilmore, National Physical Lab., UK* *Birgit Hagenhoff, Tascon GmbH, Germany*
AS-WeM	Practical Surface Analysis II: Influence of Sample Preparation and Novel Sample Prep Techniques *John Fletcher, Chalmers Univ. of Tech., Sweden* *John Moulder, Physical Electronics USA*
AS+SS-WeA	Characterization of Buried Interfaces *Douglas Bell, Jet Propulsion Laboratory, California Institute of Technology* *Fred Stevie, North Carolina State University*
AS-ThM	Practical Surface Analysis III: Multiple-technique Problem-solving and Structure-property Correlations *Don Baer, Pacific Northwest National Lab.* *Dario Stacchiola, Brookhaven National Lab.*
AS+SS-ThA	Advances in 2D Chemical Mapping and Data Analysis *Julia Fulghum, University of New Mexico* *Barry Wise, Eigenvector Research, Inc.*
AS-ThP	Applied Surface Science Poster Session

BIOMATERIAL INTERFACES

The Biomaterials Interfaces Division is organizing a series of sessions to provide an interdisciplinary forum for the presentation and discussion of fundamental aspects of bio-interface science and engineering. The need to increase our understanding of the interactions between biomolecules and surfaces, the behavior of complex macromolecular systems at materials interfaces, and interactions between biomolecules, is being driven by the rapid growth in biomedical research and the role these applications play in the fields of biology, biotechnology, diagnostics, dentistry and medicine. The BI program brings together recent advances made in materials science and molecular biology with sophisticated surface and interface analysis methods, and theoretical and modeling approaches to biological systems. This year's program is composed of five oral sessions, covering Characterisation of Biological Interfaces, Biosensors and Diagnostics, including spectroscopy, imaging, microscopy, quantification, and chemometrics, biosensors and diagnostics; Cells and Microorganisms at Surfaces, including cell-material interactions, biofilms, biofouling, tissue engineering, and artificial organs; Biomolecules at Interfaces, including proteins at surfaces, nucleic acids, polysaccharides, adsorption, blood-contacting materials, bioadhesion, and infection and immunity; and Biophysics, Membranes and Nanoscale Biological Interfaces, including: biological membranes, vesicles, forces, recognition, patterning, nanofabrication, microscopy, and microfluidics. We have introduced an exciting new feature this year: on Tuesday afternoon we feature Flash Presentations, with an accompanying Networking Session involving associated poster presentations. Prizes will be awarded for the best Flash Presentations. Traditional posters will also be presented on Tuesday evening.

CODE	SESSION
BI+AS-MoM	Characterization of Biological and Biomaterials Surfaces (1) *David Castner, University of Washington*
BI+AS-MoA	Characterization of Biological and Biomaterials Surfaces (2) *Ralf Richter, CIC biomaGUNE & University Grenoble Alpes, Spain*
BI-TuA	Cells and Microorganisms at Surfaces *Matthew Becker, University of Akron*
BI-TuP	Biomaterial Interfaces Poster Session
BI-WeM	Biomolecules at Interfaces *Sanjay Kumar, Univ. of California, Berkeley*
BI-WeA	Biophysics, Membranes and Nanoscale Biological Interfaces *Zev Gartner, Univ. of California, San Francisco* *Noo Li Jeon, Seoul National University, Korea*

BIOMATERIAL PLENARY SESSION AND RECEPTION

The Biomaterials Interfaces program kicks off with the now traditional Biomaterials Plenary Session. This year we are pleased to have presentations from three eminent scientists and engineers who have made important contributions to our field. Suzie Pun develops bio-inspired materials to advance drug delivery and molecular imaging technologies, in areas including cancer therapy, the central nervous system and cell therapy. She strives to achieve this goal by integrating techniques from engineering, chemistry, and cell biology. Jacob Israelachvili has made seminal contributions to our understanding of intermolecular and surface forces in complex fluids, biological and materials systems. Philip Messersmith has made important contributions in a broad swathe of biomaterials science, encompassing adhesion, functional coatings, regenerative medicine, drug delivery and nanomedicine. The session will close close with the opportunity for further discussions at our traditional industry sponsored Plenary Reception.

CODE	SESSION
BP-SuA	Biomaterials Plenary Session *Jacob Israelachvili, Univ. of Calif., Santa Barbara* *Phillip Messersmith, Univ. of Calif., Berkeley* *Suzie Pun, University of Washington*

ELECTRONIC MATERIALS AND PROCESSING

The Electronic Materials and Processing Division (EMPD) encompasses the science and engineering of materials and interfaces that advance device technology. For AVS 62, EMPD will sponsor fourteen oral sessions containing over 100 talks, a panel discussion, and a poster session on materials synthesis, devices, fabrication, and characterization. Researchers from around the world will present their work on a diverse spectrum of devices and technologies for advanced logic, ultra-dense memory, solar, optoelectronic, high power/frequency/temperature, and light management applications. The symposium topics span electronic/optoelectronic/photonic properties, surface and interface defect engineering, and newly emerging materials properties and processing techniques. In celebration of the 50th anniversary of Moore's law, several sessions will to explore both "More Moore" and "More than Moore" devices and technologies, and a panel discussion is planned to discuss the future direction of the semiconductor and global nano-electronics industry. Additional sessions are devoted to rectenna solar devices, MIM diodes, III-N nitrides and other wide band gap semiconductors, and nanoparticle-based electronic and photonics. Traditionally, EMPD has maintained an excellent list of distinguished invited speakers. This year, we will host well over 30 invited speakers. Among them are: Grace Hiuli Xing (Cornell), Albert Grill (IBM, * John A. Thornton Memorial Award), Emanuel Tutuc (U. Texas, Austin), Ji Ung Lee (SUNY Polytechnic), Robert Clark (TEL), Joshua Robinson (Penn State), Sanjay Banerjee (U. Texas, Austin), Seongjun Park (Samsung), Bill Bottoms (3MTS), Thomas Kazior (Raytheon), John Robertson (Cambridge), Patricia Mooney (Simon Fraser), Brian Downey (NRL), Mikhail Baklanov (IMEC), Jeff Bielefeld (Intel), Hask Pakbaz (SBA), Stefano Carbrini (LBNL), Shalini Gupta (Northrup-Grumman), John Muth (NCSU), Dan Dapkus (USC), Anna Fontcuberta I Morral (EPFL Switzerland), Vivian Ferry (U. Minnesota), Matt Law (UC Irvine), and Bart Kooi (U. Groningen).

CODE	SESSION
EM+AS+SS-MoM	Rectenna Solar Cells, MIM Diodes, and Oxide Interfaces *Garret Moddel, University of Colorado and RedWave Energy, Inc.*
EM+NS+PS-MoM	More Moore! Materials and Processes to Extend CMOS Another Decade *Ji Ung Lee, SUNY Polytechnic Institute* *Emanuel Tutuc, Univ. of Texas at Austin* *Grace Huili Xing, Cornell University*
EM+AS+SS-MoA	MIM Diodes, Functional Oxides, and TFTs *Sang-Yeol Lee, Cheongju University, Republic of Korea* *Darrell Schlom, Cornell University*
EM+NS+PS-MoA	More Moore! II *Robert Clark, TEL Technology Center, America, LLC*
EM-TuM	Beyond CMOS: Materials and Devices for a Post CMOS Era *Sanjay Banerjee, Microelectronics Research Center, Univ. of Texas at Austin* *Sundaresan Jayaraman, Georgia Institute of Technology* *Seongjun Park, Samsung Advanced Institute of Technology, Republic of Korea* *Joshua Robinson, Pennsylvania State Univ.*
EM+MN+PS-TuA	More than Moore: Novel Approaches for Increasing Integrated Functionality *Bill Bottoms, 3MTS* *Thomas Kazior, Raytheon Company*
EM-TuP	Electronic Materials and Processing Poster Session
EM-WeM	Beyond CMOS: Resistive Switching Devices *John Robertson, Cambridge University, United Kingdom of Great Britain and Northern Ireland*
EM+AS+MS+SS-WeA	Surface and Interface Challenges in Wide Bandgap Materials *Brian Downey, Naval Research Laboratory* *Patricia Mooney, Simon Fraser Univ., Canada*
EM-WeA	Interconnects: Methods and Materials for Removing Connectivity Constraints *Mikhail Baklanov, IMEC* *Jeffery Bielefeld, Intel Corporation*
EM+MS-ThM	III-N Nitrides for Optoelectronic Applications *Stefano Cabrini, Lawrence Berkeley National Laboratory (LBNL)* *Shalini Gupta, Northrop Grumman ES*
EM-ThM	Interconnects II *Alfred Grill, IBM Research Division, T.J. Watson Research Center** *Hash Pakbaz, SBA Materials*
EM+EN-ThA	Materials for Light Management *Vivian Ferry, University of Minnesota* *Anna Fontcuberta i Morral, EPFL, Switzerland*
EM+MS-ThA	III-N Nitrides II *P.Daniel Dapkus, Univ. of Southern Calif.* *John Muth, North Carolina State University*
EM+AS+EN+NS-FrM	Nanoparticles for Electronics and Photonics *Bart Kooi, Univ. of Groningen, The Netherlands* *Matt Law, UC Irvine*

MAGNETIC INTERFACES AND NANOSTRUCTURES

The Magnetic Interfaces and Nanostructures Division (MI) program features emerging results in topical areas related to magnetic interfaces and nanostructures. The 2015 MI program topics include: (1) magnetic oxides and fluorides (2) spin currents (3) spin structures, and (4) hybrid magnetic structures. The 2015 program highlights electron spin related phenomena at the intersection of basic and applied science. We are co-sponsoring with the Actinides and Rare Earths (AC), Synchrotron Analysis (SA), 2D Materials (2D), Atom Probe Tomography (AP) and Scanning Probe Microscopy (SP) focus topics. The Magnetic Interfaces and Nanostructures Division will be selecting the best graduate student presentation from finalists for the Leo Falicov Award. MI will also offer an award for postdoctoral fellows who will be presenting MIND papers at this year's International Symposium. The winner of both awards will be announced towards the end of the meeting.

CODE	SESSION
MI-TuM	Oxides, Fluorides, and Spin Structures *Stefano Bonetti, Stockholm University, Sweden* *David Lederman, West Virginia University* *Yayoi Takamura, University of California, Davis*
MI+SA-TuA	Spin Currents, Spin Textures and Hybrid Magnetic Structures *Geoffrey Beach, Massachusetts Inst. of Technology* *Daniel Dougherty, North Carolina State Univ.* *Georg Woltersdorf, Martin Luther University Halle-Wittenberg, Germany*
MI-TuP	Magnetic Interfaces Poster Session

*John A. Thornton Memorial Award and Lecture Winner

MANUFACTURING SCIENCE AND TECHNOLOGY:

MSTG and the Professional Leadership Committee are leading a special session on Tuesday Afternoon. Here we will host representatives from a number of National Labs and other User Facilities. Talks will highlight their capabilities, programs for users, and general information on how to work with them. The discussion will be continued during the Tuesday poster session where they will be manning posters with additional information. MSTG is partnering with AIP to present the Industrial Physics Forum's invited sessions in Mesoscale Science and Technology and Metamaterials and the Additive Manufacturing Focus Topic.

CODE	SESSION
MS-TuA	Working with National Labs and User Facilities
MS-TuP	Aspects of Manufacturing Science and Technology Poster Session

MEMS AND NEMS

The MEMS and NEMS Technology Group (MN) program will highlight recent advances in the broad areas of micro/nanoelectromechanical systems (MEMS/NEMS), especially latest fundamental studies of novel materials, processes, devices, and emerging functions and applications of MEMS/NEMS, in various areas including manufacturing, energy, communication, and healthcare. The ability to manipulate and engineer mechanical structures in various emerging low-dimensional materials creates intriguing possibilities of integrating these devices with existing fluidic, electronic and optical on-chip networks. This year's sessions will cover such areas that are thematically related to multi-scale phenomena and interactions of materials with focus on advanced lithography, pattern transfer and fabrication at the micro/nanoscale, along with characterization, integration and packaging of MEMS/NEMS. The program continues to embrace latest progresses in optical MEMS/NEMS, micro/nanophotonics, optomechanics, quantum MEMS/NEMS, resonant systems, CMOS-MEMS, mesoscopic dynamics and dissipation processes, inertial sensors, chemical sensors and lab-on-chip analytical microsystems, harsh-environment transducers, parametric and nonlinear MEMS/NEMS, and MEMS/NEMS-enabled energy technologies, etc. It also aims to capture some of the latest advances in soft materials, flexible and implantable MEMS/NEMS for biosensing, bio-inspired microsystems, wearable and wireless healthcare. The AVS62 MN program also highlights focus sessions to feature latest advances and exciting new results in scalable and additive nanomanufacturing, and fundamental nanomechanics and NEMS based on atomically thin 2D crystals.

CODE	SESSION
MN+MG-TuM	Multiscale Phenomena & Interactions in Micro- and Nano-Systems (8:00–10:00 am) & Optical MEMS/NEMS, Photonics, and Quantum Nanosystems (11:00 am–12:20 pm) *Ania Bleszynski Jayich, Univ. of California at Santa Barbara* *Beth L. Pruitt, Stanford University*
MN+BI-TuA	BioMEMS/NEMS, Wearable and Implantable Devices *Mehran Mehregany, Case Western Reserve University* *Kurt Petersen, Silicon Valley Band of Angels*
MN+AM-WeM	Emerging Materials & Fabrication Technologies toward Scalable & Additive Nanomanufacturing I *Stephen Y. Chou, Princeton University* *Khershed Cooper, Natl. Science Foundation (NSF)* *Jay Guo, University of Michigan, Ann Arbor* *Regina Ragan, University of California Irvine*
MN+AM-WeA	Emerging Materials & Fabrication Technologies toward Scalable & Additive Nanomanufacturing II *Costas Grigoropoulos, Univ. of Calif. at Berkeley* *Tsu-Jae Liu, Univ. of California at Berkeley* *Christian Zorman, Case Western Reserve Univ.*
MN-ThM	Atomic Layer Nanostructures and 2D NEMS *Evan Reed, Stanford University* *Tian-Ling Ren, Tsinghua University, China*

NANOMETER-SCALE SCIENCE AND TECHNOLOGY

This division (NS) explores the science and technology that emerges when material is shrunk to the nanoscale. We have invited leading figures from around the globe to provide perspective from the forefront of their respective fields as part of the seven NS sessions listed below. For particular note are the following sessions:

- NS-MoM "Nanotools and Nanodevices" which features the Peter Mark Memorial Award Lecture, the NSTD Nanotechnology Recognition Award Lecture, and a third invited talk by the winner of last year's NSTD Postdoc Award
- NS-MoA "Optical Spectroscopy at the Nanoscale" which has three invited speakers
- NS-WeM "Nanodiamond for Optical and Biomedical Applications" which is a new area for NS.

Also of note are many sessions co-sponsored by NS, in particular the Helium Ion Microscopy focus topic sessions, which feature a session on FIB. NSTD will also hold their annual student and postdoc award competitions during the lunch break on Wednesday.

CODE	SESSION
NS-MoM	Nanotools and Nanodevices *Keith A. Brown, Northwestern University* *Peter Maksymovych, Oak Ridge Natl. Lab.** *Meyya Meyyappan, NASA Ames Research Ctr.*
NS+AS+SP-MoA	Optical Spectroscopy at the Nanoscale *Dmitri Basov, Univ. of California San Diego* *Mikhail Belkin, University of Texas at Austin* *FrancescoSimone Ruggeri, Ecole Polytechnique Fédérale de Lausanne (EPFL), Switzerland*
NS+SP-TuM	Nanoscale Imaging and Materials Characterization *Ozgur Sahin, Columbia University*
NS+EN+SS-TuA	Nanophotonics, Plasmonics, and Energy *Jennifer Dionne, Stanford University*
NS-TuP	Nanometer-scale Science and Technology Poster Session
NS-WeM	Nanodiamond for Optical and Biomedical Applications *Lloyd Hollenberg, Univ. of Melbourne, Australia* *Jörg Wrachtrup, Univ. of Stuttgart, Germany*
NS+EN+MG+SS+TF-WeA	Nanoscale Catalysis and Surface Chemistry *Milko Van der Boom, Weizmann Institute of Science, Israel*

*Peter Mark Memorial Award Winner

NS+MN-ThM Nanopatterning and Nanolithography/Nanoscale Mechanics
James Liddle, Center for Nanoscale Science and Technology, Natl. Inst. of Standards and Tech.
Michael Roukes, Calif. Institute of Tech.
Kimberly Turner, Univ. of Calif., Santa Barbara

PLASMA SCIENCE AND TECHNOLOGY

The 2015 Plasma Science and Technology Division (PSTD) highlights state-of-the-art advances in plasma research, ranging from fundamental studies of plasma physics and chemistry to applications for semiconductor fabrication, 2D materials enablement and plasmas for medicine and biological applications. The core program includes seventeen oral sessions and a poster session, as well as additional joint sessions with the 'Advanced Surface Engineering,' 'Electronic Materials' and 'Thin Film' divisions as well as '2D' and 'Surface Modification of Materials by Plasmas for Medical Purposes' focus topics.

The week begins with sessions on "Atmospheric Pressure Plasma Processing" and "Advanced FEOL/Gate Etching" addressing state of the art plasma processing in atmospheric pressure environments as well as leading-edge plasma etch technology at the forefront of the semiconductor industry. Succeeding sessions on "Advanced BEOL/Interconnect Etching," "Novel Materials and Etch Chemistry," "Ion Implantation and Plasma Doping" and a partial session on Directed Self Assembly (DSA) continue to explore latest results pertaining to the semiconductor industry. To encompass recent developments aiming to enable atomic scale precision, this year we feature sessions on "Atomic Layer Etching (ALE)" and "Plasma Deposition and Plasma-assisted Atomic Layer Deposition (ALD)." Fundamental scientific issues and various new and exciting results are also reported in traditional fields of plasma science and technology in sessions "Plasma Diagnostics, Sensors, and Control," "Plasma Modeling," "Plasma Surface Interactions" and "Plasma Sources." Modern applications of plasma technologies, such as processing of Graphene, 2D, and other novel materials will be addressed in sessions on "Plasma Processing for 2D Materials," co-sponsored sessions in the 2D Focus Topic, as well as a partial session on Plasma Synthesis of Novel Materials while research on plasma medicine will be showcased in the "Plasmas for Medicine and Biological Applications" session and co-sponsored sessions in the "Surface Modification of Materials by Plasmas for Medical Purposes" Focus Topic. The Poster session of the PSTD, which is scheduled on Thursday evening, provides an ideal venue for in-depth discussion on all topics above.

The Plasma Prize invited lecture, entitled "Plasma Processing of Materials: What makes Plasma Special and Future Outlook?" will be delivered by 2014 winner Dr. Richard van de Sanden, in the "Plasma Deposition and Plasma-assisted Atomic Layer Deposition (ALD)" session on Wednesday afternoon. The 2015 Plasma Prize winner will be announced at the PSTD Business Meeting in Room 210B at 6:20 PM on Tuesday, immediately following the afternoon sessions.

There are multiple finalists for the 2015 Coburn and Winters Student Award, who present throughout the week (see program for specific times). The winner is scheduled to be announced in the Coburn and Winters Student Award ceremony in Room 210A at 12:20 PM on Thursday.

CODE	SESSION
PS+SE-MoM	Atmospheric Pressure Plasma Processing I *Leanne Pitchford, CNRS and University of Toulouse 3, France*
PS-MoM	Advanced FEOL/Gate Etching *Sébastien Barnola, CEA, LETI, MINATEC Campus, France* *Miyako Matsui, Hitachi Ltd., Japan*
PS+EM-MoA	Directed Self Assembly and Plasma Synthesis of Novel Materials *Glenn Fredrickson, University of California at Santa Barbara* *Michael Gordon, University of California at Santa Barbara*
PS-MoA	Plasma Diagnostics, Sensors and Control I *Frank De Lucia, Ohio State University*
PS+BI+SM-TuM	Plasmas for Medicine and Biological Applications *Peter Bruggeman, University of Minnesota* *David Graves, Univ. of Calif. at Berkeley* *Buddy D. Ratner, University of Washington*
PS-TuM	Advanced BEOL/Interconnect Etching *John Arnold, IBM Research Division, Albany, NY*
PS1-TuA	Novel Materials and Etch Chemistry *Makoto Sekine, Nagoya University, Japan*
PS2-TuA	Plasma Modeling *Yeon Ho Im, Chonbuk National University, Republic of Korea* *Kouichi Ono, Kyoto University, Japan* *Phillip Stout, Applied Materials*
PS+2D+SE-WeM	Plasma Diagnostics, Sensors and Control II *Michael Ashfold, University of Bristol, United Kingdom of Great Britain and Northern Ireland*
PS+SS+TF-WeM	Atomic Layer Etching (ALE) and Low-Damage Processes I *Alok Ranjan, TEL Technology Center, America, LLC*
PS+AS+SS-WeA	Plasma Surface Interactions *Vincent Donnelly, University of Houston*
PS+TF-WeA	Plasma Deposition and Plasma Assisted ALD *Peter Awakowicz, Ruhr-University Bochum, Germany* *Richard van de Sanden, DIFFER*
PS+2D-ThM	Plasma Processing for 2D Materials *Li-Chyong Chen, National Taiwan Univ. Taiwan, Republic of China* *Daniil Marinov, LPP-CNRS, Ecole Polytechnique, France*
PS+AP+SE-ThA	Advanced Ion Implantation and Plasma Doping *Ty Prosa, CAMECA Instruments Inc.* *Anthony Renau, Applied Materials, Varian Semiconductor Equipment* *Hirokazu Ueda, Tokyo Electron Limited, Japan*
PS-ThA	Plasma Sources *Jes Asmussen, Michigan State University* *Neil Benjamin, Lam Research Corporation*
PS-ThP	Plasma Science and Technology Poster Session
PS+SE-FrM	Atmospheric Pressure Plasma Processing II *Steven Shannon, North Carolina State Univ.*
PS+SS+TF-FrM	Atomic Layer Etching (ALE) and Low-Damage Processes II *Olivier Joubert, LTM-CNRS, France* *Harmeet Singh, Lam Research Corporation*

SURFACE SCIENCE

SS provides a forum for cutting-edge research that involves solid surfaces and interfaces. Phenomena that take place at the gas-solid and liquid-solid interfaces are prominent within the Division programs. Technical sessions address atomistic, structural, electronic and chemical phenomena at surfaces and interfaces, their impact on materials properties, and their implication for technology and environmental processes. Surface Chemistry is an important divisional theme, encompassing the kinetics and dynamics of surface chemical events from adsorption and reaction to catalysis. Film and nanostructure growth is another key theme, explored from a fundamental perspective, through the development of new growth and processing methods for materials preparation. Surface chemical modification and photon-driven chemistry at surfaces are important concentrations. Lively sessions are devoted to the surface science of metallic, semiconductor, oxide and organic surfaces that support unique chemical activity and electronic properties. Surface science applications in high-impact areas — particularly energy science, microelectronics, nanotechnology, and environmental science — are highlighted in the program. This Division's overarching goal is to provide the atomistic insights on solid surfaces and interfaces needed to advance our understanding of materials systems and benefit society.

This year's surface science sessions will be highlighted by presentations from the 2014 Gaede-Langmuir Award Hajo Freund of the Fritz-Haber Institute, addressing the atomistics of complex materials as catalysts, and Charles Campbell of the University of Washington, the 2015 Medard W. Welch Award winner, discussing reaction steps on transition metal catalysts. In addition to co-sponsorship with other Divisions, Groups and Focus Topics, several SS sessions will be of broad interest to attendees. Tuesday morning's SS session on Nanoplasmonics complements NS's Tuesday afternoon and TF's Friday morning sessions. Those interested in the In-situ Focus Topic will want to join Wednesday morning's SS session addressing Ambient Surfaces and In-Operando Studies. The two SS sessions on Thursday focusing on Semiconductor Surfaces and Interfaces are particularly timely given the 50th anniversary of Moore's Law and the sessions of the Industrial Physics Forum that will be at the Symposium.

CODE	SESSION
SS+AS+EN-MoM	Synthesis, Structure and Characterization of Oxides *Matthias Batzill, Univ. of South Florida*
SS-MoA	Organics and Ionic Liquids: Surfaces, Layers, Interfaces and Chirality *Georg Held, University of Reading, UK* *Hans-Peter Steinrueck, Univ. Erlangen-Nurnberg, Germany*
SS+AS+EN+NS-TuM	Nanostructures, Nanoplasmonics and Surface Reactions *Sulio Linic, University of Michigan*
SS+AS+EN-TuM	Mechanistic Insight of Surface Reactions: Catalysis, ALD, etc. – I *Hajo Freund, Fritz Haber Institute of the Max Planck Society, Germany**
SS+AS+EN-TuA	Mechanistic Insight of Surface Reactions: Catalysis, ALD, etc. – II *Martin Sterrer, University of Graz, Austria*
SS+EN-TuA	Photocatalysis, Photochemistry, and Chirality at Surfaces *Hrvoje Petek, University of Pittsburgh*
SS-TuP	Surface Science Poster Session
SS+AS+NS-WeM	Nanostructures: Growth Reactivity & Catalysis *Steven Tait, Indiana University*
SS-WeM	Environmental Interfaces, Ambient Surfaces and In-Operando Studies *Hendrik Bluhm, Lawrence Berkeley Lab, University of California, Berkeley*
SS+AS+EN-WeA	Metals, Alloys & Oxides: Reactivity and Catalysis *Charles Campbell, Univ. of Washington** *Donna Chen, University of South Carolina*
SS+AS-WeA	Surface Dynamics, Non-Adiabaticity, and Single Molecule Phenomena *Marisol Alcantara Ortigoza, University of Central Florida*
SS+AS+EM+EN-ThM	Semiconductor Surfaces and Interfaces – I *Stacey Bent, Stanford University*
SS+AS+EM+EN-ThA	Atomistic Modeling of Surface Phenomena & Semiconductor Surfaces and Interfaces – II *William Schneider, Univ. of Notre Dame*

THIN FILM

The Thin Film Division 13 core oral sessions and one poster session. A broad range of outstanding invited speakers will touch on topics across the gamut of thin film science and technology. There are 6 sessions on atomic layer deposition (ALD), encompassing emerging applications, energy, nanoelectronics, thermoelectrics, 1- and 2D-applications, various manufacturing processes, precursor synthesis and properties, and growth characterization. These sessions highlight basic science and the pursuit of applications. We are also excited about the core sessions on Thin Films: growth and characterization, self-assembled and layer-by-layer growth. We have a session including Energetic thin films which covers thin films structures with stored chemical energy. We offer new sessions on Biological thin films, Magnetic thin films, Synchrotron radiation, Optical and other characterization of thin films. Various other sessions cover electronic applications and manufacturing processes. We are excited to offer students the possibility to present a 2–3 minute oral synopsis and introduction of their posters at the end of the Thursday Morning Session. For the third year, we will host a student-only session to highlight the Harper Award candidates in which the student finalists will present their work in an interactive "Shark Tank" type of Forum. This is an excellent opportunity for graduate and undergraduate students in the Thin Film area to get together informally for discussions and to provide feedback for the Harper Award presentations of their fellow students. Finally, the Thin Film Division is pleased to solicit nominations for a new award, the Founders' Thin Film Technologist Award.

CODE	SESSION
TF+AS+SS-MoM	Self-Assembled Monolayers, Layer-by-Layer, etc. *Cathleen Crudden, Queen's Univ., Canada*
TF+2D+MG+NS-MoA	ALD, CVD, MLD, and PLD on Special Materials *Adrienne Stiff-Roberts, Duke University* *Virginia Wheeler, U.S. Naval Research Lab.*
TF+EM+MI+MS-TuM	ALD for Alternative Devices *SangIn Lee, Veeco* *Ramakrishnan Rajagopalan, Pennsylvania State University*
TF-TuA	ALD for Emerging Applications *Yongfeng Mei, Fudan University, China*

*Gaede-Langmuir Award Winner

*Medard W. Welch Award Winner

TF+EN-WeM	ALD for Energy *Angel Yanguas-Gil, Argonne National Lab.*
TF+SS-WeM	ALD Surface Reactions and Precursors *Anu Mallikarjunan, Air Products and Chemicals, Inc.*
TF+AS+BI-WeA	Thin Films for Biological and Biomedical Applications *Mallika Kamarajugadda, Medtronic plc* *Francois Rossi, European Commission, Joint Research Centre (JRC), Italy*
TF+AS+EM+EN+MN-WeA	CV Infiltration Methods and Energetic and Thermal Properties of Thin Films *Troy Barbee Jr., Lawrence Livermorore National Laboratory* *Robert Davis, Brigham Young University* *Murali Narasimhan, Applied Materials, Inc.*
TF+AS+NS+SA-ThM	Thin Film: Growth and Characterization, Optical and Synchrotron Characterization I *Angelique Bousquet, Institut de Chimie de Clermont-Ferrand, France* *Jeffery Terry, Illinois Inst. of Technology*
TF+EM+NS+PS+SM-ThM	Plasma ALD and Nano-applications *Dennis Hausmann, Lam Research Corp.* *Harm Knoops, Oxford Instruments Plasma Technology, UK* *Veena Misra, NCSU*
TF+AS+NS+SA-ThA	Thin Film: Growth and Characterization, Optical and Synchrotron Characterization II
TF+PS-ThA	Thin Film Permeation Barriers and Membranes *Stuart Cogan, University of Texas at Dallas* *Hindrik de Vries, FOM institute DIFFER, The Netherlands*
TF-ThP	Thin Films Poster Session
TF+MI-FrM	Thin Films for Light Trapping, Plasmonic, and Magnetic Applications *Zhifeng Ren, University of Houston* *Dieter Weller, HGST a Western Digital company*

VACUUM TECHNOLOGY

The Vacuum Technology Division (VTD) encompasses the science of achieving, maintaining, analyzing, and measuring vacuum across many applications. Our core sessions feature Vacuum Measurement and Primary Standards (VT-MoM), Gas Dynamics and Modeling, Pumping and Outgassing (VT-TuA), Accelerator and Large Vacuum Systems (VT-WeM), Partial Pressure Analysis and Vacuum Quality Analysis and Control (VT-WeA). A very exciting new session showcases talks on Extreme High Vacuum (VT-MoA). Another special session is on Vacuum Suitcases and Particulate Control (VT-TuM), featuring all invited speakers.

Please plan to attend the VT Poster session Tuesday evening. It features a Student Poster Competition, with a $500 first place award, where students in any discipline are invited to share their innovative solutions to vacuum equipment challenges. Student presenter awards will also be given for the best presentations by students in the VT sessions.

Additionally, we are pleased to announce the second annual VT Early Career Award winner, Dr. J. Burst of National Renewable Energy Laboratory, who will present an invited talk in VT-TuM session.

During the symposium, we will host the annual VTD Business Meeting 4:40 on Monday Afternoon at the end of Extreme High Vacuum session. The VTD chair will highlight the activities conducted by the VTD over the past year, and solicit inputs for planning technical program for 63rd AVS Symposium from the members. We encourage all VTD members to join us in this important interaction between the officers and members.

VTD will again host the "Ask the Experts" booth, located in the exhibit area, where experienced vacuum scientists, engineers and technicians strive to answer perplexing vacuum technology questions.

CODE	SESSION
VT-MoM	Vacuum Measurement, Calibration, and Primary Standards *Paul Arnold, MKS Instruments, Inc., Granvillle-Phillips Product Center*
VT-MoA	Extreme High Vacuum
VT-TuM	Vacuum Suitcases and Particulate Control *Daniel Babbs, Brooks Automation* *James Burst, National Renewable Energy Lab.* *Paolo Michelato, Italian National Institute for Nuclear Physics (INFN), Italy* *David Pui, University of Minnesota*
VT-TuA	Gas Dynamics and Modeling, Pumping and Outgassing *Sergei Syssoev, Brooks Automation*
VT-TuP	Vacuum Technology Poster Session
VT-WeM	Accelerator and Large Vacuum Systems *Eshraq Al-Dmour, Max IV Laboratory*
VT-WeA	Vacuum Quality and Partial Pressure Analysis *Matthew S. Kowitt, Stanford Research Systems* *Jonathan Leslie, MKS Instruments Spectra Products, UK* *Ronald Vane, XEI Scientific Inc.*

FOCUS TOPICS

2D MATERIALS

The 2D Materials (2D) focus topic is a crosscutting AVS-wide interdisciplinary forum for discussion of fundamental science and novel applications of emerging 2D materials. Our program, spanning the entire week, offers a diverse set of 9 oral sessions complemented by a poster session, which are co-sponsored by several AVS Divisions and focus topics. The comprehensive review of state of the art will be presented in 18 invited talks and 50 contributed papers, discussing the world-wide efforts in exploring the fundamental properties of emerging 2-D materials, their growth, fabrication and characterization; mechanical, thermal, electronic, magnetic, and optical properties, emergent 2D materials, dopants, defects and heterostructures of 2D materials, surface chemistry, functionalization and sensor applications.

CODE	SESSION
2D+EM+NS+PS+SP+SS+TF-MoM	2D Materials: Growth and Fabrication *Joshua Goldberger, Ohio State University* *Arend van der Zande, University of Illinois at Urbana Champaign*
2D+EM+MC+MS+NS-MoA	2D Materials: Devices and Applications *Cory Dean, Columbia University* *Peide Ye, Purdue University*

2D+EM+NS+SS+TF-TuM	Optical and Optoelectronic Properties of 2D Materials *Thomas Mueller, Vienna Univ. of Tech., Austria* *Xiaobo Yin, University of Colorado Boulder*
2D+EM+MC+MI+NS+SP+SS+TF-TuA	Electronic and Magnetic Properties of 2D Materials *M. Zahid Hasan, Princeton University* *Feng Wang, Univ. of California at Berkeley* *Andrea Young, Univ. of Calif. at Santa Barbara*
2D+MN+NS+SP+SS+TF-WeM	Mechanical and Thermal Properties of 2D Materials *Zenghui Wang, Case Western Reserve Univ.*
2D+EM+IS+MC+NS+SP+SS-WeA	Dopants and Defects in 2D Materials *An-Ping Li, Oak Ridge National Lab.* *Oleg Yazyev, Ecole Polytechnique Fédérale de Lausanne (EPFL), Switzerland*
2D+EM+MG+NS+SE+SM+SS+TF-ThM	Emergent 2D Materials *Stefan Förster, Institute of Physics, Martin-Luther-Universität Halle-Wittenberg, 06120 Halle, Germany* *Michael Naguib, Oak Ridge National Lab.*
2D+EM+MG+NS+SS+TF-ThA	Heterostructures of 2D Materials *Judy Cha, Yale University* *Peter Sutter, Univ. of Nebraska – Lincoln*
2D-ThP	2D Materials Focus Topic Poster Session
2D+EM+IS+NS+PS+SP+SS-FrM	Surface Chemistry of 2D Materials: Functionalization, Membranes, Sensors *Patrick Soukiassian, CEA, France*

ACCELERATING MATERIALS DISCOVERY FOR GLOBAL COMPETITIVENESS

Worldwide, global competitiveness is being sought through materials innovation and a reduction in the time to production. Japan started the Funding Program for World-Leading Innovative R&D on Science and Technology (FIRST) in 2009. Singapore has funded a National Framework for Innovation and Enterprise. In Europe, materials are viewed as a key enabler for boosting industrial and technological growth. Materials design and innovation have been a central focus. In the United States, this effort is captured by Materials Genome Initiative (MGI) (http://www.whitehouse.gov/mgi). In the same way that the Human Genome Project accelerated a range of biological sciences by identifying and deciphering the basic building blocks of the human genetic code, MGI can accelerate our understanding of the fundamentals of material science, providing a wealth of practical information that entrepreneurs and innovators will be able to use to develop new products. The presentations associated with this focus topic discuss progress in integrating efforts in computation, data informatics and experimentation. For example, Jacqueline Cole (University of Cambridge, UK) will talk about rational design approaches suitable for discovering novel materials for dye sensitized solar cells, Altaf Karim (COMSATS Institute of Information Technology, Pakistan) will engage the audience in intelligent computational frame works that accelerate the discovery of catalysts for alternative fuels, while Andrew Rappe (University of Pennsylvania, USA) will focus on the controlled nanoscale patterning of Ti- and Mn-based perovskite type oxides for catalysis and light harvesting. In the same session, Eva Zurek (University of Buffalo, USA) will provide insights into the open-source evolutionary algorithm XtalOpt EA that her group has developed for crystal structure prediction. In another session, Mark Bradley (University of Edinburgh, UK) will talk about application of polymer microarray technology for bio-material discovery and Rampi Ramprasad (University of Connecticut, USA) will show how quantum mechanics based combinatorial searches of chemical space are used to identify polymer repeat units that could lead to desirable dielectric properties.

CODE	SESSION
MG+BI+MS+NS+TF-MoM	Development of Novel Materials *Jacqueline Cole, Univ. of Cambridge, UK* *Altaf Karim, COMSATS Institute of Information Technology, Pakistan* *Andrew Rappe, University of Pennsylvania* *Eva Zurek, University at Buffalo-SUNY*
MG+2D+MI+NS+TF-MoA	Design and Discovery (Bio and Other Interfaces) *Mark Bradley, University of Edinburgh, UK* *Rampi Ramprasad, Univ. of Connecticut*

ACTINIDES AND RARE EARTHS

Actinides and Rare Earths exhibit many unique and diverse physical, chemical and magnetic properties, due in large part to the complexity of their 5f and 4f electronic structure. These Special Topic Sessions will concentrate upon the chemistry, physics and material science in the Lanthanide and Actinide materials, driven by the 4f and 5f electronic structure. Particular emphasis will be placed upon the 4f/5f magnetic structure, surface science and thin film properties and their applications to energy related issues. For the actinides, fundamental actinide science and its role in resolving technical challenges posed by actinide materials will be stressed, particularly with regard to energy applications, including energy generation, novel nuclear fuels and structural materials, waste remediation and waste disposal. Both basic and applied experimental approaches, including synchrotron-radiation-based and neutron-based investigations, as well as theoretical modeling computational simulations, are to be part of the Special Sessions. Of particular importance are the issues connected to potential renaissance in Nuclear Energy, including fuel synthesis, oxidation, corrosion, intermixing, stability in extreme environments, prediction of properties via bench-marked simulations, separation science, environmental impact and disposal of waste products. Potentially, the shared sessions will be with MIND, Surface Science, Thin Films, Applied Surface Science, Synchrotron Radiation, and Energy Frontiers. This would be the 6th AC Focus Topic at the AVS Symposia. The previous ones were at Albuquerque (1), Nashville (2), Tampa (3), Long Beach (4) and Baltimore (5).

CODE	SESSION
AC+AS+MI-WeM	Magnetism, Complexity and Superconductivity in the Actinides and Rare Earths *Krzysztof Gofryk, Idaho National Lab.* *Marc Janoschek, Los Alamos National Lab.* *Evgeniya Tereshina, Institute of Physics ASCR, Czech Republic*
AC+AS+MI-WeA	Chemistry and Physics of the Actinides and Rare Earths *Albert Migliori, Los Alamos National Lab.* *David Shuh, Lawrence Berkeley Natl. Lab.* *Tonya Vitova, Karlsruhe Inst. of Tech., Germany*
AC+AS+MI-ThM	Nuclear Power and Waste Remediation *Melissa Denecke, Univ. of Manchester, UK* *Alexander I. Landa, Lawrence Livermore National Laboratory*
AC+AS+MI-ThP	AC Poster Session

ADDITIVE MANUFACTURING / 3D PRINTING

The new Focus Topic on Additive Manufacturing (also known as 3D Printing) is an AVS-wide interdisciplinary forum which will review the world wide effort in exploring the fundamental issues in the fabrication of parts which are not possible using conventional methods. The organizers of this Focus Topic assembled a broad coalition of scientists who strive to understand the scientific phenomena affecting the usage of metals, ceramics and polymers in future manufacturing, and to provide a forum to discuss the recent advances in the application of additive manufacturing. The Focus Topic will cover: applications, materials used, and processes employed. A session on Additive Fabrication for Electronic Devices and Systems is offered. The talks in this session will highlight past achievements in the field as well as future strategies.

CODE	SESSION
AM+EM+MS+ TF-WeM	Materials, Designs, and Applications of Additive Manufacturing *Ed Morris, NCDMM* *Michael W. Peretti, General Electric Aviation* *Ryan Wicker, University of Texas at El Paso* *Yaoyao Fiona Zhao, McGill Univ., Canada*
AM+EM+MS+ TF-ThM	Technologies Enabled by Additive Manufacturing/Future of Additive Manufacturing *Teresa Clement, Raytheon Company* *Tony DeCarmine, Oxford Performance Materials* *Phill Dickens, Univ. of Nottingham, UK, United Kingdom of Great Britain and Northern Ireland* *Douglas C. Hofmann, NASA Jet Propulsion Lab., California Institute of Technology*
AM+EM+MS+ TF-ThA	Additive Fabrication for Electronic Devices and Systems *Ana Claudia Arias, Univ. of Calif. at Berkeley* *Eugene Chow, Palo Alto Research Center (PARC)* *Michael McAlpine, University of Minnesota*
AM-ThP	Additive Manufacturing/3D Printing Poster Session

ATOM PROBE TOMOGRAPHY

Atom Probe Tomography (APT) is an evolving technique based on a combination of atomic-resolution field ion microscopy and time of flight mass spectrometry that can provide quantitative three-dimensional compositional imaging and analysis of a volume that is approximately 100 x 100 x 500 nm^3 with a spatial resolution of approximately 0.2 nm. In effect, APT provides the position and identification of atoms (isotopes) within an analyzed volume with analytical detection sensitivity in the 1 part-per-million range. Despite its destructive nature, APT excels where most of the other techniques fail with (chemical/elemental) sensitivity close to other surface analysis techniques such as SIMS and Auger analysis, as well as spatial (structural/atomic) resolution close to high resolution transmission electron microscopy with a significantly higher field-of-view. This unique capability, combined with correlative electron microscopy, is helping to understand phenomena such as grain boundary segregation and diffusion, materials degradation and failure, microstructural evolution, defect migration and cluster formation, and nucleation and growth of materials with buried interfaces through 3D chemical imaging. This technique has been extensively used to understand 3D structures in metals and new developments in incorporating pulsed laser assisted evaporation helps extend the use of the technique to more insulating materials such as oxides and ceramics. Even more recently, APT is being applied to further to understand geological and biological materials with significantly complicated structure and chemical features. The organizers of this Focus Topic symposium seek to bring together a broad coalition of scientists who apply 3D APT to understand interfacial and nanoscale science phenomena in metals, semiconductors, insulators and soft materials, as well as to provide a forum to discuss the recent advances in the application of APT. This discussion will be facilitated by highlighting past achievements in the field and by discussing current experimental results along with the future developments.

CODE	SESSION
AP+AS+MC+ MI+NS-MoM	Atom Probe Tomography of Nanomaterials *Dieter Isheim, Northwestern University* *C.-G Park, Pohang University of Science and Technology (POSTECH), National Institute for Nanomaterials Technology (NINT), Republic of Korea* *Lorenzo Rigutti, University of Rouen* *Taisuke Sasaki, National Institute for Materials Science (NIMS), Japan*
AP+AS-MoA	Current and New Research Fields for Applications of Atom Probe Tomography *Sophie Primig, University of New South Wales, Australia* *Mattias Thuvander, Chalmers University of Technology, Sweden*
AP+AS-TuM	New Applications of Atom Probe Tomography *Stephan Gerstl, ETH Zürich, Switzerland* *Daniel Schreiber, Pacific Northwest Natl. Lab.*
AP-TuP	Atom Probe Tomography Poster Session

ENERGY FRONTIERS

The Energy Frontiers Focus Topic provides a forum for interdisciplinary, cutting-edge research centered on energy conversion and storage. This year's agenda focuses on solar energy conversion, including both photovoltaics and photocatalysis, as well as energy storage using batteries and supercapacitors. All abstracts related to these topics will be considered. Emphasis is on fundamental and applied research related to surfaces, interfaces, materials, and devices for energy conversion and storage. Experimental, theoretical, and computational studies are welcome. The Energy Frontiers Focus Topic will host four oral sessions and one poster session. "Solar cells" includes thin film, crystalline Si, and nanostructured varieties, with particular interest in emerging materials such as CZTSSe and perovskites. "Photocatalysis" includes all solar fuels, especially photoelectrochemical and photocatalytic hydrogen production by water splitting. "Batteries and Supercapacitors" includes applications in Li-based and non-Li charge storage devices. The EN program features oral sessions on each of these topics as well as a poster session encompassing all areas of energy conversion and storage. EN also co-sponsors 14 energy-related sessions hosted by the EMPD, IS, NSTD, SE, SS, and TF Divisions and Focus Topics. Highlights of the Energy Frontiers program will include talks by renowned invited speakers from academia, industry, and national laboratories.

CODE	SESSION
EN+AS+EM+ NS+SE+SS+TF-MoM	Solar Cells I *Kaushik Roy Choudhury, DuPont*

EN+AS+EM+ NS+SE+SS+TF-MoA	Solar Cells II *Michael McGehee, Stanford University*
EN+AS+EM+ SE+SS-TuM	Photocatalysis *Joel Ager, Lawrence Berkeley National Lab.* *Thomas Jaramillo, Stanford University*
EN+EM+NS+ SE+SS+TF-TuA	Batteries and Supercapacitors *Marca Doeff, Lawrence Berkeley Natl. Lab.* *Alexander Kozen, University of Maryland, College Park* *Debra Rolison, U.S. Naval Research Lab.*
EN-TuP	Energy Frontiers Poster Session

HELIUM ION MICROSCOPY

The Focus Topic on Helium Ion Microscopy (HIM) provides a forum for scientists working with Gas Field Ion Source (GFIS) Microscopes and those interested in its prospects and capabilities. An HIM is capable of imaging conductive as well as insulating samples without special treatment at nanometer resolution. Alternatively, using Neon instead of Helium gas during GFIS operation, nanostructures can be engineered with unprecedented precision and reduced collateral damage. The focus topic covers all aspects of science currently explored with the HIM. Special emphasis will be given to the development of analytic additions such RBS and SIMS. There will be an subsession on other Focused Ion Beam (FIB) techniques that broadens the range of ion sources discussed and allows for a more complete overview on the field of ion beam based nano modification. Finally classic semiconductor applications as well as new alternative device concepts realized with the help of GFIS sources will be presented. A Poster session will be held to present the newest results in the field and allow for a more detailed presentation of the findings.

CODE	SESSION
HI+AS+SS+ NS-ThM	Focused Ion Beam technology (08:00–10:00)/ Fundamentals of Helium Ion Microscopy (11:00–12:20) *Chad Rue, FEI Company* *Tom Wirtz, Luxembourg Institute of Science and Technology (LIST), Luxembourg*
HI+AS+NS-ThA	Imaging and Milling with He and Ne Ion Beams *Shane Cybart, Univ. of California San Diego* *Shida Tan, Intel Corporation*
HI-ThP	Aspects of Helium Ion Microscopy Poster Session

IN-SITU SPECTROSCOPY AND MICROSCOPY

Exploration of material structure and chemistry under real conditions using different spectroscopic and microscopic techniques is critical for correlating material structure and chemistry to functions they perform toward scalable and predicative materials, catalysis, and energy storage. This focused symposium presents current capabilities of in situ characterization techniques, new structure and chemistry revealed with these in situ tools, and progress in new microscopic and spectroscopic techniques.

Topics of particular interest include:

- Fundamental studies of surface chemistry of single crystal and nanomaterials under reaction conditions
- Ambient pressure X-ray photoelectron spectroscopy studies for catalytic and energy materials in the gas phase
- X-ray absorption spectroscopy and chemical and structural information of materials under reaction condition
- In situ studies of solid-liquid interface
- Environmental TEM studies for catalytic and energy materials
- In situ studies using X-ray absorption spectroscopy and vibrational spectroscopy for catalytic and energy materials.

CODE	SESSION
IS+AS+SS-MoM	Fundamental Studies of Surface Chemistry of Single Crystal and Nanomaterials under Reaction Conditions *Fabio Ribeiro, Purdue University* *Gabor Somorjai, Univ. of Calif., Berkeley*
IS+AS+SA+SS-MoA	Ambient Pressure X-ray Photoelectron Spectroscopy Studies for Catalytic and Energy Materials in Gas Phase *Miquel Salmeron, Lawrence Berkeley National Laboratory* *Robert Schlögl, Fritz-Haber-Institut der Max-Planck-Gesellschaft, Germany*
IS+AS+SA+SS-TuM	In-situ Studies of Solid-liquid Interfaces *Peng Chen, Cornell University* *John Hemminger, Univ. of California, Irvine*
IS+AS+SS-TuA	Environmental TEM Studies for Catalytic and Energy Materials *Peter Crozier, Arizona State University* *Seiji Takeda, Osaka University, Japan* *Zili Wu, Oak Ridge National Laboratory*
IS-TuP	In-Situ Spectroscopy and Microscopy Poster Session
IS+AS+SA+SS-WeM	In-situ Studies Using X-ray Absorption Spectroscopy and Vibrational Spectroscopy for Catalytic and Energy Materials *Miguel A. Bañares, Instituto de Catálisis y Petroleoquímica, Madrid* *Anatoly Frenkel, Yeshiva University*
IS+SS+NS+BI+ VT+MN+AS-WeA	In situ Imaging of Liquids using Microfluidics *James Evans, Pacific Northwest Natl. Lab.* *Bernd Winter, Helmholtz-Zentrum Berlin für Materialien und Energie/Elektronen-speicherring BESSY II, Germany*

IPF ON MESOSCALE SCIENCE AND TECHNOLOGY OF MATERIALS AND METAMATERIALS

The topic of the IPF is Mesoscale Science and Technology of Materials and Metamaterials, and is the sixth IPF jointly sponsored by the American Institute of Physics and AVS since 2006. The IPF's focus on emerging topics in the applied physical sciences of interest to corporate and non-academic researchers. Traditionally the IPF's program consists of only invited talks in a range of topics of some communality, followed by the Frontiers in Physics session that addresses recent major advances in the sciences regardless of topic. Mesoscale science concepts apply to virtually all physical and biological sciences. The selection of topics offered at this year's IPF reflects areas of research and technology of interest to the attendees of the AVS International Symposium. Specifically, the selected topics of the 15 invited talks on mesoscale science cover the areas of Energy Storage and Generation, Biological Systems, Metamaterials, Degradation Sciences and Electrochemistry. The Frontiers in Physics session on Tuesday afternoon consists of five varied talks by world class researchers covering the fields of engineered bio-fabrication, in-vivo nanoscale sequential imaging of biomechanical processes, frontiers in ocean sensing, novel

quasiparticle and spin related phenomena in solids and the quest for Einstein's gravitational waves.

Mesoscale science encompasses the domain where a physical description in terms of macroscopic classical concepts becomes inadequate and where a description in terms of the discreet atomic nature of materials and structures fails because of system complexity in terms of component heterogeneity and component size. The goal of mesoscale technology is to harness the wealth of variables in composition, chemical bonding, dimensionality, size and architecture to create structures of predetermined functionality that not only can supplant existing technologies, but create structures and devices with new capabilities for diverse applications. Included here are the synthetic solids referred to as metamaterials, assemblies of equivalent multi-atomic units which functionally assume a role analogous to those of individual atoms in regular solids, but collectively exhibit new properties and functionalities. The realization of the full potential of mesoscale devices and structures requires not only innovation in synthesis and assembly of multi-atomic elements at various hierarchical levels, but also further refinements in and development of new diagnostic tools, as well as substantial advances in theoretical and computational methods with acceptable predictive capabilities. Many of these challenges are reflected in the talks of this year's IPF.

CODE	SESSION
IPF+MS-MoM	Materials for Energy Generation and Storage (8:20–10:20 am) & Mesoscale Phenomena in the Biosciences I (10:40 am–12:00 pm) *Anna C. Balazs, University of Pittsburgh* *William Bentley, Fischell Department of Bioengineering, University of Maryland* *William Carter, HRL Laboratories, LLC* *SangBok Lee, Univ. of Maryland, College Park* *Eli Yablonovitch, Univ. of California, Berkeley*
IPF+MS-MoA	Mesoscale Phenomena in the Biosciences II (2:20–3:40 pm) & Metamaterials (3:40–5:40 pm) *Federico Capasso, Harvard University* *Nader Engheta, University of Pennsylvania* *Tony Heinz, Stanford University* *Elizabeth Loboa, UNC-Chapel Hill & NC State University* *Gerry McDermott, University of California, San Francisco*
IPF+MS-TuM	Degradation Science (8:00–10:00 am) & Electrochemistry from Nano to Meso Scale (11:00 am–12:20 pm) *Paul Braun, Univ. of Ill. at Urbana-Champaign* *Roger French, Case Western Reserve Univ.* *Kristin A. Persson, Lawrence Berkeley Natl. Lab.* *Anthony Rollett, Carnegie Mellon University* *Henry White, University of Utah*
IPF+MS-TuA	Frontiers in Physics *Susan K. Avery, Woods Hole Oceanographic Institution* *Angela Belcher, MIT Koch Institute for Integrative Cancer Research* *Joel Moore, University California, Berkeley* *John Spence, Arizona State University* *Michael Zucker, Massachusetts Inst. of Tech.*

MATERIALS CHARACTERIZATION IN THE SEMICONDUCTOR INDUSTRY

The rapidly changing landscape in semiconductor device fabrication is continually pushing the frontiers of materials characterization. Some examples of these changes, albeit limited to CMOS based logic devices include: a) incorporation of strained Si technology, b) introduction of new materials such as III-V materials, HK-MGs, etc., c) the movement from planar to 3D structures, etc. With the continual miniaturization and move away from planar structures toward 3D structures comes the increased complexity in satisfying the ever increasing characterization needs.

This Focus Topic is aimed at the latest characterization methods and/or instrumentation in use or being developed to satisfy these characterization needs. Examples include; a) new instrumentation whether implemented or being developed, b) new sample preparation protocols, c) development of "hybrid approaches", i.e. the use of multiple characterization techniques that can provide information beyond the capabilities of the individual techniques alone, to d) the fabrication of new micron-scale test structures that more effectively mimic the nano-scale regions of interest.

CODE	SESSION
MC-TuM	Characterization of 3D Structures *Kenneth Burch, Boston College* *Zhiyong Ma, Intel Corporation* *Jean-Luc Rouviere, CEA-Univ. Grenoble Alps, France*
MC-TuP	Materials Characterization in the Semiconductor Industry Poster Session (All areas)

NOVEL TRENDS IN SYNCHROTRON AND FEL-BASED ANALYSIS

The purpose of this topical session is to provide a forum for discussing recent developments in the characterization of material properties employing synchrotron and free electron laser radiation. The advancements involve unprecedented space, spectral and time resolution that can be achieved with ultrabright and tunable light in the X-ray, VUV or IR range. The three oral sub-sessions will focus on a few selected fields where this has led to important breakthroughs, namely in imaging and nanodiffraction, in magnetic dynamics, as well as generated new insights in correlated materials, organic materials and 2D solids.

CODE	SESSION
SA-MoM	Imaging and Nanodiffraction (8:20–10:00 am) & Novel Insights in Correlated Materials, Organic Materials and 2D Solids (10:40 am–12:00 pm) *Gerhard Gruebel, Magnetic Dynamics, Germany* *Adam Hitchcock, McMaster University, Canada* *Alex Reid, SLAC National Accelerator Laboratory* *Gijs van der Schot, Uppsala University, Sweden*
SA-MoA	New Insights in Correlated Materials, Organic Materials and 2D Solids *Satoshi Kera, Institute for Molecular Science, Japan* *Alessandra Lanzara, Univ. of California, Berkeley* *Fulvio Parmigiani, Elettra-Sincrotrone Trieste, Italy* *Robert Schoenlein, Lawrence Berkeley National Lab.*

SCANNING PROBE MICROSCOPY

The scanning probe microscopy (SPM) field has provided a family of techniques that have revolutionized our understanding of nanoscale interfacial phenomena. Now comprised of more than 20 different types of microscopy, the field has provided advanced tools that are able to image, manipulate and interrogate the functionality of surface features to the level of individual molecules and atoms. Such tools underpin the research activities encompassed by many AVS divisions. This focus topic will provide a forum for the discussion of the latest

advances and novel applications made in the SPM field. Areas of particular interest include approaches to improve imaging capability, the acquisition of probe-sample interaction data, and the novel and emerging applications in physical and chemical functional imaging. These interests are reflected through invited and contributed presentations in 5 key areas, namely: (1) Advances in Scanning Probe Microscopy, (2) Probe-Sample Interactions, (3) Electronic and Transport Properties, (4) Chemical Reactions at the Nanoscale, and (5) Material Growth on the Surface.

CODE	SESSION
SP+AS+NS+SS-WeM	Advances in Scanning Probe Microscopy *Keji Lai, University of Texas at Austin* *Hari Manoharan, Stanford University*
SP+2D+AS+NS+SS-WeA	Probing Electronic and Transport Properties *Young Kuk, Seoul National University, Republic of Korea* *Brian LeRoy, University of Arizona*
SP+AS+NS+SS-ThM	Probing Chemical Reactions at the Nanoscale *Xiaoqing Pan, Univ. of California, Irvine* *Bilge Yildiz, Massachusetts Inst. of Tech.*
SP+BI+NS+SS+TF-ThA	Probing Material Growth on the Surface *Zheng Gai, Oak Ridge National Laboratory* *Pengpeng Zhang, Michigan State Univ.*
SP-ThP	Scanning Probe Microscopy Poster Session
SP+AS+MI+NS+SS-FrM	Probe-Sample Interactions *Daniel Rugar, IBM Research Division* *Weida Wu, Rutgers University*

SELECTIVE DEPOSITION AS AN ENABLER OF SELF-ALIGNMENT

With the realization that pattern placement will limit scaling long before devices and interconnects fail to perform intrinsically, the AVS continues to sponsor a focus topic aimed at providing a state -of-the-art perspective of self-alignment techniques. Advanced lithographic techniques in combination with self-alignment strategies such as selective deposition have the potential of providing both continued dimensional scaling and accurate pattern placement. Researchers from academia and industry will present their work on the selective deposition of inorganic and organic thin films. Themes include selective atomic layer/chemical vapor/molecular layer deposition (w/ a special emphasis on inherently selective precursor development), selective poisoning, activation and acceleration schemes for deposition and etch, tunable incubation and inhibition strategies, fault tolerance for pattern replication techniques, geometric selectivity of deposition (e.g. conformality vs. bottom-up fill behavior) and modeling techniques aimed at evaluating the fundamental drivers for selectivity.

CODE	SESSION
SD+AS+EM-ThM	Fundamentals of Selective Deposition *Roy Gordon, Harvard University* *Charles Winter, Wayne State University*
SD+AS+EM+PS-ThA	Process Development for Selective Deposition and Self-aligned Patterning *Florian Gstrein, Intel Corporation* *Suvi Haukka, ASM Microchemistry Ltd., Finland*
SD-ThP	SD: Selective Deposition as an Enabler of Self-Alignment Poster Session

SPECTROSCOPIC ELLIPSOMETRY

For the 7th year in a row, the AVS International Symposium will host the Spectroscopic Ellipsometry Focus Topic in 2015. The Spectroscopic Ellipsometry Focus Topic is synergistically supported by the transversal, yet complementary themes of material science and characterization, physics and chemistry principles at the basis of surface modification and (thin) film growth and novel fields of application. In 2015 the Spectroscopic Ellipsometry Focus Topic will host two oral and one poster session with outstanding invited and contributed presentations. The first oral session will feature contributions dedicated to novel applications and theoretical approaches of Spectroscopic Ellipsometry including the development of new instrumentation as well as recent advances in the use of Ellipsometry for the characterization of organic and biological materials. This session will host invited talks by Prof. B. Drevillon, Ecole Polytechnique on "Multi-Spectral Polarimetric Imaging and Biomedical Applications" and by Prof. Gang Jin, Chinese Academy of Sciences on "Biosensor based on Imaging Ellipsometry and its Biomedical Applications." The second oral session will focus on the characterization of Nanostructures and Metamaterials using Ellipsometry and also include classical Spectroscopic Ellipsometry research and application areas like optical coatings and inorganic thin films. This oral session will feature one invited talk by Dr. V. Kamineni, GlobalFoundries on "Spectroscopic Ellipsometry for Critical Dimensions Analysis." At the end of the session the SE FT student award for Outstanding Contributions to the Field of Spectroscopic Ellipsometry which is sponsored by the J.A. Woollam Co., Inc. will be presented to a graduate student or young postdoc.

CODE	SESSION
EL+EM+EN-ThM	Spectroscopic Ellipsometry: Novel Applications and Theoretical Approaches *Bernard Drevillon, LPICM-CNRS, Ecole Polytechnique, France* *Gang Jin, Institute of Mechanics, Chinese Academy of Sciences, China*
EL+AS+BI+EM-ThA	Optical Characterization of Nanostructures and Metamaterials *Vimal Kamineni, GLOBALFOUNDRIES*
EL-ThP	Spectroscopic Ellipsometry Poster Session

SURFACE MODIFICATION OF MATERIALS BY PLASMAS FOR MEDICAL PURPOSES

Plasma processing is an ideal way to either create new or modify existing material surfaces for use in various applications, including medicine. In the Focus Topic "Surface Modification of Materials by Plasmas for Medical Purposes Focus Topic," plasma processing of biomaterials, pharmaceuticals, and living organisms, including human bodies, for biomedical and therapeutic applications is discussed. There are two major topical categories in this Focus Topic. One is concerned with plasma synthesis or modification of biomaterials and pharmaceuticals and the other is concerned with the use of plasmas as direct therapeutics, including treating infected tissue, wound healing, and cancer treatment, among many others. The former covers the chemistry of biomaterial surfaces and biological molecules, biointerfaces, and efficacy of medical devices that are made or modified via plasma processes. The latter covers a field known as plasma medicine, in which biological reactions in living organisms triggered by plasma generated chemically reactive species are discussed. Latest interests in these categories include plasma polymerization and surface modification to increase biocompatibility of materials, plasma processes

to create antimicrobial surfaces, biomimetic materials, 3D cell scaffolds, etc., plasma-liquid interaction, plasma-enhanced chemical reactions in liquid, and plasma-cell or tissue interaction. All sessions are co-sponsored by Applied Surface Science (AS), Biointerfaces (BI), and Plasma Science and Technology (PS).

CODE	SESSION
SM+AS+BI+PS-ThM	Plasma Processing of Biomaterials *Salvador Borros, Institut Químic de Sarrià, Ramon Llull University, Barcelona, Spain* *Masaaki Nagatsu, Shizuoka Univ., Japan* *Jean-Michel Pouvesle, GREMI CNRS/ Université d'Orléans, France*
SM+AS+BI+PS-ThA	Plasma Processing of Biomaterials and Biological Systems *Cristina Canal, Technical University of Catalonia, Spain* *Hans Griesser, Univ. of South Australia* *Kevin Healy, Univ. of California at Berkeley* *Mark Kushner, University of Michigan*
SM-ThP	Surface Modification of Materials by Plasmas for Medical Purposes Poster Session

TRIBOLOGY

The 2015 Tribology Focus Topic will feature sessions on nanoscale wear with applications in nano-metrology and nano-manufacturing, molecular origins of friction, lubricants and coatings, and friction in biological systems. Sessions are jointly sponsored by the Applied Surface Science (ASSD) Division, Thin Films (TF), Nanometer-scale Science and Technology (NSTD), and Biointerfaces (BI). Presentations will carry a materials focus in areas such as thin film deposition, solid lubricants, nanocomposites designed for tribological function, self-healing interfaces, wear-resistant polymers, and biomaterials. Contributions will consider advances in in-situ, molecularly specific, spatially resolved approaches to the quantitative characterization of tribological interfaces as well as accounts of numerical computation and molecular modeling of tribological materials and biomaterials. We have an exciting group of invited speakers including David Burris (U. Delaware) who will give a talk on cartilage tribology, James Batteas (Texas A&M) who will discuss friction in atomically thin films, and Ernst Meyer (Basel University) who will present his work on single molecule tribology. Other invited speakers include Rob Carpick, Ashlie Martini, Michael Chandross, Martin Dienwiebel and Rowena Crockett. In addition to the four oral sessions, we will have a poster session, which will provide an opportunity for personal exchange and discussion of results with colleagues.

CODE	SESSION
TR+TF-ThM	Nanolubricants and Coatings *Michael Chandross, Sandia National Labs.* *Martin Dienwiebel, Karlsruhe Institut for Technology (KIT), Germany*
TR+AS+NS+SS-ThA	Molecular Origins of Friction *Ashlie Martini, Univ. of California Merced* *Rémy Pawlak, Univ. of Basel, Switzerland*
TR-ThP	Tribology Poster Session
TR+AS+BI+NS-FrM	Nanoscale Wear and Biotribology *James Batteas, Texas A&M University* *David Burris, University of Delaware* *Robert W. Carpick, Univ. of Pennsylvania* *Rowena Crockett, Empa, Switzerland*

SESSION OVERVIEW

Symposium Plenary Lecture

Mon. 12:15 p.m. Room 210G
"Electronic Materials Research and Development for Future Computation and System-On-Chip Applications" Robert Chau, Intel Corporation

Advanced Surface Engineering

Mon.	AM	Room 212A	Nanostructured Thin Films and Coatings
Mon.	PM	Room 212A	Thin Film Technologies for Energy Storage, Conversion and Harvesting
Tue.	AM	Room 212A	Atmospheric Pressure Plasmas, CVD and Other Deposition Methods
Tue.	PM	Room 212A	Pulsed Plasmas in Surface Engineering
Tue.	PM	Room Hall 3	Advanced Surface Engineering Poster Session

Applied Surface Science

Mon.	AM	Room 212D	Quantitative Surface Analysis: Obtaining Quantitative Information in the Face of Material Complexity and Morphology Influences
Mon.	PM	Room 212D	Practical Surface Analysis I: Interpretation Challenges
Tue.	AM	Room 212D	Chemical/Molecular Information from Sub-micron Features and Materials
Tue.	PM	Room 212D	Challenges in the Characterization of Polymer/Organic/ Biological Systems
Wed.	AM	Room 212D	Practical Surface Analysis II: Influence of Sample Preparation and Novel Sample Prep Techniques
Wed.	PM	Room 212D	Characterization of Buried Interfaces
Thu.	AM	Room 212D	Practical Surface Analysis III: Multiple-technique Problem-solving and Structure-property Correlations
Thu.	PM	Room 212D	Advances in 2D Chemical Mapping and Data Analysis
Thu.	PM	Room Hall 3	Applied Surface Science Poster Session

Biomaterial Interfaces

Mon.	AM	Room 211D	Characterization of Biological and Biomaterials Surfaces (1)
Mon.	PM	Room 211D	Characterization of Biological and Biomaterials Surfaces (2)
Tue.	PM	Room 211D	Cells and Microorganisms at Surfaces
Tue.	PM	Room Hall 3	Biomaterial Interfaces Poster Session
Wed.	AM	Room 211D	Biomolecules at Interfaces
Wed.	PM	Room 211D	Biophysics, Membranes and Nanoscale Biological Interfaces

Biomaterials Plenary Session

Sun.	PM	Room 211D	Biomaterials Plenary Session

Electronic Materials and Processing

Mon.	AM	Room 211A	Rectenna Solar Cells, MIM Diodes, and Oxide Interfaces
Mon.	AM	Room 210E	More Moore! Materials and Processes to Extend CMOS Another Decade
Mon.	PM	Room 211A	MIM Diodes, Functional Oxides, and TFTs
Mon.	PM	Room 210E	More Moore! II
Tue.	AM	Room 210E	Beyond CMOS: Materials and Devices for a Post CMOS Era
Tue.	PM	Room 210E	More than Moore: Novel Approaches for Increasing Integrated Functionality
Tue.	PM	Room Hall 3	Electronic Materials and Processing Poster Session
Wed.	AM	Room 210E	Beyond CMOS: Resistive Switching Devices
Wed.	PM	Room 211C	Surface and Interface Challenges in Wide Bandgap Materials
Wed.	PM	Room 210E	Interconnects: Methods and Materials for Removing Connectivity Constraints
Thu.	AM	Room 210E	III-N Nitrides for Optoelectronic Applications
Thu.	AM	Room 211C	Interconnects II
Thu.	PM	Room 211C	Materials for Light Management
Thu.	PM	Room 210E	III-N Nitrides II
Fri.	AM	Room 211C	Nanoparticles for Electronics and Photonics

Magnetic Interfaces and Nanostructures

Tue.	AM	Room 230A	Oxides, Fluorides, and Spin Structures
Tue.	PM	Room 230A	Spin Currents, Spin Textures and Hybrid Magnetic Structures
Tue.	PM	Room Hall 3	Magnetic Interfaces Poster Session

Manufacturing Science and Technology

Tue.	PM	Room 114	Working with National Labs and User Facilities
Tue.	PM	Room Hall 3	Aspects of Manufacturing Science and Technology Poster Session

MEMS and NEMS

Tue.	AM	Room 211A	Multiscale Phenomena & Interactions in Micro- and Nano-Systems (8:00–10:00 am) & Optical MEMS/NEMS, Photonics, and Quantum Nanosystems (11:00 am–12:20 pm)
Tue.	PM	Room 211A	BioMEMS/NEMS, Wearable and Implantable Devices
Wed.	AM	Room 211A	Emerging Materials & Fabrication Technologies toward Scalable & Additive Nanomanufacturing I
Wed.	PM	Room 211A	Emerging Materials & Fabrication Technologies toward Scalable & Additive Nanomanufacturing II
Thu.	AM	Room 210B	Atomic Layer Nanostructures and 2D NEMS

Nanometer-scale Science and Technology

Mon.	AM	Room 212B	Nanotools and Nanodevices
Mon.	PM	Room 212B	Optical Spectroscopy at the Nanoscale
Tue.	AM	Room 212B	Nanoscale Imaging and Materials Characterization
Tue.	PM	Room 212B	Nanophotonics, Plasmonics, and Energy
Tue.	PM	Room Hall 3	Nanometer-scale Science and Technology Poster Session
Wed.	AM	Room 212B	Nanodiamond for Optical and Biomedical Applications
Wed.	PM	Room 212B	Nanoscale Catalysis and Surface Chemistry
Thu.	AM	Room 212B	Nanopatterning and Nanolithography/ Nanoscale Mechanics

Plasma Science and Technology

Mon.	AM	Room 210A	Atmospheric Pressure Plasma Processing I
Mon.	AM	Room 210B	Advanced FEOL/Gate Etching
Mon.	PM	Room 210B	Directed Self Assembly and Plasma Synthesis of Novel Materials

SESSION OVERVIEW

Mon.	PM	Room 210A	Plasma Diagnostics, Sensors and Control I
Tue.	AM	Room 210A	Plasmas for Medicine and Biological Applications
Tue.	AM	Room 210B	Advanced BEOL/Interconnect Etching
Tue.	PM	Room 210A	Novel Materials and Etch Chemistry
Tue.	PM	Room 210B	Plasma Modeling
Wed.	AM	Room 210B	Plasma Diagnostics, Sensors and Control II
Wed.	AM	Room 210A	Atomic Layer Etching (ALE) and Low-Damage Processes I
Wed.	PM	Room 210B	Plasma Surface Interactions
Wed.	PM	Room 210A	Plasma Deposition and Plasma Assisted ALD
Thu.	AM	Room 210A	Plasma Processing for 2D Materials
Thu.	PM	Room 210B	Advanced Ion Implantation and Plasma Doping
Thu.	PM	Room 210A	Plasma Sources
Thu.	PM	Room Hall 3	Plasma Science and Technology Poster Session
Fri.	AM	Room 210A	Atmospheric Pressure Plasma Processing II
Fri.	AM	Room 210B	Atomic Layer Etching (ALE) and Low-Damage Processes II

Surface Science

Mon.	AM	Room 113	Synthesis, Structure and Characterization of Oxides
Mon.	PM	Room 113	Organics and Ionic Liquids: Surfaces, Layers, Interfaces and Chirality
Tue.	AM	Room 112	Nanostructures, Nanoplasmonics and Surface Reactions
Tue.	AM	Room 113	Mechanistic Insight of Surface Reactions: Catalysis, ALD, etc. – I
Tue.	PM	Room 113	Mechanistic Insight of Surface Reactions: Catalysis, ALD, etc. – II
Tue.	PM	Room 112	Photocatalysis, Photochemistry, and Chirality at Surfaces
Tue.	PM	Room Hall 3	Surface Science Poster Session
Wed.	AM	Room 113	Nanostructures: Growth Reactivity & Catalysis
Wed.	AM	Room 112	Environmental Interfaces, Ambient Surfaces and In-Operando Studies
Wed.	PM	Room 113	Metals, Alloys & Oxides: Reactivity and Catalysis
Wed.	PM	Room 112	Surface Dynamics, Non-Adiabaticity, and Single Molecule Phenomena
Thu.	AM	Room 113	Semiconductor Surfaces and Interfaces – I
Thu.	PM	Room 113	Atomistic Modeling of Surface Phenomena & Semiconductor Surfaces and Interfaces – II

Thin Film

Mon.	AM	Room 111	Self-Assembled Monolayers, Layer-by-Layer, etc.
Mon.	PM	Room 111	ALD, CVD, MLD, and PLD on Special Materials
Tue.	AM	Room 111	ALD for Alternative Devices
Tue.	PM	Room 111	ALD for Emerging Applications
Wed.	AM	Room 111	ALD for Energy
Wed.	AM	Room 114	ALD Surface Reactions and Precursors
Wed.	PM	Room 114	Thin Films for Biological and Biomedical Applications
Wed.	PM	Room 111	CV Infiltration Methods and Energetic and Thermal Properties of Thin Films
Thu.	AM	Room 111	Thin Film: Growth and Characterization, Optical and Synchrotron Characterization I
Thu.	AM	Room 114	Plasma ALD and Nano-applications
Thu.	PM	Room 111	Thin Film: Growth and Characterization, Optical and Synchrotron Characterization II
Thu.	PM	Room 114	Thin Film Permeation Barriers and Membranes
Thu.	PM	Room Hall 3	Thin Films Poster Session
Fri.	AM	Room 111	Thin Films for Light Trapping, Plasmonic, and Magnetic Applications

Vacuum Technology

Mon.	AM	Room 230B	Vacuum Measurement, Calibration, and Primary Standards
Mon.	PM	Room 230B	Extreme High Vacuum
Tue.	AM	Room 230B	Vacuum Suitcases and Particulate Control
Tue.	PM	Room 230B	Gas Dynamics and Modeling, Pumping and Outgassing
Tue.	PM	Room Hall 3	Vacuum Technology Poster Session
Wed.	AM	Room 230B	Accelerator and Large Vacuum Systems
Wed.	PM	Room 230B	Vacuum Quality and Partial Pressure Analysis

Exhibitor Technology Spotlight

Tue.	AM	Exhibit Hall 1	Exhibitor Technology Spotlight Session
Tue.	PM	Exhibit Hall 1	Exhibitor Technology Spotlight Session
Tue.	PM	Exhibit Hall 1	Exhibitor Technology Spotlight Session
Wed.	AM	Exhibit Hall 1	Exhibitor Technology Spotlight Session
Wed.	PM	Exhibit Hall 1	Exhibitor Technology Spotlight Session

2D Materials Focus Topic

Mon.	AM	Room 212C	2D Materials: Growth and Fabrication
Mon.	PM	Room 212C	2D Materials: Devices and Applications
Tue.	AM	Room 212C	Optical and Optoelectronic Properties of 2D Materials
Tue.	PM	Room 212C	Electronic and Magnetic Properties of 2D Materials
Wed.	AM	Room 212C	Mechanical and Thermal Properties of 2D Materials
Wed.	PM	Room 212C	Dopants and Defects in 2D Materials
Thu.	AM	Room 212C	Emergent 2D Materials
Thu.	PM	Room 212C	Heterostructures of 2D Materials
Thu.	PM	Room Hall 3	2D Materials Focus Topic Poster Session
Fri.	AM	Room 212C	Surface Chemistry of 2D Materials: Functionalization, Membranes, Sensors

Accelerating Materials Discovery for Global Competitiveness Focus Topic

Mon.	AM	Room 114	Development of Novel Materials
Mon.	PM	Room 114	Design and Discovery (Bio and Other Interfaces)

Actinides and Rare Earths Focus Topic

Wed.	AM	Room 230A	Magnetism, Complexity and Superconductivity in the Actinides and Rare Earths
Wed.	PM	Room 230A	Chemistry and Physics of the Actinides and Rare Earths
Thu.	AM	Room 230A	Nuclear Power and Waste Remediation
Thu.	PM	Room Hall 3	AC Poster Session

Additive Manufacturing/3D Printing Focus Topic

Wed.	AM	Room 211B	Materials, Designs, and Applications of Additive Manufacturing
Thu.	AM	Room 211A	Technologies Enabled by Additive Manufacturing/Future of Additive Mfg.

Thu.	PM	Room 211A	Additive Fabrication for Electronic Devices and Systems
Thu.	PM	Room Hall 3	Additive Manufacturing/3D Printing Poster Session

Atom Probe Tomography Focus Topic

Mon.	AM	Room 230A	Atom Probe Tomography of Nanomaterials
Mon.	PM	Room 230A	Current and New Research Fields for Applications of Atom Probe Tomography
Tue.	AM	Room 211D	New Applications of Atom Probe Tomography
Tue.	PM	Room Hall 3	Atom Probe Tomography Poster Session

Energy Frontiers Focus Topic

Mon.	AM	Room 211B	Solar Cells I
Mon.	PM	Room 211B	Solar Cells II
Tue.	AM	Room 211B	Photocatalysis
Tue.	PM	Room 211B	Batteries and Supercapacitors
Tue.	PM	Room Hall 3	Energy Frontiers Poster Session

Helium Ion Microscopy Focus Topic

Thu.	AM	Room 211B	Focused Ion Beam technology (8:00–10:00 am)/Fundamentals of Helium Ion Microscopy (11:00 am–12:20 pm)
Thu.	PM	Room 211B	Imaging and Milling with He and Ne Ion Beams
Thu.	PM	Room Hall 3	Aspects of Helium Ion Microscopy Poster Session

In-Situ Spectroscopy and Microscopy Focus Topic

Mon.	AM	Room 211C	Fundamental Studies of Surface Chemistry of Single Crystal and Nanomaterials under Reaction Conditions
Mon.	PM	Room 211C	Ambient Pressure X-ray Photoelectron Spectroscopy Studies for Catalytic and Energy Materials in Gas Phase
Tue.	AM	Room 211C	In-situ Studies of Solid-liquid Interfaces
Tue.	PM	Room 211C	Environmental TEM Studies for Catalytic and Energy Materials
Tue.	PM	Room Hall 3	In-Situ Spectroscopy and Microscopy Poster Session
Wed.	AM	Room 211C	In-situ Studies Using X-ray Absorption Spectroscopy and Vibrational Spectroscopy for Catalytic and Energy Materials
Wed.	PM	Room 211B	In situ Imaging of Liquids using Microfluidics

IPF on Mesoscale Science and Technology of Materials and Metamaterials

Mon.	AM	Room 210F	Materials for Energy Generation and Storage (8:20-10:20) & Mesoscale Phenomena in the Biosciences I (10:40-12:00)
Mon.	PM	Room 210F	Mesoscale Phenomena in the Biosciences II (2:20-3:40) & Metamaterials (3:40-5:40)
Tue.	AM	Room 210F	Degradation Science (8:00-10:00) & Electrochemistry from Nano to Meso Scale (11:00-12:20)
Tue.	PM	Room 210F	Frontiers in Physics

IUVSTA

Fri.	AM	Room 212D	IUVSTA Highlights Seminar

Materials Characterization in the Semiconductor Industry Focus Topic

Tue.	AM	Room 114	Characterization of 3D structures
Tue.	PM	Room Hall 3	Materials Characterization in the Semiconductor Industry Poster Session (All areas)

Novel Trends in Synchrotron and FEL-Based Analysis Focus Topic

Mon.	AM	Room 112	Imaging and Nanodiffraction (8:20-10:00 am) & Novel Insights in Correlated Materials, Organic Materials and 2D Solids (10:40 am -12:00 pm)
Mon.	PM	Room 112	New Insights in Correlated Materials, Organic Materials and 2D Solids

Scanning Probe Microscopy Focus Topic

Wed.	AM	Room 212A	Advances in Scanning Probe Microscopy
Wed.	PM	Room 212A	Probing Electronic and Transport Properties
Thu.	AM	Room 212A	Probing Chemical Reactions at the Nanoscale
Thu.	PM	Room 212A	Probing Material Growth on the Surface
Thu.	PM	Room Hall 3	Scanning Probe Microscopy Poster Session
Fri.	AM	Room 212A	Probe-Sample Interactions

Selective Deposition as an Enabler of Self-Alignment Focus Topic

Thu.	AM	Room 210F	Fundamentals of Selective Deposition
Thu.	PM	Room 210F	Process Development for Selective Deposition and Self-aligned Patterning
Thu.	PM	Room Hall 3	SD: Selective Deposition as an Enabler of Self-Alignment Poster Session

Spectroscopic Ellipsometry Focus Topic

Thu.	AM	Room 112	Spectroscopic Ellipsometry: Novel Applications and Theoretical Approaches
Thu.	PM	Room 112	Optical Characterization of Nanostructures and Metamaterials
Thu.	PM	Room Hall 3	Spectroscopic Ellipsometry Poster Session

Surface Modification of Materials by Plasmas for Medical Purposes Focus Topic

Thu.	AM	Room 211D	Plasma Processing of Biomaterials
Thu.	PM	Room 211D	Plasma Processing of Biomaterials and Biological Systems
Thu.	PM	Room Hall 3	Surface Modification of Materials by Plasmas for Medical Purposes Poster Session

Tribology Focus Topic

Thu.	AM	Room 230B	Nanolubricants and Coatings
Thu.	PM	Room 230B	Molecular Origins of Friction
Thu.	PM	Room Hall 3	Tribology Poster Session
Fri.	AM	Room 230B	Nanoscale Wear and Biotribology

IUVSTA SEMINAR

Friday, October 23, 2015, 8:00 a.m.–12:45 p.m.
San Jose Convention Center, Room 212 D

The International Union of Vacuum Science, Technique and Applications (IUVSTA) is a Union of national member societies from 31 countries whose role is to stimulate international collaboration in the fields of vacuum science, techniques and applications and related multi-disciplinary topics including solid-vacuum and other interfaces. It has 9 divisions paralleling the division structure of the AVS. Once every three years, a Highlight Seminar is held where a representative of each division presents an overview of the scientific and technological advances in area of interest of the division. This year the Highlight Seminar will be an integral part of the AVS program occurring on Friday morning. Registration for the AVS is not needed to attend this IUVSTA session. The nine talks should be of particular interest to AVS attendees since they will bolster the international nature of the AVS symposium and highlight the great diversity and complementarity of topics and advances across the discipline all in one session.

Moderator:
Prof. David N. Ruzic, Scientific Director of IUVSTA,
University of Illinois at Urbana-Champaign, USA

8:00 a.m.
"Recent Advances in Applied Surface Science"
Dr. Bonnie Tyler, *National Physics Laboratory, United Kingdom*

8:30 a.m.
"Needs and Challenges of Vacuum Techniques in Biointerfaces Analysis"
Dr. Giacomo Ceccone, *European Commission Unit Nanobiosciences, Italy*
Dr. Anouk Galtayries, *Chimie ParisTech, France*

9:00 a.m.
"Electronic Materials for Energy Harvesting and Energy Storage"
Dr. Reinhard Horst Schwarz, *University of Lisbon, Portugal*

9:30 a.m.
"Nanometer Sized Structures are still Up-to-Date"
Dr. Christian Teichert, *Montanuniversität Leoben, Austria*

10:00 a.m.
"Recent Highlights and Trends in Plasma Science and Technology"
Prof. Timo Gans, *University of York, United Kingdom*

10:30 a.m. **Break**

10:45 a.m.
"Advances in Surface Engineering"
Prof. Ivan Petrov, *University of Illinois at Urbana-Champaign, USA*

11:15 a.m.
"Building Surfaces without Bulk: Last Highlights from Surface Science Division Beyond Graphene"
Prof. Maria C. Asensio, *Synchrotron SOLEIL, University Paris-Saclay, France*

11:45 a.m.
"Highlights and Challenges in Thin Film Deposition"
Prof. Christoph Eisenmenger-Sittner, *Vienna University of Technology, Austria*

12:15 p.m.
"Highlights of Next Generation Vacuum Science and Technology"
Dr. Jay Hendricks, *National Institute of Standards and Technology, USA*

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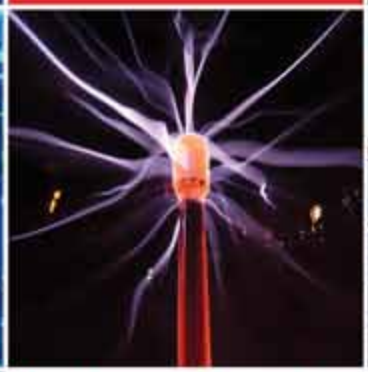

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SAN JOSE MARRIOTT HOTEL

MEETINGS AND SPECIAL EVENTS

SATURDAY, OCTOBER 17, 2015

2:00 p.m.	Educational Materials and Outreach Committee Meeting	Willow Glen I (H)
6:30 p.m.	Education Committee Dinner	Arcadia Restaurant (H)

SUNDAY, OCTOBER 18, 2015

7:30 a.m.	AVS Board of Directors' Executive Session (Closed Session)	Blossom Hill II-III (H)
8:45 a.m.	AVS Board of Directors' Meeting	Blossom Hill II-III (H)
12:30 p.m.	AVS Board of Directors' Lunch	Blossom Hill I (H)
1:00 p.m.	Tutorial: Introduction to Atom Probe Tomography	111 (CC)
1:00 p.m.	Tutorial: Practical Introduction to Synchrotron Science	114 (CC)
3:00 p.m.	Biomaterials Plenary Session and Reception	211D (CC)
5:30 p.m.	Professional Development Tutorial on Entrepreneurship	111 (CC)
6:00 p.m.	ASTM E-42 Business Meeting	Salon II (H)
6:00 p.m.	Science Educators' Workshop Teachers' Reception	Willow Glen III (H)
6:00 p.m.	Vacuum Technology Division Executive Committee Meeting and Dinner	Almaden (H)
7:00 p.m.	ASTM E-42 Workshop: "A Surface Analysis Carol: The Ghosts of Surface Analysis Past, Present, and Future"	Salon II (H)
7:00 p.m.	International Dignitaries & Chapter Chairs Reception (Invitation Only)	San Carlos (H)
7:00 p.m.	Short Course Committee Meeting and Dinner	Silicon Valley Boardroom (H)

MONDAY, OCTOBER 19, 2015

7:00 a.m.	Professional Leadership Committee Meeting and Breakfast	Arcadia Restaurant (H)
8:00 a.m.	Science Educators' Workshop	Blossom Hill II-III (H)
9:00 a.m.	Peter Mark Award Lecture: "Taking Control of the Nanoscale with Scanning Programming Microscopy," Peter Maksymovych, Oak Ridge National Lab	212B (CC)
12:00 p.m.	Science Educators' Workshop Lunch	Blossom Hill I (H)
12:15 p.m.	Plenary Lecture: Robert S. Chau, Intel Corporation, "Electronic Materials Research and Development for Future Computation and System-on-Chip Applications"	210G (CC)
12:15 p.m.	Recommended Practices Committee Meeting and Lunch	Willow Glen III (H)
1:15 p.m.	Professional Development: Lunch with the Editors – AVS Writer's Workshop	210E (CC)
1:30 p.m.	2016 AVS Program Committee Meeting and Lunch	Salon III (H)
4:30 p.m.	Publications Committee Meeting	Willow Glen II (H)
4:45 p.m.	Vacuum Technology Division Business Meeting	230B (CC)
5:30 p.m.	Welcome Mixer	Concourse I (CC)
5:45 p.m.	Biomaterial Interfaces Division Business Meeting	211D (CC)
6:30 p.m.	Biointer*phases* Reception (Invitation Only)	Scott's Seafood (Offsite)
7:00 p.m.	Applied Surface Science Division Executive Committee Meeting and Dinner	Willow Glen II (H)
7:30 p.m.	Publications Committee Meeting and Dinner (Invitation Only)	Scott's Seafood (Offsite)
7:30 p.m.	Manufacturing Science and Technology Group Committee Meeting and Dinner	Willow Glen III (H)
7:30 p.m.	Thin Film Division/Harper Award TED-Talk Competition (Invitation Only)	111 (CC)
8:30 a.m.-5:00 p.m.	*Short Course Program*	*Various Rooms (H)*

TUESDAY, OCTOBER 20, 2015

7:00 a.m.	Women in AVS Diversity Breakfast	Salon III (H)
7:30 a.m.	Awards Committee Meeting and Lunch	Willow Glen I (H)
8:00 a.m.	Science Educators' Workshop	Blossom Hill II-III (H)
9:20 a.m.	AVS 2014 Gaede-Langmuir Invited Talk: "Models for Heterogeneous Catalysts: Complex Materials at the Atomic Level," Hajo Freund, Fritz Haber Institute of the Max Planck Society, Germany	113 (CC)
10:00 a.m.	Session Coffee Break	Hall 1 (CC)
12:00 p.m.	Science Educators' Workshop Lunch	Blossom Hill I (H)
12:20 p.m.	Exhibit Hall Lunch	Hall 1 (CC)
12:20 p.m.	PSTD Coburn and Winters Adjudication Session (Closed Session)	210A (CC)
12:30 p.m.	Chapters, Divisions, and Groups Meeting and Lunch (Invitation Only)	Willow Glen III (H)
12:30 p.m.	Professional Development: Job Information Forum and Lunch	210E (CC)
2:40 p.m.	Professional Development: "Working with National Labs and User Facilities"	114 (CC)
3:00 p.m.	Marketing Communications Committee Meeting	Boardroom (H)
3:40 p.m.	Session Refreshment Break	Hall 1 (CC)
4:00 p.m.	EMPD/PSTD Panel Discussion: "Moore's Law and the Future of the Semiconductor Industry"	210E (Center)
6:05 p.m.	Electronic Materials and Processing Division Business Meeting	210E (CC)
6:05 p.m.	Nanometer-scale Science and Technology Division Business Meeting	212B (CC)

CC = San Jose Convention Center
H = San Jose Marriott

= New Attendee Networking Events

MEETINGS AND SPECIAL EVENTS

6:25 p.m.	Magnetic Interfaces and Nanostructures Division Business Meeting	230A (CC)
6:25 p.m.	Plasma Science and Technology Division Business Meeting	210A (CC)
6:25 p.m.	Surface Science Division Business Meeting	112 (CC)
6:25 p.m.	Thin Film Division Business Meeting	111 (CC)
6:30 p.m.	Electronic Materials and Processing Division Forum: Careers at LAM Research	210E (CC)
6:30 p.m.	MEMS and NEMS Technical Group Executive Committee Meeting and Dinner	Willow Glen II (H)
6:30 p.m.	Poster Session and Refreshments (Sponsored by MKS)	Hall 3 (CC)
7:00 p.m.	Magnetic Interfaces and Nanostructures Division Executive Committee Meeting and Dinner	Boardroom (H)
7:00 p.m.	Nanometer-scale Science and Technology Division Meeting and Dinner	San Carlos (H)
7:00 p.m.	Plasma Science and Technology Executive Committee Meeting and Dinner	Salon VI (H)
7:00 p.m.	Surface Science Division Executive Committee Meeting and Dinner	Willow Glen III (H)
7:00 p.m.	Thin Film Division Executive Committee Meeting and Dinner	Salon V (H)
7:30 p.m.	Applied Surface Science Division Business Meeting	Salon IV (H)
7:45 p.m.	Biomaterial Interfaces Division Executive Committee Meeting and Dinner	Salon II (H)
7:45 p.m.	Electronic Materials and Processing Division Executive Committee Meeting and Dinner	Almaden (H)
8:00 p.m.	ASTM E-42 and Applied Surface Science Division Joint Workshop: "When is 'Perfect' the Enemy of 'Good Enough?' Maintaining Perspective in Surface Analysis"	Salon IV (H)
8:30 a.m.-5:00 p.m.	*Short Course Program*	*Various Rooms (H)*
10:00 a.m.-5:00 p.m.	*Equipment Exhibition*	*Hall 1 (CC)*

WEDNESDAY, OCTOBER 21, 2015

6:15 a.m.	35th Annual AVS Run (Register at Run Booth before Wednesday in the Convention Center)	TBD
7:30 a.m.	Diversity Committee Meeting and Breakfast	Arcadia Restaurant (H)
8:00 a.m.	Advanced Surface Engineering Division Business Meeting	Almaden (H)
8:15 a.m.	Advanced Surface Engineering Division Executive Committee Meeting (Lunch Offsite)	Almaden (H)
10:00 a.m.	Session Coffee Break	Hall 1 (CC)
12:20 p.m.	Exhibit Hall Lunch	Hall 1 (CC)
12:30 p.m.	Governance Committee Meeting and Lunch	Arcadia Restaurant (H)
12:30 p.m.	Nanometer-scale Science and Technology Division Graduate Student Award Competition	212B (CC)
12:30 p.m.	PacSurf Committee Meeting and Lunch	Boardroom (H)
12:30 p.m.	Professional Development: Federal Funding Town Hall and Lunch	210E (CC)
12:30 p.m.	Surface Science Division Mort Traum Awards Ceremony	113 (CC)
3:30 p.m.	History Committee Meeting	Boardroom (H)
3:40 p.m.	Session Refreshment Break	Hall 1 (CC)
4:20 p.m.	Medard W. Welch Award Lecture: "Thermodynamics and Kinetics of Elementary Reaction Steps on Late Transition Metal Catalysts," Charles Campbell, Univ. of Washington	113 (CC)
4:30 p.m.	E&M Reception (Invitation Only)	Hall 1 (CC)
6:30 p.m.	AVS Awards Ceremony & Reception	210G (CC)
8:30 a.m.-5:00 p.m.	*Short Course Program*	*Various Rooms (H)*
10:00 a.m.-4:30 p.m.	*Equipment Exhibition*	*Hall 1 (CC)*

THURSDAY, OCTOBER 22, 2015

7:30 a.m.	Membership Committee Meeting and Breakfast	Arcadia Restaurant (H)
8:00 a.m.	John A. Thornton Award Lecture: "PECVD Low and Ultralow Dielectric Constant Materials: From Invention and Research to Products," Alfred Grill, IBM Research Division, T.J. Watson Research Center	211C (CC)
10:00 a.m.	Session Coffee Break	Hall 1 (CC)
12:20 p.m.	Exhibit Hall Lunch/Finale	Hall 1 (CC)
12:20 p.m.	Plasma Science and Technology Division Coburn and Winters Award Ceremony	211D (CC)
12:30 p.m.	2016 AVS Program Committee Chairs' Meeting and Lunch	Almaden (H)
12:30 p.m.	AVS Business Meeting	211A (CC)
6:00 p.m.	Poster Session and Refreshments	Hall 3 (CC)
6:00 p.m.	Selective Deposition Reception and Networking Event	210F (CC)
6:30 p.m.	2015/2016 Program Committee Reception and Dinner	Blossom Hill I-III (H)
7:00 p.m.	*Surface Science Spectra* Editorial Board Dinner	Almaden (H)
8:30 a.m.-5:00 p.m.	*Short Course Program*	*Various Rooms (H)*
10:00 a.m.-2:30 p.m.	*Equipment Exhibition*	*Hall 1 (CC)*

FRIDAY, OCTOBER 23, 2015

8:00 a.m.	IUVSTA Highlight Seminar	212D (CC)

CC = San Jose Convention Center
H = San Jose Marriott

= New Attendee Networking Events

JVSTA

Journal of Vacuum Science & Technology A

- Surfaces
- Films
- Vacuum

www.jvsta.org

Understanding interfaces and surfaces at a fundamental level and using this understanding to advance the state-of-the-art in various technological applications defines the scope of the *Journal of Vacuum Science and Technology A*. This journal is devoted to publishing reports of original research, letters, and review articles.

Website Features Editor's Picks, Most Cited, and Most Read

Topics include but are not limited to:

- Applied and fundamental surface science
- Atomic layer deposition
- Electronic and photonic materials and their processing
- Magnetic thin films and interfaces
- Materials and thin films for energy conversion and storage
- Photovoltaics including thin-film solar cells and organic and hybrid solar cells
- Plasma science and technology including plasma surface interactions, plasma diagnostics plasma deposition and etching and applications of plasmas to micro- and nanoelectronics
- Surface Engineering
- Thin film deposition, etching, properties and characterization
- Transmission electron microscopy including in *situ* methods
- Tribology
- Vacuum science and technology

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JVSTB

Journal of Vacuum Science & Technology B

- **Nanometer Structures**
- **Microelectronics**
- **Processing, Measurement, Phenomena**

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The *Journal of Vacuum Science and Technology B* is devoted to publishing reports of original research, letters, and review articles on microelectronics and nanometer structures and devices. The emphasis is on processing, measurement and phenomena associated with micrometer and nanometer structures and devices. Processing may include vacuum processing, plasma processing and microlithography among others, while measurement refers to a wide range of materials and device characterization methods for understanding the physics and chemistry of submicron and nanometer structures and devices.

Website Features Editor's Picks, Most Cited, and Most Read

Topics include but are not limited to:

- Compound semiconductor electronics and optoelectronics
- Devices for energy conversion and storage
- Dielectrics in micro- and nanoelectronics
- Graphene, carbon nanotubes and fullerenes: materials & devices
- Group IV semiconductor microelectronics
- Lithography
- Microelectromechanical and nanoelectromechanical systems and devices (MEMS & NEMS)
- Nanometer science and technology
- Nanostructured materials and devices including nanowires, nanoparticles and quantum dots,
- Organic and molecular electronics
- Photovoltaics based on nanostructured materials, dye-sensitized and other excitonic solar cells
- Plasmonics
- Spintronics and magnetic devices
- Vacuum nanoelectronics

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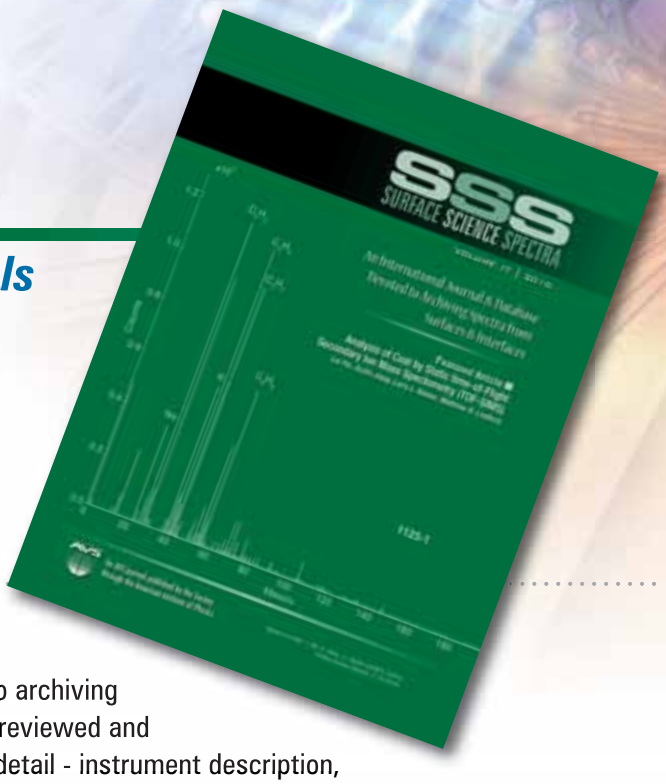
SSS
SURFACE SCIENCE SPECTRA



Journal and Database for Individuals or Analytical Laboratories

- **Reference Spectra**
- **Spectra from Technological Materials**
- **Comparison Spectra from Well-Defined Materials**

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Surface Science Spectra is an international journal devoted to archiving spectra from surfaces and interfaces. Data records are peer-reviewed and technically edited. Spectral descriptions include much more detail - instrument description, calibration, and raw spectral data - than traditional journals. *SSS* offers XPS, Auger, UPS, SIMS, EELS/HREELS spectra from a wide range of materials.

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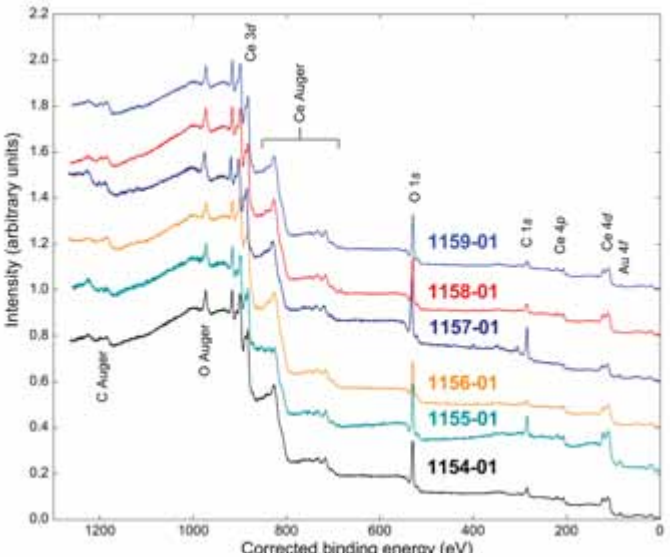

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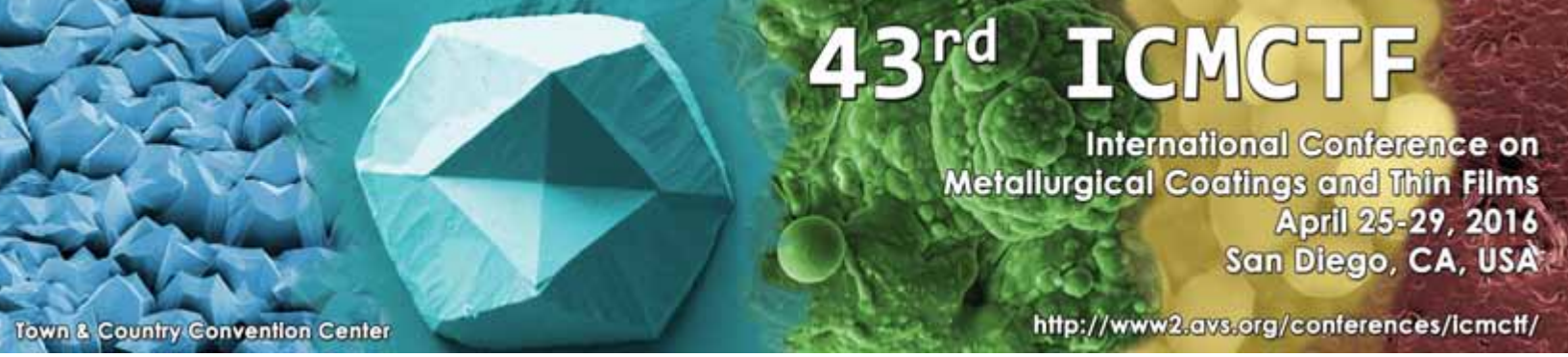

April 25 - 29, 2016, San Diego, CA

Town & Country Hotel

www2.avs.org/conferences/ICMCTF

Sponsored by the AVS Advanced Surface Engineering Division

CONFERENCE OVERVIEW

The **ICMCTF** is the premier international conference in the field of **thin-film deposition**, **characterization,** and **advanced surface engineering**, promoting global exchange of ideas and information among scientists, technologists, and manufacturers. The conference includes more than 60 high-profile invited speakers across fourteen symposia, along with focused topic sessions, short courses, equipment exhibition, and social events.

TECHNICAL SYMPOSIA

- **A** Coatings for use at High Temperatures
- **B** Hard Coatings and Vapor Deposition Technology
- **C** Fundamentals and Technology of Multifunctional Thin Films
- **D** Coatings for Biomedical and Healthcare Applications
- **E** Tribology & Mechanical Behavior of Coatings & Engineered Surfaces
- **F** New Horizons in Coatings and Thin Films
- **G** Surface Engineering – Applied Research and Industrial Applications
- **H** Advanced Characterization of Coatings and Thin Films

TOPICAL SYMPOSIA

- **TS1** Biointerfaces
- **TS2** Thermal Spray Technologies and Coatings
- **TS3** Self-healing Materials
- **TS4** Plasma Diagnostics and Modeling
- **TS5** Atmospheric Plasma Applications
- **TS6** Ambient-Coating Interactions

Symposium "G" is jointly organized with SVC

PLENARY LECTURE

"Nanogenerators as New Energy Technology and Piezotronics for Smart Systems"

Zhong Lin Wang
Hightower Chair in Materials Science and Engineering
Georgia Institute of Technology
Atlanta, USA

EXHIBITION KEYNOTE LECTURE

"Functional Coatings Produced by Plasma Processes – Technology and Recent Applications "

Wolfgang Diehl
Vice-Director of Fraunhofer IST
Braunschweig, Germany
SVC President (2014-2016)

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Important dates: Mark your calendar

Abstract submission:	October 1, 2015
Awards nomination:	October 1, 2015
Early registration (required for presenters):	March 23, 2016
Manuscript submission:	April 1, 2016

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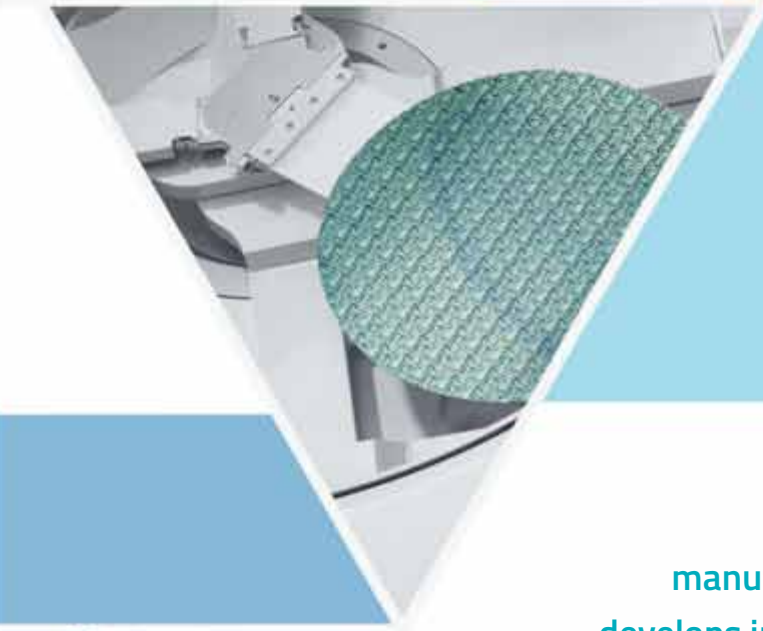

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- EMERGING TECHNOLOGIES
- HIGH POWER IMPULSE MAGNETRON SPUTTERING (HIPIMS)
- OPTICAL COATINGS
- PLASMA PROCESSING
- LARGE AREA COATINGS
- COATINGS AND PROCESSES FOR BIOMEDICAL & ENVIRONMENTAL APPLICATIONS
- FUNDAMENTALS OF INTERFACE DESIGN: a joint session organized with ICMCTF (AVS/ASED)
- HEURÉKA! POST-DEADLINE RECENT DEVELOPMENTS
- TECHNICAL POSTER PRESENTATIONS

MAY 9-13 **EDUCATION PROGRAM**

MAY 11-12 **EQUIPMENT EXHIBIT**

MAY 10-13 **INTERACTIVE NETWORKING**

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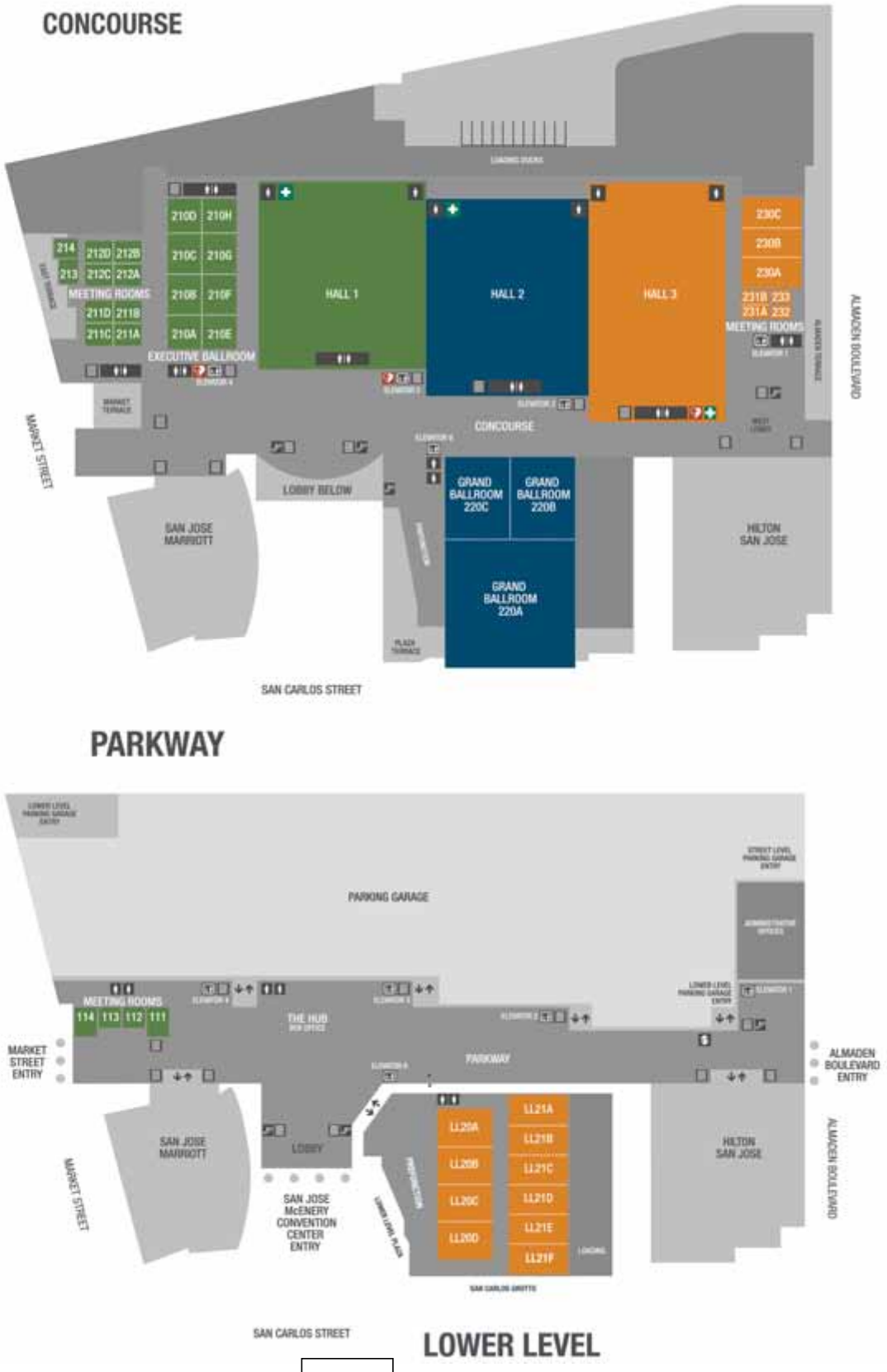

NOTES

Technical Sessions
Key to Session/Abstract Numbers

2D 2D Materials Focus Topic
AC Actinides and Rare Earths Focus Topic
AM Additive Manufacturing/3D Printing Focus Topic
AP Atom Probe Tomography Focus Topic
AS Applied Surface Science
BI Biomaterial Interfaces
BP Biomaterials Plenary Session
EL Spectroscopic Ellipsometry Focus Topic
EM Electronic Materials and Processing
EN Energy Frontiers Focus Topic
EW Exhibitor Technology Spotlight
HI Helium Ion Microscopy Focus Topic
IPF IPF on Mesoscale Science and Technology of Materials and Metamaterials
IS In-Situ Spectroscopy and Microscopy Focus Topic
MC Materials Characterization in the Semiconductor Industry Focus Topic
MG Accelerating Materials Discovery for Global Competitiveness Focus Topic
MI Magnetic Interfaces and Nanostructures
MN MEMS and NEMS
MS Manufacturing Science and Technology
NS Nanometer-scale Science and Technology
PS Plasma Science and Technology
SA Novel Trends in Synchrotron and FEL-Based Analysis Focus Topic
SD Selective Deposition as an Enabler of Self-Alignment Focus Topic
SE Advanced Surface Engineering
SM Surface Modification of Materials by Plasmas for Medical Purposes Focus Topic
SP Scanning Probe Microscopy Focus Topic
SS Surface Science
TF Thin Film
TR Tribology Focus Topic
VT Vacuum Technology

Sessions organized by multiple topics are labeled with acronyms (e.g. **EM+SS**), then: a number indicating parallel sessions by the same topic (e.g. **SS1**), then: a dash followed by the first two characters of the day: **Mo**nday, **Tu**esday, **We**dnesday, **Th**ursday, **Fr**iday, then: **M**orning, **A**fternoon, **E**vening, **P**oster, then: a number to indicate the time slot scheduled for each abstract.
Example: SS1-MoM9 (Surface Science, Monday morning, 11:00 am).

Room/ Day	111	112	113	114	210A	210B	210E	210F	211A	211B
SuA										
MoM	TF+ Self-Assembled Monolayers, Layer-by-Layer, etc.	SA Imaging & Nanodiff. (8:20-10:00) & Novel Insights in Corr. Mtls, Org. Mtls & 2D Solids (10:40 am -12:00 pm)	SS+ Synthesis, Structure and Character-ization of Oxides	MG+ Development of Novel Materials	PS+ Atmospheric Pressure Plasma Processing I	PS Advanced FEOL/Gate Etching	EM+ More Moore! Materials and Processes to Extend CMOS Another Decade	IPF+ Mats for Ener. Gener. & Stor. (8:20-10:20) & Meso- scale Phen in Biosci I (10:40-12:00)	EM+ Rectenna Solar Cells, MIM Diodes, and Oxide Interfaces	EN+ Solar Cells I
MoA	TF+ ALD, CVD, MLD, and PLD on Special Materials	SA New Insights in Corr. Mtls, Organic Mtls and 2D Solids	SS Organics and Ionic Liquids: Surf., Layers, Interfaces and Chirality	MG+ Design and Discovery (Bio and Other Interfaces)	PS Plasma Diagnostics, Sensors and Control I	PS+ Directed Self Assembly and Plasma Synthesis of Novel Materials	EM+ More Moore! II	IPF+ Mesoscale Phenom in the Biosci II (2:20-3:40) & Meta-mtls (3:40-5:40)	EM+ MIM Diodes, Functional Oxides, and TFTs	EN+ Solar Cells II
TuM	TF+ ALD for Alternative Devices	SS+ Nanostructures, Nano-plasmonics and Surface Reactions	SS+ Mech. Insight of Surface Reactions: Catalysis, ALD, etc. - I	MC Character-ization of 3D structures	PS+ Plasmas for Medicine and Biological Applications	PS Advanced BEOL/ Interconnect Etching	EM Beyond CMOS: Materials and Devices for a Post CMOS Era	IPF+ Degrad. Sci (8:00-10:00) & Electro-chemistry from Nano to Meso (11:00-12:20)	MN+ Multi. Phen & Int in Mic/Nano Syst (8:00-10:00) & Opt. MEMS/ NEMS, Pho, & Quant. Nano (11:00-12:20)	EN+ Photocatalysis
TuL										
TuA	TF ALD for Emerging Applications	SS+ Photocatalysis, Photo-chemistry, and Chirality at Surfaces	SS+ Mechanistic Insight of Surf. Reactions: Catalysis, ALD, etc. - II	MS Working with National Labs and User Facilities	PS1 Novel Materials and Etch Chemistry	PS2 Plasma Modeling	EM+ More than Moore: Novel Approaches for Inc. Integrated Functionality	IPF+ Frontiers in Physics	MN+ BioMEMS/ NEMS, Wearable & Implantable Devices	EN+ Batteries and Super-capacitors
TuP										
WeM	TF+ ALD for Energy	SS Environ. Inter, Ambient Surf., In-Operando Studies, & Adsorption on 2D Materials	SS+ Nano-structures: Growth Reactivity & Catalysis	TF+ ALD Surface Reactions and Precursors	PS+ Atomic Layer Etching (ALE) and Low-Damage Processes I	PS+ Plasma Diagnostics, Sensors and Control II	EM Beyond CMOS: Resistive Switching Devices		MN+ Emerg Matls & Fab Tech. toward Scalable & Additive Nanomanu-facturing I	AM+ Materials, Designs, and Applications of Additive Manufacturing
WeL										
WeA	TF+ CV Infiltration Methods & Energ & Thermal Prop. of Thin Films	SS+ Surf Dynamcs, Non-Adiabati-city, and Single Molecule Phenomena	SS+ Metals, Alloys & Oxides: Reactivity and Catalysis	TF+ Thin Films for Biological and Biomedical Applications	PS+ Plasma Deposition and Plasma Assisted ALD	PS+ Plasma Surface Interactions	EM Interconnects: Meth. & Matls for Removing Connect Constraints	HI GFIS Based Nano-structuring	MN+ Emerg Matls & Fab Tech toward Scalable & Additive Nanomanufact uring II	IS+ In situ Imaging of Liquids using Microfluidics
ThM	TF+ Thin Film: Growth and Charac, Optical & Synch Char I	EL+ Spect Ellipsometry: Novel Apps and Theoretical Approaches	SS+ Semiconductor Surfaces and Interfaces - I	TF+ Plasma ALD and Nano-applications	PS+ Plasma Processing for 2D Materials	MN Atomic Layer Nanostructures and 2D NEMS	EM+ III-N Nitrides for Optoelectronic Applications	SD+ Fundamentals of Selective Deposition	AM+ Tech Enabled by Additive Manuf/Future of Additive Manufacturing	HI+ FIB Tech (08:00-10:00)/Fund of Helium Ion Micro (11:00-12:20)
ThA	TF+ Thin Film: Growth & Char, Optical & Synchrotron Character-ization II	EL+ Optical Char of Nanostructures and Metamaterials	SS+ Atom Modeling of Surf Phen & Semicond Surfaces & Interfaces - II	TF+ Thin Film Permeation Barriers and Membranes	PS Plasma Sources	PS+ Advanced Ion Implantation and Plasma Doping	EM+ III-N Nitrides II	SD+ Process Develop for Selective Dep & Self-aligned Patterning	AM+ Additive Fabrication for Electronic Devices and Systems	HI+ Imaging and Milling with He and Ne Ion Beams
ThP										
FrM	TF+ Thin Films for Light Trap., Plasmonic, & Magnetic Applications				PS+ Atmospheric Pressure Plasma Processing II	PS+ Atomic Layer Etching (ALE) & Low-Damage Processes II				

at a Glance

211C	211D	212A	212B	212C	212D	230A	230B	Hall 1	Hall 3
	BP Biomaterials Plenary Session								
IS+ Fundamental Studies of Surf Chem of Single Crystal & Nanomaterials under Reaction Conditions	BI+ Characterization of Biological and Biomaterials Surfaces (1)	SE+ Nanostructured Thin Films and Coatings	NS Nanotools and Nanodevices	2D+ 2D Materials: Growth and Fabrication	AS QSA: Obtain Quant. Info in the Face of Matl Complexity & Morph Influences	AP+ Atom Probe Tomography of Nanomaterials	VT Vacuum Measurement, Calibration, and Primary Standards		
IS+ Amb Press X-ray Photo Spect Stud for Cat. & Energy Matls in Gas Phase	BI+ Character-ization of Biological and Biomaterials Surfaces (2)	SE+ Thin Film Tech for Energy Storage, Conversion and Harvesting	NS+ Optical Spectroscopy at the Nanoscale	2D+ 2D Materials: Devices and Applications	AS Practical Surface Analysis I: Interpretation Challenges	AP+ Current & New Research Fields for App of Atom Probe Tomography	VT Extreme High Vacuum		
IS+ In-situ Studies of Solid-liquid Interfaces	AP+ New Applications of Atom Probe Tomography	SE+ Atmospheric Pressure Plasmas, CVD and Other Deposition Methods	NS+ Nanoscale Imaging and Materials Character-ization	2D+ Optical and Optoelectronic Properties of 2D Materials	AS+ Chemical/Molecular Info from Sub-micron Features and Materials	MI Oxides, Fluorides, and Spin Structures	VT Vacuum Suitcases and Particulate Control	EW Exhibitor Technology Spotlight Session	
								EW Exhibitor Technology Spotlight Session	
IS+ Environmental TEM Studies for Catalytic and Energy Materials	BI Cells and Micro-organisms at Surfaces	SE+ Pulsed Plasmas in Surface Engineering	NS+ Nanophotonics, Plasmonics, and Energy	2D+ Electronic and Magnetic Properties of 2D Materials	AS+ Challenges in the Char of Polymer/Organic /Biological Systems	MI+ Spin Currents, Spin Textures and Hybrid Magnetic Structures	VT Gas Dynamics and Modeling, Pumping and Outgassing	EW Exhibitor Technology Spotlight Session	
									POSTER SESSIONS BI, EM, EN, IS, MC, MI, MS, NS, SE, SS, VT
IS+ In-situ Studies Using X-ray Absorp Spect & Vib. Spect for Catal & Energy Materials	BI Biomolecules at Interfaces	SP+ Advances in Scanning Probe Microscopy	NS Nanodiamond for Optical and Biomedical Applications	2D+ Mechanical and Thermal Properties of 2D Materials	AS Pract. Surface Anal. II: Inf of Samp Prep & Novel Sample Prep Tech	AC+ Magnetism, Complex & Supercond in the Actinides & Rare Earths	VT Accelerator and Large Vacuum Systems	EW Exhibitor Technology Spotlight Session	
								EW Exhibitor Technology Spotlight Session	
EM+ Surface and Interface Challenges in Wide Bandgap Materials	BI Biophysics, Membranes and Nanoscale Biological Interfaces	SP+ Probing Electronic and Transport Properties	NS+ Nanoscale Catalysis and Surface Chemistry	2D+ Dopants and Defects in 2D Materials	AS+ Characterization of Buried Interfaces	AC+ Chemistry and Physics of the Actinides and Rare Earths	VT Vacuum Quality and Partial Pressure Analysis		
EM Interconnects II	SM+ Plasma Processing of Biomaterials	SP+ Probing Chemical Reactions at the Nanoscale	NS+ Nanopatterning and Nanolithography /Nanoscale Mechanics	2D+ Emergent 2D Materials	AS Pract Surf Anal. III: Multi-tech Prob solving & Struct-prop Correlations	AC+ Nuclear Power and Waste Remediation	TR+ Nanolubricants and Coatings		
EM+ Materials for Light Management	SM+ Plasma Processing of Biomaterials and Biological Systems	SP+ Probing Material Growth on the Surface		2D+ Heterostructures of 2D Materials	AS+ Advances in 2D Chemical Mapping and Data Analysis		TR+ Molecular Origins of Friction		
									POSTER SESSIONS 2D, AC, AM, AS, EL, PS, SM, SP, TF, TR
EM+ Nanoparticles for Electronics and Photonics		SP+ Probe-Sample Interactions		2D+ Surf Chem of 2D Materials: Funct, Membranes, Sensors	IUVSTA Highlights Seminar		TR+ Nanoscale Wear and Biotribology		

SUNDAY SPECIAL EVENTS

7:30 a.m.	AVS Board of Directors' Executive Session (Closed Session) — Blossom Hill II-III (H)
8:45 a.m.	AVS Board of Directors' Meeting — Blossom Hill II-III (H)
12:30 p.m.	AVS Board of Directors' Lunch — Blossom Hill I (H)
1:00 p.m.	Tutorial: Introduction to Atom Probe Tomography — 111 (CC)
1:00 p.m.	Tutorial: Practical Introduction to Synchrotron Science — 114 (CC)
3:00 p.m.	Biomaterials Plenary Session and Reception — 211D (CC)
5:30 p.m.	Professional Development Tutorial on Entrepreneurship — 111 (CC)
6:00 p.m.	ASTM E-42 Business Meeting — Salon II (H)
6:00 p.m.	Science Educators' Workshop Teachers' Reception — Willow Glen III (H)
6:00 p.m.	Vacuum Technology Division Executive Committee Meeting and Dinner — Almaden (H)
7:00 p.m.	ASTM E-42 Workshop: "A Surface Analysis Carol: The Ghosts of Surface Analysis Past, Present, and Future" — Salon II (H)
7:00 p.m.	International Dignitaries & Chapter Chairs Reception (Invitation Only) — San Carlos (H)
7:00 p.m.	Short Course Committee Meeting and Dinner — Silicon Valley Boardroom (H)

CC = San Jose Convention Center
H = San Jose Marriott

= New Attendee Networking Events

NOTES

Biomaterials Plenary Session
Room: 211D - Session BP-SuA

Biomaterials Plenary Session
Moderator: Graham Leggett, University of Sheffield

3:00 pm	**BP-SuA1 Invited** Phage, Peptides and Polymers: Targeted Polymeric Delivery using Peptide Ligands Identified by Phage Display, L. CHAN, M. CIESLEWICZ, G. LIU, B. LIVESAY, C. NGAMBENJAWONG, **SUZIE PUN**, S. SALIPANTE, N. WHITE, University of Washington	
3:20 pm	Invited talk continued.	
3:40 pm	**BP-SuA3 Invited** Experimental and Theoretical Challenges regarding the Fundamental Interactions between Biomolecules and Biosurfaces, **JACOB ISRAELACHVILI**, University of California at Santa Barbara	
4:00 pm	Invited talk continued.	
4:20 pm	**BP-SuA5 Invited** Biomimetic Surface Coatings Inspired by Polyphenols Found in Mussels, Tea, Wine and Chocolate, T. SILEIKA, D. BARRETT, Northwestern University, **PHILLIP MESSERSMITH**, University of California at Berkeley	
4:40 pm	Invited talk continued.	
5:00 pm	**BIOMATERIALS PLENARY RECEPTION**	
5:20 pm		
5:40 pm		

Anticipated Schedule
Sunday Morning, October 18, 2015

TIME	SESSION	ROOM
8:00 am		
8:20 am		
8:40 am		
9:00 am		
9:20 am		
9:40 am		
10:00 am		
10:20 am		
10:40 am		
11:00 am		
11:20 am		
11:40 am		
12:00 pm		

Lunch

when _____

with _____

where _____

Anticipated Schedule
Sunday Afternoon, October 18, 2015

TIME	SESSION	ROOM
1:00 pm		
1:20 pm		
1:40 pm		
2:00 pm		
2:20 pm		
2:40 pm		
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MONDAY SPECIAL EVENTS

7:00 a.m.	Professional Leadership Committee Meeting and Breakfast — Arcadia Restaurant (H)
8:00 a.m.	Science Educators' Workshop — Blossom Hill II-III (H)
9:00 a.m.	Peter Mark Award Lecture: "Taking Control of the Nanoscale with Scanning Programming Microscopy," Peter Maksymovych, Oak Ridge National Lab — 212B (CC)
12:00 p.m.	Science Educators' Workshop Lunch — Blossom Hill I (H)
12:15 p.m.	Plenary Lecture: Robert S. Chau, Intel Corporation, "Electronic Materials Research and Development for Future Computation and System-on-Chip Applications" — 210G (CC)
12:15 p.m.	Recommended Practices Committee Meeting and Lunch — Willow Glen III (H)
1:15 p.m.	Professional Development: Lunch with the Editors – AVS Writer's Workshop — 210E (CC)
1:30 p.m.	2016 AVS Program Committee Meeting and Lunch — Salon III (H)
4:30 p.m.	Publications Committee Meeting — Willow Glen II (H)
4:45 p.m.	Vacuum Technology Division Business Meeting — 230B (CC)
5:30 p.m.	Welcome Mixer — Concourse I (CC)
5:45 p.m.	Biomaterial Interfaces Division Business Meeting — 211D (CC)
6:30 p.m.	Biointerphases Reception (Invitation Only) — Scott's Seafood (Offsite)
7:00 p.m.	Applied Surface Science Division Executive Committee Meeting and Dinner — Willow Glen II (H)
7:30 p.m.	Publications Committee Meeting and Dinner (Invitation Only) — Scott's Seafood (Offsite)
7:30 p.m.	Manufacturing Science and Technology Group Committee Meeting and Dinner — Willow Glen III (H)
7:30 p.m.	Thin Film Division/Harper Award TED-Talk Competition (Invitation Only) — 111 (CC)

CC = San Jose Convention Center
H = San Jose Marriott

= New Attendee Networking Events

MONDAY SHORT COURSES

8:30 a.m.	A Comprehensive Course on Surface Analysis and Depth Profiling by X-Ray Photoelectron Spectroscopy (XPS or ESCA), Auger Electron Spectroscopy (AES), Focused Ion Beam Analysis (FIB) and Secondary Ion Mass Spectroscopy (SIMS) and other Major Techniques (3 days)
8:30 a.m.	Fundamentals of Vacuum Technology (4 days)
8:30 a.m.	Sputter Deposition
8:30 a.m.	Vacuum Vessel Engineering
8:30 a.m.	X-ray Photoelectron Spectroscopy (XPS or ESCA) & Auger Electron Spectroscopy (AES)

LOCATION: All AVS Short Courses will be held at the San Jose Marriott (HQ)
COURSE HOURS: All AVS Short Courses will run 8:30 a.m. – 5:00 p.m. (1.5 hour break for lunch – Lunch not included)

NOTES

	2D Materials Focus Topic Room: 212C - Session 2D+EM+NS+PS+SP+SS+TF-MoM 2D Materials: Growth and Fabrication **Moderators:** Cory Dean, Columbia University, Peide Ye, Purdue University	Atom Probe Tomography Focus Topic Room: 230A - Session AP+AS+MC+MI+NS-MoM Atom Probe Tomography of Nanomaterials **Moderator:** Daniel Perea, Pacific Northwest National Laboratory
8:20 am	**2D+EM+NS+PS+SP+SS+TF-MoM1** Growth and FTIR Characterization of 2D Hexagonal Boron Nitride on Metal Substrates, **BORIS FEIGELSON**, V.M. BERMUDEZ, J.K. HITE, Z.R. ROBINSON, V.D. WHEELER, K. SRIDHARA, S.C. HERNÁNDEZ, US Naval Research Laboratory	**AP+AS+MC+MI+NS-MoM1 Invited** Correlative Multi-scale Analysis of Nd-Fe-B Permanent Magnet, **TAISUKE SASAKI**, T. OHKUBO, K. HONO, National Institute for Materials Science (NIMS), Japan
8:40 am	**2D+EM+NS+PS+SP+SS+TF-MoM2** Effect of Surface Termination on the Growth of Graphene on Cu Single Crystal Substrates, **TYLER MOWLL**, E.W. ONG, University at Albany-SUNY, P. TYAGI, GLOBALFOUNDRIES, Z.R. ROBINSON, College at Brockport-SUNY, C.A. VENTRICE, JR., SUNY Polytechnic Institute	Invited talk continued.
9:00 am	**2D+EM+NS+PS+SP+SS+TF-MoM3** Thermally Annealed and Electropolished Cu Substrates for CVD Growth of 2D Materials: Graphene, h-BN and MoS_2, **KARTHIK SRIDHARA**, Texas A&M University, B.N. FEIGELSON, J.K. HITE, US Naval Research Laboratory, A. NATH, George Mason University, M. FUHRER, Monash University, Australia, D.K. GASKILL, US Naval Research Laboratory, H. CASTANEDA, L.O. NYAKITI, Texas A&M University	**AP+AS+MC+MI+NS-MoM3 Invited** Atom-Probe Tomography of Materials with Dimensions in the Nanometer Range, **DIETER ISHEIM**, Northwestern University
9:20 am	**2D+EM+NS+PS+SP+SS+TF-MoM4** *In Situ* Optical Diagnostics During Molybdenum Disulfide Chemical Vapor Deposition, **BERC KALANYAN**, J.E. MASLAR, W.A. KIMES, B.A. SPERLING, National Institute of Standards and Technology (NIST), R. TIECKELMANN, T. ORZALI, SEMATECH, R. BEAMS, S.J. STRANICK, A.V. DAVYDOV, National Institute of Standards and Technology (NIST)	Invited talk continued.
9:40 am	**2D+EM+NS+PS+SP+SS+TF-MoM5 Invited** Controlled Interfaces in 2D Materials, **AREND VAN DER ZANDE**, University of Illinois at Urbana Champaign	**AP+AS+MC+MI+NS-MoM5** Exploring Atom Probe Tomography for Energy Storage and Conversion Materials, **PRITESH PARIKH**, University of California, San Diego, A. DEVARAJ, Pacific Northwest National Laboratory, S. MENG, University of California, San Diego
10:00 am	Invited talk continued.	**AP+AS+MC+MI+NS-MoM6** Atom Probe Tomography of Pt-based Nanoparticles, **KATJA EDER**, P.J. FELFER, J.M. CAIRNEY, The University of Sydney, Australia
10:20 am	**BREAK**	**BREAK**
10:40 am	**2D+EM+NS+PS+SP+SS+TF-MoM8** Obtaining Clean Suspended CVD Graphene: Comparative Examination of Few Transfer and Cleaning Protocols, **ALEXANDER YULAEV**, National Institute of Standards and Technology (NIST), University of Maryland (UMD), G. CHENG, A. HIGHT WALKER, National Institute of Standards and Technology (NIST), M. LEITE, University of Maryland (UMD), A. KOLMAKOV, NIST	**AP+AS+MC+MI+NS-MoM8 Invited** APT & TEM Observations on Local Crystallization of NbO_2 used in Switching Devices, J.-H. LEE, Pohang University of Science and Technology (POSTECH), Samsung Electronics, Republic of Korea, J.-B. SEOL, **C.-G PARK**, Pohang University of Science and Technology (POSTECH), National Institute for Nanomaterials Technology (NINT), Republic of Korea
11:00 am	**2D+EM+NS+PS+SP+SS+TF-MoM9** Low-Energy Electron Microscopy of Transition Metal Dichalcogenides Prepared by Various Methods, **SERGIO DE LA BARRERA**, P. MENDE, S. SATPATHY, R. FEENSTRA, Carnegie Mellon University, S. WU, X.D. XU, University of Washington, S. VISHWANATH, X. LIU, J. FURDYNA, D. JENA, H. XING, University of Notre Dame, Y.-C. LIN, S.M. EICHFELD, J.A. ROBINSON, Pennsylvania State University	Invited talk continued.
11:20 am	**2D+EM+NS+PS+SP+SS+TF-MoM10 Invited** Atomically-Thin 2D Layers of Group IV Semiconductors, **JOSHUA GOLDBERGER**, The Ohio State University	**AP+AS+MC+MI+NS-MoM10 Invited** Correlating Atom Probe Tomography with High-Resolution Scanning Transmission Electron Microscopy and Micro-Photoluminescence Spectroscopy: The Case of III-Nitride Heterostructures, **LORENZO RIGUTTI**, University of Rouen
11:40 am	Invited talk continued.	Invited talk continued.

	Applied Surface Science **Room: 212D - Session AS-MoM** **Quantitative Surface Analysis: Obtaining Quantitative Information in the Face of Material Complexity and Morphology Influences** **Moderators:** Christopher Szakal, National Institute of Standards and Technology (NIST), Alberto Herrera-Gomez, CINVESTAV-Queretaro, Mexico	**Biomaterial Interfaces** **Room: 211D - Session BI+AS-MoM** **Characterization of Biological and Biomaterials Surfaces (1)** **Moderators:** Dan Graham, University of Washington, Joe Baio, Oregon State University
8:20 am	**AS-MoM1** Quantitative XPS of Core-Shell Nanoparticles, **CEDRIC POWELL**, National Institute of Standards and Technology (NIST), M. CHUDZICKI, W.S.M. WERNER, W. SMEKAL, Technical University of Vienna, Austria	**BI+AS-MoM1** Characterizing the Dissociative Properties of Surface-Bound Biomolecules by *In Vacuo* XPS, **KENAN FEARS**, Naval Research Laboratory
8:40 am	**AS-MoM2** The Satellites of the 2*p* Core Level of Transition-Metals, **ALBERTO HERRERA-GOMEZ**, CINVESTAV-Queretaro, Mexico	**BI+AS-MoM2** Quantifying Time-Dependent Mechanical Behavior of Cells, Biomaterials, and Their Interfaces, M. FUCHS, N. SCHWARZER, N. BIERWISCH, **CLAUDIA FUCHS**, SIO Saxonian Institute of Surface Mechanics, Germany
9:00 am	**AS-MoM3** Quantitative Analysis of Advanced Commercial Glasses for Display Technologies, **CODY CUSHMAN**, Brigham Young University, N.J. SMITH, Corning, T. GREHL, P. BRUENER, ION-TOF GmbH, Germany, M.R. LINFORD, Brigham Young University	**BI+AS-MoM3 Invited** Quantifying the Surface Chemistry and Overlayer Thickness of Functionalized Nanoparticles, **DAVID CASTNER**, University of Washington
9:20 am	**AS-MoM4** New Horizons in Practical Applications of Sputter Depth Profiling, **WILLIAM STICKLE**, C.N. YOUNG, M.D. JOHNSON, HP, A.A. ELLSWORTH, A.V. WALKER, University of Texas at Dallas	Invited talk continued.
9:40 am	**AS-MoM5 Invited** ASSD 30th Anniversary Lecture: Sensitivity Factors in XPS: Where Do They Come From and How Accurate Are They?, **JOHN GRANT**, University of Dayton	**BI+AS-MoM5** Structure-Function Relation in Gizzard Plates of Cephalaspidean Gastropod, M. SHEPELENKO, V. BRUMFELD, E. KLEIN, Weizmann Institute of Science, Israel, H. LUBINEVSKY, Israel Oceanographic & Limnological Research (IOLR) and National Institute of Oceanography, L. ADDADI, S. WEINER, **SIDNEY COHEN**, Weizmann Institute of Science, Israel
10:00 am	Invited talk continued.	**BI+AS-MoM6** Photothermal AFM-IR of Bacteria on Polymer Films: Impact of Cantilever Damping on Quantitative IR Measurements, **DANIEL BARLOW**, J.C. BIFFINGER, Naval Research Laboratory, A.L. COCKRELL, Nova Research, M. LO, K. KJOLLER, D. COOK, Anasys Instruments, W. KYUNG LEE, P.E. PEHRSSON, Naval Research Laboratory, W.J. GOODSON, Air Force Research Laboratory, J.N. RUSSELL, JR., Naval Research Laboratory
10:20 am	**BREAK**	**BREAK**
10:40 am	**AS-MoM8** Ar^+ and Cluster Ion Depth Profiling for Quantitative XPS Inorganic Thin Film Analysis, **JENNIFER MANN**, J.F. MOULDER, S.R. BRYAN, J.S. HAMMOND, Physical Electronics	**BI+AS-MoM8** Where's Waldo? 3D Localization of Polymer Nanoparticles in Cells using ToF-SIMS, **DANIEL GRAHAM**, University of Washington, J.T. WILSON, Vanderbilt University, J. LAI, L.J. GAMBLE, P.S. STAYTON, D.G. CASTNER, University of Washington
11:00 am	**AS-MoM9** Preservation of Chemical States in Mixed Material Surfaces when Profiling with Noble Gas Clusters, **CHRISTOPHER DEEKS**, J.P.W. TREACY, P. MACK, T.S. NUNNEY, Thermo Fisher Scientific, UK	**BI+AS-MoM9** XPS and ToF-SIMS Analysis of Functiionalized Nanoparticles: Effects of Sample Cleaning and Preparations, R. LA SPINA, V. SPAMPINATO, I. OJEA, F.J. ROSSI, D. GILLILAND, **GIACOMO CECCONE**, European Commission, Joint Research Centre, IHCP, Italy
11:20 am	**AS-MoM10 Invited** Photoemission from Complex Material Systems: Obtaining Quantitative Information, **ROBERT OPILA**, J. CHURCH, University of Delaware	**BI+AS-MoM10** Engineered Surfaces for Bio-Relevant Applications, **MARLON WALKER**, NIST, A. VAISH, University of Delaware, D. VANDERAH, NIST/Institute for Bioscience and Biotechnology Research
11:40 am	Invited talk continued.	**BI+AS-MoM11** Breast Cancer Tumor Metabolism Investigated with ToF-SIMS, **LARA GAMBLE**, B.M. BLUESTEIN, D.J. GRAHAM, University of Washington

	Electronic Materials and Processing Room: 211A - Session EM+AS+SS-MoM **Rectenna Solar Cells, MIM Diodes, and Oxide Interfaces** **Moderators:** John Conley, Oregon State University, Dale Kotter, RedWave Energy, Inc.	Electronic Materials and Processing Room: 210E - Session EM+NS+PS-MoM **More Moore! Materials and Processes to Extend CMOS Another Decade** **Moderator:** Christopher Hinkle, University of Texas at Dallas
8:20 am	**EM+AS+SS-MoM1 Invited** Harvesting Energy with Optical Rectennas: Challenges and Innovations, **GARRET MODDEL**, University of Colorado and RedWave Energy, Inc., S. JOSHI, B. PELZ, A. BELKADI, S. YUAN, University of Colorado at Boulder, P. BRADY, D. KOTTER, RedWave Energy, Inc.	**EM+NS+PS-MoM1** Effects of Deposition Temperature and Pre-rapid Thermal Process on Electrical and Interfacial Characteristics of Alumina on GaSb, **SEONGKYUNG KIM**, H.J. KIM, Seoul National University, Korea, Republic of Korea
8:40 am	Invited talk continued.	**EM+NS+PS-MoM2** Selective Wet Etching of III-V Semiconductors with HCl and H_2O_2, **PABLO MANCHENO-POSSO**, . JAIN, A.J. MUSCAT, University of Arizona
9:00 am	**EM+AS+SS-MoM3** Demonstration of Traveling-Wave Metal-Insulator-Metal Diodes for 28 THz (10.6 μ m) Rectennas, **BRADLEY PELZ**, University of Colorado at Boulder, G. MODDEL, University of Colorado at Boulder and Redwave Energy	**EM+NS+PS-MoM3** Border Trap Analysis and Reduction for ALD High-k InGaAs Gate Stacks, **KECHAO TANG**, Stanford Univ., R. WINTER, Technion – Israel Inst. of Tech., T. KENT, UC, San Diego, M. NEGARA, Stanford Unive., R. DROOPAD, Texas State Univ., A.C. KUMMEL, UC, San Diego, M. EIZENBERG, Technion – Israel Inst. of Tech., P. MCINTYRE, Stanford Univ.
9:20 am	**EM+AS+SS-MoM4** Basic Efficiency Limits for Rectenna Solar Power Conversion, **HEYLAL MASHAAL**, J.M. GORDON, Ben-Gurion University of the Negev, Israel	**EM+NS+PS-MoM4** Self-LIMITING CVD of an Air Stable Silicon Oxide Bilayer for Preparation of Subsequent Silicon or Gate Oxide ALD on InGaAs(001)-(2x4), **MARY EDMONDS**, T. KENT, S. WOLF, University of California at San Diego, J. KACHIAN, N. YOSHIDA, M. CHANG, Applied Materials, D. ALVEREZ, Rasirc, Inc, R. DROOPAD, Texas State University, A.C. KUMMEL, University of California at San Diego
9:40 am	**EM+AS+SS-MoM5** Coherence Effects in Periodic Arrays of Nano-Antennas used for Energy Harvesting and Self-Imaging, **PETER LERNER**, SciTech Associates, LLC, P.H. CULTER, N.M. MISKOVSKY, Penn State University	**EM+NS+PS-MoM5 Invited** Going Big in Two-Dimensions, **JOSHUA ROBINSON**, The Pennsylvania State University
10:00 am	**EM+AS+SS-MoM6** Metamaterial Enhanced Rectenna for Efficient Energy Harvesting, D. LU, **WON PARK**, University of Colorado Boulder, P. BRADY, Redwave Energy Inc.	Invited talk continued.
10:20 am	**BREAK**	**BREAK**
10:40 am	**EM+AS+SS-MoM8** Efficient Zero-Bias Infrared Rectification at the Nanoscale: A Metal-Oxide-Metal Based Metamaterial Approach, **PAI-YEN CHEN**, M.M.C. CHENG, Wayne State University	**EM+NS+PS-MoM8 Invited** 2D Bipolar Devices for Novel Logic Applications: Fabrication, Characterization and Applications, **JI UNG LEE**, SUNY Polytechnic Institute
11:00 am	**EM+AS+SS-MoM9** Modeling of and Power from Nb-NbOx-based Nanorectenna Arrays, **R.M. OSGOOD**, US Army NSRDEC, J. XU, G.E. FERNANDES, Brown University, M. ROTHSCHILD, K. DIEST, MIT Lincoln Laboratory, M. KANG, K.B. KIM, Seoul National University, Republic of Korea, L. PARAMESWARAN, MIT Lincoln Laboratory, P. PERIASAMY, IBM, M. CHIN, Army Research Laboratory, S. KOOI, MIT Institute for Soldier Nanotechnologies, S. GIARDINI, US Army NSRDEC, R. O'HAYRE, P. JOGHEE, Colorado School of Mines	Invited talk continued.
11:20 am	**EM+AS+SS-MoM10** Metal-Insulator-Insulator-Metal Diodes for Rectenna Applications, **SHIJIA LIN**, N. MURARI, J.F. CONLEY, JR., Oregon State University	**EM+NS+PS-MoM10 Invited** Electron Transport and Tunneling in Graphene-based Heterostructures, **EMANUEL TUTUC**, The University of Texas at Austin
11:40 am	**EM+AS+SS-MoM11** Built-in Potential in Fe_2O_3-Cr_2O_3 Superlattices for Improved Photoexcited Carrier Separation, **TIFFANY KASPAR**, D.K. SCHREIBER, S.R. SPURGEON, S.A. CHAMBERS, Pacific Northwest National Laboratory	Invited talk continued.

	Energy Frontiers Focus Topic Room: 211B - Session EN+AS+EM+NS+SE+SS+TF-MoM Solar Cells I **Moderators:** Jason Baxter, Drexel University, Chintalapalle Ramana, University of Texas at El Paso	IPF on Mesoscale Science and Technology of Materials and Metamaterials Room: 210F - Session IPF+MS-MoM Materials for Energy Generation and Storage (8:20-10:20) & Mesoscale Phenomena in the Biosciences I (10:40-12:00) **Moderators:** Carolyn Larabell, University of California, San Francisco, Alain Diebold, SUNY College of Nanoscale Science and Engineering
8:20 am	**EN+AS+EM+NS+SE+SS+TF-MoM1** Elevated Temperature Phase Stability of CZTS-Se Thin Films for Solar Cells, E. CHAGAROV, K. SARDASHTI, University of California at San Diego, D.B. MITZI, Duke University, R.A. HAIGHT, IBM T.J. Watson Research Center, **ANDREW C. KUMMEL**, University of California at San Diego	**IPF+MS-MoM1 Invited** Synthesis and Behavior of Nanostructures in Mesoscale Architectures, **SANGBOK LEE**, G.W. RUBLOFF, E. GILLETTE, C. LIU, University of Maryland, College Park, X. CHEN, Lam Research Corporation, J. HU, S. WITTENBERG, L. GRAHAM, University of Maryland, College Park, P. BANERJEE, Washington University, St. Louis
8:40 am	**EN+AS+EM+NS+SE+SS+TF-MoM2** Chemical and Electrical Characterization of Polycrystalline CZTS,Se and CIGS,Se Grain Boundaries by NanoAuger and Kelvin Probe Force Microscopy (KPFM), **KASRA SARDASHTI**, UC San Diego, P.D. ANTUNEZ, R.A. HAIGHT, IBM T.J. Watson Research Center, A.C. KUMMEL, UC San Diego	Invited talk continued.
9:00 am	**EN+AS+EM+NS+SE+SS+TF-MoM3 Invited** Non-Vacuum Processing of Sustainable Semiconductors for Thin-Film Photovoltaics, **KAUSHIK ROY CHOUDHURY**, DuPont	**IPF+MS-MoM3 Invited** Ultralight Microlattices: Defining the Limits of Lightweight Materials, **WILLIAM CARTER**, HRL Laboratories, LLC
9:20 am	Invited talk continued.	Invited talk continued.
9:40 am	**EN+AS+EM+NS+SE+SS+TF-MoM5** Spin Coating Thin Film CZTS for Efficient, Low-Cost Solar Cells on Flexible Glass Substrates, D. KAVA, J. GALINDO, C.O. SANA, S. SHAHRIAR, **DEIDRA HODGES**, University of Texas at El Paso	**IPF+MS-MoM5 Invited** "Can Opto-Electronics Provide the Motive Power for Future Vehicles?", **ELI YABLONOVITCH**, University of California, Berkeley
10:00 am	**EN+AS+EM+NS+SE+SS+TF-MoM6** Band Gap Profile of Cu(In,Ga)(Se,S) 2 Thin Films via High-Resolution Reflection Electron Energy Loss Spectroscopy, **SUNG HEO**, H.I. LEE, J.B. PARK, G.S. PARK, Samsung Advanced Institute of Technology, Republic of Korea, D.H. LEE, J.G. NAM, Samsung, Republic of Korea, H.J. KANG, Chungbuk National University, Republic of Korea, B.D. CHOI, Sungkyunkwan University, Republic of Korea	Invited talk continued.
10:20 am	**BREAK**	**BREAK**
10:40 am	**EN+AS+EM+NS+SE+SS+TF-MoM8** Spatial Atmospheric ALD of Zinc Oxysulfide Buffer Layers for CIGS Solar Cells, C. FRIJTERS, P.J. BOLT, P. POODT, **ANDREA ILLIBERI**, Solliance/TNO, Netherlands	**IPF+MS-MoM8 Invited** The Convergence of Synthetic Biology and Biofabrication: Guiding Biological Function at the Mesoscale, **WILLIAM BENTLEY**, Fischell Department of Bioengineering, University of Maryland
11:00 am	**EN+AS+EM+NS+SE+SS+TF-MoM9** Deep Level Electron Traps in Epitaxial $CuInSe_2$ Probed using Photo-Modulated X-ray Photoelectron Spectroscopy, **NICOLE JOHNSON**, University of Illinois at Urbana-Champaign, P. AYDOGAN, Bilkent University, Turkey, A. ROCKETT, University of Illinois at Urbana-Champaign, S. SUZER, Bilkent University, Turkey	Invited talk continued.
11:20 am	**EN+AS+EM+NS+SE+SS+TF-MoM10** The Role of ZnTe Buffer Layers on the Performance and Stability of CdTe Solar Cells, **JIAOJIAO LI**, Colorado School of Mines, A. ABBAS, Loughborough University, UK, D.M. MEYSING, J.D. BEACH, D.R. DIERCKS, Colorado School of Mines, M.O. REESE, T.M. BARNES, National Renewable Ener\gy Laboratory, C.A. WOLDEN, Colorado School of Mines, J.M. WALLS, Loughborough University, UK	**IPF+MS-MoM10 Invited** Using Mesoscale Modeling to Design Materials that Compute: Coupling Self-Oscillating Gels and Piezoelectric Films, V.V. YASHIN, S.P. LEVITAN, **ANNA C. BALAZS**, University of Pittsburgh
11:40 am	**EN+AS+EM+NS+SE+SS+TF-MoM11** The Performance and Durability of Broadband Anti-Reflection Coatings for Thin Film CdTe Solar Cells, G. WOMACK, P.M. KAMINSKI, **JOHN WALLS**, Loughborough University, UK	Invited talk continued.

	In-Situ Spectroscopy and Microscopy Focus Topic Room: 211C - Session IS+AS+SS-MoM Fundamental Studies of Surface Chemistry of Single Crystal and Nanomaterials under Reaction Conditions **Moderators:** Franklin (Feng) Tao, University of Kansas, Zili Wu, Oak Ridge National Laboratory	Accelerating Materials Discovery for Global Competitiveness Focus Topic Room: 114 - Session MG+BI+MS+NS+TF-MoM Development of Novel Materials **Moderator:** Talat Rahman, University of Central Florida
8:20 am	**IS+AS+SS-MoM1 Invited** Hot Electron In-Situ Surface Chemistry at Oxide-Metal Interfaces. Foundations of Acid-Base Catalysis, **GABOR SOMORJAI**, University of California, Berkeley	
8:40 am	Invited talk continued.	
9:00 am	**IS+AS+SS-MoM3** In-situ GISAXS/GIXAS Characterization of $Co_{1-x}Pt_x$ Bimetallic Clusters under H_2 and CO + H_2 Mixture, **B. YANG**, Material Science Division, Argonne National Laboratory, G. KHADRA, J. TUAILLON-COMBES, Institut Lumière Matière, University Lyon & CNRS, France, E. TYO, Material Science Division, Argonne National Laboratory, S. SEIFERT, X-ray Science Division, Argonne National Laboratory, X. CHEN, Department of Mechanical Engineering, Northwestern University, V. DUPUIS, Institut Lumière Matière, University Lyon & CNRS, France, S. VAJDA, Material Science Division, Argonne National Laboratory	**MG+BI+MS+NS+TF-MoM3 Invited** Molecular Engineering of Dyes for Dye-Sensitized Solar Cells via Rational Design, **JACQUELINE COLE**, University of Cambridge, UK
9:20 am	**IS+AS+SS-MoM4** Novel Surface Oxide on Pt(111) as the Active Phase for NO and CO Oxidation Studied with the ReactorSTM, **MATTHIJS VAN SPRONSEN***, J.W.M. FRENKEN, I.M.N. GROOT, Leiden University, Netherlands	Invited talk continued.
9:40 am	**IS+AS+SS-MoM5** *In Operando* Study of Dimethyl Methylphosphonate Degradation Over Metallic and Oxidized Cu(111) Surfaces via Ambient-Pressure X-ray Photoelectron Spectroscopy, **LENA TROTOCHAUD**, A.R. HEAD, Lawrence Berkeley National Laboratory (LBNL), Y. YU, University of Maryland, O. KARSLIOGLU, M. HARTL, LBNL, B. EICHHORN, University of Maryland, H. BLUHM, LBNL	**MG+BI+MS+NS+TF-MoM5 Invited** Accelerating the Discovery of Alternative Fuel Catalysts through Intelligent Computational Framework, **ALTAF KARIM**, COMSATS Institute of Information Technology, Pakistan
10:00 am	**IS+AS+SS-MoM6** Bridging the Pressure and Materials Gap between Surface Science and Catalysis: Probing the Surface of Metal Oxide Nanoparticles under Reaction Conditions, **MARIA KIPREOS**, M. FOSTER, University of Massachusetts, Boston	Invited talk continued.
10:20 am	**BREAK**	**BREAK**
10:40 am	**IS+AS+SS-MoM8 Invited** The Use of Integrated *Operando, In Situ* and DFT Techniques to Unravel the Steps of Heterogeneous Catalytic Reactions, **FABIO RIBEIRO**, W.N. DELGASS, J. GREEELEY, R. GOUNDER, J. MILLER, Purdue University, W.F. SCHNEIDER, University of Notre Dame	**MG+BI+MS+NS+TF-MoM8 Invited** Controlled Spontaneous Nanoscale Patterning of Nonstoichiometric Reconstructions for Catalysis and Light Harvesting, J.M. MARTIREZ, D. SALDANA-GRECO, University of Pennsylvania, W.A. SAIDI, University of Pittsburgh, J.S. LIM, **ANDREW RAPPE**, University of Pennsylvania
11:00 am	Invited talk continued.	Invited talk continued.
11:20 am	**IS+AS+SS-MoM10** In Situ XPS Of Graphene-Catalyst Interactions During Chemical Vapor Deposition, **ROBERT WEATHERUP**, Lawrence Berkeley National Laboratory	**MG+BI+MS+NS+TF-MoM10 Invited** Developing Evolutionary Algorithms for *a priori* Crystal Structure Prediction and Applications towards Novel Pressure-Stabilized Materials, **EVA ZUREK**, University at Buffalo-SUNY
11:40 am	**IS+AS+SS-MoM11** Mechanism Study for Salen Ligand Homogeneous Catalyst in a Heterogeneous Catalysis System, **NICLAS JOHANSSON**, S. CHAUDHARY, A.R. HEAD, O. SNEZHKOVA, J.N. ANDERSEN, J. KNUDSEN, J. SCHNADT, Lund University, Sweden	Invited talk continued.

*** Morton S. Traum Award Finalist**

	Nanometer-scale Science and Technology Room: 212B - Session NS-MoM Nanotools and Nanodevices **Moderator:** Jun Nogami, University of Toronto, Canada	Plasma Science and Technology Room: 210A - Session PS+SE-MoM Atmospheric Pressure Plasma Processing I **Moderator:** François Reniers, Université Libre de Bruxelles
8:20 am		
8:40 am		
9:00 am	**NS-MoM3 Invited** Peter Mark Memorial Award Lecture: Taking Control of the Nanoscale with Scanning Programming Microscopy, **PETER MAKSYMOVYCH***, Oak Ridge National Lab	**PS+SE-MoM3 Invited** Modeling Non-Equilibrium Plasma Jets at Atmospheric Pressure, **LEANNE PITCHFORD**, CNRS and University of Toulouse 3, France
9:20 am	Invited talk continued.	Invited talk continued.
9:40 am	**NS-MoM5 Invited** Directing Nanoscale Mass and Energy Transport using Cantilever-Free Scanning Probes, **KEITH A. BROWN**, D.J. EICHELSDOERFER, C.A. MIRKIN, Northwestern University	**PS+SE-MoM5** Vacuum Ultraviolet Polymer Etching and Modification by a Remote Atmospheric Pressure Plasma Jet, **ANDREW KNOLL**, P. LUAN, E.A.J. BARTIS, G.S. OEHRLEIN, University of Maryland, College Park
10:00 am	Invited talk continued.	**PS+SE-MoM6** Recent Development and Application of Low Cost and Portable Atmospheric Pressure Microplasma Generation Devices, **CHENG-CHE HSU**, P.K. KAO, Y.J. YANG, Y.H. HUANG, National Taiwan University, Taiwan, Republic of China
10:20 am	**BREAK**	**BREAK**
10:40 am	**NS-MoM8** Tin-Catalyzed Single Crystal Germanium Nanowire Growth and Structural Characteristics, **GERENTT CHAN**, A. MENG, A.F. MARSHALL, P.C. MCINTYRE, Stanford University	**PS+SE-MoM8** Experimental Study of Micron-Scale, Field Emission-Driven Microplasmas, **MIHAI BILICI**, C.R. BOYLE, Case Western Reserve University, D.B. GO, University of Notre Dame, R.M. SANKARAN, Case Western Reserve University
11:00 am	**NS-MoM9** Suppressed Thermal Conduction across Weakly Coupled Atomic Layers in ReS_2, **JOONKI SUH**†, Department of Materials Science & Engineering, University of California, Berkeley, C. MONACHON, C. DAMES, Department of Mechanical Engineering, University of California, Berkeley, J. WU, Department of Materials Science & Engineering, University of California, Berkeley	**PS+SE-MoM9** Precise Energy and Temperature Measurements in Dielectric Barrier Discharges (DBD) at Atmospheric Pressure., B. NISOL, Groupe des Couches Minces (GCM) and Department of Engineering Physics, Polytechnique Montréal, Canada, M. ARCHAMBAULT-CARON, H. GAGNON, Groupe des Couches Minces (GCM) and Department of Engineering Physics, Polytechnique Montréal, S. LEROUGE, Department of Mechanical Engineering, École de Technologie Supérieure (ETS), and Centre de Recherche du CHUM (CRCHUM), **M.R. WERTHEIMER**, Groupe des Couches Minces (GCM) and Department of Engineering Physics, Polytechnique Montréal, Canada
11:20 am	**NS-MoM10 Invited** NSTD Nanotechnology Recognition Award Talk: Nanomaterials in Sensor and Electronics Development, **MEYYA MEYYAPPAN‡**, NASA Ames Research Center	**PS+SE-MoM10** Plasma-Induced Conductivity in Dielectrics: A Study of Dielectric Barrier Discharges, **FLORAN PEETERS§**, FOM Institute DIFFER, Netherlands, R.F. RUMPHORST, Eindhoven University of Technology, Netherlands, M.C.M. VAN DE SANDEN, FOM Institute DIFFER, Netherlands
11:40 am	Invited talk continued.	**PS+SE-MoM11** Fabrication of Flexible, Electrically-Conductive Features by Microplasma Reduction of Cation-Cross-Linked Polyacrylic Acid (CCL-PAA) Films, **SOUVIK GHOSH§**, R. YANG, P.X.-L. FENG, C.A. ZORMAN, R.M. SANKARAN, Case Western Reserve University

*** Peter Mark Memorial Award Winner**
† NSTD Student Award Finalist
‡ NSTD Recognition Award
§ Coburn & Winters Student Award Finalist

	Plasma Science and Technology **Room: 210B - Session PS-MoM** **Advanced FEOL/Gate Etching** **Moderator:** Chanro Park, GLOBALFOUNDRIES	**Novel Trends in Synchrotron and FEL-Based Analysis Focus Topic** **Room: 112 - Session SA-MoM** **Imaging and Nanodiffraction (8:20-10:00 am) & Novel Insights in Correlated Materials, Organic Materials and 2D Solids (10:40 am -12:00 pm)** **Moderators:** Herrmann Dürr, Stanford University, Petra Rudolf, University of Groningen
8:20 am	**PS-MoM1 Invited** FEOL Patterning Challenges for Sub 14nm FDSOI Technology, **SÉBASTIEN BARNOLA**, N. POSSEME, P. PIMENTA-BARROS, C. VIZIOZ, CEA, LETI, MINATEC Campus, France, C. ARVET, ST Microelectronics, France, O. POLLET, A. SARRAZIN, CEA, LETI, MINATEC Campus, France, M. GARCIA-BARROS, ST Microelectronics, France, L. DESVOIVRES, CEA, LETI, MINATEC Campus, France	**SA-MoM1 Invited** Nanoscale Chemical Imaging by Soft X-ray Spectro-microscopy and Spectro-ptychography, **ADAM HITCHCOCK**, X.H. ZHU, McMaster University, Canada, J. WU, McMaster University, D. SHAPIRO, T. TYLISZCZAK, Lawrence Berkeley Lab, University of California, Berkeley
8:40 am	Invited talk continued.	Invited talk continued.
9:00 am	**PS-MoM3** Material and Etch Interaction Comparisons for SIT Patterning, **JOHN SPORRE**, IBM Corporation, A. RALEY, TEL Technology Center, America, LLC, D. MOREAU, STMicroelectronics, M. SANKARAPANDIAN, P.K.C. SRIPADARAO, J. FULLAM, M. BRETON, R. CHAO, S. KANAKASABAPATHY, IBM Corporation, A. KO, TEL Technology Center, America, LLC	**SA-MoM3 Invited** Imaging Single Cells in a Beam of Live Cyanobacteria with an X-ray Laser, **GIJS VAN DER SCHOT**, Uppsala University, Sweden
9:20 am	**PS-MoM4** Trim Etch for sub-20 nm Technology, **GUANGJUN YANG**, D. KELLER, Y. RUI, R. BENSON, A. SCHRINSKY, Micron Technology	Invited talk continued.
9:40 am	**PS-MoM5** Laser-Assisted Dry Etch of poly-Si and SiO_2 for Semiconductor Processing, **JASON PECK**, G.A. PANICI, I.A. SHCHELKANOV, D.N. RUZIC, University of Illinois at Urbana-Champaign	**SA-MoM5** The Entire Story on a Single Sample: New Opportunities for Micro-Spectroscopy at the Electro-Spectro-Microscopy Beamline at NSLS II, **ANDREW WALTER**, E. VESCOVO, Brookhaven National Laboratory
10:00 am	**PS-MoM6** Spatial Resolution Considerations for Uniformity Improvement by Gas Cluster Ion Beam Etch, **JOSHUA LAROSE**, TEL Technology Center, America, LLC, B. PFEIFER, V. GIZZO, Tokyo Electron, N. JOY, N.M. RUSSELL, TEL Technology Center, America, LLC	**SA-MoM6** Nanoscale Tomography and Spectroscopy with the HZB X-ray Microscope, **GERT SCHNEIDER**, Helmholtz-Zentrum Berlin für Materialien und Energie GmbH, Germany
10:20 am	**BREAK**	**BREAK**
10:40 am	**PS-MoM8 Invited** Analysis of Surface Reaction Layers formed by Highly Selective Etching with Pulsed Microwave Plasma, **MIYAKO MATSUI**, Hitachi Ltd., Japan, M. MORIMOTO, N. IKEDA, T. ONO, Hitachi High-Technologies Corp.	**SA-MoM8 Invited** Exploring All-optical Magnetic Switching with Resonant X-rays, **ALEXANDER REID**, SLAC National Accelerator Laboratory
11:00 am	Invited talk continued.	Invited talk continued.
11:20 am	**PS-MoM10** Improvement of Gate Shoulder Retention and SiN Selectivity over Si in Spacer Process, **YOHEI ISHII**, K. OKUMA, N. NEGISHI, J. MANOS, Hitachi High Technologies America Inc.	**SA-MoM10 Invited** Ultrafast Dynamics in Magnetic Systems, **GERHARD GRUEBEL**, Magnetic Dynamics, Germany
11:40 am	**PS-MoM11** Advanced Patterning Applications Using High Selectivity Etch Chemistry, **NATHAN MARCHACK**, S.U. ENGELMANN, E.A. JOSEPH, R.L. BRUCE, H. MIYAZOE, E.M. SIKORSKI, IBM T.J. Watson Research Center, T. SUZUKI, M. NAKAMURA, A. ITOU, ZEON Chemicals L.P., H. MATSUMOTO, Zeon Corporation, Kawasaki, Japan	Invited talk continued.

	Advanced Surface Engineering Room: 212A - Session SE+AS+NS+TR-MoM Nanostructured Thin Films and Coatings **Moderators:** Robert Franz, Montanuniversität Leoben, Austria, Andrey Voevodin, Air Force Research Laboratory	Surface Science Room: 113 - Session SS+AS+EN-MoM Synthesis, Structure and Characterization of Oxides **Moderator:** Robert Bartynski, Rutgers, the State University of New Jersey
8:20 am	**SE+AS+NS+TR-MoM1** Reactively Sputter Deposited Ternary AlN-based Coatings, **JOERG PATSCHEIDER**, Empa, Switzerland, E. LEWIN, Uppsala University, Sweden	**SS+AS+EN-MoM1** Oxygen Uptake on Rh(111), **DANIEL KILLELEA**, J. DEROUIN, R.G. FARBER, Loyola University Chicago
8:40 am	**SE+AS+NS+TR-MoM2** Mo_2BC Coatings for Metal Forming: Interactions Between Tool Surface and Aluminium by Theory and Experiment, **JOCHEN SCHNEIDER**, RWTH Aachen University, Germany, H. BOLVARDI, Oerlikon Balzers, Liechtenstein, D. MUSIC, RWTH Aachen University, Germany	**SS+AS+EN-MoM2** Formation of Subsurface Oxygen and Surface Oxides on Ag(111) by Atomic Oxygen, **JONATHAN DEROUIN***, R.G. FARBER, D.R. KILLELEA, Loyola University Chicago
9:00 am	**SE+AS+NS+TR-MoM3** Molecular Dynamics Simulations of TiN/TiN(001) Growth, **DANIEL EDSTRÖM**, D.G. SANGIOVANNI, V. CHIRITA, L. HULTMAN, Linköping University, Sweden, J.E. GREENE, I. PETROV, University of Illinois at Urbana Champaign	**SS+AS+EN-MoM3 Invited** Surface and Bulk Properties of Pure and Mixed Titania, **MATTHIAS BATZILL**, University of South Florida
9:20 am	**SE+AS+NS+TR-MoM4** Stress Design of Multi-layered Coatings, **WOLFGANG SEIDL**, Christian Doppler Laboratory for Application Oriented Coating Development at the Institute of Materials Science and Technology, Vienna University of Technology, 1040 Vienna, Austria, M. ARNDT, Oerliko Balzers, Oerlikon Surface Solutions AG, 9496 Balzers, Liechtenstein, P. POLCIK, Plansee Composite Materials GmbH, 86983 Lechbruck am See, Germany, P.H. MAYRHOFER, Vienna University of Technology, Austria	Invited talk continued.
9:40 am	**SE+AS+NS+TR-MoM5 Invited** Atomistic Guided Development of Hard Coatings and Thin Films for Severe Applications, **PAUL MAYRHOFER**, Vienna University of Technology, Austria	**SS+AS+EN-MoM5** Characterizations of Non-polar Polar Interfaces: Cr_2O_3 on ZnO (0001) and (000-1), **XIAODONG ZHU**, M.D. MORALES-ACOSTA, J. SHEN, F.J. WALKER, J. CHA, E.I. ALTMAN, Yale University
10:00 am	Invited talk continued.	**SS+AS+EN-MoM6** Effects of Substrate Temperature and Oxygen Flow Rate on the Electronic Properties and Optical Dispersion of MgO Thin Films, **YUSRAMA DENNY**, T. FIRMANSYAH, University of Sultan Ageng Tirtayasa, Indonesia, S.S. LEE, H.J. KANG, Chungbuk National University, Republic of Korea
10:20 am	**BREAK**	**BREAK**
10:40 am	**SE+AS+NS+TR-MoM8** Crystallographic Stabilization of δ-WC Thin Films by Alloying with B, using Reactive Magnetron Sputtering of W in Trimethylboron $(CH_3)_3B$, **HANS HÖGBERG**, L. TENGDELIUS, M. SAMUELSSON, G. GRECZYNSKI, F. ERIKSSON, L. HULTMAN, Linköping University, Sweden	**SS+AS+EN-MoM8** Exploring Iron Oxide Clusters and Films Supported on HOPG with HREELS and AES, **JOEL LANGFORD**, University of California, Irvine, F. ROSNER, Technical University of Munich, Germany, J. KWON, J.C. HEMMINGER, University of California, Irvine
11:00 am	**SE+AS+NS+TR-MoM9** Epitaxial and Polycrystalline WNx and MoNx Films Deposited by Reactive DC Magnetron Sputtering, **BRIAN OZSDOLAY**, K. BALASUBRAMANIAN, Rensselaer Polytechnic Institute, C.P. MULLIGAN, U.S. Army Armament Research Development & Engineering Center, Benét Laboratories, M.J. GUERETTE, L. HUANG, D. GALL, Rensselaer Polytechnic Institute	**SS+AS+EN-MoM9** Computational Materials Design®: Ionic Conduction in Rare-Earth-Metal Oxides from the First Principles-based Studies, **SUSAN ASPERA**, M. SAKAUE, M. ALAYDRUS, T.P.T. LINH, N.H. LINH, H. NAKANISHI, Osaka University, Japan, H. KASAI, Akashi College, Japan
11:20 am	**SE+AS+NS+TR-MoM10** Phase Stability and In Situ Growth Stresses in Thin Cu/Nb Multilayered Films, **QIANYING GUO**, L. WAN, R.L. MARTENS, G.B. THOMPSON, University of Alabama	**SS+AS+EN-MoM10** Modeling and Characterization of Exemplar Sealing Glasses to Develop Chemistry-Structure-Property Relationships, **MICHAEL BRUMBACH**, T. ZEITLER, T. ALAM, M. RODRIGUEZ, L. CRISCENTI, M. KALAN, A. MIRABAL, D. BENCOE, K. EWSUK, Sandia National Laboratories
11:40 am	**SE+AS+NS+TR-MoM11** Droplets in Cathodic Arc Evaporated $(Al,Cr)_2O_3$-based Coatings and the Nucleation of Dedicated Crystalline Structures, **CHRISTIAN M. KOLLER**, CDL AOS, TU Wien, Austria, R. HAHN, TU Wien, Austria, J. RAMM, Oerlikon Balzers, Oerlikon Surface Solutions AG, Liechtenstein, S. KOLOZSVÁRI, Plansee Composite Materials GmbH, Germany, P.H. MAYRHOFER, CDL AOS, TU Wien, Austria	

* **Morton S. Traum Award Finalist**

	Thin Film Room: 111 - Session TF+AS+SS-MoM **Self-Assembled Monolayers, Layer-by-Layer, etc.** **Moderators:** Han Zuilhof, Wageningen University, Netherlands, Nathan Guisinger, Argonne National Laboratory	Vacuum Technology Room: 230B - Session VT-MoM **Vacuum Measurement, Calibration, and Primary Standards** **Moderators:** Bob Garcia, MKS Instruments, Joe Becker, Kurt J. Lesker Company
8:20 am	**TF+AS+SS-MoM1** The Effects of Embedded Dipoles in Aromatic Self-Assembled Monolayers, **SWEN SCHUSTER**, Universität Heidelberg, Germany, T. ABU-HUSEIN, Universität Frankfurt, Germany, D.A. EGGER, I. HEHN, Graz University of Technology, Austria, M. KIND, Universität Frankfurt, Germany, E. ZOJER, Graz University of Technology, Austria, A. TERFORT, Universität Frankfurt, Germany, M. ZHARNIKOV, Universität Heidelberg, Germany	**VT-MoM1 Invited** History of Widely Used Vacuum Gauges and the Variations and Motivations That Occurred Along the Way: How Did We Get Where We Are?, **PAUL ARNOLD**, MKS Instruments,Inc.,Granvillle-Phillips Product Center
8:40 am	**TF+AS+SS-MoM2** IR Spectroscopic studies of Molecular Thin Films exhibiting Spontaneous Dipole Alignment, **ALEXANDER ROSU-FINSEN**, Heriot-Watt University, UK, J. LASNE, Heriot-Watt University, France, A. CASSIDY, D. FIELD, Aarhus University, Denmark, M.R.S. MCCOUSTRA, Heriot-Watt University, UK	Invited talk continued.
9:00 am	**TF+AS+SS-MoM3** Coordination-Based Molecular Assemblies as Electrochromic Materials: Ultra-High Switching Stability and Coloration Efficiencies[1], **MICHAL LAHAV**, Weizmann Institute of Science, Israel	**VT-MoM3** MicroPirani MEMS Sensors for Vacuum Pressure Measurement - Looking Back and Ahead, **CASPAR CHRISTIANSEN**, O. WENZEL, MKS Granville-Phillips Division, Denmark
9:20 am	**TF+AS+SS-MoM4** New Approaches to the Preparation of Well-defined Metal Films on Top of Self-assembled Monolayers, **MICHAEL ZHARNIKOV**, Universität Heidelberg, Germany	**VT-MoM4** Performance Assessment of Absolute Capacitance Manometers Used in Long-term Irradiation Studies, **LILY WANG**, P.D. HONNELL, Los Alamos National Laboratory
9:40 am	**TF+AS+SS-MoM5 Invited** N-Heterocyclic Carbenes as Novel Ligands for Self Assembled Monolayers on Gold, **CATHLEEN CRUDDEN**, Queen's University, Canada	**VT-MoM5** Analysis of Pressure Measurement Techniques from 1 kPa to 130 kPa, **JACOB RICKER**, J. HENDRICKS, National Institute of Standards and Technology
10:00 am	Invited talk continued.	**VT-MoM6** Comparisons between Capacitance Diaphragm Gauges with Different Types of Diaphragm Materials using Force-balanced Piston Gauge, **HANWOOK SONG**, KRISS, Korea, Republic of Korea, M. SALAZAR, UST, Republic of Korea, S.Y. WOO, KRISS, Korea, Republic of Korea
10:20 am	**BREAK**	**BREAK**
10:40 am	**TF+AS+SS-MoM8** Improved Stability of Ag Thin Films due to Several Organic Surface Monolayers, **MIDORI KAWAMURA**, Kitami Institute of Technology, Japan, C. KUDO, T. SASAKI, Y. ABE, K.H. KIM, T. KIBA, Kitami Institute of Technology	**VT-MoM8** Inverted Magnetron with Different Cathode Materials, **MARTIN WÜEST**, J. MARKI, INFICON Ltd., Liechtenstein
11:00 am	**TF+AS+SS-MoM9** Electronic Structures of the Biaxially-strained GaSb(111) Films, **TAKUYA HATAYAMA**, The University of Electro-Communications (UEC-Tokyo), Japan, A. AKAISHI, The University of Electro-Communications (UEC-Tokyo), J. NAKAMURA, The University of Electro-Communications (UEC-Tokyo), Japan	**VT-MoM9** Modern Day Challenges to Ionization Gauge Lifetimes, **GERARDO ALEJANDRO BRUCKER**, S.C. HEINBUCH, T.R. SWINNEY, MKS Granville-Phillips Division, Longmont
11:20 am	**TF+AS+SS-MoM10** How to Repel Polymer Adsorption on Flat Surfaces?, **ZHANHUA WANG**, S.P. PUJARI, M.M.J. SMULDERS, H. ZUILHOF, Wageningen University, Netherlands	**VT-MoM10** Dynamic Pressure Changes for Measurement of Ionization Gauge Response Times, **NEIL PEACOCK**, MKS Instruments, Granville-Phillips®
11:40 am	**TF+AS+SS-MoM11** Symmetric Attachment of Annulated Aromatic Hydrocarbons in Self-assembled Monolayers by Use of Oxazoles, C. PARTES, University of Frankfurt, Germany, S. SCHUSTER, T. WÄCHTER, University of Heidelberg, Germany, **MARTIN KIND**, University of Frankfurt, Germany, M. ZHARNIKOV, University of Heidelberg, Germany, A. TERFORT, University of Frankfurt, Germany	**VT-MoM11** Photonic Realization of the Pascal: The Future of Pressure and Vacuum Metrology?, **JAY HENDRICKS**, J.E. RICKER, A. STONE, F. EGAN, E. SCACE, F. STROUSE, National Institute of Standards and Technology

NOTES

	2D Materials Focus Topic Room: 212C - Session 2D+EM+MC+MS+NS-MoA 2D Materials: Devices and Applications **Moderators:** Joshua Goldberger, The Ohio State University, Arend van der Zande, University of Illinois at Urbana Champaign	Atom Probe Tomography Focus Topic Room: 230A - Session AP+AS-MoA Current and New Research Fields for Applications of Atom Probe Tomography **Moderator:** Baishakhi Mazumder, Center for Nanophase and Materials Sciences Oak Ridge National Laboratory, Oak Ridge, TN 37831, USA
2:20 pm	**2D+EM+MC+MS+NS-MoA1 Invited** Designer Materials from the Assembly of 2D Layered Heterostructures, **CORY DEAN**, Columbia University	**AP+AS-MoA1 Invited** APT Studies of the Embrittlement of Fe-Cr Ferrite, **MATTIAS THUVANDER**, Chalmers University of Technology, Sweden, J. ODQVIST, P. HEDSTRÖM, KTH Royal Institute of Technology, Sweden
2:40 pm	Invited talk continued.	Invited talk continued.
3:00 pm	**2D+EM+MC+MS+NS-MoA3** Structural Semiconducting-to-Metallic Phase Transition in Monolayer Transition Metal Dichalcogenides Induced by Electrostatic Gating, **YAO LI**, K.-A. DUERLOO, E.J. REED, Stanford University	**AP+AS-MoA3** Comparing APT Mass Spectral Ranging for Compositional Accuracy: A Case Study with Cast Duplex Stainless Steels, **DANIEL PEREA**, A. EATON, J. LIU, Pacific Northwest National Laboratory, S. MBURU, S. SCHWARM, R. KOLLI, S. ANKEM, University of Maryland
3:20 pm	**2D+EM+MC+MS+NS-MoA4** Use of Voltage-Contrast and Dynamical XPS for Characterization of Graphene-Based Devices in Operation, **SEFIK SUZER**, Bilkent University, Turkey	**AP+AS-MoA4** Chemical Imaging of Atmospheric Aerosols using Atom Probe Tomography and Multi-Modal Characterization, **JIA LIU**, M.I. NANDASIRI, L. GORDON, G. KULKARNI, V. SHUTTHANANDAN, Pacific Northwest National Laboratory, S.A. THEVUTHASAN, Qatar Environment and Energy Research Institute, Qatar, A. DEVARAJ, Pacific Northwest National Laboratory
3:40 pm	**2D+EM+MC+MS+NS-MoA5** Molecular Spintronic Quantum Devices, **MARIO RUBEN**, KIT, Germany	**AP+AS-MoA5 Invited** Combining Atom Probe Tomography with TKD and FiB for Comprehensive Characterization of High Performance Materials, **SOPHIE PRIMIG**, University of New South Wales, Australia, K. BABINSKY, P. HASLBERGER, C. HOFER, D. LANG, C. TURK, Montanuniversität Leoben, Austria
4:00 pm	**2D+EM+MC+MS+NS-MoA6** Avalanche Photodiodes based on MoS_2/Si Heterojunctions, **ORIOL LÓPEZ SÁNCHEZ**, Ecole Polytechnique Fédérale de Lausanne (EPFL), Switzerland, G. FIORI, G. IANNACCONE, Università di Pisa, Italy, D. DUMENCO, Ecole Polytechnique Fédérale de Lausanne (EPFL), Switzerland, E. CHARBON, Delft University of Technology, Netherlands	Invited talk continued.
4:20 pm	**2D+EM+MC+MS+NS-MoA7 Invited** From Black Phosphrus to Phosphorene, **PEIDE YE**, Purdue University	**AP+AS-MoA7** Atom Probe Tomography Studies of FeCo Nanocomposite Soft Magnetic Materials, A. LEARY, V. DEGEORGE, V. KEYLIN, Carnegie Mellon University, **ARUN DEVARAJ**, J. CUI, Pacific Northwest National Laboratory, M. MCHENRY, Carnegie Mellon University
4:40 pm	Invited talk continued.	
5:00 pm	**2D+EM+MC+MS+NS-MoA9** Ambient Oxidation and Alumina Passivation of Exfoliated Black Phosphorus Transistors, **JOSHUA WOOD**, S. WELLS, D. JARIWALA, K.-S. CHEN, X. LIU, V. SANGWAN, E. CHO, L. LAUHON, T.J. MARKS, M.C. HERSAM, Northwestern University	
5:20 pm	**2D+EM+MC+MS+NS-MoA10** Electro-Acoustic Characterization of Transition Metal Dichalcogenide Films on $LiNbO_3$, **EDWIN PRECIADO**, UC Riverside, F.J.R. SCHÜLEIN, A. WIXFORTH, Universität Augsburg, Germany, A. NGUYEN, D. BARROSO, M. ISARRARAZ, G. VON SON, I. LU, L. BARTELS, UC Riverside, H. KRENNER, Universität Augsburg, Germany	

	Applied Surface Science Room: 212D - Session AS-MoA	Biomaterial Interfaces Room: 211D - Session BI+AS-MoA
	Practical Surface Analysis I: Interpretation Challenges **Moderators:** Karen Gaskell, University of Maryland, College Park, Alan Spool, HGST, a Western Digital Company	**Characterization of Biological and Biomaterials Surfaces (2)** **Moderators:** Joe Baio, Oregon State University, Dan Graham, University of Washington
2:20 pm	**AS-MoA1 Invited** ASSD 30th Anniversary Lecture: XPS: Three Challenges and an Opportunity, **JAMES CASTLE**, University of Surrey, UK	**BI+AS-MoA1** Characterization of Protein G B1 Immobilized Gold Nanoparticles using Time of Flight Secondary Ion Mass Spectrometry and X-ray Photoelectron Spectroscopy, **YUNG-CHEN WANG***, D.G. CASTNER, University of Washington
2:40 pm	Invited talk continued.	**BI+AS-MoA2** Controlled Molecular Mechanisms of Engineered Solid Binding Proteins on Surfaces, **CHRISTOPHER SO**, National Research Council postdoc cited at Naval Research Laboratory, S. WALPER, US Naval Research Laboratory, R. STINE, Nova Research, D.E. BARLOW, K. WAHL, US Naval Research Laboratory
3:00 pm	**AS-MoA3** Results from a VAMAS Inter-Laboratory Comparison on the Measurement of Composition of Organic Mixtures in Depth Profiling, **ALEXANDER SHARD**, National Physical Laboratory, UK	**BI+AS-MoA3** Molecular-Level Surface Analysis Demonstrates the Impact of Detergent Selection on Decellularized Tissues, **ADAM TAYLOR**, University of Washington, L.J. WHITE, University of Nottingham, UK, D.M. FAULK, L.T. SALDIN, University of Pittsburgh, D.G. CASTNER, University of Washington, S.F. BADYLAK, University of Pittsburgh, B.D. RATNER, University of Washington
3:20 pm	**AS-MoA4** *In Operando* Studies of High Temperature, Heterogeneous Electrocatalysis on a Lanthanum Strontium Manganite-based Solid Oxide Electrochemical Cell, **AARON GELLER**, B. EICHHORN, University of Maryland, College Park	**BI+AS-MoA4** Liquid Repelling Surfaces Based on Candle Soot are Non-Fouling, **LARS SCHMÜSER**, M. PAVEN, N. ENCINAS, Max Planck Institute for Polymer Research, Mainz, Germany, D.J. GRAHAM, D.G. CASTNER, University of Washington, D. VOLLMER, H.J. BUTT, T. WEIDNER, Max Planck Institute for Polymer Research, Mainz, Germany
3:40 pm	**AS-MoA5 Invited** Building the Link Between XPS Data and Functional Properties of Materials, **KATERYNA ARTYUSHKOVA**, I. MATANOVIC, S. KABIR, University of New Mexico, B. KIEFFER, New Mexico State University, A. SEROV, P. ATANASSOV, University of New Mexico	**BI+AS-MoA5** Time-of-Flight Secondary Ion Mass Spectrometry Investigations of the Pancreatic Islet Tumor Microenvironment, **BLAKE BLUESTEIN**, Department of Bioengineering, University of Washington, F.M. MORRISH, D. HOCKENBERY, Fred Hutchinson Cancer Research Center, L.J. GAMBLE, Department of Bioengineering, University of Washington
4:00 pm	Invited talk continued.	**BI+AS-MoA6** Paper-based Device for Home Phenylalanine Monitoring from a Sample of Whole Blood, R. ROBINSON, **ELAIN FU**, Oregon State University
4:20 pm	**AS-MoA7** Multitechnique Characterization of Protein G B1 Orientation on Surfaces, **ELISA HARRISON**, G. INTERLANDI, D.G. CASTNER, University of Washington	**BI+AS-MoA7 Invited** Multivalent Probes for Tuneable 'Superselective' Targeting, G.V. DUBACHEVA, CIC biomaGUNE, Spain, T. CURK, University of Cambridge, UK, R. AUZÉLY-VELTY, Cermav, Cnrs, France, D. FRENKEL, University of Cambridge, UK, **RALF RICHTER**, CIC biomaGUNE & University Grenoble Alpes, Spain
4:40 pm	**AS-MoA8** Investigation of Composition and Structure of Functionalized Carbon Materials, **SVITLANA PYLYPENKO**, K.N. WOOD, Colorado School of Mines, A.A. DAMERON, National Renewable Energy Laboratory, R. O'HAYRE, Colorado School of Mines	Invited talk continued.
5:00 pm	**AS-MoA9** How to Make Amorphous Carbon Stable: An *In Situ* XPS and NEXAFS Investigation of Thermally-Induced Structural Evolution of Amorphous Carbon Surfaces, **FILIPPO MANGOLINI**, Ecole Centrale de Lyon - LTDS, France, J. HILBERT, J.B. MCCLIMON, J.R. LUKES, R.W. CARPICK, University of Pennsylvania	**BI+AS-MoA9** Targeted Ultrathin Silica Nanoshells as HIFU Sensitizing Agents for *In Vivo* LnCAP Prostate Tumor Removal, **JAMES WANG**, A. LIBERMAN, C. BARBACK, S. BLAIR, R. MATTREY, W. TROGLER, A.C. KUMMEL, UC San Diego
5:20 pm	**AS-MoA10** A Comparative Study of the Native Oxide on 316L Stainless Steel by XPS and ToF-SIMS, **SABRINA TARDIO**, M.-L. ABEL, University of Surrey, UK, R.H. CARR, Huntsman PU, J.E. CASTLE, J.F. WATTS, University of Surrey, UK	**BI+AS-MoA10** Transparent Field Effect Sensor with Nanostructured Amorphous In-Ga-Zn-O Wires, **XIAOSONG DU**, Y. LI, J. MOTLEY, G. HERMAN, Oregon State University
5:45 pm		**BID BUSINESS MEETING**

*** ASSD Student Award Finalist**

	Electronic Materials and Processing Room: 211A - Session EM+AS+SS-MoA **MIM Diodes, Functional Oxides, and TFTs** **Moderators:** Pat Brady, RedWave Energy, Inc., John Conley, Oregon State University	Electronic Materials and Processing Room: 210E - Session EM+NS+PS-MoA **More Moore! II** **Moderators:** Christopher Hinkle, University of Texas at Dallas, Andrew C. Kummel, University of California at San Diego
2:20 pm	**EM+AS+SS-MoA1** Engineered Tunnel-Barrier Terahertz Rectifiers for Optical Nantennas, **IVONA MITROVIC**, N. SEDGHI, A.D. WEERAKKODY, J.F. RALPH, S. HALL, J.S. WRENCH, P.R. CHALKER, University of Liverpool, UK, Z. LUO, S. BEEBY, University of Southampton, UK	**EM+NS+PS-MoA1** Effect of *Ex Situ* and *In Situ* Surface Cleaning on the Quality of Al_2O_3-SiGe(001) Interfaces, K. SARDASHTI, **KAI-TING HU**, UC San Diego, S. MADISETTI, College of Nanoscale Science and Engineering, Albany-SUNY, K. TANG, Stanford University, S. OKTYABRSKY, College of Nanoscale Science and Engineering, Albany-SUNY, P.C. MCINTYRE, Stanford University, S. SIDDIQUI, B. SAHU, Globalfoundries, N. YOSHIDA, J. KACHIAN, Applied Materials Inc., A.C. KUMMEL, UC San Diego
2:40 pm	**EM+AS+SS-MoA2** MIM Diodes for RF Energy Harvesting, A.A. KHAN, A. SYED, F. GHAFFAR, **ATIF SHAMIM**, King Abdullah University of Science and Technology	**EM+NS+PS-MoA2** Surface Passivation for ALD-Al_2O_3/SiGe MOS Devices, **LIANGLIANG ZHANG**, Stanford University, V. HASSAN, C. LO, C. OLSEN, M.A. FOAD, Applied Materials Inc., P.C. MCINTYRE, Stanford University
3:00 pm	**EM+AS+SS-MoA3** Diode Structure Based on Carbon Materials for Ultra high Frequency Driving, **JAEEUN JANG**, Daegu Gyeongbuk Institute of Science and Technology (DGIST), Republic of Korea	**EM+NS+PS-MoA3 Invited** Harnessing Chemistry to deliver Materials and Process for theNext 10 Years of CMOS Evolution, **ROBERT CLARK**, TEL Technology Center, America, LLC
3:20 pm	**EM+AS+SS-MoA4** Optical Rectenna Arrays using Vertically Aligned Carbon Nanotubes, **BARATUNDE COLA**, Georgia Institute of Technology	Invited talk continued.
3:40 pm	**EM+AS+SS-MoA5 Invited** World Record Tunable Microwave Dielectrics, C.H. LEE, Cornell University, N.D. ORLOFF, National Institute of Standards and Technology (NIST), T. BIROL, Y. ZHU, Y. NIE, Cornell University, V. GOIAN, Institute of Physics ASCR, R. HAISLMAIER, Pennsylvania State University, J.A. MUNDY, Cornell University, J. JUNQUERA, Universidad de Cantabria, P. GHOSEZ, Université de Liège, R. UECKER, Leibniz Institute for Crystal Growth, V. GOPALAN, Pennsylvania State University, S. KAMBA, Institute of Physics ASCR, L.F. KOURKOUTIS, K.M. SHEN, D.A. MULLER, Cornell University, I. TAKEUCHI, University of Maryland, College Park, J.C. BOOTH, National Institute of Standards and Technology (NIST), C.J. FENNIE, **D.G. SCHLOM**, Cornell University	**EM+NS+PS-MoA5** Density Functional Theory Molecular Dynamics Simulations and Experimental Characterization of high-k/SiGe(110) and SiGe(001) Interfaces, A.C. KUMMEL, E. CHAGAROV, University of California at San Diego, B. SAHU, Globalfoundries, S. OKTYABRSKY, S. MADISETTI, College of Nanoscale Science and Engineering, Albany-SUNY, **TOBIN KAUFMAN-OSBORN**, University of California at San Diego
4:00 pm	Invited talk continued.	**EM+NS+PS-MoA6** Density-Functional Theory Molecular Dynamics Simulations of a-HfO_2/Ge(100)(2x1) and a-ZrO_2/Ge(100)(2x1) Interface Passivation, **EVGUENI CHAGAROV**, University of California at San Diego, L.M. PORTER, Carnegie Mellon University, A.C. KUMMEL, University of California at San Diego
4:20 pm	**EM+AS+SS-MoA7 Invited** Bandgap Engineering and Application of SiZnSnO Amorphous Oxide Semiconductor, **SANG-YEOL LEE**, Cheongju University, Republic of Korea	**EM+NS+PS-MoA7** Lower Temperature Silicon Nitride ALD on $Si_{0.5}Ge_{0.5}$(110) with No Solid By-product Formation, **STEVEN WOLF**, M. EDMONDS, T. KENT, University of California at San Diego, D. ALVAREZ, RASIRC, R. DROOPAD, Texas State University, A.C. KUMMEL, University of California at San Diego
4:40 pm	Invited talk continued.	**EM+NS+PS-MoA8** Novel Delivery of Unstable Precursors for Atomic Layer Deposition, **DANIEL ALVAREZ**, J. SPIEGELMAN, E. HEINLEIN, R. HOLMES, C. RAMOS, S. WEBB, K. JOHNSON, RASIRC
5:00 pm	**EM+AS+SS-MoA9** Self-aligned Vertical ZnO-based Circuits by Spatial ALD, **SHELBY NELSON**, C.R. ELLINGER, L.W. TUTT, Eastman Kodak Company	**EM+NS+PS-MoA9** Passivation and Functionalization of SiGe(001) and (110) for ALD Nucleation in FinFET Structure, **SANGWOOK PARK**, H. KIM, University of California at San Diego, B. SAHU, S. SIDDIQUI, GLOBALFOUNDRIES U.S. Inc., N. YOSHIDA, A. BRANDT, Applied Materials, Inc., E. CHAGAROV, A.C. KUMMEL, University of California at San Diego
5:20 pm	**EM+AS+SS-MoA10** Geometrically Asymmetric Tunneling Nanostructures by Atomic Layer Deposition, **JIE QI**, X. JIANG, B.G. WILLIS, University of Connecticut	**EM+NS+PS-MoA10** Band Structure and Critical Points of Pseudomorphic $Ge_{1-y}Sn_y$ Alloys on Ge, **NALIN FERNANDO**, T.N. NUNLEY, S. ZOLLNER, New Mexico State University, D. ZHANG, R. HICKEY, J. KOLODZEY, University of Delaware

	Energy Frontiers Focus Topic Room: 211B - Session EN+AS+EM+NS+SE+SS+TF-MoA Solar Cells II **Moderator:** Stacey Bent, Stanford University	IPF on Mesoscale Science and Technology of Materials and Metamaterials Room: 210F - Session IPF+MS-MoA Mesoscale Phenomena in the Biosciences II (2:20-3:40) & Metamaterials (3:40-5:40) **Moderators:** Carolyn Larabell, University of California, San Francisco, Mark Brongersma, Stanford University
2:20 pm	**EN+AS+EM+NS+SE+SS+TF-MoA1** Influence of Annealing Temperature in the Bulk Defect Formation in Perovskite Thin Films, **WEINA PENG**, B.X. ANAND, L.-H. LIU, S.C. SAMPAT, B.E. BEARDEN, A.V. MALKO, Y.J. CHABAL, University of Texas at Dallas	**IPF+MS-MoA1 Invited** Mesoscale Imaging in Cell Biology, **GERRY MCDERMOTT**, M. DO, J.-H. CHEN, A. WALTER, M.A. LE GROS, C.A. LARABELL, University of California, San Francisco
2:40 pm	**EN+AS+EM+NS+SE+SS+TF-MoA2** SPELEEM Studies on the Surface and Electronic Structure of Halide Perovskites, **WENCAN JIN**, H.-C. HUANG, P. BULLEN, Columbia University, J. SADOWSKI, Brookhaven National Laboratory, X. WU, H. ZHU, X. ZHU, R.M. OSGOOD, JR., Columbia University	Invited talk continued.
3:00 pm	**EN+AS+EM+NS+SE+SS+TF-MoA3 Invited** Tandem Solar Cells Using Perovskites, Silicon and CIGS, **MICHAEL MCGEHEE**, Stanford University	**IPF+MS-MoA3 Invited** Biomimetic Material Approaches to Tissue Engineering, Regenerative Medicine, and Wound Healing, **ELIZABETH LOBOA**, UNC-Chapel Hill & NC State University
3:20 pm	Invited talk continued.	Invited talk continued.
3:40 pm	**EN+AS+EM+NS+SE+SS+TF-MoA5** Lifetime, Mobility, and Diffusion of Photoexcited Carriers in Ligand-Exchanged Lead Selenide Nanocrystal Films Measured by Time-Resolved Terahertz Spectroscopy, G.W. GUGLIETTA, Drexel University, B.T. DIROLL, E.A. GAULDING, J.L. FORDHAM, University of Pennsylvania, S. LI, Drexel University, C.B. MURRAY, University of Pennsylvania, **JASON BAXTER**, Drexel University	**IPF+MS-MoA5 Invited** Structured Light and Structured Surface Waves from Metasurfaces, **FEDERICO CAPASSO**, Harvard University
4:00 pm	**EN+AS+EM+NS+SE+SS+TF-MoA6** iCVD Synthesis and Integration of Poly(vinylpyrrolidone) and Poly(4-vinylpyridine) as Polymer Electrolytes in Dye Sensitized Solar Cells, **YURIY Y. SMOLIN**, S. JANAKIRAMAN, A.J. SAUTER, M. SOROUSH, K.K.S. LAU, Drexel University	Invited talk continued.
4:20 pm	**EN+AS+EM+NS+SE+SS+TF-MoA7** Interfacial Effects on Device Performance in Organic Solar Cells, **HUANXIN JU**, J.F. ZHU, University of Science and Technology of China, D.S. GINGER, University of Washington	**IPF+MS-MoA7 Invited** Quest for Extreme Photonics, **NADER ENGHETA**, University of Pennsylvania
4:40 pm	**EN+AS+EM+NS+SE+SS+TF-MoA8** Tungsten-Titanium Mixed Oxide Thin Films for Improved Structural and Optical Properties for Solar Driven Applications, **MIRELLA VARGAS**, The University of Texas at El Paso, N.R. MURPHY, Air Force Research Laboratory, R.V. CHINTALAPALLE, The University of Texas at El Paso	Invited talk continued.
5:00 pm	**EN+AS+EM+NS+SE+SS+TF-MoA9** Potential Resolution to the "Doping Puzzle" in Pyrite FeS_2, X. ZHANG, M. LI, L. O'BRIEN, J. WALTER, M. MANNO, F. MORK, J. KAKALIOS, **ERAY AYDIL**, C. LEIGHTON, University of Minnesota	**IPF+MS-MoA9 Invited** 2D Materials: Graphene and Beyond, **TONY HEINZ**, Stanford University
5:20 pm	**EN+AS+EM+NS+SE+SS+TF-MoA10** Interparticle Contact Radius and Electron Transport in Thin Films Comprised of Nanocrystals, **ELIJAH THIMSEN**, D. LANIGAN, Washington University, St. Louis	Invited talk continued.

	In-Situ Spectroscopy and Microscopy Focus Topic Room: 211C - Session IS+AS+SA+SS-MoA Ambient Pressure X-ray Photoelectron Spectroscopy Studies for Catalytic and Energy Materials in Gas Phase **Moderators:** Peter Crozier, Arizona State University, Franklin (Feng) Tao, University of Kansas	Accelerating Materials Discovery for Global Competitiveness Focus Topic Room: 114 - Session MG+2D+MI+NS+TF-MoA Design and Discovery (Bio and Other Interfaces) **Moderators:** Sean Jones, National Science Foundation (NSF), Lynnette Madsen, National Science Foundation (NSF)
2:20 pm	**IS+AS+SA+SS-MoA1 Invited** In situ Electron Spectroscopy for Energy Science, **ROBERT SCHLÖGL**, Fritz-Haber-Institut der Max-Planck-Gesellschaft, Germany	**MG+2D+MI+NS+TF-MoA1 Invited** Polymer Microarrays - High Throughput Methods for Bio-material Discovery for the Control and Modulation of Stem Cells and Translational Application, **MARK BRADLEY**, University of Edinburgh, UK
2:40 pm	Invited talk continued.	Invited talk continued.
3:00 pm	**IS+AS+SA+SS-MoA3** Catalysis on Singly Dispersed Bimetallic Sites on Oxide Support, **LUAN NGUYEN**, University of Kansas, A. FRENKEL, Yeshiva University, J. LI, Tsinghua University, China, F. TAO, University of Kansas	**MG+2D+MI+NS+TF-MoA3 Invited** Rational Accelerated Design of Polymer Dielectrics, **RAMPI RAMPRASAD**, University of Connecticut
3:20 pm	**IS+AS+SA+SS-MoA4** Oxidation and Recovery of WC Thin Film Surfaces, E. MONAZAMI, University of Virginia, J.B. MCCLIMON, University of Pennsylvania, N. JOHANSSON, P. SHAYESTEH, S. URPELAINEN, J. SCHNADT, Lund University, Sweden, **PETRA REINKE**, University of Virginia	Invited talk continued.
3:40 pm	**IS+AS+SA+SS-MoA5 Invited** Microscopy, Spectroscopy, and Reactivity of Surfaces in Vacuum and under Ambient Reaction Pressures, **MIQUEL SALMERON**, B. EREN, Lawrence Berkeley National Laboratory	**MG+2D+MI+NS+TF-MoA5** Method to Make a Stable Copper-Carbon Alloy, **IVAN SHCHELKANOV**, D.N. RUZIC, I. JASIUK, University of Illinois at Urbana Champaign
4:00 pm	Invited talk continued.	**MG+2D+MI+NS+TF-MoA6** Development of Nanoporous Solid Phase Microextraction (SPME) Fibers by Sputtering, **MATTHEW LINFORD**, C.V. CUSHMAN, B. SINGH, A. DIWAN, Brigham Young University
4:20 pm	**IS+AS+SA+SS-MoA7** Novel Solutions for Ambient Pressure and *In Situ* Photoelectron Spectro-Microscopy, **HIKMET SEZEN**, M. AMATI, L. GREGORATTI, Elettra-Sincrotrone Trieste, Italy	
4:40 pm	**IS+AS+SA+SS-MoA8** *In Situ* Studies of Partial Oxidation of Methanol to Hydrogen on Isolated Bimetallic Site Pt_1Zn_n, **SHIRAN ZHANG**, L. NGUYEN, University of Kansas, A. FRENKEL, Yeshiva University, J. LIU, Arizona State University, F. TAO, University of Kansas	
5:00 pm	**IS+AS+SA+SS-MoA9** New Developments in Small Spot and Imaging Near Ambient Pressure XPS, **ANDREAS THISSEN**, SPECS Surface Nano Analysis GmbH	
5:20 pm	**IS+AS+SA+SS-MoA10** In Situ Measurement of the Abundances and Temperatures of the Constituents of Semiconductor Manufacturing Plasmas via Terahertz Absorption Spectroscopy: Comparison with Theoretical Models, **YASER HELAL**, C.F. NEESE, F.C. DE LUCIA, The Ohio State University, A. AGARWAL, B. CRAVER, P.R. EWING, P.J. STOUT, M.D. ARMACOST, Applied Materials, Inc.	

	Nanometer-scale Science and Technology Room: 212B - Session NS+AS+SP-MoA **Optical Spectroscopy at the Nanoscale** **Moderator:** Craig Prater, Anasys Instruments	Plasma Science and Technology Room: 210B - Session PS+EM-MoA **Directed Self Assembly and Plasma Synthesis of Novel Materials** **Moderator:** Eric Joseph, IBM T.J. Watson Research Center
2:20 pm	**NS+AS+SP-MoA1 Invited** Nanoscale Infrared Spectroscopy Characterization of Amyloid Aggregates Structure, **FRANCESCO SIMONE RUGGERI**, Ecole Polytechnique Fédérale de Lausanne (EPFL), Switzerland, T. MULLER, University of Cambridge, UK, D. GALANTE, CNR, Italy, T.P.J. KNOWLES, University of Cambridge, UK, H. LASHUEL, Ecole Polytechnique Fédérale de Lausanne (EPFL), Switzerland, C. D'ARRIGO, CNR, Italy, G. DIETLER, Ecole Polytechnique Fédérale de Lausanne (EPFL), Switzerland	**PS+EM-MoA1 Invited** Forward and Inverse Computational Tools for Directed Self-Assembly, G.H. FREDRICKSON, **SEAN PARADISO**, University of California at Santa Barbara
2:40 pm	Invited talk continued.	Invited talk continued.
3:00 pm	**NS+AS+SP-MoA3 Invited** Recent Progress in Tip-Enhanced Mid-Infrared Photoexpansion Nanospectroscopy, M. JIN, F. LU, **MIKHAIL BELKIN**, The University of Texas at Austin	**PS+EM-MoA3** Improvement of Block Copolymer Masked Silicon Etch Profile using Neutral Beam, **DEOKHYUN YUN**, J.W. PARK, H.S. KIM, G.Y. YEOM, Sungkyunkwan University, Republic of Korea
3:20 pm	Invited talk continued.	**PS+EM-MoA4** Plasma Etching of Directed Self Assembly based Patterns for Aggressively Scaled CMOS Applications, **HIROYUKI MIYAZOE**, H. TSAI, R.L. BRUCE, S.U. ENGELMANN, M. BRINK, A. PYZYNA, IBM T.J. Watson Research Center, C. LIU, IBM Albany Nanotech Center, A. VORA, D. SANDERS, IBM Almaden Research Center, M. MAHER, W. DURAND, C. ELLISON, G. WILLSON, The University of Texas at Austin, M. GUILLORN, E.A. JOSEPH, IBM T.J. Watson Research Center
3:40 pm	**NS+AS+SP-MoA5 Invited** Nano-photonic Phenomena in van der Waals Heterostructures, **DMITRI BASOV**, University of California San Diego	
4:00 pm	Invited talk continued.	**PS+EM-MoA6 Invited** Microplasma Based Synthesis of Nanomaterials, **MICHAEL GORDON**, University of California at Santa Barbara
4:20 pm	**NS+AS+SP-MoA7** Ultrahigh Vacuum Tip-Enhanced Raman Spectroscopy and Fluorescence of a Self-Assembled Porphyrin Monolayer, **NAIHAO CHIANG**, N. JIANG, Northwestern University, D. CHULHAI, Pennsylvania State University, E. POZZI, M.C. HERSAM, Northwestern University, L. JENSEN, Pennsylvania State University, T. SEIDEMAN, R.P. VAN DUYNE, Northwestern University	Invited talk continued.
4:40 pm	**NS+AS+SP-MoA8** Nano-Optical Spectroscopic Imaging of Monolayer MoS_2, **WEI BAO***, UC Berkeley, N. BORYS, Lawrence Berkeley National Lab, C. KO, J. SUH, W. FAN, UC Berkeley, A. THRON, Lawrence Berkeley National Lab, Y. ZHANG, A. BUYANIN, UC Berkeley, J. ZHANG, S. CABRINI, P. ASHBY, A. WEBER-BARGIONI, Lawrence Berkeley National Lab, S. TONGAY, Arizona State University, S. ALONI, D. OGLETREE, Lawrence Berkeley National Lab, J. WU, UC Berkeley, M.B. SALMERON, Lawrence Berkeley Lab, UC Berkeley, P. SCHUCK, Lawrence Berkeley National Lab	**PS+EM-MoA8** Nucleation of Silicon Nanocrystals in a Remote Plasma without Subsequent Coaguation, **ILKER DOGAN**, Eindhoven University of Technology, Netherlands, S.L. WEEKS, S. AGARWAL, Colorado School of Mines, M.C.M. VAN DE SANDEN, Dutch Institute for Fundamental Energy Research (DIFFER), Netherlands
5:00 pm	**NS+AS+SP-MoA9** Hybrid Peak-force Tapping/near-field s-SNOM Microscope for Nano-chemical and Nano-mechanical Imaging of Proteins and Other Nanoscale Systems, **MARTIN WAGNER**, Bruker Nano Surfaces, K. CARNEIRO, S. HABELITZ, University of California, T. MUELLER, Bruker Nano Surfaces	**PS+EM-MoA9** Atmospheric Plasma Synthesis of Metallic Platinum Nanoparticles for PEMFC Technology using an Organometallic-Carbon Solution Nebulized in the Post-Discharge of an RF Torch, **JOFFREY BANETON**, D. MERCHE, ULB, Belgium, M. RAES, VUB, Belgium, V. DEBAILLE, ULB, Belgium, G. CALDARELLA, V. STERGIOPOULOS, ULg, Belgium, H. TERRYN, VUB, Belgium, N. JOB, ULg, Belgium, F.A.B. RENIERS, ULB, Belgium
5:20 pm		**PS+EM-MoA10** Low Energy Helium Ion Irradiation Induced Surface Modification of Metals, **IREM TANYELI†**, FOM Institute DIFFER, Netherlands, L. MAROT, D. MATHYS, University of Basel, Switzerland, M.C.M. VAN DE SANDEN, FOM Institute DIFFER, Netherlands, G. DE TEMMERMAN, ITER Organization

* **NSTD Student Award Finalist**
† **Coburn & Winters Student Award Finalist**

	Plasma Science and Technology Room: 210A - Session PS-MoA Plasma Diagnostics, Sensors and Control I **Moderator:** Erik Johnson, LPICM-CNRS, Ecole Polytechnique, France	Novel Trends in Synchrotron and FEL-Based Analysis Focus Topic Room: 112 - Session SA-MoA New Insights in Correlated Materials, Organic Materials and 2D Solids **Moderators:** Herrmann Dürr, Stanford University, Petra Rudolf, University of Groningen
2:20 pm	**PS-MoA1 Invited** Submillimeter Studies of Molecular Plasmas: Applications to Semiconductor Plasma Processing, **FRANK DE LUCIA**, Ohio State University	**SA-MoA1** Operando Soft X-ray Spectromicroscopy on Electronic States of Graphene Transistors, **HIROKAZU FUKIDOME**, Tohoku University, Japan
2:40 pm	Invited talk continued.	**SA-MoA2** Micro-metric Electronic Patterning of a Topological Band Structure using a Photon Beam, **NICK DE JONG**, E. FRANTZESKAKIS, B. ZWARTSENBERG, Y. HUANG, B.V. TRAN, P. PRONK, E. VAN HEUMEN, D. WU, Y. PAN, University of Amsterdam, M. RADOVIC, Paul Scherrer Institute, N.C. PLUMB, N. XU, Paul Scherrer Institut, M. SHI, Paul Scherrer Institute, A. DE VISSER, M.S. GOLDEN, University of Amsterdam
3:00 pm	**PS-MoA3** Using Broadband Absorption Spectroscopy to Elucidate Energy Partitioning and its Impact on Surface Reactivity, **JOSHUA BLECHLE**, A.R. HANNA, E.R. FISHER, Colorado State University	**SA-MoA3 Invited** Switching 2D Materials Properties with Light, **ALESSANDRA LANZARA**, University of California, Berkeley
3:20 pm	**PS-MoA4** CF_3^+ Fragmentation by Electron Impact Ionization of Perfluoro-Vinyl-Ethers, **YUSUKE KONDO**, K. ISHIKAWA, T. HAYASHI, Y. MIYAWAKI, K. TAKEDA, H. KONDO, M. SEKINE, M. HORI, Nagoya University, Japan	Invited talk continued.
3:40 pm	**PS-MoA5** A Comprehensive Quantitative Study of Low Pressure Inductively-Coupled Plasmas in Cl_2, O_2 and Mixtures, MICKAËL FOUCHER, D. MARINOV, P. CHABERT, LPP-CNRS, Ecole Polytechnique, France, A. AGARWAL, S. RAUF, Applied Materials Inc., **JEAN-PAUL BOOTH**, LPP-CNRS, Ecole Polytechnique, France	**SA-MoA5 Invited** Science-driven Requirements for Soft X-ray Free Electron Lasers, **FULVIO PARMIGIANI**, Elettra-Sincrotrone Trieste, Italy
4:00 pm	**PS-MoA6** Optical Emission Diagnostics for Detection of High Energy Electrons in Argon Plasmas, **SHICONG WANG**, J. BOFFARD, C.C. LIN, A.E. WENDT, University of Wisconsin - Madison	Invited talk continued.
4:20 pm	**PS-MoA7** Plasma Characteristics in a Dual-Frequency Inductively Coupled Plasma Source for the Etch Tool, **VLADIMIR NAGORNY**, Mattson Technology, V. GODYAK, RF Plasma Consulting	**SA-MoA7 Invited** Revealing Spin Texture Dynamics in Complex Materials via Time-resolved Resonant Soft X-ray Scattering, **ROBERT SCHOENLEIN**, Lawrence Berkeley National Laboratory
4:40 pm	**PS-MoA8** Spatial Oscillations and Frequency Shifts in Pulsed Capacitively Coupled Plasmas, **JOHN POULOSE**, L.J. OVERZET, The University of Texas at Dallas, S. SHANNON, North Carolina State University, D. COUMOU, MKS Instruments, M.J. GOECKNER, The University of Texas at Dallas	Invited talk continued.
5:00 pm	**PS-MoA9** Curling Probe Measurement of Electron Density in Pulse-Modulated Plasma at High Frequency, **ANIL PANDEY**, Chubu University, Japan, W. SAKAKIBARA, DOWA Thermotech, Japan, H. MATSUOKA, DOWA Thermotech, K. NAKAMURA, H. SUGAI, Chubu University, Japan	**SA-MoA9 Invited** Electronic States of Functional Molecular Materials Probed by Low-energy Excitation, **SATOSHI KERA**, Institute for Molecular Science, Japan
5:20 pm	**PS-MoA10** Detection of Biomedically Relevant Reactive Oxygen Species in Atmospheric Pressure Plasmas, **SANDRA SCHRÖTER***, J. BREDIN, K. NIEMI, J.P. DEDRICK, University of York, UK, M. FOUCHER, Ecole Polytechnique, France, N. DE OLIVEIRA, D. JOYEUX, L. NAHON, Synchrotron Soleil, France, J.-P. BOOTH, Ecole Polytechnique, France, E. WAGENAARS, T. GANS, D. O'CONNELL, University of York, UK	Invited talk continued.

*** Coburn & Winters Student Award Finalist**

	Advanced Surface Engineering **Room: 212A - Session SE+EM+EN-MoA** **Thin Film Technologies for Energy Storage, Conversion and Harvesting** **Moderators:** Michael Stueber, Karlsruhe Institute of Technology, Andrey Voevodin, Air Force Research Laboratory	**Surface Science** **Room: 113 - Session SS-MoA** **Organics and Ionic Liquids: Surfaces, Layers, Interfaces and Chirality** **Moderators:** Janice Reutt-Robey, University of Maryland, College Park, John Russell, Jr., Naval Research Laboratory
2:20 pm	**SE+EM+EN-MoA1** Properties of Zinc Oxide Thin Films Grown on Silicon Wafers by Pulsed Laser Deposition, **YILU LI**, J.W. WROBEL, M.K. MICHAEL, University of Missouri-Kansas City	**SS-MoA1** ZnTPP, PTCDA, TCNQ, and TTF on TiO2(110): Molecule-Oxide Interaction and Electronic Energy Level Alignment, **CHARLES RUGGIERI**, S. RANGAN, R.A. BARTYNSKI, Rutgers, the State University of New Jersey, J.I. MARTINEZ, Institute of Materials Science of Madrid, Spain, F. FLORES, J. ORTEGA, Autonomous University of Madrid, Spain
2:40 pm	**SE+EM+EN-MoA2** Enhanced Photovoltaic Power Conversion Efficiency in Bilayer Oxide Thin Films, **JOYPROKASH CHAKRABARTTY**, R. NECHACHE, C. HARNAGEA, S. LI, F. ROSEI, Institut National de la Recherche Scientifique (INRS), Canada	**SS-MoA2** Characterizing the Influence of Water on Charging and Layering at Electrified Ionic-Liquid/Solid Interfaces, **HSIU-WEI CHENG**, Max-Planck-Institut für Eisenforschung GmbH, Germany, P. STOCK, Max-Planck Institut für Eisenforschung GmbH, Germany, B. MOEREMANS, Universiteit Hasselt, Belgium, T. BAMIPOS, Max Planck Institut fur Eisenforschung GmbH, Germany, X. BANQUY, University of Montreal, Canada, F.U. RENNER, Universiteit Hasselt, Belgium, M. VALTINER, Max-Planck Institut für Eisenforschung GmbH, Germany
3:00 pm	**SE+EM+EN-MoA3** Synthesis of Crystallized and Nanostructured TiO_2 Thin Films by Reactive Magnetron Sputtering for Application as Photoanode in Dye Sensitive Solar Cells, J. DERVAUX, P.-A. CORMIER, S. KONSTANTINIDIS, Université de Mons, Belgium, P. MOSKOVKIN, S. LUCAS, University of Namur, Belgium, **RONY SNYDERS**, Université de Mons, Belgium	**SS-MoA3 Invited** Interfaces of Ionic Liquids, **HANS-PETER STEINRÜCK**, Universität Erlangen-Nürnberg, Germany
3:20 pm	**SE+EM+EN-MoA4** Silver-Carbon-Nanotube Metal Matrix Composites for Metal Contacts on Space Photovoltaic Cells, **OMAR K. ABUDAYYEH**, C. NELSON, S.M. HAN, University of New Mexico, N. GAPP, D.M. WILT, Air Force Research Laboratory	Invited talk continued.
3:40 pm	**SE+EM+EN-MoA5 Invited** Laser Liftoff of Single Crystal GaAs Thin Films and Energy Conversion Devices, **BRUCE CLEMENS**, G. HAYES, V. PARAMESHWARAN, A. JAN, J.B. REEVES, Stanford University	**SS-MoA5** Free-Standing Gold Nanoparticles on Ultrathin Ionic Liquid Films Studies by Low Energy Ion Scattering (LEIS) Analysis, **THOMAS GREHL**, P. BRUENER, ION-TOF GmbH, Germany, L. CALABRIA, P. MIGROWSKI, D.L. BAPTISTA, F. BERNARDI, Laboratory of Molecular Catalysis, UFRGS, Brazil, H. BRONGERSMA, ION-TOF GmbH, Germany, J. DUPONT, Laboratory of Molecular Catalysis, UFRGS, Brazil
4:00 pm	Invited talk continued.	**SS-MoA6** Early-Stage Solid-Electrolyte Interphase (SEI) Formation: Probing Molecular Carbonate Decomposition Pathways and Artificial Lithium Ethylene Dicarbonate Monolayers, **WENTAO SONG**, J.E. REUTT-ROBEY, University of Maryland, College Park
4:20 pm	**SE+EM+EN-MoA7** Optical and Structural Properties of Metal-dielectric Composite Films, **LIRONG SUN**, N.R. MURPHY, J.G. JONES, J.T. GRANT, Air Force Research Laboratory	**SS-MoA7 Invited** Racemization and Enantioselectivity on Metal Surfaces, **GEORG HELD**, University of Reading, UK
4:40 pm	**SE+EM+EN-MoA8** Polycrystalline Diamond Films as an Anticorrosion Protection for Zirconium Alloys used in Nuclear Reactors, **IRENA KRATOCHVILOVA**, Institute of f Physics AS CR, R. SKODA, 2Czech Technical University in Prague, Faculty of Mechanical Engineering, P. SAJDL, 5University of Chemistry and Technology, Power Engineering Department	Invited talk continued.
5:00 pm	**SE+EM+EN-MoA9** Enhanced CO_2 Permeation Characteristics Performance On A Crack-Free Nanostructured Ceramic Membrane, **NGOZI NWOGU**, E. GOBINA, Robert Gordon University, UK	**SS-MoA9** Mapping of Enantioselective Reaction Kinetics across Surface Structure Space: Tartaric and Aspartic Acid on Cu(111) Structure Spread Single Crystals, **ANDREW GELLMAN**, A. REINICKER, Carnegie Mellon University
5:20 pm	**SE+EM+EN-MoA10** Atomic Layer Deposition of Alumina and Titania Passivation Layers in Microchannel Reactors for Coke Suppression, **HAO FENG**, Xi'an Modern Chemistry Research Institute, China	**SS-MoA10** Enantioselective Adsorption on Platinum Surfaces, S. KARAKALOS, **FRANCISCO ZAERA**, University of California

	Thin Film Room: 111 - Session TF+2D+MG+NS-MoA ALD, CVD, MLD, and PLD on Special Materials **Moderators:** Giovanna Scarel, James Madison University, Mark Davidson, University of Florida	Vacuum Technology Room: 230B - Session VT-MoA Extreme High Vacuum **Moderators:** Martin Wüest, INFICON Ltd., Liechtenstein, Jay Hendricks, NIST
2:20 pm	**TF+2D+MG+NS-MoA1** Optical Enhancement of Polyethylene Teraphthalate Films Modified by Organometallic Vapor Infiltration, **HALIL AKYILDIZ**, North Carolina State University, J.G. SIMMONS, Redstone Arsenal, H.O. EVERITT, Duke University, J.S. JUR, North Carolina State University	**VT-MoA1** An XHV Standard: Making Absolute Measurements in the UHV and XHV, **JAMES A. FEDCHAK**, J. SCHERSCHLIGT, M.S. SEFA, National Institute of Standards and Technology (NIST)
2:40 pm	**TF+2D+MG+NS-MoA2 Invited** Organic and Hybrid Organic-Inorganic Thin Film Deposition by Resonant Infrared, Matrix-Assisted Pulsed Laser Evaporation, **ADRIENNE STIFF-ROBERTS**, Duke University	**VT-MoA2** Reducing the Ultimate Pressure of Turbo Pumps for XHV Applications, **JULIA SCHERSCHLIGT**, J. FEDCHAK, M.S. SEFA, NIST
3:00 pm	Invited talk continued.	**VT-MoA3** XHV Cryopump Performance and Limitations for the Jefferson Lab Polarized Electron Source, **MARCY STUTZMAN**, P.A. ADDERLEY, M. POELKER, Thomas Jefferson National Accelerator Facility
3:20 pm	**TF+2D+MG+NS-MoA4** Process Control: It's All About the Chamber Wall Temperature Control!, **RICHARD FERTELL**, Proteus Industries Inc.	**VT-MoA4** A Comparison of Reduced Outgassing Rates for Air-Baked and Vacuum-Baked Stainless Steel Vacuum Chambers, **MAKFIR SEFA**, J. FEDCHAK, J. SCHERSCHLIGT, National Institute of Standards and Technology (NIST)
3:40 pm	**TF+2D+MG+NS-MoA5 Invited** Integrating Ultrathin ALD/ALE Films with 1D and 2D Materials to Enable New Device Structures, **VIRGINIA WHEELER**, N. NEPAL, U.S. Naval Research Laboratory, A. NATH, George Mason University, A.D. KOEHLER, Z.R. ROBINSON, J.K. HITE, K.M. DANIELS, M.A. MASTRO, U.S. Naval Research Laboratory, E. SELF, P. PINTAURO, Vanderbilt University, J.D. CALDWELL, R.L. MYERS-WARD, D.K. GASKILL, C.R. EDDY JR., U.S. Naval Research Laboratory	**VT-MoA5** Very Low Gas Flow Measurements of Inert Gases for XHV Calibration, **SEFER AVDIAJ**, University of Prishtina, Albania, J. SETINA, Institute of Metals and Technology (IMT), Slovenia
4:00 pm	Invited talk continued.	**VT-MoA6** Deposition of Non-Evaporative Getters (NEG) in Very Narrow Chambers, **ANDRE ANDERS**, X. ZHOU, Y. YANG, C. SWENSON, Lawrence Berkeley National Laboratory
4:20 pm	**TF+2D+MG+NS-MoA7** Development of the Optical Properties of Silicon Rich Oxide Films Growth by CVD Techniques for Possible Photovoltaic Applications, **KARIM MONFIL-LEYVA**, Benemérita Universidad Autónoma de Puebla, Mexico, A.L. MUÑOZ-ZURITA, Universidad Politécnica Metropolitana de Puebla, Mexico, E. OJEDA-DURÁN, A. BENÍTEZ, J. CARRILLO-LÓPEZ, J.A. LUNA-LÓPEZ, R.C. AMBROSIO-LÁZARO, Benemérita Universidad Autónoma de Puebla, Mexico	**VT-MoA7** Production of Extreme High Vacuum with Vacuum Thermal Oxidized 304 Stainless Steel Chamber and NEG-SIP Combination, **TAEKYUN HA**, Pohang Accelerator Laboratory, Republic of Korea, B. CHO, KRISS, Republic of Korea, S. CHUNG, POSTECH, C.D. PARK, Pohang Accelerator Laboratory
4:40 pm	**TF+2D+MG+NS-MoA8** Phase Transformation in a Thin Film with a Moving Boundary and Convective Boundary Conditions, **RAHUL BASU**, VTU, India	**4:45 pm VTD BUSINESS MEETING**
5:00 pm	**TF+2D+MG+NS-MoA9** Radical-Enhanced Atomic Layer Deposition Enabled Multiferroic Composite Synthesis, C. PHAM, **JEFFREY CHANG**, J.P. CHANG, University of California at Los Angeles	
5:20 pm	**TF+2D+MG+NS-MoA10** Plasma Enhanced Deposition of Nanocrystalline Silicon Thin Films from SiF4 by RF-PECVD and MDECR: Key Aspects of Growth Dynamics, JK. WANG, P. BULKIN, I. FLOREA, J.L. MAURICE, **ERIK JOHNSON**, LPICM-CNRS, Ecole Polytechnique, France	

Anticipated Schedule
Monday Morning, October 19, 2015

TIME	SESSION	ROOM
8:00 am		
8:20 am		
8:40 am		
9:00 am		
9:20 am		
9:40 am		
10:00 am		
10:20 am		
10:40 am		
11:00 am		
11:20 am		
11:40 am		
12:00 pm		

Lunch

when _____

with _____

where _____

Anticipated Schedule
Monday Afternoon, October 19, 2015

TIME	SESSION	ROOM
1:00 pm		
1:20 pm		
1:40 pm		
2:00 pm		
2:20 pm		
2:40 pm		
3:00 pm		
3:20 pm		
3:40 pm		
4:00 pm		
4:20 pm		
4:40 pm		
5:00 pm		

TUESDAY SPECIAL EVENTS

7:00 a.m. Women in AVS Diversity Breakfast — Salon III (H)
7:30 a.m. Awards Committee Meeting and Lunch — Willow Glen I (H)
8:00 a.m. Science Educators' Workshop — Blossom Hill II-III (H)
9:20 a.m. AVS 2014 Gaede-Langmuir Invited Talk: "Models for Heterogeneous Catalysts: Complex Materials at the Atomic Level," Hajo Freund, Fritz Haber Institute of the Max Planck Society, Germany — 113 (CC)
10:00 a.m. Session Coffee Break — Hall 1 (CC)
12:00 p.m. Science Educators' Workshop Lunch — Blossom Hill I (H)
12:20 p.m. Exhibit Hall Lunch — Hall 1 (CC)
12:20 p.m. PSTD Coburn and Winters Adjudication Session (Closed Session) — 210A (CC)
12:30 p.m. Chapters, Divisions, and Groups Meeting and Lunch (Invitation Only) — Willow Glen III (H)
12:30 p.m. Professional Development: Job Information Forum and Lunch — 210E (CC)
2:40 p.m. Professional Development: "Working with National Labs and User Facilities" — 114 (CC)
3:00 p.m. Marketing Communications Committee Meeting — Boardroom (H)
3:40 p.m. Session Refreshment Break — Hall 1 (CC)
4:00 p.m. EMPD/PSTD Panel Discussion: "Moore's Law and the Future of the Semiconductor Industry" — 210E (Center)
6:05 p.m. Electronic Materials and Processing Division Business Meeting — 210E (CC)
6:05 p.m. Nanometer-scale Science and Technology Division Business Meeting — 212B (CC)
6:25 p.m. Magnetic Interfaces and Nanostructures Division Business Meeting — 230A (CC)
6:25 p.m. Plasma Science and Technology Division Business Meeting — 210A (CC)
6:25 p.m. Surface Science Division Business Meeting — 112 (CC)
6:25 p.m. Thin Film Division Business Meeting — 111 (CC)
6:30 p.m. Electronic Materials and Processing Division Forum: Careers at LAM Research — 210E (CC)
6:30 p.m. MEMS and NEMS Technical Group Executive Committee Meeting and Dinner — Willow Glen II (H)
6:30 p.m. Poster Session and Refreshments (Sponsored by MKS) — Hall 3 (CC)
7:00 p.m. Magnetic Interfaces and Nanostructures Division Executive Committee Meeting and Dinner — Boardroom (H)
7:00 p.m. Nanometer-scale Science and Technology Division Meeting and Dinner — San Carlos (H)
7:00 p.m. Plasma Science and Technology Executive Committee Meeting and Dinner — Salon VI (H)
7:00 p.m. Surface Science Division Executive Committee Meeting and Dinner — Willow Glen III (H)
7:00 p.m. Thin Film Division Executive Committee Meeting and Dinner — Salon V (H)
7:30 p.m. Applied Surface Science Division Business Meeting — Salon IV (H)
7:45 p.m. Biomaterial Interfaces Division Executive Committee Meeting and Dinner — Salon II (H)
7:45 p.m. Electronic Materials and Processing Division Executive Committee Meeting and Dinner — Almaden (H)
8:00 p.m. ASTM E-42 and Applied Surface Science Division Joint Workshop: "When is 'Perfect' the Enemy of 'Good Enough?' Maintaining Perspective in Surface Analysis" — Salon IV (H)

10:00 a.m.-5:00 p.m. Equipment Exhibition..... Hall 1 (CC)

CC = San Jose Convention Center
H = San Jose Marriott
= New Attendee Networking Events

TUESDAY SHORT COURSES

8:30 a.m. A Comprehensive Course on Surface Analysis and Depth Profiling by X-Ray Photoelectron Spectroscopy (XPS or ESCA), Auger Electron Spectroscopy (AES), Focused Ion Beam Analysis (FIB) and Secondary Ion Mass Spectroscopy (SIMS) and other Major Techniques (3 days)
8:30 a.m. Focused Ion Beams (FIB) and Secondary Ion Mass Spectrometry (SIMS)
8:30 a.m. Fundamentals of Vacuum Technology (4 days)
8:30 a.m. Plasma Etching & RIE: The Fundamentals and Applications (2 days)
8:30 a.m. ***NEW!*** Vacuum and Cryogen Safety

LOCATION: All AVS Short Courses will be held at the San Jose Marriott (HQ)
COURSE HOURS: All AVS Short Courses will run 8:30 a.m. – 5:00 p.m. (1.5 hour break for lunch – Lunch not included)

NOTES

	2D Materials Focus Topic Room: 212C - Session 2D+EM+NS+SS+TF-TuM Optical and Optoelectronic Properties of 2D Materials **Moderators:** M. Zahid Hasan, Princeton University, Andrea Young, University of California at Santa Barbara	Atom Probe Tomography Focus Topic Room: 211D - Session AP+AS-TuM New Applications of Atom Probe Tomography **Moderator:** Arun Devaraj, Pacific Northwest National Laboratory
8:00 am	**2D+EM+NS+SS+TF-TuM1** The Tri-Angular Lattice Exciton (3ALE) Model: Exciton Physics at the Atomic Scale, F. TSENG, NRC Research Associate, E. SIMSEK, George Washington University, **DANIEL GUNLYCKE**, Naval Research Laboratory	**AP+AS-TuM1 Invited** Development of Atom Probe Tomography for Studying Nuclear Corrosion Issues, **DANIEL SCHREIBER**, Pacific Northwest National Laboratory
8:20 am	**2D+EM+NS+SS+TF-TuM2** Opposite Dependence of Microwave-Induced vs. Field-Induced Imaging Contrast in NV^- based Fluorescence Microscopy as Function of Optical Excitation, **ETIENNE GOOVAERTS**, S.K.R. SINGAM, University of Antwerp, Belgium, M. NESLADEK, Hasselt University, Belgium, M. GIUGLIANO, University of Antwerp, Belgium	Invited talk continued.
8:40 am	**2D+EM+NS+SS+TF-TuM3 Invited** 2D Materials and Heterostructures for Applications in Optoelectronics, **THOMAS MUELLER**, Vienna University of Technology, Austria	**AP+AS-TuM3 Invited** Using Aqueous Solutions by Cryo-Fixation As a Matrix for Analyzing Materials in APT, **STEPHAN GERSTL**, B. SCHERRER, ETH Zürich, Switzerland, J.M. CAIRNEY, University of Sydney, Australia, R. SPOLENAK, R. WEPF, ETH Zürich, Switzerland
9:00 am	Invited talk continued.	Invited talk continued.
9:20 am	**2D+EM+NS+SS+TF-TuM5** Excitations and Ultrafast Charge Response in Bilayer Transition-Metal Dichalcogenides, **VOLODYMYR TURKOWSKI**, T.S. RAHMAN, University of Central Florida	**AP+AS-TuM5** Quantitative Microstructural Analysis of Geological Materials by Atom Probe: Understanding the Mechano-Chemical Behaviour of Zircon, **ALEXANDRE LA FONTAINE**, The University of Sydney, Australia, S. PIAZOLO, Australian Research Council Centre of Excellence for Core to Fluid Systems/GEMOC, P. TRIMBY, L. YANG, J.M. CAIRNEY, The University of Sydney, Australia
9:40 am	**2D+EM+NS+SS+TF-TuM6** Automatic Localization and Identification of 2D-Material Flakes by Spectroscopic Imaging Ellipsometry, **SEBASTIAN FUNKE**, P.H. THIESEN, Accurion GmbH, Germany, G. GREG HEARN, Accurion Inc.	
10:00 am	**BREAK - Complimentary Coffee in Exhibit Hall**	**BREAK - Complimentary Coffee in Exhibit Hall**
10:20 am	**BREAK - Complimentary Coffee in Exhibit Hall**	**BREAK - Complimentary Coffee in Exhibit Hall**
10:40 am	**BREAK - Complimentary Coffee in Exhibit Hall**	**BREAK - Complimentary Coffee in Exhibit Hall**
11:00 am	**2D+EM+NS+SS+TF-TuM10** Systematic Hydrogen Intercalation of Epitaxial Graphene for THz Plasmonics, **KEVIN DANIELS**, National Research Council postdoc working at NRL, A. BOYD, American Society for Engineering Education postdoc working at NRL, R.L. MYERS-WARD, D.K. GASKILL, U.S. Naval Research Laboratory	**AP+AS-TuM10** Atom Probe Tomography Investigation of TiSiN Thin Films Made Possible by ^{15}N Isotopic Substitution, **DAVID ENGBERG**, Linköping University, Sweden, L.J.S. JOHNSON, Sandvik Coromant, Sweden, M.P. JOHANSSON-JÖESAAR, SECO Tools AB, Sweden, M. ODÉN, Linköping University, Sweden, M. THUVANDER, Chalmers University of Technology, Sweden, L. HULTMAN, Linköping University, Sweden
11:20 am	**2D+EM+NS+SS+TF-TuM11** Determining the Optical Properties of Exfoliated 2D Molybdenum Disulfide on Various Substrates with Imaging Spectroscopic Ellipsometry, **PETER H. THIESEN**, Accurion GmbH, Germany, S. FUNKE, HAWK, Germany, B. MILLER, E. PARZINGER, TU München, Germany, G. HEARN, Accurion Inc., A.W. HOLLEITNER, U. WURSTBAUER, TU München, Germany	**AP+AS-TuM11** Investigating the Alternating Cation/Anion Compositions in a High-Voltage Li-Mn-Rich Oxide Electrode during First Charge-Discharge Cycle using Atom Probe tomography, **BAISHAKHI MAZUMDER**, D. MOHANTY, C. DANIEL, D. WOOD III, Oak Ridge National Laboratory
11:40 am	**2D+EM+NS+SS+TF-TuM12 Invited** Nonlinear Optical Spectroscopy of 2D Semiconductor Monolayers, **XIAOBO YIN**, University of Colorado Boulder	
12:00 pm	Invited talk continued.	

	Applied Surface Science Room: 212D - Session AS+NS-TuM Chemical/Molecular Information from Sub-micron Features and Materials **Moderators:** Carl Ventrice, Jr., SUNY Polytechnic Institute, David Carr, Physical Electronics USA	Electronic Materials and Processing Room: 210E - Session EM-TuM Beyond CMOS: Materials and Devices for a Post CMOS Era **Moderators:** Christopher Hinkle, University of Texas at Dallas, Suzanne Mohney, Penn State University
8:00 am		**EM-TuM1 Invited** Secret Ingredients in Thin-TFET: A 2D Material-based Transistor, **GRACE HUILI XING**, Cornell University
8:20 am		Invited talk continued.
8:40 am	**AS+NS-TuM3 Invited** ASSD 30th Anniversary Speaker: Defect Detection and Characterization in Wafer Processing and Magnetic Storage Technologies – Then, Now and (maybe) the Future., **CHRISTOPHER BRUNDLE**, C R Brundle and Associates	**EM-TuM3** Application of Thermodynamics to Processing Transition Metal Dichalcogenides, **SUZANNE MOHNEY**, A.C. DOMASK, T.N. WALTER, R.L. GURUNATHAN, Y. ZENG, Penn State University
9:00 am	Invited talk continued.	**EM-TuM4** Stress-Directed Compositional Patterning of SiGe Substrates for Lateral Quantum Barrier Manipulation, S. GHOSH, University of New Mexico, D. KAISER, University of Pennsylvania, J. BONILLA, University of New Mexico, T. SINNO, University of Pennsylvania, **SANG M. HAN**, University of New Mexico
9:20 am	**AS+NS-TuM5** Characterisation of Glass-To-Metal Interfaces using FIB and STEM, **PAUL YATES**, University of Surrey, UK	**EM-TuM5 Invited** Interlayer Tunnel FETs, **SANJAY BANERJEE**, Microelectronics Research Center, University of Texas at Austin
9:40 am	**AS+NS-TuM6** X-ray Structural Analysis of Self-assembled Nano-Dielectrics, **LI ZENG**, A. WALKER, Northwestern University, R. TURRISI, University of Milano-Bicocca, Italy, M.C. HERSAM, T.J. MARKS, M.J. BEDZYK, Northwestern University	Invited talk continued.
10:00 am	**BREAK - Complimentary Coffee in Exhibit Hall**	**BREAK - Complimentary Coffee in Exhibit Hall**
10:20 am	**BREAK - Complimentary Coffee in Exhibit Hall**	**BREAK - Complimentary Coffee in Exhibit Hall**
10:40 am	**BREAK - Complimentary Coffee in Exhibit Hall**	**BREAK - Complimentary Coffee in Exhibit Hall**
11:00 am	**AS+NS-TuM10 Invited** Multimodal Imaging for Physical and Chemical Surface Characterization using a Combined Atomic Force Microscopy-Mass Spectrometry Platform, **OLGA OVCHINNIKOVA**, Oak Ridge National Laboratory	**EM-TuM10 Invited** Graphene and TMD for Electronic Devices, **SEONGJUN PARK**, J. LEE, J. HEO, K. LEE, E. LEE, S. LEE, S. JUNG, Samsung Advanced Institute of Technology, Republic of Korea
11:20 am	Invited talk continued.	Invited talk continued.
11:40 am	**AS+NS-TuM12** Understanding the TERS Effect with On-line Tunneling and Force Feedback Using Multiprobe AFM/NSOM with Raman Integration, A. LEWIS, The Hebrew University of Jerusalem and Nanonics Imaging Ltd, Israel, **RIMMA DEKHTER**, P. HAMRA, Y. BAR-DAVID, H. TAHA, Nanonics Imaging Ltd, Jerusalem, Israel	**EM-TuM12 Invited** On Smart Textiles and Vacuum: The Joys of Innovation and Discovery on Quality of Life, **SUNDARESAN JAYARAMAN**, Georgia Institute of Technology
12:00 pm	**AS+NS-TuM13** High Resolution CREM for Electrical Characterization of Thin Oxide Layers, **HAGAI COHEN**, A. GIVON, Weizmann Institute of Science, Israel	Invited talk continued.

	Energy Frontiers Focus Topic Room: 211B - Session EN+AS+EM+SE+SS-TuM Photocatalysis **Moderators:** Jason Baxter, Drexel University, Manjula Nandasiri, Pacific Northwest National Laboratory	Exhibitor Technology Spotlight Room: Hall 1 - Session EW-TuM Exhibitor Technology Spotlight Session **Moderator:** Dennis Sollon, Kurt J. Lesker
8:00 am	**EN+AS+EM+SE+SS-TuM1** Ultra-dense Hydrogen and Low Energy Nuclear Reactions, **SVEINN OLAFSSON**, Science Institute, Physics department University of Iceland, L. HOLMLID, University of Gothenburg, Sweden	
8:20 am	**EN+AS+EM+SE+SS-TuM2** Optical and Surface Properties of Semiconductor Nanowires for Solar Fuels, **ELEONORA FRAU**, J. VUKAJLOVIC, A. DALMAU-MALLORQUI, A. FONCTUBERTA I MORRAL, E. ALARCON LLADO, Ecole Polytechnique Fédérale de Lausanne (EPFL), Switzerland	
8:40 am	**EN+AS+EM+SE+SS-TuM3 Invited** Engineering Surfaces and Interfaces for Photoelectochemical (PEC) Water-Splitting, **THOMAS JARAMILLO**, J.D. BENCK, Stanford University, J. KIBSGAARD, SLAC National Accelerator Laboratory, T.R. HELLSTERN, C.J. HAHN, P. CHAKTHRANONT, R. BRITTO, K.D. FONG, Stanford University	
9:00 am	Invited talk continued.	
9:20 am	**EN+AS+EM+SE+SS-TuM5** Bulk and Surface Effects of Incorporating Titanium Into Hematite Thin Films to Improve Photoelectrochemical Water Splitting, **ANTHONY ABEL**, A.M. PATEL, Drexel University, I.G. TORREGROSA, Utrecht University, Netherlands, B. OPASANONT, J.B. BAXTER, Drexel University	
9:40 am	**EN+AS+EM+SE+SS-TuM6** Iron Oxide Nanoparticle Growth on Highly Oriented Pyrolytic Graphite (HOPG) and Photocatalytic Properties of Pt on Iron Oxide, **JAYDE KWON**, J.C. HEMMINGER, University of California, Irvine	
10:00 am	**BREAK - Complimentary Coffee in Exhibit Hall**	
10:20 am	**BREAK - Complimentary Coffee in Exhibit Hall**	**EW-TuM8** Ask the Experts Special EW Session, **GERARDO ALEJANDRO BRUCKER**, MKS Granville-Phillips Division, Longmont
10:40 am	**BREAK - Complimentary Coffee in Exhibit Hall**	**EW-TuM9** The Nano Probe Station for Your 2D Characterization Needs: The First Low Temperature MultiProbe SPM-NSOM System Integrated with Raman, **AARON LEWIS**, Nanonics
11:00 am	**EN+AS+EM+SE+SS-TuM10 Invited** Interface Design for Efficient and Stable Photoelectrochemical Water Splitting, **JOEL AGER**, Lawrence Berkeley National Laboratory	
11:20 am	Invited talk continued.	
11:40 am	**EN+AS+EM+SE+SS-TuM12** Buried, Hetero, and p-i-electrolyte III-V Photoelectrochemical Junctions with Significantly Enhanced Photocurrent Onset Potentials, **JAMES YOUNG**, H. DOSCHER, J. TURNER, T. DEUTSCH, National Renewable Energy Laboratory	
12:00 pm	**EN+AS+EM+SE+SS-TuM13** X-ray Absorption Studies on the Li-S Battery Cathode Side, **Y.F. YE**, University of Science and Technology of China, A. KAWASE, Lawrence Berkeley National Laboratory, H.X. JU, University of Science and Technology of China, E. CAIRNS, Lawrence Berkeley National Laboratory, J.-H. GUO, Lawrence Berkeley Lab, University of California, Berkeley, J.F. ZHU, University of Science and Technology of China	

	IPF on Mesoscale Science and Technology of Materials and Metamaterials **Room: 210F - Session IPF+MS-TuM** **Degradation Science (8:00-10:00) & Electrochemistry from Nano to Meso Scale (11:00-12:20)** **Moderators:** Stacey Bent, Stanford University, Gary Rubloff, University of Maryland, College Park,	**In-Situ Spectroscopy and Microscopy Focus Topic** **Room: 211C - Session IS+AS+SA+SS-TuM** **In-situ Studies of Solid-liquid Interfaces** **Moderators:** Anatoly Frenkel, Yeshiva University, Franklin (Feng) Tao, University of Kansas
8:00 am	**IPF+MS-TuM1 Invited** Mesoscale Evolution & Temporal Analytics of Photovoltaic Energy Materials: A Degradation Science Approach, **ROGER FRENCH**, Case Western Reserve University	**IS+AS+SA+SS-TuM1** Wafer Scale Fabrication of the Suspended Graphene Membranes for *In Situ* Electron Microscopy and Spectroscopy in Liquids, **HONGXUAN GUO**, A. YULAEV, A. KOLMAKOV, National Institute of Standards and Technology (NIST)
8:20 am	Invited talk continued.	**IS+AS+SA+SS-TuM2** Water at Ionic Liquid Interfaces Probed by APXPS, **JOHN NEWBERG**, Y. KHALIFA, A. BRODERICK, University of Delaware
8:40 am	**IPF+MS-TuM3 Invited** Why Structural Failure is Mesoscale: From Dislocations to Fatigue Cracks, **ANTHONY ROLLETT**, Carnegie Mellon University	**IS+AS+SA+SS-TuM3** Probig the Liquid-Solid Interface of polycrystalline Pt in 1.0 M KOH using Ambient Pressure Photoemission Spectroscopy and "Tender" X-rays, **MARCO FAVARO**, B. JEON, P.N. ROSS, Z. HUSSAIN, J. YANO, Z. LIU, E.J. CRUMLIN, Lawrence Berkeley National Laboratory (LBNL)
9:00 am	Invited talk continued.	**IS+AS+SA+SS-TuM4** Toward Ambient Pressure Electron Spectroscopy with Conventional XPS Instrumentation, **ANDREI KOLMAKOV**, National Institute of Standards and Technology (NIST)
9:20 am	**IPF+MS-TuM5 Invited** Engineered 3D Mesoscale Battery Electrodes: Opportunities and Issues, **PAUL BRAUN**, University of Illinois at Urbana-Champaign	**IS+AS+SA+SS-TuM5 Invited** Solvation and Chemistry at the Interface: Near Ambient Pressure Electron Spectroscopy Studies of Aqueous Solution Interfaces, **JOHN HEMMINGER**, University of California, Irvine
9:40 am	Invited talk continued.	Invited talk continued.
10:00 am	**BREAK - Complimentary Coffee in Exhibit Hall**	**BREAK - Complimentary Coffee in Exhibit Hall**
10:20 am	**BREAK - Complimentary Coffee in Exhibit Hall**	**BREAK - Complimentary Coffee in Exhibit Hall**
10:40 am	**BREAK - Complimentary Coffee in Exhibit Hall**	**BREAK - Complimentary Coffee in Exhibit Hall**
11:00 am	**IPF+MS-TuM10 Invited** A Materials Genome Approach to Design of Novel Materials and Liquids for Energy Conversion and Storage, **KRISTIN A. PERSSON**, Lawrence Berkeley National Laboratory	**IS+AS+SA+SS-TuM10 Invited** In situ Single-molecule Microscopy of Photoelectrocatalysis for Solar Water Oxidation, **PENG CHEN**, Cornell University
11:20 am	Invited talk continued.	Invited talk continued.
11:40 am	**IPF+MS-TuM12 Invited** Electrical Double Layer Effects on Ion Transport in Thin-Layer Solid-State Electrolytes, **HENRY WHITE**, J. XIONG, M. EDWARDS, University of Utah	**IS+AS+SA+SS-TuM12** *In Situ* and *Operando* AP-XPS for the Oxidation State of Pd at Solid/Liquid Interface, **B. JEONG**, M. FAVARO, P.N. ROSS, Z. HUSSAIN, Lawrence Berkeley National Laboratory (LBNL), Z. LIU, Shanghai Institute of Microsystem and Information Technology, China, B.S. MUN, J. LEE, Gwangju Institute of Science and Technology, Republic of Korea, E.J. CRUMLIN, Lawrence Berkeley National Laboratory (LBNL)
12:00 pm	Invited talk continued.	**IS+AS+SA+SS-TuM13** In situ Characterization of Switchable Ionic Liquids by Liquid ToF-SIMS and SALVi, **JUAN YAO**, X. SUI, D. LAO, Y. ZHOU, S. NUNE, D. HELDEBRANT, Z. ZHU, X.-Y. YU, Pacific Northwest National Laboratory

Tuesday Morning, October 20, 2015

	Materials Characterization in the Semiconductor Industry Focus Topic Room: 114 - Session MC-TuM Characterization of 3D structures **Moderator:** Paul van der Heide, GLOBALFOUNDRIES, Inc.	Magnetic Interfaces and Nanostructures Room: 230A - Session MI-TuM Oxides, Fluorides, and Spin Structures **Moderator:** Greg Szulczewski, The University of Alabama
8:00 am	**MC-TuM1 Invited** Expanding Roles of Materials Characterization and Metrology in Advancing Moore's Law, **ZHIYONG MA**, Intel Corporation	**MI-TuM1 Invited** Magnetic Interactions at Perovskite Oxide Interfaces, **YAYOI TAKAMURA**, B. LI, R.V. CHOPDEKAR, University of California, Davis, E. ARENHOLZ, Lawrence Berkeley National Laboratory, A. MEHTA, SLAC National Accelerator Laboratory, M.D. BIEGALSKI, H.M. CHRISTEN, Oak Ridge National Laboratory
8:20 am	Invited talk continued.	Invited talk continued.
8:40 am	**MC-TuM3** X-ray based Characterization of Strained SiGe on FinFETs, **KRITI KOHLI**, M.A. SMITH, A. MADAN, Z. ZHU, J.R. HOLT, GLOBALFOUNDRIES, M. KLARE, Revera	**MI-TuM3 Invited** X-ray Imaging of Magnetism at the Nanoscale, **S. BONETTI**, Stockholm University, Sweden, R. KUKREJA, Z. CHEN, Stanford University, F. MACIA, J.M. HERNANDEZ, Universitat de Barcelona, Spain, A. EKLUND, KTH Royal Institute of Technology, Sweden, D. BACKES, New York University, J. FRISCH, SLAC National Accelerator Laboratory, Y. ACREMANN, Laboratorium für Festkörperphysik, ETH Zürich, Switzerland, J. KATINE, HGST, G. MALM, KTH Royal Institute of Technology, Sweden, S. URAZHDIN, Emory University, A.D. KENT, New York University, OHLDAG, J. STÖHR, H.A. DÜRR, SLAC National Accelerator Laboratory
9:00 am	**MC-TuM4** Atomic Scale Analysis by Atom Probe on 3D Semiconductor Structures, **AJAY KUMAR KAMBHAM**, S. SHINTRI, D. FLATOFF, P. VAN DER HEIDE, Globalfoundries	Invited talk continued.
9:20 am	**MC-TuM5 Invited** Preparing and Characterizing Nanoscale Topological Insulators, **KENNETH BURCH**, Boston College	**MI-TuM5 Invited** Complex Fluorides: A New Class of Multiferroic and Magnetoelectric Materials, **DAVID LEDERMAN**, A. KC, T.A. JOHNSON, C. CEN, A.H. ROMERO, P. BORISOV, West Virginia University
9:40 am	Invited talk continued.	Invited talk continued.
10:00 am	**BREAK - Complimentary Coffee in Exhibit Hall**	**BREAK - Complimentary Coffee in Exhibit Hall**
10:20 am	**BREAK - Complimentary Coffee in Exhibit Hall**	**BREAK - Complimentary Coffee in Exhibit Hall**
10:40 am	**BREAK - Complimentary Coffee in Exhibit Hall**	**BREAK - Complimentary Coffee in Exhibit Hall**
11:00 am	**MC-TuM10** "More than Moore": Could Silicene Be the Future of Electronics?, J. AVILA, CH. CHEN, S. LORCY, **MARIA ASENSIO**, Synchrotron SOLEIL, France	**MI-TuM10** Spin-Dependent Size of Interband Hybridization Gap: The Interplay of Adlayer and Substrate States in Pb/Cu(111), **MARKUS DONATH**, S.N.P. WISSING, K.T. RITTER, A.B. SCHMIDT, P. KRUEGER, Muenster University, Germany
11:20 am	**MC-TuM11** Challenges in Measuring Strain in Nanoscale 3D FinFET Structures, **A. MADAN**, GLOBALFOUNDRIES, S. MOCHOZUKI, IBM Albany Nanotech Center, C. MURRAY, IBM, T. J. Watson Research Center, D. COOPER, CEA, LETI, MINATEC Campus, France, Y. WANG, W. WENG, T. PINTO, GLOBALFOUNDRIES	**MI-TuM11** Energy Dispersion and Spin Structure of Unoccupied Electronic States of BiTeI: A Matter of Surface Termination?, **CHRISTIAN LANGENKÄMPER***, K. MIYAMOTO, A.B. SCHMIDT, P. KRÜGER, M. DONATH, Westfälische Wilhelms-Universität Münster, Germany
11:40 am	**MC-TuM12 Invited** Strain Measurement using Electron Beam Techniques, **JEAN-LUC ROUVIERE**, CEA-University Grenoble Alps, France, N. BERNIER, CEA, LETI, MINATEC Campus, France, D. COOPER, CEA-LETI, France	**MI-TuM12** Abnormal Asymmetric Domain Expansion and Skyrmion Bubble Stability in Thin Films with Strong Dzyaloshinskii-Moriya Interaction, **LUCAS CARETTA**, M. MANN, AJ. TAN, G.S.D. BEACH, Massachusetts Institute of Technology
12:00 pm	Invited talk continued.	**MI-TuM13** Control and Characterization of Magnetic Domain Patterns in Complex Oxide Microstructures, **M. LEE**, T. WYNN, R.V. CHOPDEKAR, University of California, Davis, E. FOLVEN, J. GREPSTAD, Norwegian University of Science and Technology, A. SCHOLL, A. YOUNG, Lawrence Berkeley National Laboratory (LBNL), S. RETTERER, Oak Ridge National Laboratory, Y. JIA, B. LI, Y. TAKAMURA, University of California, Davis

*** Falicov Student Award Finalist**

Tuesday Morning, October 20, 2015

	MEMS and NEMS **Room: 211A - Session MN+MG-TuM** **Multiscale Phenomena & Interactions in Micro- and Nano-Systems (8:00-10:00 am) & Optical MEMS/NEMS, Photonics, and Quantum Nanosystems (11:00 am-12:20 pm)** **Moderators:** Robert Davis, Brigham Young University, Robert Ilic, National Institute of Standards and Technology (NIST), Meredith Metzler, University of Pennsylvania	**Nanometer-scale Science and Technology** **Room: 212B - Session NS+SP-TuM** **Nanoscale Imaging and Materials Characterization** **Moderator:** Mehmet Z. Baykara, Bilkent University
8:00 am	**MN+MG-TuM1 Invited** Microengineering for Mechanobiology, **BETH L. PRUITT**, Stanford University	**NS+SP-TuM1** Influence of Focused Electron Beam on Electrical Characterization of Advanced MOSFETs, **JONGHYUK KANG**, S.H. LEE, Samsung Electronics Co., LTD., South Korea, B.D. CHOI, Sungkyunkwan University, Republic of Korea
8:20 am	Invited talk continued.	**NS+SP-TuM2** *In Situ* Synthesis and Characterization of Core-Shell Nanoparticle Arrays Using Dynamic Transmission Electron Microscopy, **JOSEPH MCKEOWN**, Lawrence Livermore National Laboratory, Y. WU, University of Tennessee, J.D. FOWLKES, Oak Ridge National Laboratory, P.D. RACK, University of Tennessee, G.H. CAMPBELL, Lawrence Livermore National Laboratory
8:40 am	**MN+MG-TuM3** Introducing Students to MEMS: A Practical Process for the Fabrication and Testing of Piezoresistive Cantilevers, **FREDERIC LOIZEAU**, E. SADEGHIPOUR, T. LARSEN, J.Y. SIM, C. ROOZEBOOM, E. MAZZOCHETTE, B.L. PRUITT, Stanford University	**NS+SP-TuM3** Investigation of Nickel-assisted Growth of Silicon Carbide Nanowires, **LUNET E. LUNA**, R. MABOUDIAN, C. CARRARO, University of California at Berkeley
9:00 am	**MN+MG-TuM4** Deflection Control of an Electroactive Polymer Bimorph Actuator by Carrier Frequency Modulation, **LEEYA ENGEL**, Tel Aviv University, Israel, K. VAN VOLKINBURG, University of California Irvine, Y. SHACHAM-DIAMAND, Tel Aviv University, Israel, G.N. WASHINGTON, University of California Irvine, S. KRYLOV, Tel Aviv University, Israel	**NS+SP-TuM4** Homogeneous Nucleation and Characterization of Nanodiamonds Synthesized in an Atmospheric-Pressure Microplasma, **JONATHAN COLE**, R.M. SANKARAN, Case Western Reserve University
9:20 am	**MN+MG-TuM5** Solder Based Self-Assembly Method For 3D Integration Using Poly-Acrylic Acid, **CONNOR SMITH**, Y. FENG, S.L. BURKETT, The University of Alabama	**NS+SP-TuM5 Invited** Chemically-specific Intramolecular Imaging with Atomic Force Microscopy, **OZGUR SAHIN**, Columbia University
9:40 am	**MN+MG-TuM6** Investigation of Excess Pb Content and Solution Concentration of Pb_xTiO_3 Seed Layer on the Electric Properties of $Pb(Zr,Ti)O_3$Films for MEMS Applications, **JIAN ZHONG**, V. BATRA, S. KOTRU, The University of Alabama	Invited talk continued.
10:00 am	**BREAK - Complimentary Coffee in Exhibit Hall**	**BREAK - Complimentary Coffee in Exhibit Hall**
10:20 am	**BREAK - Complimentary Coffee in Exhibit Hall**	**BREAK - Complimentary Coffee in Exhibit Hall**
10:40 am	**BREAK - Complimentary Coffee in Exhibit Hall**	**BREAK - Complimentary Coffee in Exhibit Hall**
11:00 am	**MN+MG-TuM10 Invited** Mechanics and Spins in Diamond, ANIA BLESZYNSKI JAYICH, **DONGHUN LEE**, University of California at Santa Barbara	**NS+SP-TuM10** Time-Resolved Small-Angle X-ray Scattering of Detonating Composition B-3 at the Advanced Photon Source, **R.C. HUBER**, D. PODLESAK, Los Alamos National Laboratory (LANL), M. BAGGE-HANSEN, Lawrence Livermore National Laboratory (LLNL), D. DATTELBAUM, M. FIRESTONE, LANL, T. GRABER, Washington State University, R. GUSTAVSEN, LANL, R. HODGIN, LLNL, B.J. JENSEN, LANL, L.M. LAUDERBACH, LLNL, P. RIGG, Washington State University, B. RINGSTRAND, LANL, S. SEIFERT, Argonne National Laboratory, N. SINCLAIR, Washington State University, E. WATKINS, LANL, T.M. WILLEY, T. VAN BUUREN, LLNL
11:20 am	Invited talk continued.	**NS+SP-TuM11** LEEM Imaging of Growth of Au on Ge(110), **BRET STENGER**, A. DORSETT, M.S. VAN ZIJLL, C.A. GABRIS, C.K.B. PAW U, S. CHIANG, University of California, Davis
11:40 am	**MN+MG-TuM12** Nano-Optomechanical Fin Resonators Designed for Sensing in Liquid Environments, **JOCELYN WESTWOOD-BACHMAN**, W.K. HIEBERT, University of Alberta and The National Institute for Nanotechnology, Canada	**NS+SP-TuM12** Strength and Fracture of Graphene Oxide Nanosheets, C. CAO, University of Toronto, Canada, M. DALY, B. CHEN, C.V. SINGH, Y. SUN, University of Toronto, **TOBIN FILLETER**, University of Toronto, Canada
12:00 pm	**MN+MG-TuM13** Directed Magnetic Optical Resonator Microballoons for Particle Imaging Manometry in 3D Environment, **NILADRI BANERJEE**, University of Utah	**NS+SP-TuM13** Low-Temperature Atomic Layer Deposition of Crystalline Platinum Nanoclusters on Graphene Nanoplatelets Using (Methylcyclopentadienyl)-Trimethylplatinum and Oxygen, **HAO VAN BUI**, Delft University of Technology, Netherlands, R. BEVAART, F. GRILLO, Delft University of Technology, J.R. VAN OMMEN, Delft University of Technology, Netherlands

	Plasma Science and Technology Room: 210A - Session PS+BI+SM-TuM **Plasmas for Medicine and Biological Applications** **Moderator:** Satoshi Hamaguchi, Osaka University, Japan	Plasma Science and Technology Room: 210B - Session PS-TuM **Advanced BEOL/Interconnect Etching** **Moderator:** Tetsuya Tatsumi, Sony Corporation, Japan
8:00 am	**PS+BI+SM-TuM1 Invited** Glow-Discharge Plasma Applications in the Biomedical Sciences: Frontiers and Horizons, **BUDDY D. RATNER**, University of Washington	**PS-TuM1 Invited** Interconnect Patterning in the EUV Era, **JOHN ARNOLD**, IBM Research Division, Albany, NY
8:20 am	Invited talk continued.	Invited talk continued.
8:40 am	**PS+BI+SM-TuM3 Invited** Non-Equilibrium Plasmas in Contact with Solutions: Biological Interactions and Material Synthesis, **PETER BRUGGEMAN**, University of Minnesota	**PS-TuM3** Challenges for the sub-32nm Pitch Self-aligned Quadruple Patterning (SAQP) at Back End of Line (BEOL), **NIHAR MOHANTY**, R. FARRELL, A. RALEY, E. FRANKE, J. SMITH, S. SONG, A. KO, A. RANJAN, A. DEVILLIERS, P. BIOLSI, TEL Technology Center, America, LLC, W. WANG, G. BEIQUE, C. LABELLE, L. SUN, R. KIM, Globalfoundries, Ny, Usa
9:00 am	Invited talk continued.	**PS-TuM4** Novel Patterning Process for the 7xnm and Beyond, **TORU HISAMATSU**, Tokyo Electron Miyagi Limited, Japan, T. OISHI, S. OGAWA, Tokyo Electron Miyagi Limited, Y. KIHARA, M. HONDA, Tokyo Electron Miyagi Limited, Japan
9:20 am	**PS+BI+SM-TuM5 Invited** Plasma Biomedicine and Reactive Species, **DAVID GRAVES**, University of California at Berkeley	**PS-TuM5** Advanced Interconnect Process Techniques with EUV Photolithographic Masks and Sub-50nm Pitch Structures, **JESSICA DECHENE**, J.C. SHEARER, IBM Research Division, A.P. LABONTE, GLOBALFOUNDRIES, J. LUCAS, H. MATSUMOTO, B. MESSER, A. METZ, TEL Technology Center, America, LLC, C. LABELLE, GLOBALFOUNDRIES, J.C. ARNOLD, IBM Research Division
9:40 am	Invited talk continued.	**PS-TuM6** Advanced Plasma Etch Techniques for Sub-50nm Pitch Contact & Interconnect Etches, **ANDRE LABONTE**, Globalfoundries, NY, USA, R. CHAO, J.M. DECHENE, IBM Albany Nanotech Center, B. NAGABHIRAVA, P. WANG, P. FRIDDLE, Lam Research, N. RASSOUL, ST Microelectronics, C. LABELLE, Globalfoundries, NY, USA, J.C. ARNOLD, IBM Albany Nanotech Center, M. GOSS, Lam Research
10:00 am	**BREAK - Complimentary Coffee in Exhibit Hall**	**BREAK - Complimentary Coffee in Exhibit Hall**
10:20 am	**BREAK - Complimentary Coffee in Exhibit Hall**	**BREAK - Complimentary Coffee in Exhibit Hall**
10:40 am	**BREAK - Complimentary Coffee in Exhibit Hall**	**BREAK - Complimentary Coffee in Exhibit Hall**
11:00 am	**PS+BI+SM-TuM10** Cold Atmospheric Plasma for the Treatment of Chronic Infected Wounds, **JENNIFER GRANICK**, V.S.S.K. KONDETI, A. TRUONG, R.C. HUNTER, P.J. BRUGGEMAN, University of Minnesota	**PS-TuM10** Kelvin Via Rc Reduction in Metal Hard-Mask based Cu/Ultra Low-K Interconnects by Special Gas Base Plasma Etching Recipe Development, **BRANDON KUO**, UMC, Taiwan, Republic of China
11:20 am	**PS+BI+SM-TuM11** Humidity Effect on the Surface Modification and Bio-Deactivation of Lipopolysaccharide (LPS) by Surface Micro-Discharge (SMD), **PINGSHAN LUAN**, E.A.J. BARTIS, A.J. KNOLL, University of Maryland, College Park, C. ANDERSON, D.B. GRAVES, University of California at Berkeley, J. SEOG, G.S. OEHRLEIN, University of Maryland, College Park	**PS-TuM11** Characterization of Patterned Porous Low-*k* Dielectrics after Plasma Patterning and Subsequent Wet Processing/Cleaning, **QUOCTOAN LE**, E. KESTERS, S. DECOSTER, B.T. CHAN, F. HOLSTEYNS, IMEC, Belgium, S. DE GENDT, IMEC, KU Leuven Belgium
11:40 am	**PS+BI+SM-TuM12** Plasma Diagnostics of Dielectric Barrier Discharge within a Sealed Meat Package, **VLADIMIR MILOSAVLJEVIC**, Dublin Institute of Technology, Ireland, J. LALOR, P. BOURKE, P.J. CULLEN, Dublin Institute of Technology	**PS-TuM12** Cryogenic Etching of Porous Organosilicate Low-k Materials: Reduction of Plasma Induced Damage, **F. LEROY**, T. TILLOCHER, GREMI CNRS/Université d'Orléans, France, L. ZHANG, IMEC, KU Leuven, Belgium, P. LEFAUCHEUX, GREMI CNRS/Université d'Orléans, France, K. YATSUDA, TEL, Japan, K. MAEKAWA, TEL Technology Center, America, LLC, J.-F. DE MARNEFFE, M. BAKLANOV, IMEC, Belgium, R. DUSSART, GREMI CNRS/Université d'Orléans, France
12:00 pm	**PS+BI+SM-TuM13** Low-Temperature Plasma Surface Modification of Porous Polymeric Materials for Environmental and Medical Applications, **MICHELLE MANN**, A. PEGALAJAR-JURADO, E.R. FISHER, Colorado State University	**PS-TuM13** Remote Shielded Microwave Mini Plasma Source for Sample Cleaning, **HERMAN BEKMAN**, R.J. BOLT, F.A. NENNIE, P.M. MUILWIJK, F.T. MOLKENBOER, N.B. KOSTER, O. KIEVIT, TNO Technical Sciences, Netherlands

Tuesday Morning, October 20, 2015

	Advanced Surface Engineering Room: 212A - Session SE+PS+SM-TuM Atmospheric Pressure Plasmas, CVD and Other Deposition Methods **Moderators:** Hana Barankova, Uppsala University, Sweden, Michael Stueber, Karlsruhe Institute of Technology	Surface Science Room: 112 - Session SS+AS+EN+NS-TuM Nanostructures, Nanoplasmonics and Surface Reactions **Moderator:** Bruce Koel, Princeton University
8:00 am	**SE+PS+SM-TuM1** Synthesis of Hybrid Nanoparticles - Fluorinated (Super)Hydrophobic Coatings by Atmospheric Plasma : Possibilities and Challenges, J. MERTENS, J. HUBERT, N. VANDENCASTEELE, **FRANÇOIS RENIERS**, Université Libre de Bruxelles, Belgium	**SS+AS+EN+NS-TuM1** Metal Nanoparticles Supported on Hierarchically Porous Supports for Heterogeneous Catalysis, **TRUPTI KOTBAGI**, The University of Alabama, Y. HAKAT, M.G. BAKKER, The Univeristy of Alabama
8:20 am	**SE+PS+SM-TuM2** Deposition of Antifouling PMOXA-like Coatings using Atmospheric Pressure Helium Plasma Jet, **SAMEER AL-BATAINEH**, A. CAVALLARO, M. RAMIASA, K. VASILEV, University of South Australia	**SS+AS+EN+NS-TuM2** ENDOM: A Simple Method to Deposit Nanostructures from Nanowires to Nanopores, **ASHLEY ELLSWORTH**, A.V. WALKER, University of Texas at Dallas
8:40 am	**SE+PS+SM-TuM3** Antibacterial Silicon Oxide Thin Films Doped with Zinc and Copper Grown by Atmospheric Pressure Plasma Chemical Vapor Deposition, E. JÄGER, Montanuniversität Leoben, J. SCHMIDT, A. PFUCH, S. SPANGE, O. BEIER, INNOVENT e.V., O. JANTSCHNER, R. DANIEL, Montanuniversität Leoben, **CHRISTIAN MITTERER**, Montanuniversität Leoben, Austria	**SS+AS+EN+NS-TuM3 Invited** Chemical Reaction on Photo-excited Plasmonic Nanostructures, **SULIO LINIC**, University of Michigan
9:00 am	**SE+PS+SM-TuM4** Carbon Bridge Incorporation in Organic-Inorganic Hybrid Coatings using Atmospheric Plasma Deposition in Ambient Air, **LINYING CUI**, Stanford University, G. DUBOIS, IBM Almaden Research Center, R.H. DAUSKARDT, Stanford University	Invited talk continued.
9:20 am	**SE+PS+SM-TuM5 Invited** Atmospheric Plasma in Liquids, **LADISLAV BARDOS**, H. BARANKOVA, Uppsala University, Sweden	**SS+AS+EN+NS-TuM5** Structured Noble Metal Nanosurfaces for Biosensing and Bioanalysis (4): TLC-SERS and *In Situ* Monitoring of Surface-Adsorbed Target Molecules, **HIROYUKI TAKEI**, J. SAITO, K. WATANABE, Toyo University, Japan, T. OKAMOTO, Riken, Japan, H. VIEKER, A. BEYER, A. GÖLZHÄUSER, Bielefeld University, Germany
9:40 am	Invited talk continued.	**SS+AS+EN+NS-TuM6** Growth and Intercalation of Cu and Dy on the Basal Plane of Graphite, **PATRICIA A. THIEL**, D. APPY, E.J. KWOLEK, D. SHAO, M. WALLINGFORD, M.C. TRINGIDES, J.W. EVANS, Y. HAN, Iowa State University, H. LEI, Institute of Solid State Physics, CAS, China, C.-Z. WANG, Iowa State University
10:00 am	**BREAK - Complimentary Coffee in Exhibit Hall**	**BREAK - Complimentary Coffee in Exhibit Hall**
10:20 am	**BREAK - Complimentary Coffee in Exhibit Hall**	**BREAK - Complimentary Coffee in Exhibit Hall**
10:40 am	**BREAK - Complimentary Coffee in Exhibit Hall**	**BREAK - Complimentary Coffee in Exhibit Hall**
11:00 am	**SE+PS+SM-TuM10** Study of Polymer Confinement Effects in Nanocomposite Thin Films Synthesized by Initiated Chemical Deposition, **CHIA-YUN(SHARON) HSIEH**, K.K.S. LAU, Drexel University	**SS+AS+EN+NS-TuM10** Surface-Mediated Self-assembly of a Flexible Nucleoside Analogue into Micron-sized Hydrogen-bonded Polymers, **J. WANG**, P. BONNESEN, Oak Ridge National Laboratory, E. RANGEL, E. VALLEJO, A. SANCHEZ-CASTILLO, Universidad Autónoma del Estado de Hidalgo, Mexico, H.J. CLEAVES, Tokyo Institute of Technology, Japan, A.P. BADDORF, B. SUMPTER, M. PAN, P. MAKSYMOVYCH, M. FUENTES-CABRERA, Oak Ridge National Laboratory
11:20 am	**SE+PS+SM-TuM11** Persistent Superhydrophilicity of Polycarbonate Surfaces *via* Nanoimprint Lithography *and* Atomic Layer Deposition, **XUE LI**, Institute of Materials Research and Engineering (IMRE), Singapore, K.S.L. CHONG, M.S.M. SAIFULLAH, R.B. YANG, C.S. LEE, Y.C. LOKE, Institute of Materials Research and Engineering (IMRE), A.Y. HE, Loke	**SS+AS+EN+NS-TuM11** Nanowire Kinking during Vapor-liquid-solid Growth: Experiments and Simulations, **YANMING WANG**, Y. LI, Stanford University, S. RYU, Korea Advanced Institute of Science and Technology, P.C. MCINTYRE, W. CAI, Stanford University
11:40 am	**SE+PS+SM-TuM12** Evolution and Evaluation of CVD based SiGeC Alloy Films, J.B. IKBAL, National University of Singapore, **GOPALAKRISHNAN KRISHNAN**, Megamart OE Pte Ltd, Singapore	**SS+AS+EN+NS-TuM12** Adsorption of Water and Bromine on Gold Nanoclusters Investigated by Neutralization in Low Energy Alkali Ion Scattering, **CHRISTOPHER SALVO**, J. KEAGY, J.A. YARMOFF, UC Riverside
12:00 pm	**SE+PS+SM-TuM13** A Simplistic Two-Step Route to Synthesize Titanium Dioxide Structures and their Application as Humidity and Ethanol Vapor Sensors, **NIPUN SHARMA**, R. NAGAR, Symbiosis Institute of Technology (SIT), Symbiosis International University (SIU), India, V. DHONGADE, K. DAWARE, S.W. GOSAVI, Savitribai Phule Pune University, India	**SS+AS+EN+NS-TuM13** Optical Constants Measured for Fe, Ni and Pd by Reflection Electron Energy-Loss Spectroscopy Spectra, H. XU, B. DA, S.F. MAO, University of Science and Technology of China, J. TOTH, K. TOKESI, Institute for Nuclear Research, Hungarian Academy of Sciences (ATOMKI), **ZEJUN DING**, University of Science and Technology of China

	Surface Science Room: 113 - Session SS+AS+EN-TuM Mechanistic Insight of Surface Reactions: Catalysis, ALD, etc. - I **Moderator:** Ludwig Bartels, University of California - Riverside	Thin Film Room: 111 - Session TF+EM+MI+MS-TuM ALD for Alternative Devices **Moderators:** Richard Vanfleet, Brigham Young University, Jesse Jur, North Carolina State University
8:00 am	**SS+AS+EN-TuM1** Active Sites of Nitrogen-Doped Carbon Materials for Oxygen Reduction Reaction, **TAKAHIRO KONDO**, D. GUO, R. SHIBUYA, C. AKIBA, S. SAJI, J. NAKAMURA, University of Tsukuba, Japan	**TF+EM+MI+MS-TuM1 Invited** FAST-ALD™ with Close Proximity (CP) Plasma for Low Temperature Applications: Nano-Composite Layer (NCL) Stacks for Flexible Substrates, **SANGIN LEE**, Veeco
8:20 am	**SS+AS+EN-TuM2** Cerium Oxide-Induced Intercalation of Oxygen on Supported Graphene, **ZBYNEK NOVOTNY**, Pacific Northwest National Laboratory, F.P. NETZER, Karl-Franzens University, Austria, Z. DOHNALEK, Pacific Northwest National Laboratory	Invited talk continued.
8:40 am	**SS+AS+EN-TuM3** Dissociation Dynamics of Energetic Water Molecules on TiO_2(110): Combined Molecular Beam Scattering and Scanning Tunneling Microscopy Study, Z.-T. WANG, Y.-G. WANG, R.T. MU, Y. YOON, G.A. SCHENTER, R. ROUSSEAU, I. LYUBINETSKY, **ZDENEK DOHNALEK**, Pacific Northwest National Laboratory	**TF+EM+MI+MS-TuM3** Atmospheric Roll-to-Roll Spatial Molecular Layer Deposition for flexible barriers, **FIEKE VAN DEN BRUELE**, F. GROB, P. POODT, Holst Centre / TNO, Netherlands
9:00 am	**SS+AS+EN-TuM4** Tracking Site-Specific C-C Coupling of Formaldehyde Molecules on Rutile TiO_2(110), **Z. ZHANG**, K. ZHU, Y. XIA, Baylor University, M. TANG, Southern Illinois University Carbondale, Z.-T. WANG, I. LYUBINETSKY, Pacific Northwest National Laboratory, Q. GE, Southern Illinois University Carbondale, Z. DOHNÁLEK, Pacific Northwest National Laboratory, K. PARK, Baylor University	**TF+EM+MI+MS-TuM4** Low Temperature, Temporal and Spatial Atomic Layer Deposition of TiO_2 using Titanium Tetra-Isopropoxide as Precursor, **M. AGHAEE**, Eindhoven University of Technology, Netherlands, P.S. MAYDANNIK, Lappeenranta University of Technology, Finland, P. JOHANSSON, Tampere University of Technology, Finland, M. CREATORE, Eindhoven University of Technology, Netherlands, T. HOMOLA, D.C. CAMERON, Masaryk University, Czech Republic, J. KUUSIPALO, Tampere University of Technology, Finland
9:20 am	**SS+AS+EN-TuM5 Invited** AVS 2014 Gaede-Langmuir Invited Talk: Models for Heterogeneous Catalysts: Complex Materials at the Atomic Level, **HAJO FREUND***, Fritz Haber Institute of the Max Planck Society, Germany	**TF+EM+MI+MS-TuM5** Spatial Atomic Layer Deposition into Flexible Porous Substrates, **KASHISH SHARMA**, University of Colorado at Boulder, D. ROUTKEVITIC, N. VARAKSA, In Redox, S.M. GEORGE, University of Colorado at Boulder
9:40 am	Invited talk continued.	**TF+EM+MI+MS-TuM6** Accurate Precursor and Reactant Delivery for Quantitative Atomic Layer Deposition, **MASAFUMI KITANO**, Stanford University, M. NAGASE, N. IKEDA, Fujikin Incorporated, Japan, P.C. MCINTYRE, Stanford University
10:00 am	**BREAK - Complimentary Coffee in Exhibit Hall**	**BREAK - Complimentary Coffee in Exhibit Hall**
10:20 am	**BREAK - Complimentary Coffee in Exhibit Hall**	**BREAK - Complimentary Coffee in Exhibit Hall**
10:40 am	**BREAK - Complimentary Coffee in Exhibit Hall**	**BREAK - Complimentary Coffee in Exhibit Hall**
11:00 am	**SS+AS+EN-TuM10** The Solid State Li-CoO Conversion Reaction Studied by ARXPS and STM, **RYAN THORPE**, S. RANGAN, Rutgers, the State University of New Jersey, A. HOWANSKY, Stony Brook University, R.A. BARTYNSKI, Rutgers, the State University of New Jersey	**TF+EM+MI+MS-TuM10 Invited** ALD for Capacitor Technologies, **RAMAKRISHNAN RAJAGOPALAN**, C. RANDALL, The Pennsylvania State University
11:20 am	**SS+AS+EN-TuM11** Imaging Water Adsorption and Dissociation on RuO_2 (110) Surfaces, **RENTAO MU**, D.C. CANTU, X. LIN, V.A. GLEZAKOU, Z.-T. WANG, I. LYUBINETSKY, R. ROUSSEAU, Z. DOHNÁLEK, Pacific Northwest National Laboratory	Invited talk continued.
11:40 am	**SS+AS+EN-TuM12** Surface Reaction Kinetics during Low Temperature ALD of Al_2O_3 Studied by Broadband Sum-frequency Generation, **VINCENT VANDALON**, W.M.M. KESSELS, Eindhoven University of Technology, Netherlands	**TF+EM+MI+MS-TuM12** Compositionally and Functionally Graded Hybrid Layer for High-Performance Adhesion, **YICHUAN DING**, R.H. DAUSKARDT, Stanford University
12:00 pm	**SS+AS+EN-TuM13** The Preparation and Redox Properties of $Cu/Al_2O_3/ZnO(0001)$ Model Surfaces, J. HU, J.J. HUANG, H. ZHANG, **MINGSHU CHEN**, Xiamen University, China	

*** Gaede Langmuir Award Winner**

Vacuum Technology
Room: 230B - Session VT-TuM

Vacuum Suitcases and Particulate Control
Moderators: James Fedchak, NIST, Marcelo Ferreira, European Spallation Source

8:00 am	**VT-TuM1 Invited** Applications for Mobile Vacuum Environments in Semiconductor Manufacturing, **DANIEL BABBS**, Brooks Automation	
8:20 am	Invited talk continued.	
8:40 am	**VT-TuM3 Invited** Experience of UHV Transportation of Critical Components, **PAOLO MICHELATO**, Italian National Institute for Nuclear Physics (INFN), Italy	
9:00 am	Invited talk continued.	
9:20 am	**VT-TuM5 Invited** Particle Behavior in Vacuum Systems: Protection Schemes for EUVL Critical Surfaces, Speed Controlled Particle Injection, Prevention of Particle Formation during Pump Down, **DAVID PUI**, University of Minnesota	
9:40 am	Invited talk continued.	
10:00 am	**BREAK - Complimentary Coffee in Exhibit Hall**	
10:20 am	**BREAK - Complimentary Coffee in Exhibit Hall**	
10:40 am	**BREAK - Complimentary Coffee in Exhibit Hall**	
11:00 am	**VT-TuM10 Invited** VTD Early Career Award Talk: Vacuum Technology Insights into Thin Film Photovoltaic Research, **JAMES BURST***, National Renewable Energy Laboratory	
11:20 am	Invited talk continued.	
11:40 am	**VT-TuM12** Differentially Pumped Interface to Transfer Environmentally Sensitive Materials Designed with Built-in figures of Merit, **HUGO CELIO**, University of Texas at Austin	
12:00 pm		

*** VTD Early Career Award**

Exhibitor Technology Spotlight
Room: Hall 1 - Session EW-TuL

Exhibitor Technology Spotlight Session
Moderator: Dennis Sollon, Kurt J. Lesker

12:20 pm		
12:40 pm	**EW-TuL2** The Latest Developments in Surface Analysis from Thermo Fisher Scientific, **TIM NUNNEY**, Thermo Fisher Scientific, UK, P. MACK, C. DEEKS, R.G. WHITE, Thermo Fisher Scientific	
1:00 pm	**EW-TuL3** EnviroESCATM – The Revolution of a Method, **ANDREAS THISSEN**, S. BAHR, T. KAMPEN, O. SCHAFF, SPECS Surface Nano Analysis GmbH, Germany	
1:20 pm	**EW-TuL4** Latest Developments in XPS and Related Methods from Kratos Analytical, **CHRIS BLOMFIELD**, J.D.P. COUNSELL, S.J. COULTAS, S.C. PAGE, Kratos Analytical Limited, UK, C. MOFFITT, Kratos Analytical Limited	
1:40 pm	**EW-TuL5** What's New from Physical Electronics, **SCOTT BRYAN**, Physical Electronics USA	
2:00 pm	**EW-TuL6** AFM of Thin Films for Nanomechanical, Nanoelectrical, and Electromechanical Characterization, **AMIR MOSHAR**, A. LABUDA, Asylum Research, an Oxford Instruments Company	

NOTES

	2D Materials Focus Topic Room: 212C - Session 2D+EM+MC+MI+NS+SP+SS+TF-TuA Electronic and Magnetic Properties of 2D Materials **Moderators:** Thomas Mueller, Vienna University of Technology, Austria, Xiaobo Yin, University of Colorado Boulder	Applied Surface Science Room: 212D - Session AS+BI-TuA Challenges in the Characterization of Polymer/Organic/ Biological Systems **Moderators:** Bonnie Tyler, National Physical Laboratory (NPL), Jeffrey Fenton, Medtronic plc
2:20 pm	**2D+EM+MC+MI+NS+SP+SS+TF-TuA1 Invited** Direct Capacitive Probe of Isospin Order in Graphene Bilayers, **ANDREA YOUNG**, University of California at Santa Barbara	**AS+BI-TuA1 Invited** ASSD 30th Anniversary Lecture: 30 Years (ToF-)SIMS of Organic Materials: from Monolayer to 3D Microarea Analysis, **BIRGIT HAGENHOFF**, Tascon GmbH, Germany
2:40 pm	Invited talk continued.	Invited talk continued.
3:00 pm	**2D+EM+MC+MI+NS+SP+SS+TF-TuA3** Patterning Hydrogenated Graphene via Electron Beam Irradiation, **WOO-KYUNG LEE**, K.E. WHITENER, J.T. ROBINSON, P.E. SHEEHAN, Naval Research Laboratory	**AS+BI-TuA3** Characterization of the Buried Interface between a Bacterial-Biofilm Resistant Coating and a Silicon Catheter by using Gas Cluster ToF-SIMS and Raman Microscopy, **BONNIE TYLER**, National Physical Laboratory (NPL), UK, A.L. HOOK, M.R. ALEXANDER, University of Nottingham, UK, A. GIOVANNOZZI, INRIM, A. PELSTER, H.F. ARLINGHAUS, University of Muenster, Germany
3:20 pm	**2D+EM+MC+MI+NS+SP+SS+TF-TuA4** Large-Area Low-Pressure Synthesis of Single-Layer MoS_2 Films and Schottky-Barrier Formation upon Metal Deposition, **MICHAEL GOMEZ**, J. MARTINEZ, M. VALENTIN, L. BARTELS, UC Riverside	**AS+BI-TuA4** How to Measure Reaction Rates on Surfaces?: Ambient Mass Spectrometry and XPS to Study the Rate of Organic Reactions on Functionalized Surfaces., R. SEN, J. ESCORIHUELA, **HAN ZUILHOF**, Wageningen University, Netherlands
3:40 pm	**BREAK**	**BREAK**
4:00 pm	**BREAK**	**BREAK**
4:20 pm	**2D+EM+MC+MI+NS+SP+SS+TF-TuA7 Invited** 2D Topological Superconductors and Weyl Semimetals with Fermi Arc Surface States, **M. ZAHID HASAN**, Princeton University	**AS+BI-TuA7** Surface versus Bulk Chemistry of Reverse Osmosis Membranes, **TAMLIN MATTHEWS**, R. CIESLINSKI, M. PAUL, A. ROY, The Dow Chemical Company
4:40 pm	Invited talk continued.	**AS+BI-TuA8** Effect of Deep UV Irradiation on Polyester Family Polymers, **LOPAMUDRA DAS**, M.J. KELLEY, College of William and Mary
5:00 pm	**2D+EM+MC+MI+NS+SP+SS+TF-TuA9 Invited** Probing Massive Dirac Electrons in Bilayer Graphene, **FENG WANG**, University of California at Berkeley	**AS+BI-TuA9 Invited** Going beyond State of the Art in SIMS Imaging in the Life-Sciences and for Organic Devices, **IAN GILMORE**, National Physical Laboratory, UK
5:20 pm	Invited talk continued.	Invited talk continued.
5:40 pm	**2D+EM+MC+MI+NS+SP+SS+TF-TuA11** Combining Photoemission and Photoluminescence Microscopy to Study Substrate Transfer Process Effects in Chemical Vapor Deposited MoS_2 Monolayers, **O.J. RENAULT**, M. FRÉGNAUX, Univ. Grenoble Alpes/ CEA, LETI, MINATEC Campus, France, J. BLEUSE, Univ. Grenoble-Alpes & CEA-INAC, France, H. KIM, Univ. Grenoble Alpes/ CEA, LETI, MINATEC Campus, France, D. VOIRY, M. CHHOWALLA, Rutgers University	**AS+BI-TuA11** Can *In Situ* Liquid SIMS Provide Enough Signals for Biology and Environmental Research?, **ZIHUA ZHU**, Y. ZHOU, X. HUA, J. YU, J.E. EVANS, D. LAO, X.-Y. YU, Pacific Northwest National Laboratory
6:00 pm	**2D+EM+MC+MI+NS+SP+SS+TF-TuA12** Pressure Induced Reversible Tuning of Electronic Structure and Transport Properties of Phosphorene, **ABHISHEK SINGH**, A. MANJANATH, A. SAMANTA, T. PANDEY, Indian Institute of Science, India	**AS+BI-TuA12** Fundamental Metrology for Tissue Imaging by SIMS - A Study of Cholesterol and Determination of the Argon Cluster Sputtering Yield, P. RAKOWSKA, M.P. SEAH, **RASMUS HAVELUND,** I.S. GILMORE, National Physical Laboratory, UK

Tuesday Afternoon, October 20, 2015

	Biomaterial Interfaces Room: 211D - Session BI-TuA Cells and Microorganisms at Surfaces **Moderator:** Heather Canavan, University of New Mexico	Electronic Materials and Processing Room: 210E - Session EM+MN+PS-TuA More than Moore: Novel Approaches for Increasing Integrated Functionality **Moderators:** Andy Antonelli, Nanometrics, Sean King, Intel Corporation
2:20 pm	**BI-TuA1** Control of Surface Physical Properties for Effectively Promoting and Maintaining Cell Clusters such as Stem Cell Colonies at Interfaces, **YINGCHIH CHANG**, P.Y. YEH, Academia Sinica, Taiwan, Republic of China	**EM+MN+PS-TuA1 Invited** Maintaining the Pace of Progress as we Approach the end of Moore's Law: *Heterogeneous Integration, New Materials, New Processes, New Architectures*, **BILL BOTTOMS**, 3MTS
2:40 pm	**BI-TuA2** Immobilized Liquid Layers for Controlled Bacterial, Fungal, and Mammalian Cell Attachment, **CAITLIN HOWELL**, N. JUTHANI, N. MACCALLUM, Y. KOVALENKO, S. KELSO, J. LIN, C. NEMR, P. KIM, J. AIZENBERG, Harvard University	Invited talk continued.
3:00 pm	**BI-TuA3** Quantitative Characterization of Bacterial Cells Mixed with Nanoparticles, P.M. MARTINS, A.R. SILVA, University of Minho, Portugal, I.M. PINTO, C. SOUSA, International Iberian Nanotechnology Laboratory, Portugal, S. LANCEROS-MÉNDEZ, University of Minho, Portugal, **DMITRI PETROVYKH**, International Iberian Nanotechnology Laboratory, Portugal	**EM+MN+PS-TuA3 Invited** More than Moore - Wafer Scale Integration of Dissimilar Materials on a Si Platform, **THOMAS KAZIOR**, J. LAROCHE, Raytheon Company
3:20 pm	**BI-TuA4** Tethered Antimicrobial Peptide WLBU2 for Capture of Circulating Bacteria and Endotoxin in Sepsis, **RAMYA RAMAN**, K.F. SCHILKE, Oregon State University	Invited talk continued.
3:40 pm	**BREAK**	**BREAK**
4:00 pm	**BREAK**	**BREAK**
4:20 pm	**BI-TuA7 Invited** Concentration Dependent Acceleration of hMSC Differentiation on Orthogonal Concentration Gradients of RGD and BMP-2 Peptides, **MATTHEW BECKER**, The University of Akron	**4:00-6:00 pm** **EMPD/PSTD PANEL DISCUSSION:** **"Moore's Law and the Future of the Semiconductor Industry"**
4:40 pm	Invited talk continued.	
5:00 pm	**BI-TuA9** How Does Plasma Surface Modification Affect Biological Responses?, **ADORACION PEGALAJAR-JURADO**, M.J. HAWKER, M.N. MANN, E.R. FISHER, Colorado State University	
5:20 pm	**BI-TuA10** Stereoscopic Tracking Reveals Responses of Barnacle Larvae to Surface Cues, S. MALESCHLIJSKI, G.H. SENDRA, S. BAUER, Karlsruhe Institute of Technology (KIT), Germany, A. DI FINO, Newcastle University, UK, L. LEAL-TAIXE, Leibnitz University Hannover, Germany, T. EDERTH, Linköping University, Sweden, N. ALDRED, Newcastle University, UK, B. LIEDBERG, NTU Singapore, A.S. CLARE, Newcastle University, UK, B. ROSENHAHN, Leibnitz University Hannover, Germany, **A. ROSENHAHN**, Ruhr-University Bochum, Germany	
5:40 pm	**BI-TuA11** New Materials Toolboxes for Tissue Engineering and Regenerative Medicine Applications, **ADAM CELIZ***, Harvard University, J. SMITH, University of Nottingham, UK, A. PATEL, R. LANGER, D. ANDERSON, Massachusetts Institute of Technology, D. MOONEY, Harvard University, L. YOUNG, M. DAVIES, C. DENNING, M.R. ALEXANDER, University of Nottingham, UK	**6:05 pm: EMPD BUSINESS MEETING** **6:30 pm: EMPD FORUM: CAREERS AT LAM RESEARCH**
6:00 pm	**BIOMATERIAL INTERFACES FLASH NETWORKING SESSION**: **PATRICK BURCH**, University of California at Berkeley BI-TuP1); **MICHAEL TAYLOR**, The University of Nottingham, UK (BI- TuP2); **JAMES FOWLER**, Oregon State University (BI-TuP3); **MAXIMILIAN SCHROEDER**, Technische Universität Dresden, Germany (BI-TuP4); **SHINGO YONEDA**, Toyo University, Japan (BI-TuP5); **MICHAEL NEWTON**, University of Washington (BI-TuP9); **NESTOR EFRÉN MENDEZ LOZANO**, UNAM, Mexico (BI-TuP10); **MARIAANTOANETA BRATESCU**, Nagoya University, Japan (BI-TuP11); **MIKI EBISAWA**, Toyo University, Japan (BI-TuP12); **TAKUMI MIYASHITA**, Toyo University, Japan (BI-TuP13); **YAROSLAVA YINGLING**, North Carolina State University (BI-TuP14); **NATHAN GUISINGER**, Argonne National Laboratory (BI-TuP16); **BEDE PITTENGER**, Bruker (BI-TuP17)	

***BID Early Career Researchers Award**

	Energy Frontiers Focus Topic Room: 211B - Session EN+EM+NS+SE+SS+TF-TuA Batteries and Supercapacitors **Moderators:** Elijah Thimsen, Washington University, St. Louis, Andrew C. Kummel, University of California at San Diego	Exhibitor Technology Spotlight Room: Hall 1 - Session EW-TuA Exhibitor Technology Spotlight Session
2:20 pm	**EN+EM+NS+SE+SS+TF-TuA1 Invited** Behavior of Layered Cathode Materials: A Route to Higher Energy Density for Li-Ion Batteries, **MARCA DOEFF**, F. LIN, Lawrence Berkeley National Laboratory, I. MARKUS, Lawrence Berkeley Lab, University of California, Berkeley	
2:40 pm	Invited talk continued.	
3:00 pm	**EN+EM+NS+SE+SS+TF-TuA3** Next-Generation Electrolytes for Lithium-Ion Batteries, **SARAH GUILLOT**, University of Wisconsin - Madison, M. USREY, A. PENA-HUESO, Silatronix, Inc., R.J. HAMERS, University of Wisconsin-Madison and Silatronix, Inc.	
3:20 pm	**EN+EM+NS+SE+SS+TF-TuA4** Physico-Chemical Properties of Polyamidoamine Dendrimer-Based Binders for Carbon Cathodes in Lithium-Sulfur Batteries, **MANJULA NANDASIRI**, P. BHATTACHARYA, A. SCHWARZ, D. LU, Pacific Northwest National Laboratory, D.A. TOMALIA, NanoSynthons LLC, W.A. HENDERSON, J. XIAO, Pacific Northwest National Laboratory	
3:40 pm	**BREAK**	
4:00 pm	**BREAK**	**EW-TuA6** High Efficiency, High Capacity and Economical "Point of Use" Gas Abatement, **D.K. PRASAD**, CS CLEAN SYSTEMS, Inc.
4:20 pm	**EN+EM+NS+SE+SS+TF-TuA7 Invited** The Road beyond Lithium Batteries is Paved — In Three Dimensions — With Rechargeable, Dendrite-Free Zinc, **DEBRA ROLISON**, J.F. PARKER, C.N. CHERVIN, I.R. PALA, M.D. WATTENDORF, J.W. LONG, U.S. Naval Research Laboratory	
4:40 pm	Invited talk continued.	
5:00 pm	**EN+EM+NS+SE+SS+TF-TuA9** Porous Silicon Electrochemical Capacitor Devices for Integrated On-Chip Energy Storage, **DONALD GARDNER**, C.W. HOLZWARTH III, Y. LIU, S. CLENDENNING, W. JIN, B.K. MOON, Z. CHEN, E.C. HANNAH, T.V. ALDRIDGE, Intel Corp, C.P. WANG, C. CHEN, Florida International University, J.L. GUSTAFSON, Intel Corp	
5:20 pm	**EN+EM+NS+SE+SS+TF-TuA10** Investigations of Magnesium Stripping and Deposition using *Operando* Ambient Pressure X-ray Photoelectron Spectroscopy, **YI YU**, Lawrence Berkeley National Laboratory, Q. LIU, Shanghai Tech University, China, B. EICHHORN, University of Maryland, College Park, E.J. CRUMLIN, Lawrence Berkeley National Laboratory	
5:40 pm	**EN+EM+NS+SE+SS+TF-TuA11 Invited** Atomic Layer Deposition of Solid Electrolytes for Beyond Lithium-Ion Batteries, **ALEXANDER KOZEN**, G.W. RUBLOFF, University of Maryland, College Park	
6:00 pm	Invited talk continued.	

	IPF on Mesoscale Science and Technology of Materials and Metamaterials **Room: 210F - Session IPF+MS-TuA** **Frontiers in Physics** **Moderators:** Jim Hollenhorst, Agilent, Cathy O'Riordan, AIP	**In-Situ Spectroscopy and Microscopy Focus Topic** **Room: 211C - Session IS+AS+SS-TuA** **Environmental TEM Studies for Catalytic and Energy Materials** **Moderators:** Franklin (Feng) Tao, University of Kansas, Judith Yang, University of Pittsburgh
2:20 pm	**IPF+MS-TuA1 Invited** Giving New Life to Materials for Energy, the Environment and Medicine, **ANGELA BELCHER**, MIT Koch Institute for Integrative Cancer Research	**IS+AS+SS-TuA1 Invited** *In Situ* and *Operando* TEM of Thermal and Photocatalysts, **PETER CROZIER**, B.K. MILLER, L. ZHANG, Q. LIU, Arizona State University
2:40 pm	Invited talk continued.	Invited talk continued.
3:00 pm	**IPF+MS-TuA3 Invited** XFEL Movies of Molecular Machines at Work, **JOHN SPENCE**, Arizona State University	**IS+AS+SS-TuA3 Invited** Environmental TEM Study of Gold and Platinum Nanoparticulate Catalysts, H. YOSHIDA, Y. KUWAUCHI, H. OMOTE, **SEIJI TAKEDA**, Osaka University, Japan
3:20 pm	Invited talk continued.	Invited talk continued.
3:40 pm	**BREAK**	**BREAK**
4:00 pm	**BREAK**	**BREAK**
4:20 pm	**IPF+MS-TuA7 Invited** Frontiers of Ocean Sensing, **SUSAN K. AVERY**, Woods Hole Oceanographic Institution	**IS+AS+SS-TuA7** Facilitating Dislocation Nucleation in Cu(Au) Solid Solutions through Atomic Segregation, **L. ZOU**, State University of New York at Binghamton, Y. LEI, University of Pittsburgh, D. ZAKHAROV, Brookhaven National Laboratory, J. WIEZOREK, University of Pittsburgh, D. SU, Brookhaven National Laboratory, Q. YIN, State University of New York at Binghamton, J. LI, State University of New York, Z. LIU, University of Pittsburgh, E. STACH, Brookhaven National Laboratory, G. WANG, J.C. YANG, University of Pittsburgh, G. ZHOU, State University of New York at Binghamton
4:40 pm	Invited talk continued.	**IS+AS+SS-TuA8** Environmental Study of the Reaction-driven Restructuring of Ni-Co Bimetallic Nanoparticles, C.S. BONIFACIO, University of Pittsburgh, H.L. XIN, Brookhaven National Laboratory, **SOPHIE CARENCO**, M.B. SALMERON, Lawrence Berkeley National Laboratory, E. STACH, Brookhaven National Laboratory, J.C. YANG, University of Pittsburgh
5:00 pm	**IPF+MS-TuA9 Invited** New States of Electronic Matter and their Potential for Science and Computation, **JOEL MOORE**, University California, Berkeley	**IS+AS+SS-TuA9 Invited** *In situ* Vibrational Spectroscopy Investigation of the Surface Dependent Redox and Acid-base Properties of Ceria Nanocrystals, **ZILI WU**, Oak Ridge National Laboratory
5:20 pm	Invited talk continued.	Invited talk continued.
5:40 pm	**IPF+MS-TuA11 Invited** The Universe in Motion: Listening to Gravitational Waves with LIGO, **MICHAEL ZUCKER**, Massachusetts Institute of Technology	**IS+AS+SS-TuA11** Direct Writing of sub-10 nm Structures from Liquid with Helium Ions, V. IBERI, R.R. UNOCIC, **NATHAN PHILLIP**, A. BELIANINOV, A.J. RONDINONE, D.C. JOY, O.S. OVCHINNIKOVA, Oak Ridge National Laboratory
6:00 pm	Invited talk continued.	

	Magnetic Interfaces and Nanostructures Room: 230A - Session MI+SA-TuA Spin Currents, Spin Textures and Hybrid Magnetic Structures **Moderator:** Greg Szulczewski, The University of Alabama	MEMS and NEMS Room: 211A - Session MN+BI-TuA BioMEMS/NEMS, Wearable and Implantable Devices **Moderators:** Wayne Hiebert, University of Alberta and The National Institute for Nanotechnology, Beth L. Pruitt, Stanford University
2:20 pm	**MI+SA-TuA1 Invited** Spin Hall Effect in Metallic Multilayers, **GEORG WOLTERSDORF**, Martin Luther University Halle-Wittenberg, Germany, M. OBSTBAUM, M. DECKER, D. WEI, C.H. BACK, University of Regensburg	**MN+BI-TuA1 Invited** Entrepreneurial Environment for Implantable and Wearable BioMEMS, **KURT PETERSEN**, Silicon Valley Band of Angels
2:40 pm	Invited talk continued.	Invited talk continued.
3:00 pm	**MI+SA-TuA3 Invited** Chiral Spin Textures in Ultrathin Ferromagnets, **GEOFFREY BEACH**, Massachusetts Institute of Technology	**MN+BI-TuA3 Invited** MEMS Sensors Make Up the Frontline of Wireless Health Solutions: Tremendous Growth Prospects, **MEHRAN MEHREGANY**, Case Western Reserve University
3:20 pm	Invited talk continued.	Invited talk continued.
3:40 pm	**BREAK**	**BREAK**
4:00 pm	**BREAK**	**BREAK**
4:20 pm	**MI+SA-TuA7 Invited** Indirect Modification of Magnetic Surface States by Organic Semiconductor Adsorbates, **DANIEL DOUGHERTY**, J. WANG, North Carolina State University	**MN+BI-TuA7** GC-MS to GC-NOMS: A Step Towards Portable Analysis, **ANANDRAM VENKATASUBRAMANIAN**, S.K. ROY, V.T.K. SAUER, W.K. HIEBERT, National Institute for Nanotechnology and University of Alberta, Canada
4:40 pm	Invited talk continued.	**MN+BI-TuA8** Label-Free Biosensing Platform Integrating a Nanofluidic Preconcentrator with Surface Plasmon Resonance Sensors, **WEI-HANG LEE**, P.S. CHUNG, National Taiwan University, Taiwan, Republic of China, P.K. WEI, Academia Sinica, Taiwan, Republic of China, W.C. TIAN, National Taiwan University, Taiwan, Republic of China
5:00 pm	**MI+SA-TuA9** Transitioning into the Ga-rich Regime of Ferromagnetic Manganese Gallium Films Grown on Gallium Nitride: Structure and Magnetism, **ANDRADA-OANA MANDRU***, J.P. CORBETT, A.L. RICHARD, Ohio University, J.M. LUCY, Ohio State University, D.C. INGRAM, Ohio University, F. YANG, Ohio State University, A.R. SMITH, Ohio University	**MN+BI-TuA9** Microparticle Patterning Using Multimode Silicon Carbide Micromechanical Resonators, **HAO JIA**, H. TANG, P.X.-L. FENG, Case Western Reserve University
5:20 pm	**MI+SA-TuA10** A Depth-Dependent Model for Atomic Valence in Magnetoelectric Systems, **MIKEL HOLCOMB**, R. TRAPPEN, J. ZHOU, West Virginia University, Y-H. CHU, National Chiao Tung University, S. DONG, Southeast University	**MN+BI-TuA10** High-Sensitivity Parametrically Amplified Chemo-Mechanical Vapor Sensors for Biohazard Application, **SHASHANK PANDEY**, University of Utah
5:40 pm	**MI+SA-TuA11** Atomic-Scale Magnetism on a Complex Insulating Surface, **BARBARA JONES**, IBM Research - Almaden, O.R. ALBERTINI, Georgetown University, S. GANGOPADHYAY, IBM Research - Almaden, A.Y. LIU, Georgetown University	
6:00 pm	**MI+SA-TuA12** Substrate Induced Spin-state Locking of $[Fe(H_2B(pz)_2)_2(bipy)]$ on Au(111), **SUMIT BENIWAL***, X. ZHANG, S. MU, University of Nebraska - Lincoln, A. NAIM, P. ROSA, G. CHASTANET, CNRS Universite de Bordeaux, France, J. LIU, Northeastern University, G. STERBINSKY, D. ARENA, Brookhaven National Laboratory, P.A. DOWBEN, A. ENDERS, University of Nebraska - Lincoln	
6:25 pm	**MIND BUSINESS MEETING**	

*** Falicov Student Award Finalist**

	Manufacturing Science and Technology Room: 114 - Session MS-TuA Working with National Labs and User Facilities **Moderator:** Bridget Rogers, Vanderbilt University, Charles R. Eddy, Jr, U.S. Naval Research Laboratory	Nanometer-scale Science and Technology Room: 212B - Session NS+EN+SS-TuA Nanophotonics, Plasmonics, and Energy **Moderator:** David Wei, University of Florida
2:20 pm		**NS+EN+SS-TuA1** Subnanoscale Exciton Dynamics of C_{60}-based Single Photon Emitters Explored by Hanbury Brown Twiss Scanning Tunneling Microscope, **PABLO MERINO MATEO**, C. GROSSE, A. ROSŁAWSKA, K. KUHNKE, K. KERN, Max-Planck-Institut für Festkörperforschung, Germany
2:40 pm	**MS-TuA2** Research Opportunities at the Cornell Nanoscale Science and Technology Facility, a member of the National Nanotechnology Coordinated Infrastructure., **MICHAEL SKVARLA**, D. RALPH, Cornell NanoScale Science and Technology Facility	**NS+EN+SS-TuA2** Low-Damage Etching Process for the Fabrication of GaAs based Light-Emitting Devices, **CEDRIC THOMAS**, A. HIGO, Tohoku University, Japan, T. KIBA, Hokkaido University, Japan, Y. TAMURA, Tohoku University, Japan, N. OKAMOTO, I. YAMASHITA, Nara Institute of Science and Technology, Japan, A. MURAYAMA, Hokkaido University, Japan, S. SAMUKAWA, Tohoku University, Japan
3:00 pm	**MS-TuA3** The CNST NanoFab at NIST is Open for Business, **VINCENT LUCIANI**, NIST Center for Nanoscale Science and Technology	**NS+EN+SS-TuA3** Surface Plasmon-Mediated Selective Deposition of Au Nanoparticles on Ag Bowtie Nano-Antennas, **JINGJING QIU**, D. WEI, University of Florida
3:20 pm	**MS-TuA4** The Molecular Foundry: A Knowledge-Based User Facility for Nanoscale Science, **BRANDEN BROUGH**, The Molecular Foundry, Berkeley Lab	**NS+EN+SS-TuA4** Broadband Light Trapping in Nanopatterned Substrates for Photovoltaic and Photonic Applications, **CARLO MENNUCCI**, Department of Physics, University of Genova, Genova, Italy, C. MARTELLA, M.C. GIORDANO, D. REPETTO, F. BUATIER DE MONGEOT, University of Genova, Italy
3:40 pm	**BREAK**	**BREAK**
4:00 pm	**BREAK**	**BREAK**
4:20 pm	**MS-TuA7** The National Renewable Energy Laboratory (NREL) - Its Mission, Organization, Research Activities, and Opportunities, **TIMOTHY GESSERT**, National Renewable Energy Laboratory	**NS+EN+SS-TuA7 Invited** *In Situ* Visualization of Intercalation-Driven Nanoparticle Phase Transitions using Plasmon-EELS, **JENNIFER DIONNE**, Stanford University
4:40 pm	**MS-TuA8** User Opportunities at the Center for Nanoscale Materials: From Hybrid Nanomaterials to Tailoring Nanoscale Interactions, **KATHLEEN CARRADO GREGAR**, Center for Nanoscale Materials at Argonne National Laboratory	Invited talk continued.
5:00 pm	**MS-TuA9** Using EMSL Capabilities to Advance Your Research, **DONALD BAER**, M. ENGELHARD, Pacific Northwest National Laboratory	**NS+EN+SS-TuA9** Pulsed Laser-Induced Self-Assembly of Noble Metal Nanoparticles and an EELS Characterization, **Y. WU**, University of Tennessee, G. LI, University of Notre Dame, C. CHERQUI, N. BIGELOW, University of Washington, J.P. CAMDEN, University of Notre Dame, D. MASIELLO, University of Washington, J.D. FOWLKES, Oak Ridge National Laboratory, P.D. RACK, University of Tennessee
5:20 pm	**MS-TuA10** From Neutron Nanoscience to Direct-write Nanofabrication at the Center for Nanophase Materials Sciences, **OLGA OVCHINNIKOVA**, Oak Ridge National Laboratory	**NS+EN+SS-TuA10** Flexible, Adaptive Optoelectronic Camouflage Skins Using Concepts Inspired by Cephalopods, **CUNJIANG YU**, University of Houston
5:40 pm	**PANEL DISCUSSION**	**NS+EN+SS-TuA11** Controlled Deposition of High Quality Nanocrystal Multilayer Structures for Optoelectronic Applications, **SARA RUPICH**, A.V. MALKO, Y.N. GARTSTEIN, Y.J. CHABAL, University of Texas at Dallas
6:00 pm		**NS+EN+SS-TuA12** Efficient Coupling of Visible Light to Thin Film Waveguides; FDTD Field Model Results for Nanometer Scale Graded Index/Waveguide Structures., **ADAM LAMBERT**, E. DEMARAY, AVS
6:05 pm		**NSTD BUSINESS MEETING**

	Plasma Science and Technology Room: 210A - Session PS1-TuA **Novel Materials and Etch Chemistry** **Moderator:** David Lishan, Plasma-Therm LLC	Plasma Science and Technology Room: 210B - Session PS2-TuA **Plasma Modeling** **Moderator:** Saravanapriyan Sriraman, Lam Research Corporation
2:20 pm	**PS1-TuA1 Invited** Low-Damage Etching Technology for Nitride Semiconductor Devices, **MAKOTO SEKINE**, Z. LIU, J. PAN, K. ISHIKAWA, K. TAKEDA, H. KONDO, M. HORI, Nagoya University, Japan	**PS2-TuA1 Invited** Realistic Plasma Etch Simulation for High Aspect Ratio Contact Hole using Graphics Processing Units, **YEON HO IM**, Chonbuk National University, Republic of Korea
2:40 pm	Invited talk continued.	Invited talk continued.
3:00 pm	**PS1-TuA3** Limitation of Surface Defects in GaN Deep Etching, N. GOSSET, **THOMAS TILLOCHER**, GREMI CNRS/Université d'Orléans, France, J. LADROUE, ST Microelectronics, France, P. LEFAUCHEUX, GREMI CNRS/Université d'Orléans, France, M. BOUFNICHEL, ST Microelectronics, France, R. DUSSART, GREMI CNRS/Université d'Orléans, France	**PS2-TuA3** Validation of Inductively Coupled Plasmas Sustained in Halogen Chemistries, **ANKUR AGARWAL**, Applied Materials Inc., M. FOUCHER, LPP-CNRS, Ecole Polytechnique, France, S. RAUF, Applied Materials Inc., J.-P. BOOTH, P. CHABERT, LPP-CNRS, Ecole Polytechnique, France, K.S. COLLINS, Applied Materials Inc.
3:20 pm	**PS1-TuA4** *In Situ* Monitoring of GaN in Process Plasma, **DAISUKE OGAWA**, Y. NAKANO, K. NAKAMURA, Chubu University, Japan	**PS2-TuA4** Enhanced SiN Etching by Hydrogen Radicals during Fluorocarbon/Hydrogen Plasma Etching; Molecular Dynamics Simulation Analyses, **YUICHI MURAKAMI**, M. ISOBE, K. MIYAKE, Osaka University, Japan, M. FUKASAWA, K. NAGAHATA, Sony Corporation, T. TATSUMI, Sony Corporation, Japan, S. HAMAGUCHI, Osaka University, Japan
3:40 pm	**BREAK**	**BREAK**
4:00 pm	**BREAK**	**BREAK**
4:20 pm	**PS1-TuA7** Thermodynamic-aided Selection of Non-PFC Plasma Chemistries, **NICHOLAS ALTIERI**, J.K.C. CHEN, L. MINARDI, J.P. CHANG, University of California Los Angeles	**PS2-TuA7 Invited** Plasma-induced Surface Roughening and Ripple Formation during Plasma Etching of Silicon, **KOUICHI ONO**, Kyoto University, Japan
4:40 pm	**PS1-TuA8** Enhancing Selectivity for Self-Aligned Contact Etching by Employing Dual Fluorocarbon Etch Gas Processes, **J.C. SHEARER**, IBM Research Division, S.U. ENGELMANN, R.L. BRUCE, E.M. SIKORSKI, IBM Research Division, T.J. Watson Research Center, T. SUZUKI, M. NAKAMURA, A. ITO, ZEON Chemicals L.P., G. MATSUURA, H. MATSUMOTO, Zeon Corporation, Japan, B. MESSER, K. HORVATH, A. METZ, TEL Technology Center, America, LLC, J.C. ARNOLD, IBM Research Division, E.A. JOSEPH, IBM Research Division, T.J. Watson Research Center	Invited talk continued.
5:00 pm	**PS1-TuA9** Pushing the Limits of Dielectric Etch with Novel Fluorocarbon Etch Gases, **R.L. BRUCE**, IBM Research Division, T.J. Watson Research Center, T. SUZUKI, ZEON Chemicals L.P., J. LEE, IBM Albany Nanotech Center, E.A. JOSEPH, S.U. ENGELMANN, IBM Research Division, T.J. Watson Research Center, A. ITOU, M. NAKAMURA, ZEON Chemicals L.P., G. MATSUURA, Zeon Corporation, Kawasaki, Japan, J.C. ARNOLD, IBM Albany Nanotech Center, E.M. SIKORSKI, IBM Research Division, T.J. Watson Research Center	**PS2-TuA9 Invited** Feature Scale Modeling of Semiconductor Processes, **PHILLIP STOUT**, Applied Materials
5:20 pm	**PS1-TuA10** First-Principles Theoretical Investigation on Mechanism of New Transition Metal Etching Process using Oxygen and argon Neutral Beams and Ethanol Gas, **TOMOHIRO KUBOTA**, Y. KIKUCHI, S. SAMUKAWA, Tohoku University, Japan	Invited talk continued.
5:40 pm	**PS1-TuA11** Generalized Approach for Selecting Viable Plasma Chemistries in Patterning Magnetic Metals, **JACK KUN-CHIEH CHEN***, T. KIM, N.D. ALTIERI, J.P. CHANG, University of California Los Angeles	**PS2-TuA11** Pattern Loading in Etch through Profile Simulation, **YITING ZHANG**, S. SRIRAMAN, J. BELEN, A. PATERSON, Lam Research Corporation, M.J. KUSHNER, University of Michigan, Ann Arbor
6:00 pm	**PS1-TuA12** Short- and Damage-Free Process for Patterning Magnetic Tunnel Junctions for High-Density Application, **D. RADISIC**, L. SOURIAU, IMEC, Belgium, V. PARASCHIV, SC Etch Technology Solutions, D. GOOSSENS, IMEC, Belgium, F. YAMASHITA, N. KOIZUMI, S. TAHARA, E. NISHIMURA, Tokyo Electron Miyagi Limited, Japan, W. KIM, G. DONADIO, D. CROTTI, J. SWERTS, S. MERTENS, T. LIN, S. COUET, D. PIUMI, GS. KAR, A. FURNEMONT, IMEC, Belgium	**PS2-TuA12** Plasma Modeling of a Magnetized Inductively-Coupled Plasma Reactor, **JASON KENNEY**, S. RAUF, K.S. COLLINS, Applied Materials, Inc.
6:25 pm	**PSTD BUSINESS MEETING**	

*** Coburn & Winters Student Award Finalist**

	Advanced Surface Engineering Room: 212A - Session SE+PS-TuA **Pulsed Plasmas in Surface Engineering** **Moderators:** Jolanta Klemberg-Sapieha, Ecole Polytechnique de Montreal, Canada, Michael Stueber, Karlsruhe Institute of Technology	Surface Science Room: 113 - Session SS+AS+EN-TuA **Mechanistic Insight of Surface Reactions: Catalysis, ALD, etc. - II** **Moderator:** Bruce D. Kay, Pacific Northwest National Laboratory
2:20 pm	**SE+PS-TuA1** Strategy for Tuning the Average Charge State of Metal Ions Incident at the Growing Film during HIPIMS Deposition, **GRZEGORZ GRECZYNSKI**, Linköping University, Sweden, I. PETROV, University of Illinois at Urbana Champaign, J.E. GREENE, University of Illinois at Urbana-Champaign, L. HULTMAN, Linköping University, Sweden	**SS+AS+EN-TuA1** How does Absorbed Hydrogen Drive Olefin Hydrogenation on Pd?, **SATOSHI OHNO**, M. WILDE, K. FUKUTANI, The University of Tokyo, Japan
2:40 pm	**SE+PS-TuA2** Study of High Power Pulsed Magnetron Sputtering Under Differing Magnetic Field Configurations, **PRIYA RAMAN**, I.A. SHCHELKANOV, J.T. MCLAIN, University of Illinois at Urbana Champaign, S. ARMSTRONG, Kurt J. Lesker Company, D.N. RUZIC, University of Illinois at Urbana Champaign	**SS+AS+EN-TuA2** CO Oxidation over Pd Catalysts Supported on Different Low-Index Surfaces of CeO_2: A Combined Experimental and Computational Study, **XIAO LIU**, Y.W. WEN, Z.Z. CHEN, B. SHAN, R. CHEN, Huazhong University of Science and Technology, China
3:00 pm	**SE+PS-TuA3 Invited** Reactive High-power Impulse Magnetron Sputtering and Pulsed Magnetron Co-sputtering of Multifunctional Films, **JAROSLAV VLCEK**, J.R. REZEK, P.M. MARES, University of West Bohemia, Czech Republic	**SS+AS+EN-TuA3** *In Situ* Adsorption and Decomposition Studies of Dimethyl Methyl Phosphonate on Molybdenum Oxide Surfaces and Nanoparticles, **ASHLEY HEAD**, L. TROTOCHAUD, Y. YU, Lawrence Berkeley National Laboratory (LBNL), Z. HICKS, X. TANG, K. BOWEN, Johns Hopkins University, B. EICHHORN, University of Maryland, College Park, H. BLUHM, LBNL
3:20 pm	Invited talk continued.	**SS+AS+EN-TuA4** Adsorption of Sterically Hindered Sulfur Containing Molecules on a Heterogeneous Model Catalyst, **SIGNE SØRENSEN**, J.V. LAURITSEN, Aarhus University, Denmark
3:40 pm	**BREAK**	**BREAK**
4:00 pm	**BREAK**	**BREAK**
4:20 pm	**SE+PS-TuA7** Target Poisoning in Mixed Ar, N_2 and CH_4 Atmosphere, in Processes Using Different Target Materials for HIPIMS/DC and DC Cathode Modes., **ANNA ONISZCZUK**, A.P. EHIASARIAN, Sheffield Hallam University, United Kingdom of Great Britain and Northern Ireland, C.F. CARLSTRÖM, M. AHLGREN, Sandvik Coromant, Sweden	**SS+AS+EN-TuA7 Invited** Metal Nanoparticles on Thin Film Oxide Supports: Interaction and Reaction of Metals with Hydroxyls, **MARTIN STERRER**, University of Graz, Austria
4:40 pm	**SE+PS-TuA8** Structure and Properties of Cr_2O_3 Coatings Deposited using DCMS, PDCMS, and DOMS, **JIANLIANG LIN**, Southwest Research Institute, W.D. SPROUL, Reactive Sputtering, Inc.	Invited talk continued.
5:00 pm	**SE+PS-TuA9** Strategy to Tailor the Composition of Silicon Oxynitride Thin Films Deposited by Reactive High Power Impulse Magnetron Sputtering using Nitrous Oxide as a Single-source Precursor, **TUOMAS HÄNNINEN**, S. SCHMIDT, J. JENSEN, L. HULTMAN, H. HÖGBERG, Linköping University, Sweden	**SS+AS+EN-TuA9** Dynamics of Isolated Surface Complexes Formed Between a Chemisorbed Chiral Molecule and a Prochiral Reactant, **JEAN-CHRISTIAN LEMAY**, Y. DONG, P.H. MCBREEN, Laval University, Canada
5:20 pm	**SE+PS-TuA10** Phase Changes Observed on AlCr Composite Cathodes due to the Exposure to Cathodic Arc Plasmas in N_2 and O_2 Atmospheres, **ROBERT FRANZ**, F. MENDEZ MARTIN, G. HAWRANEK, Montanuniversität Leoben, Austria, P. POLCIK, PLANSEE Composite Materials GmbH, Germany	**SS+AS+EN-TuA10** Density Functional Theory Study of CO Assisted Water Dissociation, **LINEY ARNADOTTIR**, L. HALBERSTADT, Oregon State University
5:40 pm	**SE+PS-TuA11** Optimization of Linear Scanning Magnetron Array Performance, **VLADIMIR KUDRIAVTSEV**, A. RIPOSAN, D.W. BROWN, C. SMITH, T. BLUCK, Intevac, Inc.	**SS+AS+EN-TuA11** Effect of Ethanol on Band Edge Properties of Bismuth Oxyhalides (BiOX, X = Cl, Br, I) and Photo Catalytic Properties, R.R. PANDEY, CSIR- National Physical Laboratory, India, **ISHWAR DAYAL SHARMA**, V S S I College, India, C. KANT, K. SAINI, CSIR- National Physical Laboratory, India
6:00 pm	**SE+PS-TuA12** Correlation of Microstructure of Deposited Thin Films with Discharge Characteristics by Modulated Pulsed Power Magnetron Sputtering (MPPMS), **M.K. LEI**, Dalian University of Technology, China	**SS+AS+EN-TuA12** Crystalline Growth of Ice - Studying the Transition from the First Wetting Layer to Multilayers with Scanning Tunneling Microscopy, **BARBARA LECHNER**, S. MAIER, M.B. SALMERON, Lawrence Berkeley National Laboratory

	Surface Science Room: 112 - Session SS+EN-TuA **Photocatalysis, Photochemistry, and Chirality at Surfaces** **Moderator:** Arthur Utz, Tufts University	Thin Film Room: 111 - Session TF-TuA **ALD for Emerging Applications** **Moderators:** Robert Grubbs, Micron Technology, Erwin Kessels, Eindhoven University of Technology, Netherlands
2:20 pm	**SS+EN-TuA1** Photoemission of Electron from Diamond Into Water: Enabling Novel Electrochemical Reduction Reactions, **ROBERT HAMERS**, D. ZHU, L.H. ZHANG, University of Wisconsin-Madison, J. BANDY, University of Wisconsin-Madson, G.M. NATHANSON, J.R. SCHMIDT, University of Wisconsin-Madison	**TF-TuA1** ALD ZnO for Rapid Synthesis of Cu-BTC MOF Thin Films and Patterns, **JUNJIE ZHAO***, W.T. NUNN, P.C. LEMAIRE, Y. LIN, M.D. DICKEY, North Carolina State University, G.W. PETERSON, Edgewood Chemical Biological Center, M.D. LOSEGO, Georgia Institute of Technology, G.N. PARSONS, North Carolina State University
2:40 pm	**SS+EN-TuA2** STM Tip-Induced Desorption of TMAA from TiO_2(110): Model Study of a Photocatalytic Process, **DENIS POTAPENKO**, R.M. OSGOOD, JR., Columbia University	**TF-TuA2** Reactions During Atomic Layer Deposition on and in UiO-66-NH_2 Metal Organic Framework Crystals, **PAUL LEMAIRE**, J. ZHAO, C. OLDHAM, G.N. PARSONS, North Carolina State University
3:00 pm	**SS+EN-TuA3 Invited** Ultrafast Time-resolved Photoelectron Spectroscopy of Photocatalytic Surfaces, **HRVOJE PETEK**, S. TAN, A. ARGONDIZZO, University of Pittsburgh	**TF-TuA3** Selective ALD Growth of Pd@Pt Core Shell Nanoparticles and its Application in PROX Reactions, K. CAO, Q.Q. ZHU, B. SHAN, State Key Laboratory of Material Processing and Die & Mould Technology, China, **RONG CHEN**, State Key Laboratory of Digital Manufacturing Equipment and Technology, China
3:20 pm	Invited talk continued.	**TF-TuA4** Thermal and Plasma ALD on Semiconductor Nanowires, **LACHLAN BLACK**, Eindhoven University of Technology, Netherlands, M.A. VERHEIJEN, A.J. STANDING, E.P.A.M. BAKKERS, Eindhoven University of Technology, W.M.M. KESSELS, Eindhoven University of Technology, Netherlands
3:40 pm	**BREAK**	**BREAK**
4:00 pm	**BREAK**	**BREAK**
4:20 pm	**SS+EN-TuA7** Surface and Interface Properties of Photoelectrocatalysts for Solar Fuels, **BRUCE KOEL**, C.X. KRONAWITTER, P. ZHAO, Z. CHEN, Princeton University	**TF-TuA7 Invited** Atomic Layer Deposition of Functional Nanosheets for Energy and Environmental Application, Y.T. ZHAO, G.S. HUANG, **YONGFENG MEI**, Fudan University, China
4:40 pm	**SS+EN-TuA8** Improving Hematite-Based Solar Water Splitting by Surface Modification with Sn, Ti, and FeOOH, **ANJLI PATEL**, A.J. ABEL, Drexel University, I. GARCIA-TORREGROSA, Utrecht University, Netherlands, B. OPASANONT, J.B. BAXTER, Drexel University	Invited talk continued.
5:00 pm	**SS+EN-TuA9** Metalation of a Polypyridine Macrocycle on Au(111): Preparation of a Water Reduction Catalyst on a Solid Substrate, **GERSON METTE**, D. SUTTER, S. SCHNIDRIG, B. PROBST, R. ALBERTO, J. OSTERWALDER, Universität Zürich, Switzerland	**TF-TuA9** Capacitive Deionization for Water Desalination Using Charge Storage in Manganese Oxide Films Grown by Atomic Layer Deposition, **JASMINE WALLAS**, M.J. YOUNG, C.B. MUSGRAVE, S.M. GEORGE, University of Colorado, Boulder
5:20 pm	**SS+EN-TuA10** Chiral Selective Chemistry Induced by Natural Selection of Spin-Polarized Electrons by DNA, **RICHARD ROSENBERG**, Argonne National Laboratory, D. MISHRA, R. NAAMAN, Weizmann Institute of Science, Israel	**TF-TuA10** Magnetoelectric Effect in Multiferroic Nanocomposites of Atomic Layer Deposition $Pb(Zr,Ti)O_3$ Coupled with Templated Mesoporous $CoFe_2O_4$, **DIANA CHIEN**, A. BUDITAMA, L. SCHELHAS, S.H. TOLBERT, J.P. CHANG, University of California at Los Angeles
5:40 pm	**SS+EN-TuA11** Creating Enantioselective Surfaces; Templating and One-to-one Interactions, **WILFRED TYSOE**, University of Wisconsin-Milwaukee	**TF-TuA11** Ultralow Density Metal Oxide Foams by Atomic Layer Deposition on Sacrificial Carbon Nanotube Matrices, **JESSE JUR**, K.L. STANO, P.D. BRADFORD, North Carolina State University
6:00 pm	**SS+EN-TuA12** Single-Molecule and Single-Active-Site Studies of Stereocontrol by Chemisorbed Chiral Molecules, **PETER MCBREEN**, Y. DONG, J.C. LEMAY, G. GOUBERT, Laval University, Canada, M.N. GROVES, B. HAMMER, Aarhus University, Denmark	**TF-TuA12** The Structure and Optical Properties of ALD W:Al_2O_3 Nanocomposite Films, **SHAISTA BABAR**, A. MANE, Argonne National Laboratory, A. O'MAHONY, Incom, Inc., A. YANGUAS-GIL, J. W. ELAM, Argonne National Laboratory
6:25 pm	**SSD BUSINESS MEETING**	**TFD BUSINESS MEETING**

* **TFD James Harper Award Finalist**

Vacuum Technology
Room: 230B - Session VT-TuA

Gas Dynamics and Modeling, Pumping and Outgassing
Moderators: Marcy Stutzman, Jefferson Lab, Jacob Ricker, NIST

2:20 pm	**VT-TuA1 Invited** The Evolution of Cryopumps, **SERGEI SYSSOEV**, Brooks Automation	
2:40 pm	Invited talk continued.	
3:00 pm	**VT-TuA3** Simulation of a Large Linear Jet Mercury Diffusion Pump with the Test Particle Monte Carlo Method, **XUELI LUO**, T. GIEGERICH, C. DAY, Karlsruhe Institute of Technology (KIT), Germany	
3:20 pm	**VT-TuA4** Monte-Carlo and Angular Coefficients Simulations of Complex Vacuum Systems Equipped with NEG Pumps, **FABRIZIO SIVIERO**, T. PORCELLI, G. BONGIORNO, M. URBANO, E. MACCALLINI, P. MANINI, SAES Getters, Italy	
3:40 pm	**BREAK**	
4:00 pm	**BREAK**	
4:20 pm	**VT-TuA7** Simulation of Steady-State and Impulse Pressure Profiles in Front-End of A1-Beamline at Cornell High Energy Synchrotron Source, **YULIN LI**, Cornell University	
4:40 pm	**VT-TuA8** APS-Upgrade Storage Ring Vacuum System Design using SynRad/MolFlow+ with Photon Scattering, **JASON CARTER**, Argonne National Laboratory	
5:00 pm	**VT-TuA9** Simulation and Measurement of Radioactive Radon in the KATRIN Main Spectrometer, **JOACHIM WOLF**, Karlsruhe Institut for Technology (KIT), Germany	
5:20 pm	**VT-TuA10** Degassing of the Kicker Magnet in J-PARC RCS via New *In Situ* Baking Method, **JUNICHIRO KAMIYA**, N. OGIWARA, M. KINSHO, Japan Atomic Energy Agency	
5:40 pm	**VT-TuA11** Uncertainty of UHV Flowmeter Standard Related to the Gas-Surface Interaction, **FELIX SHARIPOV**, Y.B. BARRETO, Universidade Federal do Parana, Brazil	
6:00 pm	**VT-TuA12** Investigation of the use of Viton as Certified Reference Material for Outgassing, **JANEZ SETINA**, Institute of Metals and Technology(IMT), Slovenia	

Anticipated Schedule
Tuesday Morning, October 20, 2015

TIME	SESSION	ROOM
8:00 am		
8:20 am		
8:40 am		
9:00 am		
9:20 am		
9:40 am		
10:00 am		
10:20 am		
10:40 am		
11:00 am		
11:20 am		
11:40 am		
12:00 pm		

Lunch

when _____

with _____

where _____

Anticipated Schedule
Tuesday Afternoon, October 20, 2015

TIME	SESSION	ROOM
1:00 pm		
1:20 pm		
1:40 pm		
2:00 pm		
2:20 pm		
2:40 pm		
3:00 pm		
3:20 pm		
3:40 pm		
4:00 pm		
4:20 pm		
4:40 pm		
5:00 pm		

NOTES

Biomaterial Interfaces
Room: Hall 3 - Session BI-TuP

Biomaterial Interfaces Poster Session
6:30 pm

BI-TuP1 Flash Networking Poster: Simple Method Toward Lignin Based Surface Coatings, **PATRICK BURCH**, P.B. MESSERSMITH, University of California at Berkeley

BI-TuP2 Flash Networking Poster: Characterising Hydrogel Chemistry Through Low Temperature ToF-SIMS, **MICHAEL TAYLOR**, D. SCURR, The University of Nottingham, UK, M. LUTOLF, Ecole Polytechnique Fédérale de Lausanne (EPFL), Swtizerland, L. BUTTERY, M. ZELZER, M.R. ALEXANDER, The University of Nottingham, UK

BI-TuP3 Flash Networking Poster: Molecular-Level Insights into the Wet Adhesion Mechanisms of the Lady Beetle (*Cocinella septempunctata*), **JAMES FOWLER**, Oregon State University, J. FRANZ, Max Planck Institute for Polymer Research, Germany, S. GORB, University of Kiel, Germany, T. WEIDNER, Max Planck Institute for Polymer Research, Germany, J.E. BAIO, Oregon State University

BI-TuP4 Flash Networking Poster: Numerical Simulation of an Atmospheric Pressure RF-Driven Plasma Needle and Heat Transfer to Adjacent Human Skin using COMSOL, **MAXIMILIAN SCHROEDER**, Technische Universität Dresden, Germany

BI-TuP5 Flash Networking Poster: Structured Noble Metal Nanosurfaces for Biosensing and Bioanalysis (1): Controlling Galvanic Displacement Reaction for Creation of Silver Nanostructures, **SHINGO YONEDA**, Toyo University, Japan, T. OKAMOTO, RIKEN, Japan, H. VIEKER, A. BEYER, A. GÖLZHÄUSER, Bielefeld University, Germany, H. TAKEI, Toyo University, Japan

BI-TuP7 Preparation of Bioglass-ZrO_2 Functionalized Coatings by EPD, **ANA ARIZMENDI-MORQUECHO**, M.A. AGUILERA-BUSTOS, Centro de Investigación en Materiales Avanzados, Mexico, A.C. CHÁVEZ-VALDEZ, Consultant, M.S.D. SÁNCHEZ-DOMÍNGUEZ, M.S.V. SÁNCHEZ-VÁZQUEZ, Centro de Investigación en Materiales Avanzados, Mexico

BI-TuP9 Flash Networking Poster: Gold Nanoparticle-Delivered RNA Genetic Control Devices, **MICHAEL NEWTON**, J.M. CAROTHERS, D.G. CASTNER, University of Washington

BI-TuP10 Flash Networking Poster: Effect of Synthesis Parameters on Structural Properties of Hydroxyapatite Nanofibers using the Hydrothermal Method, **NESTOR EFRÉN MENDEZ LOZANO**, UNAM, Mexico, R.R. VELÁZQUEZ CASTILLO, UAQ, Mexico, E.M. RIVERA MUÑOZ, UNAM, Mexico, A. MANZANO RAMÍREZ, CINVESTAV-Queretaro, Mexico, M.A. OCAMPO MORTERA, L.M. APÁTIGA CASTRO, UNAM, Mexico

BI-TuP11 Flash Networking Poster: Exhaled Breath Analysis of Ammonia Gas using Colorimetric Attenuated Total Reflectance Spectroscopy, **MARIAANTOANETA BRATESCU**, K. ISAWA, Nagoya University, Japan, T. KIGUCHI, Shibaura Institute of Technology, Japan, O.L. LI, N. SAITO, Nagoya University, Japan

BI-TuP12 Flash Networking Poster: Structured Noble Metal Nanosurfaces for Biosensing and Bioanalysis (3): Surface-Enhanced Fluorescence Detection with Cap-shaped Silver Nanoparticles, **MIKI EBISAWA**, T. KAWAKAMI, H. TAKEI, Toyo University, Japan

BI-TuP13 Flash Networking Poster: Structured Noble Metal Nanosurfaces for Biosensing and Bioanalysis (2): Localized Surface Plasmon Resonance Sensor Operating in the Near-IR Regime, **TAKUMI MIYASHITA**, N. BESSHO, Toyo University, Japan, T. OKAMOTO, Riken, Japan, H. VIEKER, A. BEYER, A. GÖLZHÄUSER, Bielefeld University, Germany, H. TAKEI, Toyo University, Japan

BI-TuP14 Flash Networking Poster: Exploration of Conformational Changes of Nucleic Acids as a Function of Interactions with Histone-mimic Nanoparticles using All-atom Simulations, **YAROSLAVA YINGLING**, J.A. NASH, North Carolina State University

BI-TuP15 Fabrication and Characterization of TiO_2 Thin Films Prepared by DC Pulsed Magnetron Sputtering for Dental Implant Application, **EUNSOL AN**, K. SON, J.B. JEON, U.C. JUNG, J.-H. KIM, I.-W. PARK, Korea Institute of Industrial Technology

BI-TuP16 Flash Networking Poster: Chiral Legos: Enantioselective Assemblies of Tryptophan on Cu(111), B. KIRALY, A. MANNIX, M.C. HERSAM, Northwestern University, **NATHAN GUISINGER**, Argonne National Laboratory

BI-TuP17 Flash Networking Poster: Nanoscale Structures in Live Cells Visualized through High Resolution Imaging and Mechanical Property Mapping, **BEDE PITTENGER**, Bruker, H. SCHILLERS, Univ. Muenster, A. SLADE, J. SHAW, S. HU, I. MEDALSY, T. MUELLER, Bruker

Electronic Materials and Processing
Room: Hall 3 - Session EM-TuP

Electronic Materials and Processing Poster Session
6:30 pm

EM-TuP1 Ionic Liquid Gated Electric Double Layer Transistors based on a-IGZO Thin Films, **PUSHPARAJ PUDASAINI**, J.H. NOH, A. WONG, A.V. HAGLUND, The University of Tennessee Knoxville, S. DAI, T.Z. WARD, Oak Ridge National Laboratory, D. MANDRUS, University of Tennessee, Knoxville and Oak Ridge National Laboratory, P.D. RACK, The University of Tennessee Knoxville

EM-TuP2 Resistor Thermal Noise Rectification for Energy Harvesting, **AMINA BELKADI**, S. JOSHI, University of Colorado at Boulder, G. MODDEL, University of Colorado at Boulder and Redwave Energy

EM-TuP3 Non-planar Configuration of MIM Tunnel Junction for Optical Frequency Rectennas, **NIKOLAI KISLOV**, Nano CVD, Inc.

EM-TuP4 High-K $MTiO_3$ (M= Ba, Sr, or Ba_xSr_{1-x}) and Its 3-D Implementation for High Charge Density Capacitors, **SHENG-PO FANG**, K.-T. KIM, Y.-K. YOON, University of Florida, Gainesville

EM-TuP5 Electrical and Optical Properties of the Porous Nickel Oxide Thin Film as Counter Electrode for the Application to Electrochromic Devices, **WONCHANG LEE**, J.U. WIE, E.C. CHOI, B.Y. HONG, Sungkyunkwan University, Republic of Korea

EM-TuP6 Tunable Optical Extinction of E-Beam Fabricated Nano-Rectennas Modified by Atomic-Layer Deposition, **RAYMOND WAMBOLD**, The Pennsylvania State University, G.J. WEISEL, D.T. ZIMMERMAN, The Pennsylvania State University, Altoona, J. QI, B.G. WILLIS, University of Connecticut

EM-TuP7 The Study of Light Control using Nanoantenna, **JEONGHEE SHIN**, S. KIM, J.E. JANG, Daegu Gyeongbuk Institute of Science and Technology (DGIST), Republic of Korea

EM-TuP8 MIM: Role of Design and Fabrication, **APARAJITA SINGH**, S. BHANSALI, Florida International University

EM-TuP9 Comparison of Hafnium Oxide and Zirconium Oxide Thin Films for Fabricating Electronic Devices, **JOUANTREY SPENCE**, F. CUNNINGHAM, R. MOTEN, Z. XIAO, Alabama A&M University

EM-TuP10 Non-Equilibrium First-Principles Study on Electron Scattering Processes in Magnetic Tunnel Junction, **MASAAKI ARAIDAI**, Nagoya University, Japan, T. YAMAMOTO, Tokyo University of Science, Japan, K. SHIRAISHI, Nagoya University, Japan

EM-TuP11 First Principles Study on Switching Mechanism of Superlattice $(GeTe)_2/Sb_2Te_3$ Phase Change Memory, **MASAYUKI TAKATO**, H. SHIRAKAWA, M. ARAIDAI, K. SHIRAISHI, Graduate School of Engineering, Nagoya University, Japan

EM-TuP12 First Principles Study on Atomic-scale Behavior of N, H Atoms and O Vacancy Related Defects in SiO_2 Layer of MONOS Memories, **HIROKI SHIRAKAWA**, Graduate School of Engineering Nagoya University, Japan, M. ARAIDAI, Graduate School of Engineering, Nagoya University, Japan, K. KAMIYA, Center for Basic Education and Integrated Learning, Kanagawa Institute of Technology, Japan, K. SHIRAISHI, Graduate School of Engineering, Nagoya University, Japan

EM-TuP13 The Profound Effect of Pure N_2 and O_2 Mixed N_2 Annealing on TiO_2 Thin Films, A.S. BHATTI, A. MEHMOOD, A. MUSHTAQ, M.A. REHMAN, **AWAIS ALI**, COMSATS Institute of Information Technology, Pakistan, S.I. SHAH, University of Delaware

EM-TuP14 Hybridization and Characterization of Reduced Graphene Oxide with Copper Nanoparticles, J.D. LEE, L.R. HUBBARD, **ANTHONY MUSCAT**, University of Arizona

EM-TuP15 Hybrid Transparent Conductive Electrodes Embedded with Pt Nanoclusters for Reliable and Efficient GaN-based Light-Emitting Diodes, K. KIM, **HYUNSOO KIM**, Chonbuk National University, Republic of Korea

EM-TuP16 Selective Area Growth of InN on Patterned Substrate by Plasma-Assisted Metal-Organic Molecular Beam Epitaxy, **WEI-CHUN CHEN**, National Applied Research Laboratories, Taiwan, Republic of China, S.Y. KUO, Chang Gung University, Taiwan, Republic of China, F.I. LAI, Yuan-Ze University, Taiwan, Republic of China, Y.C. LEE, Chung Yuan Christian University, Taiwan, Republic of China, C.N. HSIAO, National Applied Research Laboratories, Taiwan, Republic of China

EM-TuP17 N+-InGaP or N+-GaAs NanoWires for JunctionLess Transistors Fabricated by Focused Ion Beam (FIB) System, **CÁSSIO ALMEIDA**, L.P.B. LIMA, UNICAMP, Brazil, H.T. OBATA, M. COTTA, University of Campinas, Brazil, J.A. DINIZ, UNICAMP, Brazil

EM-TuP18 Thermoelectric Figure of Merit of E-Beam-Grown Nanoscale Multilayered Bi_2Te_3/Sb_2Te_3 Thin Films, **ZHIGANG XIAO**, S. BUDAK, Alabama A&M University

EM-TuP19 Novel SiC Junction Barrier Schottky Diode Structure of Power Semiconductor for Efficiency Improvement of Electic Vehicles, **JUNGHEE PARK**, Y.K. JUNG, Hyundai Motors

EM-TuP20 Atomic Layer Deposited Hybrid Organic-Inorganic Aluminates as Potential Low-k Dielectric Materials, **KARINA KLEPPER**, O. NILSEN, H. FJELLVÅG, University of Oslo, S.W. KING, Intel Corporation

EM-TuP21 Band-Gap Measurements of Low-K Porous Organosilicate Dielectrics using Vacuum Ultraviolet Irradiation, H. ZHENG, **JOSHUA BLATZ**, University of Wisconsin-Madison, S.W. KING, Intel Corporation, E. RYAN, GLOBALFOUNDRIES, Y. NISHI, Stanford University, J.L. SHOHET, University of Wisconsin-Madison

EM-TuP22 VUV Curing Process for Low-k Organosilicate Dielectrics, **HUIFENG ZHENG**, X. GUO, University of Wisconsin-Madison, S.W. KING, Intel Corporation, E. RYAN, GLOBALFOUNDRIES, Y. NISHI, Stanford University, J.L. SHOHET, University of Wisconsin-Madison

EM-TuP23 Design of a Novel SiC(Silicon carbide) MOSFET Structurefor Electric Vehicles Inverter Efficiency Improvement, **YOUNGKYUN JUNG**, J.H. PARK, Hyundai Motors

EM-TuP24 Modeling and Simulation of Electromigration Failure in on-chip Interconnects, V. SUKHAREV, **ARMEN KTEYAN**, Mentor Graphics Corporation, X. HUANG, University of California at Riverside

EM-TuP25 Method and Application of Resist Layer to Reduce CMP Related Defectivity, **BRIAN ZINN**, Process Development Engineer, DMOS5 Wafer Fab, Texas Instruments Inc., J. DAVIS, Process Integration Engineer, DMOS5 Wafer Fab, Texas Instruments Inc.

EM-TuP26 Identification of Topological Surface States in $(Bi_{1-x}Sb_x)_2Te_3$ Thin Films, **JENNA WALRATH**, A.S. CHANG, V.A. STOICA, Y.H. LIN, W. LIU, L. ENDICOTT, C. UHER, R. CLARKE, University of Michigan, R.S. GOLDMAN, University of Michigan, Ann Arbor

EM-TuP27 Quantitative Potential Profiling Across Metal-Oxide-Semiconductor Stacks, **SYLVIE RANGAN**, M. KALYANIKAR, J. DUAN, G. LIU, R.A. BARTYNSKI, E. ANDREI, L. FELDMAN, E. GARFUNKEL, Rutgers, the State University of New Jersey

Energy Frontiers Focus Topic
Room: Hall 3 - Session EN-TuP

Energy Frontiers Poster Session
6:30 pm

EN-TuP1 Effect of Ultra-violet Light on the Degradation in Organic Solar Cells, **KENJI HARAFUJI**, Ritsumeikan University, Japan, H. SATO, Ritsumeikan University

EN-TuP2 Characteristics of DSSC Fabricated at Low Temperature, **EUNCHANG CHOI**, J.U. WIE, B.Y. HONG, Sungkyunkwan University, Republic of Korea

EN-TuP3 Conductivity Enhancement Effect of Sodium Dodecyl Sulfate on PEDOT:PSS for Organic Solar Cell Application, K.-H. HWANG, H.J. SEO, S.-H. NAM, Y.J. KIM, C.Y. PARK, **JIN-HYO BOO**, Sungkyunkwan University, Republic of Korea

EN-TuP4 Study of the Synthesis of Cu_2ZnSnS_4 Thin Films by Reactive Magnetron Co-Sputtering, P.-A. CORMIER, **RONY SNYDERS**, University of Mons, Belgium

EN-TuP5 Development of Low Cost, Solution Deposition Method for High Efficiency $Cu_2ZnSn\ S_xSe_{4-X}$(CZTSSe) Thin Film Solar Cells, **CHEIK SANA**, S. SHAHRIAR, J. GALINDO, D. KAVA, D.R. HODGES, University of Texas at El Paso

EN-TuP6 Novel Counterelectrode Materials for DSCs: Preliminary Results on the Application of Niobium-Coated Conductive CVD-Grown Diamond, T.F.P. DA SILVA, Universidade Estadual de Campinas, Brazil, A.S. GONÇALVES, TZCA Sollar Cells, Brazil, H.J. CERAGIOLI, A.C. PETERLEVITZ, V. BARANAUSKAS, **LEANDROTIAGO MANERA**, Universidade Estadual de Campinas, Brazil

EN-TuP7 Synthesis and Characterization of Electron Beam Deposited $Cu_2ZnSn_{1-x}Si_xS_4$ Thin Films, **ALEJANDRO ALVAREZ BARRAGAN**, S. EXARHOS, J. HERNANDEZ, L. MANGOLINI, University of California - Riverside

EN-TuP8 Optical and Photocatalytic Properties of Nanostructured Ce-TiO_2 Mixed Oxides, R. RAMIREZ-LOPEZ, Escuela Superior de Ingenieria Quimica e Industrias Extractivas-IPN, Mexico, **ISAIAS HERNANDEZ-PEREZ**, Universidad Autonoma Metropolitana-Azcapotzalco, CBI, Mexico, R. SUAREZ-PARRA, Instituto de Energias Renovables, UNAM, Mexico, RT. HERNANDEZ-LOPEZ, Universidad Autonoma Metropolitana- Azcapotzalco, CBI, Mexico, A. GARCIA-SOTELO, E. CAMPOS, M. MELENDEZ-LIRA, Cinvestav-IPN, Mexico

EN-TuP9 Hybrid Photoelectrode Based on Two-Dimensional Materials Decorated $BiFeO_3$ Thin Films for Efficient Solar Water Splitting, C.M. YOUN, H. LEE, J. LEE, H. LEE, **TAEKJIB CHOI**, Sejong University, Republic of Korea

EN-TuP11 Improvement in Photovoltaic Response of PLZT Thin Film Capacitors with ITO Electrodes, **SUSHMA KOTRU**, V.N. HARSHAN, V. BATRA, The University of Alabama

EN-TuP12 Nanoscale Energy Converter of an Environmental Thermal (T ~ 300K) Energy – to Electrical Energy, **VALERY PTITSIN**, Russian Academy of Sciences, Russia

EN-TuP13 Development of Layer-Spinel Hybrid Cathode Material for Lithium Ion Battery, **JIN YI-CHUN**, National Tsing Hua University, Taiwan, Republic of China

EN-TuP14 Rational Design of Battery Architecture at Nanoscale: Self-Aligned Batteries Inside Nanopores via Atomic Layer Deposition, C. LIU, E. GILLETTE, **XINYI CHEN**, A.J. PEARSE, A.C. KOZEN, M. SCHROEDER, K. GREGORCZYK, S.B. LEE, G.W. RUBLOFF, University of Maryland, College Park

In-Situ Spectroscopy and Microscopy Focus Topic
Room: Hall 3 - Session IS-TuP

In-Situ Spectroscopy and Microscopy Poster Session
6:30 pm

IS-TuP1 Investigations of Graphene Covered Metal Catalyst using *Operando* Ambient Pressure X-ray Photoelectron Spectroscopy, **QIANG LIU**, Lawrence Berkeley National Laboratory (LBNL), B.H. MAO, Chinese Academy of Sciences, E.J. CRUMLIN, Lawrence Berkeley National Laboratory (LBNL), Z. LIU, Chinese Academy of Science

IS-TuP2 Probing the Electrode-Electrolyte Interfaces using *In Situ* Angle-resolved XPS, V. SHUTTHANANDAN, M.I. NANDASIRI, A. SCHWARZ, T.C. KASPAR, Pacific Northwest National Laboratory, S.A. THEVUTHASAN, Qatar Environment and Energy Research Institute, Qatar, **MURUGESAN VIJAYAKUMAR**, Pacific Northwest National Laboratory

IS-TuP3 Bimetallic Nanoparticles Stability Investigated by *In Situ* XPS and TEM, **CECILE BONIFACIO**, University of Pittsburgh, S.C. CARENCO, M.B. SALMERON, Lawrence Berkeley National Laboratory, J.C. YANG, University of Pittsburgh

Materials Characterization in the Semiconductor Industry Focus Topic
Room: Hall 3 - Session MC-TuP

Materials Characterization in the Semiconductor Industry Poster Session (All areas)
6:30 pm

MC-TuP1 Effect of Aromatic Compounds on Semiconducting Boron Carbide Heterojunctions, **ELENA ECHEVERRIA**, University of Nebraska - Lincoln, R. JAMES, F. PASQUALE, B. DONG, University of North Texas, A. ENDERS, University of Nebraska - Lincoln, A. KELBER, University of North Texas, P.A. DOWBEN, University of Nebraska - Lincoln

MC-TuP2 3 Dimensional Quantitative Composition and Structure Profiling of As Implanted Si USJ and FINFET with TOF-MEIS, **WONJA MIN**, K.S. PARK, K.-S. YU, KMAC, Republic of Korea, S.J. JOO, Y.-S. KIM, KRISS, Republic of Korea, D.W. MOON, DGIST, Republic of Korea

MC-TuP3 Characterization of the Doped Amorphous Carbon Hardmask Film Prepared by Hybrid Plasma CVD Systems, **JAEYOUNG YANG**, K.P. PARK, G.H. HUR, TES Co. Ltd., Republic of Korea

MC-TuP4 Surface Structure and Morphology of GaAs Nanowires Grown by Aerotaxy, **SOFIE YNGMAN**, S. MCKIBBIN, J. KNUTSSON, F. YANG, E. LUNDGREN, M. MAGNUSSON, R. TIMM, A. MIKKELSEN, Lund University, Sweden

MC-TuP5 Characterization of Si/Ru and Si/B_4C/Ru Multilayers using X-ray Reflectivity, X-ray Diffraction and Synchrotron-based EUV Reflectometry, **MOHAMMAD FAHEEM**, GLOBALFOUNDRIES Inc., P. VAN DER HEIDE, GLOBALFOUNDRIES, Inc., O. WOOD, Y. LIANG, A. KUMAR KAMBHAM, K. WONG, V. PARK, P. MANGAT, GLOBALFOUNDRIES Inc.

Magnetic Interfaces and Nanostructures
Room: Hall 3 - Session MI-TuP

Magnetic Interfaces Poster Session

6:30 pm

MI-TuP1 Optical and Magneto-Optical Properties of $Zn_{1-x}Mn_xO$ / ZnO Hollow Nanospheres, **DA-REN LIU**, C.J. WENG, National Applied Research Laboratories, Taiwan, Republic of China

MI-TuP3 Scanning Tunneling Microscopy Study of Magnetic Layers Grown on MgO(001) by Molecular Beam Epitaxy, **JEONGIHM PAK**, A.-O. MANDRU, J.P. CORBETT, A.R. SMITH, Ohio University

Manufacturing Science and Technology
Room: Hall 3 - Session MS-TuP

Aspects of Manufacturing Science and Technology Poster Session

6:30 pm

MS-TuP1 Development of Graphene/Al Composite Materials with High Strength, **YUSUKE OGURO**, A. MATSUMURO, Aichi Institute of Technology, Japan

MS-TuP2 Invited
The Structure and Performance of 8 wt. % Y_2O_3-ZrO_2 Coating Processed by Air Plasma Spray, **HUIJUN YU**, Suzhou Institute, Shandong University, China, C.Z. CHEN, Shandong University, China

MS-TuP4 The Role of Atomic H in the Integration of Self-Aligned $In_xGa_{1-x}As$ source and drain Regions with HfO_2 Gates for Highly Scaled NMOS Devices, **PALOMA TEJEDOR**, Instituto de Ciencia de Materiales de Madrid (ICMM), C.S.I.C., Spain

MS-TuP5 Research Opportunities at the Cornell Nanoscale Science and Technology Facility, a member of the National Nanotechnology Coordinated Infrastructure., **MICHAEL SKVARLA**, D. RALPH, Cornell NanoScale Science and Technology Facility (**MS-TuA2)**

MS-TuP6 The CNST NanoFab at NIST is Open for Business, **VINCENT LUCIANI**, NIST Center for Nanoscale Science and Technology **(MS-TuA3)**

MS-TuP7 The Molecular Foundry: A Knowledge-Based User Facility for Nanoscale Science, **BRANDEN BROUGH**, The Molecular Foundry, Berkeley Lab (**MS-TuA4)**

MS-TuP8 The National Renewable Energy Laboratory (NREL) - Its Mission, Organization, Research Activities, and Opportunities, **TIMOTHY GESSERT**, National Renewable Energy Laboratory (**MS-TuA7)**

MS-TuP9 User Opportunities at the Center for Nanoscale Materials: From Hybrid Nanomaterials to Tailoring Nanoscale Interactions, **KATHLEEN CARRADO GREGAR**, Center for Nanoscale Materials at Argonne National Laboratory (**MS-TuA8)**

MS-TuP10 Using EMSL Capabilities to Advance Your Research, **DONALD BAER**, M. ENGELHARD, Pacific Northwest National Laboratory **(MS-TuA9)**

MS-TuP11 From Neutron Nanoscience to Direct-write Nanofabrication at the Center for Nanophase Materials Sciences, **OLGA OVCHINNIKOVA**, Oak Ridge National Laboratory **(MS- TuA10)**

Nanometer-scale Science and Technology
Room: Hall 3 - Session NS-TuP

Nanometer-scale Science and Technology Poster Session
6:30 pm

NS-TuP1 Characterization of Nanodiamonds with Nitrogen Vacancy Centers for Optically Detected Magnetic Resonance in Biological Applications, **MOLLY MAY**, University of Colorado at Boulder, K. BRIGGMAN, National Institute of Standards and Technology (NIST)

NS-TuP2 Understanding the "Click Chemistry" Approach to Achieve High-Coverage, High-Precision Nanostructures Deposited on Solid Surfaces, **MACKENZIE G. WILLIAMS**, A.V. TEPLYAKOV, University of Delaware

NS-TuP3 FIB Technique for PVTEM Sampling of MESH Capacitor, **SUNGHO LEE**, Samsung Electronics, Republic of Korea, C.W. YANG, Sungkyunkwan University, Republic of Korea

NS-TuP4 FIB Technique for Dual-Axis TEM Analysis, **SANGGUL PARK**, Samsung Advanced Institute of Technology, Republic of Korea, S.H. LEE, Sungkyunkwan University, Republic of Korea

NS-TuP5 A Simple Fabrication of Nano-Pillar Structures by Contact Block Copolymer Technique, **HWASUNG KIM**, Samsung Electronics, Republic of Korea, J.W. PARK, D.H. YUN, G.Y. YEOM, Sungkyunkwan University, Republic of Korea

NS-TuP6 A Calculation of the Virtual Source Size of Electron Gun using Digital Image Processing Techniques, **CHEOLSU HAN**, Korea Basic Science Institute, Republic of Korea, B. CHO, Korea Research Institute of Standards and Science, Republic of Korea, J.-M. JEONG, J-G. KIM, Korea Basic Science Institute, Republic of Korea

NS-TuP7 Transport Properties of Ge Nanocrystals Embedded within a SiO_2 Matrix Produced by RF Sputtering, A. HERNANDEZ-HERNANDEZ, Universidad Autonoma del Estado de Hidalgo, Mexico, A. GARCIA-SOTELO, E. CAMPOS, **SALVADOR GALLARDO-HERNANDEZ**, Cinvestav-IPN, Mexico, J.L. ENRIQUEZ-CARREJO, P.G. MANI-GONZALEZ, J.R. FARIAS-MANCILLA, Universidad Autónoma de Ciudad Juárez-IIT, Mexico, M. MELENDEZ-LIRA, Centro de Investigación y de Estudios Avanzados del Instituto Politécnico Nacional, Mexico

NS-TuP8 Nanoparticles Produced by Laser Ablation in Liquid Enviroment, **LUISALBERTO HERNÁNDEZ-HERNÁNDEZ**, Instituto Politécnico Nacional, Mexico, A. HERNÁNDEZ-HERNÁNDEZ, Universidad Autónoma del Estado de Hidalgo, Mexico, F. DE MOURE-FLORES, Universidad Autónoma de Querétaro, Mexico, J.G. QUIÑONES-GALVÁN, Universidad de Guadalaja, Mexico, M. MELÉNDEZ-LIRA, CINVESTAV-IPN, Mexico

NS-TuP9 Enhanced Photoresponse of a Metal-Oxide-Semiconductor Photodetector with Germanium Nanocrystals Embedded in the Silicon Oxide Layer, **ARTURO HERNÁNDEZ-HERNÁNDEZ**, Universidad Autónoma del Estado de Hidalgo, México, L.A. HERNÁNDEZ-HERNÁNDEZ, Escuela Superior de Física y Matemáticas del Instituto Politécnico Nacional, Mexico, F. DE MOURE-FLORES, Universidad Autónoma de Querétaro, México, J.G. QUIÑONES-GALVÁN, Universidad de Guadalajara, Mexico, B. MAREL MONROY, G. SANTANA-RODRÍGUEZ, Universidad Nacional Autónoma de México, M. MELENDEZ-LIRA, Centro de Investigación y de Estudios Avanzados del Instituto Politécnico Nacional, Mexico

NS-TuP10 Analysis of Detonation Nanodiamond with the Aid of Multiwavelength Raman Spectroscopy, **MICHEL MERMOUX**, Cnrs - Lepmi, France, A. CRISCI, Cnrs - Simap, France, T. PETIT, Helmholtz-Zentrum Berlin für Materialien und Energie GmbH, Germany, H.A. GIRARD, J.C. ARNAULT, Cea - List, France

NS-TuP11 Clarifying the Role of Surface Chemistry in Fabrication of Large Nanostructured Surfaces using Ion Irradiation, **KAYLA STEEVES LLOYD**, I.L. BOLOTIN, M. MAJESKI, University of Illinois at Chicago, M. SCHMELING, Loyola University Chicago, L. HANLEY, I. VERYOVKIN, University of Illinois at Chicago

NS-TuP12 Thermionic Properties of Carbon Based Nanomaterials Produced by Microhollow Cathode PECVD, **JOHN R. HAASE**, University of Notre Dame, J.W. WOLINSKY, P.S. BAILEY, J.A. GEORGE, NASA Lyndon B. Johnson Space Center, D.B. GO, University of Notre Dame

NS-TuP13 Nitrogen Vacancies in Nanodiamond As Nanoscale Probes in Complex Environments, **MARGARET ROBINSON**, J. NG, H. ZHANG, Z. MA, R. GOLDSMITH, R.J. HAMERS, University of Wisconsin-Madison

NS-TuP14 Dielectrophoresis (DEP)-Aligned Carbon Nanotubes for Fabricating Electronic Devices, **JOHN ELIKE**, Z. XIAO, Alabama A&M University

NS-TuP15 Preparation, Characterization, and Optical properties of Al Doped Vanadium Pentoxide Nanowires, **CHEN-CHUAN CHANG**, National Tsing Hua University, Taiwan, Republic of China, M.W. HUANG, Chinese Culture University, Taiwan, Republic of China, H.C. HSIH, National Chung Hsing University, Taiwan, Republic of China

NS-TuP16 Formation of Ag Nano-net for Application to Flexible Electronics, J.W. FANG, J.K. WU, **DUNG-CHING PERNG**, National Cheng Kung University, Taiwan, Republic of China

NS-TuP17 Nichrome Nano-Pillars formed by using Plasma-Assisted GLAD, **DEAN WALTERS**, Argonne National Laboratory

NS-TuP18 A New Alternative for Silicon Thinning using NH_4OH Solution Wet Etching for 3D MOS Transistors, G.M.B. SOARES, A.R. SILVA, F.H. CIOLDIN, L.C.J. ESPÍNDOLA, J.G. FILHO, **IOSHIAKI DOI**, J.A. DINIZ, University of Campinas, Brazil

NS-TuP19 Design and Development of a Microfluidic Device for the Synthesis of Bioconjugated Lipidpolymer Hybrid Nanoparticles, **ERI TAKAMI**, San Jose State University

NS-TuP20 Integration of Fe3O4 Nanoparticles on Graphene Oxide Assisted by Ultrasound for Electrochemical Supercapacitors, **JESEUNG YOO**, Y.-S. SEO, Sejong university, Republic of Korea

NS-TuP21 Graphene Quantum Dot-Titania Nanoparticle Composite As Photoanode in Photoelectrochemical Cells, **SOWBARANIGHA CHINNUSAMY JAYANTHI**, R. KAUR, F. EROGBOGBO, San Jose State University

Advanced Surface Engineering
Room: Hall 3 - Session SE-TuP

Advanced Surface Engineering Poster Session

6:30 pm

SE-TuP1 Surface and Tribological Properties of CFx-doped TaN Thin Films With and Without CFx Top Layer, W.C. SAY, **SHANGLUN LIU**, National Taipei University of Technology, Taiwan, Republic of China, J.H. HSIEH, Ming Chi University of Technology, Taiwan, Republic of China

SE-TuP2 Biocompatibility of Porous TaOxNy Films with Various O/N Ratio, J.H. HSIEH, **YICHIH LIN**, S.J. LIAO, Ming Chi University of Technology, Taiwan, Republic of China, C. LI, National Yang Ming University, Taiwan, Republic of China, Y.H. LAI, Ming Chi University of Technology, Taiwan, Republic of China

SE-TuP3 Nanopatterned ZnO on PDMS via Decoupled Ion Beam Modification and Metal Co-Deposition, **ZACHARIAH KOYN**, B. HOLYBEE, A. SHETTY, K. NASH, J. PACHICANO, University of Illinois at Urbana-Champaign, S. SRIVASTAVA, Illinois Applied Research Institute, J.P. ALLAIN, University of Illinois at Urbana-Champaign

SE-TuP4 Investigation of Tungsten-YttriumBased Structural Materials for Nuclear Reactor Applications, **GUSTAVO MARTINEZ**, J. CHESSA, University of Texas at El Paso, M. LERCHE, Mcclellan Nuclear Research Center, R.V. CHINTALAPALLE, University of Texas at El Paso

SE-TuP5 New and Most Recent Ultra-Hardness Findings – Real or Nonsense?, **MARCUS FUCHS**, N. SCHWARZER, SIO Saxonian Institute of Surface Mechanics, Germany

SE-TuP6 The Influence of Mo Content and Bias Potential on the Structure, Mechanical Properties, and Tribological Behaviour of Cathodic Arc Evaporated Ti-Al-N Hard Coatings, **STEFAN A. GLATZ**, TU Wien, Austria, C.M. KOLLER, H. RIEDL, CDL AOS, TU Wien, Austria, R. RACHBAUER, Oerlikon Balzers, Oerlikon Surface Solutions AG, Liechtenstein, S. KOLOZSVÁRI, Plansee Composite Materials GmbH, Germany, P.H. MAYRHOFER, CDL AOS, TU Wien, Austria

SE-TuP7 High-temperature Tribological Investigations of CrAlN and CrAlSiN in Ambient and Inert Atmospheres, **MARISA REBELO DE FIGUEIREDO**, A. XIA, Montanuniversität Leoben, Austria, S. KOLOZSVÁRI, Plansee Composite Materials GmbH, Germany, R. FRANZ, Montanuniversität Leoben, Austria

Surface Science
Room: Hall 3 - Session SS-TuP

Surface Science Poster Session

6:30 pm

SS-TuP1 Self-assembly and Thermally induced Conformational Changes of Ni(II)-*meso*-tetrakis (4-tert-butylphenyl) benzoporphyrin on Cu(111) Studied by STM, **MICHAEL LEPPER**, M. STARK, L. ZHANG, FAU Erlangen-Nürnberg, H.-P. STEINRÜCK, FAU Erlangen-Nürnberg, Germany, H. MARBACH, FAU Erlangen-Nürnberg

SS-TuP3 Characterization of Pt-Re Bimetallic Clusters on TiO_2(110), **RANDIMA GALHENAGE**, K. XIE, University of South Carolina, H. YAN, Brookhaven National Laboratory, G. SEUSER, D.A. CHEN, University of South Carolina

SS-TuP4 Growth of Polymer Nanoparticles by Vapor Phase Polymerization onto Liquid Substrates, **ROBERT FRANK-FINNEY**, P. HALLER, M. GUPTA, University of Southern California

SS-TuP5 A DEMS Study of the Reduction of CO_2, CO and HCHO Pre-Adsorbed on Cu Electrodes: Empirical Inferences on the CO_2RR Mechanism, **ALNALD JAVIER**, B. CHMIELOWIEC, J. SANABRIA-CHINCHILLA, Y.G. KIM, J.H. BARICUATRO, M.P. SORIAGA, California Institute of Technology

SS-TuP6 Efficiency Improvement of Cu_2O/NiO/TiO_2 Solar Cells Prepared by Reactive Magnetron Sputtering, **TOMOKAZU TSUCHIYA**, I. TAKANO, Kogakuin University, Japan

SS-TuP7 Electrical Conductivity Control of Metal Doped DLC Films Prepared by N_2^+ Ion Beam Assistance, **TSUYOSHI INOUE**, I. TAKANO, Kogakuin University, Japan

SS-TuP8 NEXAFS Studies of N_2O-N_2 Conversion on Reduced Ceria Surface, **ALEXEI NEFEDOV**, C. YANG, F. BEBENSEE, C. WÖLL, Karlsruhe Institute of Technology, Germany

SS-TuP9 Photocatalytic Properties of TiO_2/NiO/Cu_2O Thin Films Prepared by Reactive Magnetron Sputtering, **TOSHIYA SOUMA**, I. TAKANO, Kogakuin University, Japan

MORT TRAUM FINALISTS

SS-TuP10 (SP+BI+NS+SS+TF-ThA8) Sulfur-induced Structural Motifs on Cu(111) and Au(111) Surfaces, **HOLLY WALEN***, Iowa State University, D.-J. LIU, Ames Laboratory, J. OH, H. LIM, RIKEN, Japan, J.W. EVANS, Iowa State University, C.M. AIKENS, Kansas State University, Y. KIM, RIKEN, Japan, P.A. THIEL, Iowa State University

SS-TuP11 (SS+AS+EN-MoM2) Formation of Subsurface Oxygen and Surface Oxides on Ag(111) by Atomic Oxygen, **JONATHAN DEROUIN***, R.G. FARBER, D.R. KILLELEA, Loyola University Chicago

SS-TuP12 (SS+AS+EM+EN-ThM2) Ethylenediamine Grafting on Oxide-free H-, F-, and Cl- terminated Si(111) Surfaces, **TATIANA P. CHOPRA***, R.C. LONGO, K.J. CHO, University of Texas at Dallas, M.D. HALLS, Schrodinger, Inc., P. THISSEN, Karlsruhe Institute of Technology, Germany, Y.J. CHABAL, University of Texas at Dallas

SS-TuP13 (IS+AS+SS-MoM4) Novel Surface Oxide on Pt(111) as the Active Phase for NO and CO Oxidation Studied with the ReactorSTM, **MATTHIJS VAN SPRONSEN***, J.W.M. FRENKEN, I.M.N. GROOT, Leiden University, Netherlands

SS-TuP14 (SP+BI+NS+SS+TF-ThA3) Investigation of Initial Stages of Oxidation of Ni-Cr and Ni-Cr-Mo alloys by Scanning Tunneling Microscopy and Spectroscopy, **GOPALAKRISHNAN RAMALINGAM***, P. REINKE, University of Virginia

* **Morton S. Traum Award Finalist**

Vacuum Technology
Room: Hall 3 - Session VT-TuP

Vacuum Technology Poster Session

6:30 pm

VT-TuP1 Estimating Measurement Uncertainty of Pressure Calibration, **YU-WEI LIN**, C.-P. LIN, C.N. HSIAO, National Applied Research Laboratories, Taiwan, Republic of China

VT-TuP2 Experimental Approach to Effective Pumping Speed of Dry Vacuum Pumps Due to Large Conductance of Vacuum Exhaust Line, **JONGYEON LIM**, K.M. CHOI, Korea Research Institute of Standards and Science (KRISS), Republic of Korea, S.H. PARK, M.H. KANG, S.K. LIM, National Nano Fab Center, Republic of Korea, S.W. KANG, KRISS, Republic of Korea

VT-TuP3 High-Performance CdTe-QDs for Thin Film Solar Cell Devices, **LUMU MANANDHAR**, A. PRADHAN, Norfolk State University

VT-TuP5 The ESS Vacuum Control System Concept, **HILKO SPOELSTRA**, M. ZAERA-SANZ, European Spallation Source, Sweden

VT-TuP6 Effect of Impeller Tip Clearance on the Degree of Vacuum of Self-Priming Pump, **YOUN-JEA KIM**, H.J. JEON, J.-H. BOO, Sungkyunkwan University, Republic of Korea

VT-TuP7 Simulation of the Transporting of Sputtering Particles and Comparison of the Film Thickness Distributions between Simulations and Experiments, **KOHEI KUROSHIMA**, M. IGUCHI, Osaka Vacuum, Ltd., Japan, S. SUGIMOTO, Osaka Vacuum, Ltd.Osaka Vacuum, Ltd., Japan

VT-TuP8 Finite Element Based Multiphysics Analysis of Photon Stimulated Desorption from Vacuum Chamber used in Electron Storage Ring, **KAMLESH SUTHAR**, B.K. STILLWELL, Argonne National Laboratory

WEDNESDAY SPECIAL EVENTS

6:15 a.m.	35th Annual AVS Run (Register at Run Booth before Wednesday in the Convention Center) — TBD
7:30 a.m.	Diversity Committee Meeting and Breakfast — Arcadia Restaurant (H)
8:00 a.m.	Advanced Surface Engineering Division Business Meeting — Almaden (H)
8:15 a.m.	Advanced Surface Engineering Division Executive Committee Meeting (Lunch Offsite) — Almaden (H)
10:00 a.m.	Session Coffee Break — Hall 1 (CC)
12:20 p.m.	Exhibit Hall Lunch — Hall 1 (CC)
12:30 p.m.	Governance Committee Meeting and Lunch — Arcadia Restaurant (H)
12:30 p.m.	Nanometer-scale Science and Technology Division Graduate Student Award Competition — 212B (CC)
12:30 p.m.	PacSurf Committee Meeting and Lunch — Boardroom (H)
12:30 p.m.	Professional Development: Federal Funding Town Hall and Lunch — 210E (CC)
12:30 p.m.	Surface Science Division Mort Traum Awards Ceremony — 113 (CC)
3:30 p.m.	History Committee Meeting — Boardroom (H)
3:40 p.m.	Session Refreshment Break — Hall 1 (CC)
4:20 p.m.	Medard W. Welch Award Lecture: "Thermodynamics and Kinetics of Elementary Reaction Steps on Late Transition Metal Catalysts," Charles Campbell, Univ. of Washington — 113 (CC)
4:30 p.m.	E&M Reception (Invitation Only) — Hall 1 (CC)
6:30 p.m.	AVS Awards Ceremony & Reception — 210G (CC)

10:00 a.m.-4:30 p.m. *Equipment Exhibition..... Hall 1 (CC)*

CC = San Jose Convention Center
H = San Jose Marriott

= New Attendee Networking Events

WEDNESDAY SHORT COURSES

8:30 a.m.	A Comprehensive Course on Surface Analysis and Depth Profiling by X-Ray Photoelectron Spectroscopy (XPS or ESCA), Auger Electron Spectroscopy (AES), Focused Ion Beam Analysis (FIB) and Secondary Ion Mass Spectroscopy (SIMS) and other Major Techniques (3 days)
8:30 a.m.	Fundamentals of Vacuum Technology (4 days)
8:30 a.m.	Major Analytical Techniques other than XPS, AES, FIB, SIMS
8:30 a.m.	Plasma-Enhanced CVD: Fundamentals, Techniques, and Applications
8:30 a.m.	Plasma Etching & RIE: The Fundamentals and Applications (2 days)

LOCATION: All AVS Short Courses will be held at the San Jose Marriott (HQ)
COURSE HOURS: All AVS Short Course Hours: 8:30 a.m. – 5:00 p.m. – with 1.5 hour break for Lunch (Lunch not included)

	2D Materials Focus Topic Room: 212C - Session 2D+MN+NS+SP+SS+TF-WeM **Mechanical and Thermal Properties of 2D Materials** **Moderators:** Oleg Yazev, Ecole Polytechnique Fédérale de Lausanne (EPFL), Petra Reinke, University of Virginia	Actinides and Rare Earths Focus Topic Room: 230A - Session AC+AS+MI-WeM **Magnetism, Complexity and Superconductivity in the Actinides and Rare Earths** **Moderator:** Tomasz Durakiewicz, Los Alamos National Laboratory
8:00 am	**2D+MN+NS+SP+SS+TF-WeM1** Mechanical Properties of Polycrystalline Graphene, **JOSEPH GONZALES**, University of South Florida, R. PERRIOT, Los Alamos National Laboratory, I.I. OLEYNIK, University of South Florida	**AC+AS+MI-WeM1 Invited** The Valence-Fluctuating Ground-State of δ--Pu, **MARC JANOSCHEK**, Los Alamos National Laboratory
8:20 am	**2D+MN+NS+SP+SS+TF-WeM2** Phonon Transport in Boron and Nitrogen doped Graphene, **VIJAY KUMAR JINDAL**, S. MANN, Department of Physics, Panjab University Chandigarh-160014, India, P. RANI, Department of Physics, Panjab University, Chandigarh, S. CHANDRA, Department of Physics, Panjab University Chandigarh-160014, India	Invited talk continued.
8:40 am	**2D+MN+NS+SP+SS+TF-WeM3** Lévy Flights Found in Freestanding Graphene, **PAUL THIBADO**, University of Arkansas, M. NEEK-AMAL, F. PEETERS, University of Antwerp, Belgium	**AC+AS+MI-WeM3 Invited** Exchange Bias in Heterostructures Based on UO_2, **E. TERESHINA**, Institute of Physics ASCR, Czech Republic, Z. BAO, PANalytical B.V., Netherlands, L. HAVELA, Charles University in Prague, Czech Republic, R. SPRINGELL, University of Bristol, UK, S. DANIS, Charles University in Prague, Czech Republic, A. MACKOVA, Nuclear Physics Institute ASCR, Czech Republic, T. GOUDER, R. CACIUFFO, Institute for Transuranium Elements (ITU), Germany
9:00 am	**2D+MN+NS+SP+SS+TF-WeM4** Multilayer Graphene Strength Characterization, **JOSEPH ROWLEY**, N. BOYER, K. BERRY, R.C. DAVIS, Brigham Young University, R. CREIGHTON, J. ABBOTT, S. CORNABY, M. HARKER, Moxtek Inc., R. VANFLEET, Brigham Young University	Invited talk continued.
9:20 am	**2D+MN+NS+SP+SS+TF-WeM5 Invited** Nanoelectromechanical Systems Based on 2D Materials beyond Graphene -- Effects from Geometry, Nonlinearity, and Anisotropy, **ZENGHUI WANG**, Case Western Reserve University	**AC+AS+MI-WeM5 Invited** Transport and Magnetism of 4f and 5f Systems: What we can Learn from Thermoelectric Power, **KRZYSZTOF GOFRYK**, Idaho National Laboratory
9:40 am	Invited talk continued.	Invited talk continued.
10:00 am	**BREAK - Complimentary Coffee in Exhibit Hall**	**BREAK - Complimentary Coffee in Exhibit Hall**
10:20 am	**BREAK - Complimentary Coffee in Exhibit Hall**	**BREAK - Complimentary Coffee in Exhibit Hall**
10:40 am	**BREAK - Complimentary Coffee in Exhibit Hall**	**BREAK - Complimentary Coffee in Exhibit Hall**
11:00 am	**2D+MN+NS+SP+SS+TF-WeM10** Phonon Spectroscopy of Graphene Field Effect Devices with the STM, **FABIAN NATTERER**, Y. ZHAO, J. WYRICK, NIST/CNST, W.Y. RUAN, Y.-H.C. CHAN, M.-Y.C. CHOU, Georgia Institute of Technology, N.B. ZHITENEV, J.A. STROSCIO, NIST/CNST	**AC+AS+MI-WeM10** Magnetic Properties of 2-2-1 Rare-earth and Uranium Compounds and their Interaction with Hydrogen, **S. MASKOVA**, Charles University, Prague, Czech Republic, R.V. DENYS, Institute for Energy Technology, Kjeller, Norway, I. HALEVY, Nuclear Research Center Negev, Beer-Sheva, Israel, K. MILIYANCHUK, L. AKSELRUD, Ivan Franko National University of Lviv, Lviv, Ukraine, A. KOLOMIETS, Lviv Polytechnic National University, Lviv, Ukraine, V. YARTYS, Institute for Energy Technology, Kjeller, Norway, M. GIOVANNINI, University of Genova, Genova, Italy, L. HAVELA, Charles University, Czech Republic
11:20 am	**2D+MN+NS+SP+SS+TF-WeM11** Edge-state-induced Stabilization of Dopants in Graphene, **YUUKI UCHIDA**, A. AKAISHI, J. NAKAMURA, The University of Electro-Communications (UEC-Tokyo) and JST CREST, Japan	**AC+AS+MI-WeM11** Structural, Electronic, and Magnetic Characteristics of Np_2Co_{17} and Analogue Compounds Under Pressure, **I. HALEVY**, Nuclear Research Center Negev, Israel, A. HEN, Institute for Transuranium Elements (ITU), Germany, I. ORION, Ben Gurion University, Israel, E. COLINEAU, R. ELOIRDI, J.C. GRIVEAU, ITU, Germany, F. WILHELM, A. ROGALEV, ESRF, France, N. MAGNANI, A.B. SHICK, R. CACIUFFO, ITU, Germany
11:40 am	**2D+MN+NS+SP+SS+TF-WeM12** Exploring the Thermal Stability of Two-Dimensional Black Phosphorus, **XIAOLONG LIU**, J.D. WOOD, K.-S. CHEN, E. CHO, M.C. HERSAM, Northwestern University	**AC+AS+MI-WeM12** Alloying UH_3 as a Probe into the 5*f* Magnetism, **LADISLAV HAVELA**, M. PAUKOV, I. TKACH, M. CIESLAR, Z. MATEJ, D. KRIEGNER, D. DROZDENKO, I. TUREK, M. DIVIS, Charles University, Czech Republic, N.-T.H. KIM-NGAN, Pegagogical University, Poland
12:00 pm	**2D+MN+NS+SP+SS+TF-WeM13** Gas Permeation Through 1 nm Thick Carbon Nanomembranes, A. BEYER, M. AI, Bielefeld University, Germany, S. SHISHATSKIY, J. WIND, Helmholtz-Zentrum Geesthacht, Germany, X. ZHANG, V. CHINARYAN, Y. YANG, **ARMIN GÖLZHÄUSER**, Bielefeld University, Germany	

	Additive Manufacturing/3D Printing Focus Topic **Room: 211B - Session AM+EM+MS+TF-WeM** **Materials, Designs, and Applications of Additive Manufacturing** **Moderators:** Erik B. Svedberg, The National Academies, Neal Orringer, 3D Systems	**Applied Surface Science** **Room: 212D - Session AS-WeM** **Practical Surface Analysis II: Influence of Sample Preparation and Novel Sample Prep Techniques** **Moderators:** William Stickle, HP
8:00 am	**AM+EM+MS+TF-WeM1 Invited** An Overview of Additive Manufacturing, **ED MORRIS**, R. GORHAM, NCDMM	**AS-WeM1 Invited** ASSD 30th Anniversary Lecture: A Historical Perspective of the Materials Challenges and Instrumentation Solutions Available for Practical X-ray Photoelectron and Auger Electron Spectroscopy, **JOHN MOULDER**, Physical Electronics USA
8:20 am	Invited talk continued.	Invited talk continued.
8:40 am	**AM+EM+MS+TF-WeM3 Invited** Material Considerations and Opportunities for Laser Powder Bed Additive Manufacturing, **MICHAEL W. PERETTI**, D.H. ABBOTT, General Electric Aviation	**AS-WeM3** Using Argon clusters for Improved XPS Information, **JONATHAN COUNSELL**, S.J. COULTAS, C.J. BLOMFIELD, D. SURMAN, C. MOFFITT, Kratos Analytical Limited, UK
9:00 am	Invited talk continued.	**AS-WeM4** *In Situ* Chemical Imaging of Environmental Liquid Surfaces and Interfaces Using Microfluidics and Dynamic ToF-SIMS: Toward Multimodal and Mesoscale Imaging, **XIAO-YING YU**, Z. ZHU, Pacific Northwest National Laboratory
9:20 am	**AM+EM+MS+TF-WeM5** High Quality and High Speed EBM 3D Printing by the Integration of High Performance Electron Sources, **COLIN RIBTON**, TWI Ltd., UK, S. DEL POZO, TWI Ltd. and Brunel University, UK	**AS-WeM5** A VAMAS Inter-laboratory Study of the Measurement of Chemistry and Thickness of Nanoparticle Coatings, **DAVID CANT**, N.A. BELSEY, C. MINELLI, A. SHARD, National Physical Laboratory, UK
9:40 am	**AM+EM+MS+TF-WeM6** Laser Induced Forward Transfer of High-Viscosity, Polymer-Based VO_2 Inks, **ERIC BRECKENFELD**, H. KIM, T. SUTTO, N. CHARIPAR, A. PIQUÉ, Naval Research Laboratory	
10:00 am	**BREAK - Complimentary Coffee in Exhibit Hall**	**BREAK - Complimentary Coffee in Exhibit Hall**
10:20 am	**BREAK - Complimentary Coffee in Exhibit Hall**	**BREAK - Complimentary Coffee in Exhibit Hall**
10:40 am	**BREAK - Complimentary Coffee in Exhibit Hall**	**BREAK - Complimentary Coffee in Exhibit Hall**
11:00 am	**AM+EM+MS+TF-WeM10 Invited** New Digital Design System for Additive Manufacturing and its Demands on Materials and Processing, Y. TANG, A. KURTZ, S. YANG, **YAOYAO FIONA ZHAO**, McGill University, Canada	**AS-WeM10** A Quantitative Quest: Single Cell Analysis by LG-SIMS, **CHRISTOPHER SZAKAL**, National Institute of Standards and Technology (NIST)
11:20 am	Invited talk continued.	**AS-WeM11** Ambient Mass Spectrometry Imaging of Live Cells and Tissues, J.K. KIM, **DAEWON MOON**, DGIST, Republic of Korea
11:40 am	**AM+EM+MS+TF-WeM12 Invited** Printing Multi-Functionality using Additive Manufacturing, **RYAN WICKER**, University of Texas at El Paso	**AS-WeM12 Invited** Intricacies of Sample Preparation for ToF-SIMS Analysis of Biological Specimens, **JOHN FLETCHER**, Chalmers University of Technology, Sweden
12:00 pm	Invited talk continued.	Invited talk continued.

	Biomaterial Interfaces Room: 211D - Session BI-WeM	Electronic Materials and Processing Room: 210E - Session EM-WeM
	Biomolecules at Interfaces **Moderator:** Axel Rosenhahn, Ruhr-University Bochum	**Beyond CMOS: Resistive Switching Devices** **Moderator:** Christopher Hinkle, University of Texas at Dallas
8:00 am	**BI-WeM1** Understanding Hydration of Proteins by SALVI and Liquid ToF-SIMS, **JIACHAO YU**, Y. ZHOU, X. HUA, Z. ZHU, Pacific Northwest National Laboratory, S. LIU, Southeast University, China, X.-Y. YU, Pacific Northwest National Laboratory	**EM-WeM1** Tantalum Oxide Resistive Memory Devices by IAD, **RONALD GOEKE**, M. MARINELLA, D.R. HUGHART, Sandia National Laboratories
8:20 am	**BI-WeM2** Direct Measurement of the Interaction Free Energies of Single Hydrophobic Peptides with Extended Hydrophobic Surfaces, **PHILIPP STOCK**, T. UTZIG, M. VALTINER, Max-Planck Institut für Eisenforschung GmbH, Germany	**EM-WeM2** Capacitance and Resistance Switching in HfO_2 RRAM, **CHRISTOPHE VALLEE**, P. GONON, C. MANNEQUIN, T. WAKRIM, M. SAADI, LTM, Univ. Grenoble Alpes, CEA-LETI, France, A. SYLVESTRE, G2elab, Univ. Grenoble Alpes, France
8:40 am	**BI-WeM3 Invited** Cells and Extracellular Matrices as Smart Materials: Dissecting and Rebuilding Mechaniobiological Units, **SANJAY KUMAR**, University of California, Berkeley	**EM-WeM3 Invited** Materials Selection for Oxide-based Resistive Random Access Memory (RRAM), **JOHN ROBERTSON**, Y. GUO, Cambridge University, United Kingdom of Great Britain and Northern Ireland
9:00 am	Invited talk continued.	Invited talk continued.
9:20 am	**BI-WeM5** Molecular Modeling of Biofunctionalized Hydrogels to Guide Hydrogel Design, X. LI, Clemson University, M.L. BECKER, University of Akron, N.S. MURTHY, Rutgers University, **ROBERT LATOUR**, Clemson University	**EM-WeM5** Role of Active and Inert Electrodes in Filament Formation in Resistive Switching Devices (RRAM), **GARGI GHOSH**, Virginia Tech, S.W. KING, Intel Corporation, M.K. ORLOWSKI, Virginia Tech
9:40 am	**BI-WeM6** Physisorption of Stimuli-Responsive Polypeptides with Genetically Programmable Aqueous Phase Behavior, **LINYING LI**, C. MO, Q. TU, N.J. CARROLL, A. CHILKOTI, S. ZAUSCHER, Duke University, M. RUBINSTEIN, University of North Carolina at Chapel Hill, G.P. LÓPEZ, Duke University	**EM-WeM6** Neutron Induced Effects on HfO_x-Based Resistive Random Access Memory, **KAREN HSU**, T. CHANG, University of Wisconsin-Madison, L. ZHAO, Stanford University, R. AGASIE, University of Wisconsin-Madison, Y. NISHI, Stanford University, Z. MA, J.L. SHOHET, University of Wisconsin-Madison
10:00 am	**BREAK - Complimentary Coffee in Exhibit Hall**	**BREAK - Complimentary Coffee in Exhibit Hall**
10:20 am	**BREAK - Complimentary Coffee in Exhibit Hall**	**BREAK - Complimentary Coffee in Exhibit Hall**
10:40 am	**BREAK - Complimentary Coffee in Exhibit Hall**	**BREAK - Complimentary Coffee in Exhibit Hall**
11:00 am	**BI-WeM10** Evidence of a Molecular Boundary Lubricant at Snakeskin Surfaces, **JOE BAIO**, Oregon State University, M. SPINNER, University of Kiel, Germany, C. JAYE, D.A. FISCHER, National Institute of Standards and Technology (NIST), S. GORB, University of Kiel, Germany, T. WEIDNER, Max Planck Institute for Polymer Research, Germany	**EM-WeM10** Relation of Low-k Interconnect Si-based Dielectric Breakdown to Resistive Switching Behavior, **MARIUS ORLOWSKI**, G. GHOSH, P. KASSALEN, R. GUPTA, Virginia Tech, S.W. KING, Intel Corporation
11:20 am	**BI-WeM11** Selective Self-Assembly of Acidic Nanofibrils by a Calcite-Binding Barnacle Cement Protein, C. SO, National Research Council postdoc cited at Naval Research Laboratory, J. LIU, K. FEARS, D. LEARY, J. GOLDEN, **KATHRYN WAHL**, U.S. Naval Research Laboratory	**EM-WeM11** Thin Film Carbon Nanofuses for Permanent Data Storage, **KEVIN LAUGHLIN**, S. JAMIESON, H. WANG, J. BAGLEY, T. PEARSON, R.C. DAVIS, M.R. LINFORD, B.M. LUNT, Brigham Young University
11:40 am	**BI-WeM12** Thiolene Reaction Applied to Passive Metal Oxide Surfaces for Addressing Protein Adsorption and Cell Adhesion, **ANOUK GALTAYRIES**, V. SEMETEY, A. DELLINGER, Chimie ParisTech, France	**EM-WeM12** Low-k/Cu Resistive 2-Level PROM Memory Collocated with CMOS Back-End Metallization, **ANSHUMAN VERMA**, G. GHOSH, Virginia Tech, S.W. KING, Intel Corporation, M.K. ORLOWSKI, Virginia Tech
12:00 pm	**BI-WeM13** Scaling from Single Molecule to Macroscopic Adhesion at Polymer/Metal Interfaces, **THOMAS UTZIG**, S. RAMAN, M. VALTINER, Max-Planck Institut für Eisenforschung GmbH, Germany	**EM-WeM13** Novel Contact Materials for Reliable Nanoelectromechanical Switches, **FRANK STRELLER**, G. WABISZEWSKI, D. DURHAM, R.W. CARPICK, University of Pennsylvania

	Exhibitor Technology Spotlight Room: Hall 1 - Session EW-WeM Exhibitor Technology Spotlight Session **Moderator:** Dennis Sollon, Kurt J. Lesker	In-Situ Spectroscopy and Microscopy Focus Topic Room: 211C - Session IS+AS+SA+SS-WeM In-situ Studies Using X-ray Absorption Spectroscopy and Vibrational Spectroscopy for Catalytic and Energy Materials **Moderators:** Franklin (Feng) Tao, University of Kansas, Zili Wu, Oak Ridge National Laboratory
8:00 am		**IS+AS+SA+SS-WeM1** *In Situ* X-ray Absorption Spectroscopy Technique for Metal/Water Interface Characterization, **CHENGHAO WU***, University of California, Berkeley and Lawrence Berkeley National Laboratory, J.-H. GUO, M.B. SALMERON, Lawrence Berkeley National Laboratory
8:20 am		**IS+AS+SA+SS-WeM2** Tip Enhanced Raman Spectroscopy (TERS) of Graphene Nano-Ribbons and Graphene on Au Surfaces: Imaging and Vibrational Spectroscopy of Surface Reaction Products, **DELROY BAUGH**, S. LIU, T. KUMAGAI, M. WOLF, Fritz-Haber-Institut der Max-Planck-Gesellschaft, Germany
8:40 am		**IS+AS+SA+SS-WeM3** Isomerization of One Molecule Observed through Tip-Enhanced Raman Spectroscopy: Azobenzene Thiol on Au(111), **JOONHEE LEE**, N. TALLARIDA, L. RIOS, V.A. APKARIAN, University of California, Irvine
9:00 am		**IS+AS+SA+SS-WeM4** *In Situ* Characterization and Reaction Studies of MnO_x/Co_3O_4 Catalyst for CO and CO_2 Conversion, **WALTER RALSTON**, G. MELAET, University of California, Berkeley, S. ALAYOGLU, Lawrence Berkeley National Laboratory (LBNL), G.A. SOMORJAI, University of California, Berkeley
9:20 am		**IS+AS+SA+SS-WeM5 Invited** *In Situ* and *Operando* Raman Methodology to Understand the States of Oxide Catalysts and Alkane Oxidative Dehydrogenation and Ammoxidation Reactions, **MIGUEL A. BAÑARES**, Instituto de Catálisis y Petroleoquímica, Madrid
9:40 am		Invited talk continued.
10:00 am		**BREAK - Complimentary Coffee in Exhibit Hall**
10:20 am	**EW-WeM8** New and Ongoing Developments in Thin Film Deposition from the Kurt J. Lesker Company®, S. ARMSTRONG, **DUANE BINGAMAN**, B. ZINN, Kurt J. Lesker Company	**BREAK - Complimentary Coffee in Exhibit Hall**
10:40 am	**EW-WeM9** H2O2 Gas: Revolutionary new molecule for ALD, **JEFFREY SPIEGELMAN**, D. ALVAREZ, RASIRC	**BREAK - Complimentary Coffee in Exhibit Hall**
11:00 am		**IS+AS+SA+SS-WeM10 Invited** *Operando* Studies of Dynamic Restructuring of Working Catalysts by Correlated Imaging and Spectroscopy Probes, **ANATOLY FRENKEL**, Yeshiva University
11:20 am		Invited talk continued.
11:40 am		**IS+AS+SA+SS-WeM12** A Correlation of Raman and Single and Multiple Layer Graphene Conductivity as Detected with a Cryogenic Multiprobe AFM with On-line Raman, NSOM and Other SPM Modalities, **AARON LEWIS**, The Hebrew University of Jerusalem and Nanonics Imaging Ltd, Israel, O. ZINOVIEV, A. KOMISSAR, E. MAAYAN, D. LEWIS, Nanonics Imaging Ltd, Jerusalem, Israel
12:00 pm		**IS+AS+SA+SS-WeM13** Surface Structure and Chemistry of Rh(110)-1×2 Under Reaction Condition and During Catalysis explored with AP-XPS and HP-STM, **FRANKLIN (FENG) TAO**, L. NGUYEN, University of Kansas

* **ASSD Student Award Finalist**

	MEMS and NEMS **Room: 211A - Session MN+AM-WeM** **Emerging Materials & Fabrication Technologies toward Scalable & Additive Nanomanufacturing I** **Moderators:** Philip Feng, Case Western Reserve University, Roya Maboudian, University of California at Berkeley	**Nanometer-scale Science and Technology** **Room: 212B - Session NS-WeM** **Nanodiamond for Optical and Biomedical Applications** **Moderators:** Huan-Cheng Chang, Academia Sinica, Olga Shenderova, Adámas Nanotechnologies Inc.
8:00 am	**MN+AM-WeM1 Invited** The Why, the What and the How of Nanomanufacturing, **KHERSHED COOPER**, National Science Foundation (NSF)	**NS-WeM1** Time- Resolved Luminescence Nanothermometry with Nitrogen-Vacancy Centers in Nanodiamonds, O.C. CHEN, **PEI-CHANG TSAI**, Academia Sinica, Taiwan, Republic of China
8:20 am	Invited talk continued.	**NS-WeM2** Fluorescence Spectroscopy of NV Centers using a Tapered Fiber-Coupled Nanodiamond System, **GOUR PATI**, Z. WARREN, M. WILLIAMS, R. TRIPATHI, Delaware State University
8:40 am	**MN+AM-WeM3 Invited** Large-Area Nanoimprinting and Nanoplasmonics for Energy Harvesting, LEDs & Biosensing, **STEPHEN Y. CHOU**, Princeton University	**NS-WeM3 Invited** Nanoscale Measurement and Diagnostics using Diamond Quantum Probes, **JÖRG WRACHTRUP**, Universit of Stuttgart, Germany
9:00 am	Invited talk continued.	Invited talk continued.
9:20 am	**MN+AM-WeM5 Invited** Scalable Nanomanufacturing of Plasmonic and Metasurfaces, **REGINA RAGAN**, F. CAPOLINO, University of California Irvine	**NS-WeM5** Measurement of Carbon Condensates Using Small-Angle X-ray Scattering During Detonation of High Explosives, **T.M. WILLEY**, M. BAGGE-HANSEN, L.M. LAUDERBACH, R. HODGIN, S. BASTEA, L. FRIED, A. JONES, D. HANSEN, J. BENTEROU, C. MAY, Lawrence Livermore National Laboratory, T. GRABER, Washington State University, B.J. JENSEN, D. DATTELBAUM, R. GUSTAVSEN, E. WATKINS, M. FIRESTONE, Los Alamos National Laboratory, J. ILAVSKY, Argonne National Laboratory, T. VAN BUUREN, Lawrence Livermore National Laboratory
9:40 am	Invited talk continued.	**NS-WeM6** Surface Functionalization of Nanocarbons Formed from Detonating High Explosives, **BRYAN RINGSTRAND**, R.C. HUBER, D. PODLESAK, D. DATTELBAUM, R. GUSTAVSEN, M. FIRESTONE, Los Alamos National Laboratory
10:00 am	**BREAK - Complimentary Coffee in Exhibit Hall**	**BREAK - Complimentary Coffee in Exhibit Hall**
10:20 am	**BREAK - Complimentary Coffee in Exhibit Hall**	**BREAK - Complimentary Coffee in Exhibit Hall**
10:40 am	**BREAK - Complimentary Coffee in Exhibit Hall**	**BREAK - Complimentary Coffee in Exhibit Hall**
11:00 am	**MN+AM-WeM10 Invited** Roll to Roll Processes at the University of Michigan: Continuous Patterning, Flexible OPVs, and Growth of Carbon Nanomaterials, **JAY GUO**, University of Michigan, Ann Arbor	**NS-WeM10 Invited** Quantum Sensing in Biology using the Nitrogen-Vacancy Centre in Diamond, **LLOYD HOLLENBERG**, University of Melbourne, Australia
11:20 am	Invited talk continued.	Invited talk continued.
11:40 am	**MN+AM-WeM12** Nanotube Templated Manufacturing of Hierarchically Structured High Throughput Fluid Filters, **ANDREW DAVIS**, R.C. DAVIS, R. VANFLEET, Brigham Young University, N. MORRILL, Precision Membranes	**NS-WeM12** Large Scale Production of Fluorescent Nanodiamond Particles, **OLGA SHENDEROVA**, N.J. NUNN, G.E. MCGUIRE, Adámas Nanotechnologies Inc.
12:00 pm	**MN+AM-WeM13** Improved Vacuum Deposition of Small Patterned Features Using Precision Shadow Masks and a Novel Low Pressure Sputtering Source, **ROB BELAN**, Kurt J. Lesker Company, V. HEYDEMANN, Advantech U.S. Inc, S. ARMSTRONG, Kurt J. Lesker Company, T. FISHER, B. BROCATO, Advantech U.S. Inc	

	Plasma Science and Technology Room: 210B - Session PS+2D+SE-WeM Plasma Diagnostics, Sensors and Control II **Moderator:** Colin Wolden, Colorado School of Mines	Plasma Science and Technology Room: 210A - Session PS+SS+TF-WeM Atomic Layer Etching (ALE) and Low-Damage Processes I **Moderator:** Geunyoung Yeom, Sungkyunkwan University, Republic of Korea
8:00 am		**PS+SS+TF-WeM1 Invited** Atomic Layer Etching to Escape Process Tradeoffs for 7nm Technology and Beyond, **ALOK RANJAN**, M. WANG, S. SHERPA, TEL Technology Center, America, LLC, P. VENTZEK, Tokyo Electron America, Inc.
8:20 am	**PS+2D+SE-WeM2** Diagnostics for Ionized Physical Vapor Deposition Chambers, **YUILUN WU**, P. PIOTROWICZ, University of Illinois at Urbana-Champaign, I.A. SHEHELKANOV, National Nuclear Research University (MEPhI), D.N. RUZIC, University of Illinois at Urbana-Champaign	Invited talk continued.
8:40 am	**PS+2D+SE-WeM3 Invited** Probing the Plasma Chemistry that Underpins Diamond Chemical Vapour Deposition, **M.N.R. ASHFOLD**, University of Bristol, United Kingdom of Great Britain and Northern Ireland, M.W. KELLY, B.S. TRUSCOTT, University of Bristol, UK, United Kingdom of Great Britain and Northern Ireland, Y.A. MANKELEVICH, Moscow State University, Russia, Russian Federation	**PS+SS+TF-WeM3** Understanding of new processes for Atomic Layer Etching, **FLORENTIN CHAMBETTAZ**, L. VALLIER, J. DUBOIS, Univ. Grenoble Alpes-CNRS-CEA/Minatec-LTM,38000 Grenoble-France, O. JOUBERT, Univ. Grenoble Alpes-CNRS-CEA, France
9:00 am	Invited talk continued.	**PS+SS+TF-WeM4** Self-Limited Ion Implantation for Precise Low-k Spacer Etching, **NICOLAS POSSEME**, Cea-Leti, Minatec, France, M. GARCIA-BARROS, C. ARVET, ST Microelectronics, O. POLLET, Cea-Leti, Minatec, S. LAGRASTA, P. MAURY, ST Microelectronics, F. LEVERD, ST Microlectronics, C. RICHARD, ST Microelectronics, S. BARNOLA, Cea-Leti, Minatec, France
9:20 am	**PS+2D+SE-WeM5** The Influence of Plasma on Hydrogenated Silicon by Chemical Vapor Deposition, **CHUAN LI**, National Yang Ming University, Taiwan, Republic of China, J.H. HSIEH, Ming Chi University of Technology, Taiwan, Republic of China, C. YAN, National Central University, Taiwan, Republic of China	**PS+SS+TF-WeM5** Self-limiting Cyclic Etching of Silicon Nitride using Infrared Irradiation, **NOBUYA MIYOSHI**, Hitachi, Japan, H. KOBAYASHI, K. SHINODA, Hitachi, M. MATSUI, Hitachi, Japan, M. MIYAKE, K. MAEDA, Hitachi, Y. KOUZUMA, Hitachi High-Technologies, Japan, Y. KUDO, T. KANEKIYO, M. IZAWA, Hitachi High-Technologies
9:40 am	**PS+2D+SE-WeM6** Ionization Zones and the Deposition of Thin Films in the Transition Region from Non-Reactive to Reactive Magnetron Sputtering including dc, HiPIMS, and Burst-HiPIMS Modes, **YUCHEN YANG**, X. ZHOU, A. ANDERS, Lawrence Berkeley Lab, University of California, Berkeley	**PS+SS+TF-WeM6** Prospects for Thermal Atomic Layer Etching: Materials and Selectivity, **STEVEN GEORGE**, Y. LEE, J.W. DUMONT, University of Colorado at Boulder
10:00 am	**BREAK - Complimentary Coffee in Exhibit Hall**	**BREAK - Complimentary Coffee in Exhibit Hall**
10:20 am	**BREAK - Complimentary Coffee in Exhibit Hall**	**BREAK - Complimentary Coffee in Exhibit Hall**
10:40 am	**BREAK - Complimentary Coffee in Exhibit Hall**	**BREAK - Complimentary Coffee in Exhibit Hall**
11:00 am	**PS+2D+SE-WeM10** Modelling of the Reactive High Power Impulse Magnetron Sputtering (HiPIMS) process, **JONTOMAS GUDMUNDSSON**, University of Iceland, D. LUNDIN, Université Paris-Sud, France, N. BRENNING, KTH Royal Institute of Technology, Sweden, T. MINEA, Université Paris-Sud, France	**PS+SS+TF-WeM10** Atomic Layer Etching of Al_2O_3 Using Sequential, Self-Limiting Thermal Reactions with Trimethylaluminum and Hydrogen Fluoride, **YOUNGHEE LEE**, J.W. DUMONT, S.M. GEORGE, University of Colorado, Boulder
11:20 am	**PS+2D+SE-WeM11** *Pulsed Magnetron Sputtering Plasma Optimization for Large Area Growth of Two-dimensional MoS_2*, **ANDREY VOEVODIN**, Air Force Research Laboratory, C. MURATORE, University of Dayton, A.R. WAITE, J. BULTMAN, A. SAFRIET, J. HU, Air Force Research Laboratory	**PS+SS+TF-WeM11** Low Damage Etch Chamber for Atomic Layer Etching, **LEONID DORF**, S.R. DORF, T.G. MONROY, K. RAMASWAMY, K.S. COLLINS, Y. ZHANG, Applied Materials
11:40 am	**PS+2D+SE-WeM12** Molybdenum Nitride Formation by N_2 Plasma Exposure on Molybdenum Disulfide: In-situ Surface Study, **ANGELICA AZCATL**, X. QIN, Q. WANG, N. LU, M.J. KIM, C.L. HINKLE, R.M. WALLACE, The University of Texas at Dallas	**PS+SS+TF-WeM12** Modeling of Electron-Beam Generated Plasmas: Validation and System Design, **SHAHID RAUF**, A. AGARWAL, L. DORF, K.S. COLLINS, Applied Materials, Inc., D.R. BORIS, S.G. WALTON, U.S. Naval Research Laboratory
12:00 pm	**PS+2D+SE-WeM13** Low Temperature Synthesis of $AlYB_{14}$ by High Power Pulsed Magnetron Sputtering, **OLIVER HUNOLD**, Y.T. CHEN, D. MUSIC, RWTH Aachen University, Germany, P.O.A. PERSSON, Linköping University, Sweden, J.M. SCHNEIDER, RWTH Aachen University, Germany	**PS+SS+TF-WeM13** Enhanced Reaction Rate and Precursor Transport in Focused Electron Beam Induced Etching Via Pulsed Laser Assistance, **JOOHYON NOH**, University of Tennessee, J.D. FOWLKES, Oak Ridge National Laboratory, R. TIMILSINA, M.G. STANFORD, B.B. LEWIS, P.D. RACK, University of Tennessee

	Scanning Probe Microscopy Focus Topic Room: 212A - Session SP+AS+NS+SS-WeM **Advances in Scanning Probe Microscopy** **Moderators:** An-Ping Li, Oak Ridge National Lab, Saban Hus, Oak Ridge National Laboratory	Surface Science Room: 113 - Session SS+AS+NS-WeM **Nanostructures: Growth Reactivity & Catalysis** **Moderator:** John Russell, Jr., Naval Research Laboratory
8:00 am	**SP+AS+NS+SS-WeM1 Invited** Designer Electrons: Quantum Information and New Particles in Atomically Assembled Matter, **HARI MANOHARAN**, Stanford University	**SS+AS+NS-WeM1** Surface Chemistry of Single-Layer MoS_2, **KOICHI YAMAGUCHI**, E. LI, L. BARTELS, University of California - Riverside
8:20 am	Invited talk continued.	**SS+AS+NS-WeM2** On the Adsorption Behavior of a Porphyrin on Different Cu Surfaces: A Comparative Scanning Tunneling Microscopy Study, **LIANG ZHANG**, Universität Erlangen-Nürnberg, Germany, M. LEPPER, Universität Erlangen-Nürnberg, Germany, M. STARK, S. DITZE, H.-P. STEINRÜCK, H. MARBACH, Universität Erlangen-Nürnberg, Germany
8:40 am	**SP+AS+NS+SS-WeM3** Scanning Quantum Dot Microscopy, **RUSLAN TEMIROV**, C.W. WAGNER, M.F.B.G. GREEN, P.L. LEINEN, Forschungszentrum Juelich GmbH, Germany, T.D. DEILMANN, P. KRUEGER, M.R. ROHLFING, Muenster University, Germany, F.S.T. TAUTZ, Forschungszentrum Juelich GmbH, Germany	**SS+AS+NS-WeM3 Invited** Redox-Active On-Surface Assembly of Metal-Organic Chains with Single-Site Transition Metals, **STEVEN TAIT**, Indiana University
9:00 am	**SP+AS+NS+SS-WeM4** Local Probing of the Photo-carrier Lifetime by Kelvin Probe Force Microscopy, **NICOLAS CHEVALIER**, S. POUCH, D. MARIOLLE, Univ. Grenoble Alpes/ CEA, LETI, MINATEC Campus, France, B. GREVIN, Univ. Grenoble Alpes/ CEA, INAC, SPrAM, LEMOH, France, Ł. BOROWIK, Univ. Grenoble Alpes/ CEA, LETI, MINATEC Campus, France	Invited talk continued.
9:20 am	**SP+AS+NS+SS-WeM5** Nanoscale Capacitance-Voltage (C-V) Curves: Using Scanning Microwave Impedance Microscopy (sMIM) to Characterize Local Electrical Properties of Linear and Non-Linear Materials, **STUART FRIEDMAN**, Y. YANG, O. AMSTER, PrimeNano, Inc.	**SS+AS+NS-WeM5** Ultra-thin Bi(110) Films on Si(111)$\sqrt{3}$x$\sqrt{3}$-B Substrates, I. KOKUBO, Y. YOSHIIKE, K. SHISHIKURA, K. NAKATSUJI, **HIROYUKI HIRAYAMA**, Tokyo Institute of Technology, Japan
9:40 am	**SP+AS+NS+SS-WeM6** STM Study of the Correlation between Structural, Magnetic, and Electronic Properties of Co Nano-Islands on Cu(111), **JEWOOK PARK**, C. PARK, M. YOON, Z. GAI, A.P. BADDORF, A.-P. LI, Oak Ridge National Laboratory	**SS+AS+NS-WeM6** STM Study of Growth Processes for Ir/Ge(111), M.S. VAN ZIJLL, B.H. STENGER, C.H. MULLET, E.S. HUFFMAN, D. LOVINGER, W.F. MANN, **SHIRLEY CHIANG**, University of California, Davis
10:00 am	**BREAK - Complimentary Coffee in Exhibit Hall**	**BREAK - Complimentary Coffee in Exhibit Hall**
10:20 am	**BREAK - Complimentary Coffee in Exhibit Hall**	**BREAK - Complimentary Coffee in Exhibit Hall**
10:40 am	**BREAK - Complimentary Coffee in Exhibit Hall**	**BREAK - Complimentary Coffee in Exhibit Hall**
11:00 am	**SP+AS+NS+SS-WeM10 Invited** Probing Electrostatic Field Effect in Quantum Materials by Microwave Impedance Microscopy, **KEJI LAI**, University of Texas at Austin	**SS+AS+NS-WeM10** Gas Sensor Resistance Changes for Ar/O_2 and H_2O Plasma Modified SnO_2 Nanomaterials, **ERIN STUCKERT**, C.J. MILLER, E.R. FISHER, Colorado State University
11:20 am	Invited talk continued.	**SS+AS+NS-WeM11** Enhanced Adsorption of CO_2 at Steps of Planar ZnO(0001) Grown on Au(111), **XINGYI DENG**, D. SORESCU, J. LEE, National Energy Technology Laboratory
11:40 am	**SP+AS+NS+SS-WeM12** Subsurface Visualization of Soft Matrix using 3D-Spectroscopic Atomic Force Acoustic Microscopy, **KUNIKO KIMURA**, K. KOBAYASHI, A. YAO, H. YAMADA, Kyoto University, Japan	**SS+AS+NS-WeM12** Characterization of Band Gap and Lattice Constant of Ultrathin ZnO Layers on Au(111), **JUNSEOK LEE**, D. SORESCU, X. DENG, National Energy Technology Laboratory
12:00 pm	**SP+AS+NS+SS-WeM13** Quantifying the Effects of Cantilever Modes Shapes on Studies of the Liquid-Solid Interface, **ALEKS LABUDA**, M. VIANI, D. WALTERS, R. PROKSCH, Asylum Research, an Oxford Instruments company	**SS+AS+NS-WeM13** Submonolayer Water Adsorption on Stepped and Planar Pt Surfaces, **RACHAEL FARBER**, Loyola University Chicago, M.J. KOLB, Leiden Institute of Chemistry, J. DEROUIN, Loyola University Chicago, M.T.M. KOPER, L.B.F. JUURLINK, Leiden Institute of Chemistry, D.R. KILLELEA, Loyola University Chicago

	Surface Science Room: 112 - Session SS-WeM **Environmental Interfaces, Ambient Surfaces, In-Operando Studies, and Adsorption on 2D Materials** **Moderator:** Peter Sutter, University of Nebraska - Lincoln	Thin Film Room: 111 - Session TF+EN-WeM **ALD for Energy** **Moderators:** Paul Poodt, Solliance/TNO, Angel Yanguas-Gil, Argonne National Lab
8:00 am	**SS-WeM1** Liquid-Jet Ambient Pressure Photoelectron Spectroscopy Studies of the Liquid/Vapor Interface of 1-Propanol and 2-Propanol Aqueous Solutions, **MICHAEL MAKOWSKI**, J.M. LANGFORD, D. TOBIAS, J.C. HEMMINGER, University of California Irvine	**TF+EN-WeM1** Photovoltage Design for ALD Metal Oxide Protected Solar-Water-Splitting Photoanodes, **ANDREW SCHEUERMANN**, J.P. LAWRENCE, K.W. KEMP, O.L. HENDRICKS, Stanford University, A. WALSH, I. POVEY, M.E. PEMBLE, P.K. HURLEY, Tyndall National Institute, C.E.D. CHIDSEY, P.C. MCINTYRE, Stanford University
8:20 am	**SS-WeM2** Near Ambient Pressure XPS at the SLS – *In Situ* Cell Design for Solid/Vapor Interfaces and First Results in Environmental TiO_2 Photocatalysis, **F. ORLANDO**, Paul Scherrer Institut, Switzerland, A. WALDNER, Paul Scherrer Institut and ETH Zürich, Switzerland, M.-T. LEE, Paul Scherrer Institut and University of Bern, Switzerland, M. BIRRER, T. BARTELS-RAUSCH, Paul Scherrer Institut, Switzerland, C. PROFF, Paul Scherrer Institut and ETH Zürich, Switzerland, T. HUTHWELKER, A. KLEIBERT, Paul Scherrer Institut, Switzerland, J. VAN BOKHOVEN, Paul Scherrer Institut and ETH Zürich, Switzerland, M. AMMANN, Paul Scherrer Institut, Switzerland	**TF+EN-WeM2** Activity and Thermal Stability Enhanced Platinum catalysts with Nano-scale Oxide Coating via Atomic Layer Deposition, **KUN CAO**, J.M. CAI, B. SHAN, R. CHEN, Huazhong University of Science and Technology, Wuhan, China
8:40 am	**SS-WeM3** Ambient Pressure XPS Observation of Electrode Surfaces During Electrochemical Reactions, **HIROHITO OGASAWARA**, S. KAYA, H.S. SANCHEZ CASALONGUE, M.L. NG, D. FRIEBEL, A. NILSSON, SLAC National Accelerator Laboratory	**TF+EN-WeM3** Passivation of Highly-doped c-Si Solar Cell Surfaces by Atomic Layer Deposition, **BAS VAN DE LOO**, Eindhoven University of Technology, Netherlands, J. MELSKENS, Eindhoven University of Technology, G.J.M. JANSSEN, ECN Solar Energy, K.R.C. MOK, L.K. NANVER, Delft University of Technology, A.H.G. VLOOSWIJK, Tempress Systems, W.M.M. KESSELS, Eindhoven University of Technology, Netherlands
9:00 am	**SS-WeM4** Formation of Heterogeneous Multiple-Oxide/Hydroxide Species on a GaP(111) Surface Tracked by *In Situ* Near-Ambient Pressure XPS, **XUEQIANG ZHANG**, S. PTASINSKA, University of Notre Dame	**TF+EN-WeM4** Low Temperature Plasma-Assisted Atomic Layer Deposition of TiO_2 Blocking Layers for Organo-Metal Halide Perovskite Solar Cells, V. ZARDETTO, Eindhoven University of Technology, The Netherlands, F. DI GIACOMO, G. LUCARELLI, T.M. BROWN, A. DI CARLO, S. LICOCCIA, A. D'EPIFANIO, University of Rome "Tor Vergata", Italy, W.M.M. KESSELS, **M. CREATORE**, Eindhoven University of Technology, The Netherlands
9:20 am	**SS-WeM5 Invited** Investigation of Liquid/Solid Interfaces using Photoelectron Spectroscopy, **HENDRIK BLUHM**, Lawrence Berkeley Lab, University of California, Berkeley	**TF+EN-WeM5** Ultra-thin transition Metal Oxide-titania Alloy Coatings for Water Oxidation by Atomic Layer Deposition, **OLIVIA HENDRICKS**, C.E.D. CHIDSEY, P.C. MCINTYRE, Stanford University
9:40 am	Invited talk continued.	**TF+EN-WeM6** Atomic Layer Deposition of Nickel-Iron-Oxide Catalysts for Photoelectrochemical Splitting of Water, **ADRIE MACKUS**, K.L. PICKRAHN, J.G. BAKER, S.F. BENT, Stanford University
10:00 am	**BREAK - Complimentary Coffee in Exhibit Hall**	**BREAK - Complimentary Coffee in Exhibit Hall**
10:20 am	**BREAK - Complimentary Coffee in Exhibit Hall**	**BREAK - Complimentary Coffee in Exhibit Hall**
10:40 am	**BREAK - Complimentary Coffee in Exhibit Hall**	**BREAK - Complimentary Coffee in Exhibit Hall**
11:00 am	**SS-WeM10** Surface and Bulk Crystallization Kinetics of Amorphous Solid Water Nanoscale Films, **R. SCOTT SMITH**, C. YUAN, R.A. MAY, B.D. KAY, Pacific Northwest National Laboratory	**TF+EN-WeM10 Invited** From Atom to Solid: The Structure of Amorphous ALD Thin Films and Nanolaminates, **ANGEL YANGUAS-GIL**, Argonne National Laboratory
11:20 am	**SS-WeM11** Environmental Effects on Oxidative Surface Passivation Across $Al_xFe_yNi_{1-x-y}$ Composition Space, **MATTHEW PAYNE**, J.B. MILLER, A.J. GELLMAN, Carnegie Mellon University	Invited talk continued.
11:40 am	**SS-WeM12** Hydrogen-Bonded Self-Assembled Molecular Structures on Hexagonal Boron Nitride, **VLADIMIR KOROLKOV**, S. SVATEK, L. YANG, J. KERFOOT, A. SUMMERFIELD, N. CHAMPNESS, University of Nottingham, UK, T. TANIGUCHI, K. WATANABE, The National Institute for Materials Science, Japan, N. BESLEY, P. BETON, University of Nottingham, UK	**TF+EN-WeM12** Inorganic Functionalization of Colloidal Quantum Dot Solar Cells through ALD Infilling, **AXEL PALMSTROM**, P. SANTRA, S.F. BENT, Stanford University
12:00 pm	**SS-WeM13** Suppression of the Topological Surface State of Bi_2Te_3 by the Organic Molecule Manganese Phthalocyanine, **ANDREW HEWITT**, J. BOLTERSDORF, P.A. MAGGARD, D.B. DOUGHERTY, North Carolina State University	**TF+EN-WeM13** Integrating Atomic Layer Deposited Lithium-Containing Thin Films for Lithium-ion Battery Applications, J. CHO, **TREVOR SEEGMILLER**, J. LAU, L. SMITH, J. HUR, B. DUNN, J.P. CHANG, University of California at Los Angeles

Wednesday Morning, October 21, 2015

	Thin Film Room: 114 - Session TF+SS-WeM ALD Surface Reactions and Precursors **Moderators:** Sean Jones, National Science Foundation (NSF), Paul Poodt, Solliance/TNO	Vacuum Technology Room: 230B - Session VT-WeM Accelerator and Large Vacuum Systems **Moderators:** Yulin Li, Cornell University, Lily Wang, Los Alamos National Laboratory
8:00 am	**TF+SS-WeM1 Invited** High Performance Precursors for Atomic Layer Deposition of Silicon Containing Films, **ANU MALLIKARJUNAN**, Air Products and Chemicals, Inc.	**VT-WeM1 Invited** MAXIV Vacuum System: From Design to Operation, **ESHRAQ AL-DMOUR**, M. GRABSKI, J. AHLBÄCK, P. FERNANDES TAVARES, C. PASQUINO, Max IV Laboratory
8:20 am	Invited talk continued.	Invited talk continued.
8:40 am	**TF+SS-WeM3** Amorphous In_2O_3 and Sn-doped In_2O_3 Layers by ALD Prepared using Trimethyl Indium and Ozone, **ANIL MANE**, A. ALLEN, Argonne National Laboratory, R. KANJOLIA, SAFC Hitech, J. ELAM, Argonne National Laboratory	**VT-WeM3** Construction Status of the SuperKEKB Vacuum System, **YUSUKE SUETSUGU**, K. KANAZAWA, K. SHIBATA, T. ISHIBASHI, H. HISAMATSU, M. SHIRAI, S. TERUI, KEK-High Energy Accelerator Research Organization
9:00 am	**TF+SS-WeM4** Towards Organic Electronics: Atomic Layer Like Deposition of ZnS and ZnO on Organic Thin Films, Z. SHI, **AMY WALKER**, University of Texas at Dallas	**VT-WeM4** Commissioning of the 3 GeV TPS Accelerator Vacuum System, **GAO-YU HSIUNG**, Y.C. YANG, H.P. HSUEH, L.H. WU, C.M. CHENG, C.K. CHAN, J.R. CHEN, National Synchrotron Radiation Research Center, Taiwan, Republic of China
9:20 am	**TF+SS-WeM5** AlF_3 Atomic Layer Deposition or Al_2O_3 Atomic Layer Etching from Sequential Exposures of Trimethylaluminum and HF, **JAIME DUMONT**, Y. LEE, S.M. GEORGE, University of Colorado at Boulder	**VT-WeM5** Construction, Installation, and Commissioning of TPS Booster Vacuum System, **HSIN-PAI HSUEH**, C.M. CHENG, S.N. HSU, G.Y. HSIUNG, J.R. CHEN, National Synchrotron Radiation Research Center, Taiwan, Republic of China
9:40 am	**TF+SS-WeM6** A Comparison of Water Delivery Methods for Atomic Layer Deposition, **TARIQ AHMIDO**, W.A. KIMES, B.A. SPERLING, J.E. MASLAR, NIST	**VT-WeM6** Design of a 250 KV DC Electron Gun Operating at Cryogenic Temperature, **XIANGHONG LIU**, I. BAZAROV, B.M. DUNHAM, V.O. KOSTROUN, H. LEE, Cornell University
10:00 am	**BREAK - Complimentary Coffee in Exhibit Hall**	**BREAK - Complimentary Coffee in Exhibit Hall**
10:20 am	**BREAK - Complimentary Coffee in Exhibit Hall**	**BREAK - Complimentary Coffee in Exhibit Hall**
10:40 am	**BREAK - Complimentary Coffee in Exhibit Hall**	**BREAK - Complimentary Coffee in Exhibit Hall**
11:00 am	**TF+SS-WeM10** Stoichiometric Dependence of the Interface of HfO_2 ZrO_2, TiO_2, Ta_2O_5 and La_2O_3 on Si (100) by ALD, **P.G. MANI**, Universidad Autónoma de Ciudad Juárez-IIT, Mexico, E. LOPEZ, Universidad Autónoma de San Luis Potosí, Mexico, H. LEOS, Universidad Autónoma de Ciudad Juárez-IIT, Mexico, H. HERNANDEZ, Universidad Autónoma de San Luis Potosí, Mexico, J.A. HERNANDEZ, J.R. FARIAS, J.T. ELIZALDE, Universidad Autónoma de Ciudad Juárez-IIT, Mexico, M.A. MELENDEZ, CINVESTAV, Mexico, M.A. VIDAL, Universidad Autónoma de San Luis Potosí, Mexico	**VT-WeM10** Introduction to Tri Alpha Energy's Fusion Concept, Vacuum Requirements and Performance of Our Current C2U Machine, **ALAN VAN DRIE**, Tri Alpha Energy
11:20 am	**TF+SS-WeM11** In-situ Infrared Study of Atomic Layer Deposition of Molybdenum Nitride using Bis(tert-Butylimido)-Bis(dimethylamido) Molybdenum and Hydrazine, **ABRAHAM VEGA**, C.E. NANAYAKKARA, The University of Texas at Dallas, G. LIU, R. KANJOLIA, SAFC Hitech, Y.J. CHABAL, The University of Texas at Dallas	**VT-WeM11** Vacuum Architecture of an Extreme Ultra-Violet Exposure System, **FREEK MOLKENBOER**, N.B. KOSTER, A.F. DEUTZ, D.J. NARON, TNO Technical Sciences, Netherlands
11:40 am	**TF+SS-WeM12** Atomic-Layer-Deposited In_2O_3:H Transparent Conductive Oxides: How to Achieve the Best Possible Carrier Mobility, **BART MACCO***, Eindhoven University of Technology, Netherlands, H.C.M. KNOOPS, Oxford Instruments Plasma Technology, UK, M.A. VERHEIJEN, W.M.M. KESSELS, Eindhoven University of Technology, Netherlands	
12:00 pm	**TF+SS-WeM13** Mechanical Property and Corrosion Resistance Evaluation of CrVN and CrSiN Thin Films Grown by a Hybrid High Power Impulse Magnetron Sputtering and Radio Frequency Sputtering Technique, **JYH-WEI LEE**, C.Y. CHENG, P.W. CHANG, Ming Chi University of Technology, Taiwan, Taiwan, Republic of China, B.S. LOU, Chang Gung University, Taiwan, Taiwan, Republic of China	

*** TFD James Harper Award Finalist**

NOTES

Exhibitor Technology Spotlight
Room: Hall 1 - Session EW-WeL

Exhibitor Technology Spotlight Session
Moderator: Dennis Sollon, Kurt J. Lesker

12:20 pm		
12:40 pm	**EW-WeL2** Wet Cell II for Analysis at the Liquid Vacuum Interface, **JUNHANG LUO**, SPI Supplies	
1:00 pm	**EW-WeL3** Relative Permeation Performance of O-ring Seals Using DuPont Test Methodology, **MARK HELLER**, DuPont™ Kalrez®	
1:20 pm	**EW-WeL4** Advances in Bellows Electroforming, **BERL STEIN**, NiCoForm	
1:40 pm	**EW-WeL5** PREVAC's Solutions for Helium Temperature Sample Manipulation and Related Sample Transferring Systems, **ADAM DZIWOKI**, PREVAC sp. z o.o., Poland	
2:00 pm	**EW-WeL6** Variations on Vacuum Baking for MEMS Processing, **WILLIAM MOFFATT**, K. SAUTTER, Yield Engineering Systems, Inc.	

NOTES

	2D Materials Focus Topic Room: 212C - Session 2D+EM+IS+MC+NS+SP+SS-WeA	Actinides and Rare Earths Focus Topic Room: 230A - Session AC+AS+MI-WeA
	Dopants and Defects in 2D Materials **Moderators:** Daniel Gunlycke, Naval Research Laboratory, Zenghui Wang, Case Western Reserve University	**Chemistry and Physics of the Actinides and Rare Earths** **Moderator:** Ladislav Havela, Charles University, Prague, Czech Republic
2:20 pm	**2D+EM+IS+MC+NS+SP+SS-WeA1** The Effect of Defect Density on the Mechanical Properties of Graphene, **JONATHAN WILLMAN**, J.M. GONZALES, University of South Florida, R. PERRIOT, Los Alamos National Laboratory, I.I. OLEYNIK, University of South Florida	**AC+AS+MI-WeA1 Invited** High Resolution X-ray Absorption Spectroscopy as an Advanced Tool for Structural Investigations of Actinides, **TONYA VITOVA**, Karlsruhe Institute of Technology, Germany
2:40 pm	**2D+EM+IS+MC+NS+SP+SS-WeA2** Investigation of Grain Boundaries in CVD Grown MoS_2, **KOLYO MARINOV**, D. OVCHINNIKOV, D. DUMCENCO, A. KIS, Ecole Polytechnique Fédérale de Lausanne (EPFL), Switzerland	Invited talk continued.
3:00 pm	**2D+EM+IS+MC+NS+SP+SS-WeA3 Invited** Polycrystalline 2D Materials: Atomic Structure and Electronic Transport Properties, **OLEG YAZYEV**, Ecole Polytechnique Fédérale de Lausanne (EPFL), Switzerland	**AC+AS+MI-WeA3 Invited** Soft X-ray Spectromicroscopy of Actinide Materials, **DAVID SHUH**, Lawrence Berkeley National Laboratory
3:20 pm	Invited talk continued.	Invited talk continued.
3:40 pm	**BREAK**	**BREAK**
4:00 pm	**BREAK**	**BREAK**
4:20 pm	**2D+EM+IS+MC+NS+SP+SS-WeA7** Defects Compensation and Refining Optical Luminescence in Organic/Transition Metal Dichalcogenide Heterostructure, J.H. PARK, UC San Diego, A.M. SANNE, H.C.P. MOVVA, UT-Austin, S. VISHWANATH, Cornell University, **I.J. KWAK**, UC San Diego, H. XING, Cornell University, J. ROBERTSON, University of Cambridge, UK, S.K. BANERJEE, UT-Austin, A.C. KUMMEL, UC San Diego	**AC+AS+MI-WeA7 Invited** Resonant Ultrasound Spectroscopy Detects 100 Part-per-billion Effects in Plutonium, **ALBERT MIGLIORI**, Los Alamos National Laboratory
4:40 pm	**2D+EM+IS+MC+NS+SP+SS-WeA8** Reactivity and Wettability of PVD Metals on 2D Transition Metal Dichalcogenides, **CHRISTOPHER SMYTH**, S. MCDONNELL, R. ADDOU, H. ZHU, C.L. HINKLE, R.M. WALLACE, University of Texas at Dallas	Invited talk continued.
5:00 pm	**2D+EM+IS+MC+NS+SP+SS-WeA9 Invited** Defects and Boundaries in 2D Materials: Correlating Electronic Properties to Atomic Structures, **AN-PING LI**, Oak Ridge National Laboratory	**AC+AS+MI-WeA9** Spectroscopic Studies of the Oxide Layer formed on Plutonium under Ambient Conditions, **ALISON PUGMIRE**, Los Alamos National Laboratory, C.H. BOOTH, Lawrence Berkeley National Laboratory, J. VENHAUS, L. PUGMIRE, Los Alamos National Laboratory
5:20 pm	Invited talk continued.	**AC+AS+MI-WeA10** Covalent Mixing In Actinide and Lanthanide Compounds: Reliable Assignment of Cation Charges, **PAUL BAGUS**, University of North Texas, C.J. NELIN, Consultant
5:40 pm	**2D+EM+IS+MC+NS+SP+SS-WeA11** Metal Ion Intercalated 2D Materials as Transparent Electrodes, **JIAYU WAN***, W. BAO, F. GU, University of Maryland, College Park, M. FUHRER, Monash University, Malaysia, L. HU, University of Maryland, College Park	**AC+AS+MI-WeA11** An XPS and ToF SIMS Investigation of Cerium Oxidation, **PAUL ROUSSEL**, AWE, United Kingdom of Great Britain and Northern Ireland
6:00 pm	**2D+EM+IS+MC+NS+SP+SS-WeA12** Oxygen Reduction Reaction on Nitrogen-doped Graphene, **JUN NAKAMURA**, The University of Electro-Communications (UEC-Tokyo), Japan, A. ICHIKAWA, H. MATSUYAMA, A. AKAISHI, The University of Electro-Communications (UEC-Tokyo)	

* **NSTD Student Award Finalist**

	Applied Surface Science **Room: 212D - Session AS+SS-WeA** **Characterization of Buried Interfaces** **Moderators:** Xia Dong, Eli Lilly and Company, James Ohlhausen, Sandia National Laboratories	**Biomaterial Interfaces** **Room: 211D - Session BI-WeA** **Biophysics, Membranes and Nanoscale Biological Interfaces** **Moderator:** Stephanie Allen, The University of Nottingham, UK
2:20 pm	**AS+SS-WeA1 Invited** ASSD 30th Anniversary Speaker: Characterization of Sub-surface Interfaces using SIMS, TEM, and FIB or: How Much will it Cost me to Fix that Interface?, **FRED STEVIE**, North Carolina State University	**BI-WeA1** Direct Measurement of Single Molecule Interaction Free Energies at Solid/Liquid Interfaces for the Prediction of Macroscopic Properties, **MARKUS VALTINER**, S. RAMAN, T. UTZIG, P. STOCK, Max Planck Institut fur Eisenforschung GmbH, Germany
2:40 pm	Invited talk continued.	**BI-WeA2** Multipurpose Biomembranes of Sandwiches Layers: Deposition and Characterization with Surface and Biological Methods, H. HEIDARI ZARE, Munich University of Applied Sciences, Germany, D. JOCHAM, University Hospital of Schleswig-Holstein, Germany, **GERHARD FRANZ**, Munich University of Applied Sciences, Germany
3:00 pm	**AS+SS-WeA3** FIB-TOF Tomography Characterization of Organic Structures, **DAVID CARR**, G.L. FISHER, Physical Electronics USA, S. IIDA, T. MIYAYAMA, ULVAC-PHI	**BI-WeA3 Invited** Vascularized Micro-Tissue Engineered Constructs for Drug Screening, **NOO LI JEON**, Seoul National University, Korea
3:20 pm	**AS+SS-WeA4** Revisiting the Effects of Ion Sputtering of Inorganic Thin Films, **CHRISTOPHER YOUNG**, W.F. STICKLE, M.D. JOHNSON, HP, A.A. ELLSWORTH, A.V. WALKER, University of Texas at Dallas	Invited talk continued.
3:40 pm	**BREAK**	**BREAK**
4:00 pm	**BREAK**	**BREAK**
4:20 pm	**AS+SS-WeA7 Invited** Interface Characterization using Ballistic Electron Emission Microscopy and Spectroscopy: Recent Results and Related Techniques, **DOUGLAS BELL**, Jet Propulsion Laboratory, California Institute of Technology	**BI-WeA7** Controlling Cell Adhesion on Device Surfaces by Nanotopography, **ELENA LIANG**, E. MAH, S. WU, A. YEE, University of California, Irvine
4:40 pm	Invited talk continued.	**BI-WeA8** Condensation-Mediated "Living" Chain Growth Polymerization: Towards New DNA Nanostructures, L. TANG, R. GU, Duke University, J. LAMAS, Texas State University, N. LI, North Carolina State University, S. RASTOGI, Texas State University, A. CHILKOTI, Duke University, W. BRITTAIN, Texas State University, Y.G. YINGLING, North Carolina State University, **STEFAN ZAUSCHER**, Duke University
5:00 pm	**AS+SS-WeA9** Using XPS to Study Electrochemical Solid-Liquid Interfaces In-Operando: Standing-Wave Ambient-Pressure XPS (SWAPPS), **OSMAN KARSLIOGLU**, Lawrence Berkeley National Laboratory, S. NEMSAK, Forschungszentrum Juelich GmbH, Germany, I. ZEGKINOGLOU, A. SHAVORSKIY, M. HARTL, C.S. FADLEY, H. BLUHM, Lawrence Berkeley National Laboratory	**BI-WeA9** Simple Routes to All-Polymeric Corrals, Flow-Channels and Traps for Studies of Lipid and Protein Diffusion in Supported Lipid Bilayers, A. JOHNSON, P.M. CHAPMAN, A.M. ALSWIELEH, University of Sheffield, UK, P. BAO, University of Leeds, UK, A. TSARGORODSKA, S.P. ARMES, University of Sheffield, UK, S.D. EVANS, University of Leeds, UK, **GRAHAM LEGGETT**, University of Sheffield, UK
5:20 pm	**AS+SS-WeA10** Exploring the Usefulness of Monochromatic Ag Lα X-rays for XPS, **SARAH COULTAS**, J.D.P. COUNSELL, S.J. HUTTON, A.J. ROBERTS, C.J. BLOMFIELD, Kratos Analytical Limited, UK	**BI-WeA10** Measuring Cardiomyocyte Contractions on Silicon Carbide Micromechanical Resonators, **HAO TANG**, H. JIA, P.X.-L. FENG, Case Western Reserve University
5:40 pm	**AS+SS-WeA11** Optimizing the TOF-SIMS CsM^+ Depth Profile of a Tunnel Magneto Resistance (TMR) Structure, **ALAN SPOOL**, HGST, a Western Digital Company	**BI-WeA11 Invited** Programming the Robust Self-organization of Human Tissues using Interfacial Interactions, **ZEV GARTNER**, University of California, San Francisco
6:00 pm	**AS+SS-WeA12** Interface and Composition Analyses versus Performances: How to Improve Perovskite Solar Cells, Y. BUSBY, University of Namur, B-5000 Namur, Belgium, F. MATTEOCCI, University of Rome "Tor Vergata", Italy, G. DIVITINI, S. CACOVICH, University of Cambridge, UK, C. DUCATI, University of Cambridge, A. DI CARLO, University of Rome "Tor Vergata", Italy, **J.-J. PIREAUX**, University of Namur, Belgium	Invited talk continued.

	Electronic Materials and Processing Room: 211C - Session EM+AS+MS+SS-WeA **Surface and Interface Challenges in Wide Bandgap Materials** **Moderators:** Aubrey Hanbicki, U.S. Naval Research Laboratory, Rachael Myers-Ward, U.S. Naval Research Laboratory	Electronic Materials and Processing Room: 210E - Session EM-WeA **Interconnects: Methods and Materials for Removing Connectivity Constraints** **Moderators:** Andy Antonelli, Nanometrics, Michelle Paquette, University of Missouri-Kansas City
2:20 pm	**EM+AS+MS+SS-WeA1 Invited** Effects of Nitrogen and Antimony Impurities at SiO_2/SiC Interfaces, **PATRICIA MOONEY**, Simon Fraser University, Canada	**EM-WeA1** Interdiffusion Characterization of Selective Chemical Vapor Deposition Cobalt Cap and Copper, **JEFF SHU**, Z. SUN, S. CHOI, B. YATZOR, Z. BAYINDIR, G. ZHANG, Y. LEE, H. LIU, J. LANSFORD, GLOBALFOUNDRIES U.S. Inc.
2:40 pm	Invited talk continued.	**EM-WeA2** Contact Engineering on Carbon Nanotube Interconnect Vias, **YUSUKE ABE**, A. VYAS, R. SENEGOR, C. YANG, Santa Clara University
3:00 pm	**EM+AS+MS+SS-WeA3** Hydrogen Desorption from 6H-SiC (0001) Surfaces, **SEAN KING**, Intel Corporation, R. NEMANICH, R. DAVIS, North Carolina State University	**EM-WeA3 Invited** Innovative Technological Solutions for Low-k Integration Beyond 10 nm, **MIKHAIL BAKLANOV**, IMEC
3:20 pm	**EM+AS+MS+SS-WeA4** Chemical and Microstructural Characterization of Interfaces between Metal Contacts and β-Ga_2O_3, **LISA M. PORTER**, Y. YAO, J.A. ROKHOLT, R.F. DAVIS, Carnegie Mellon University, G.S. TOMPA, N.M. SBROCKEY, T. SALAGAJ, Structured Materials Industries, Inc.	Invited talk continued.
3:40 pm	**BREAK**	**BREAK**
4:00 pm	**BREAK**	**BREAK**
4:20 pm	**EM+AS+MS+SS-WeA7** Regrown InN Ohmic Contacts by Atomic Layer Epitaxy, **CHARLES EDDY, JR.**, U.S. Naval Research Laboratory, N. NEPAL, Sotera Defense Solutions, M.J. TADJER, T.J. ANDERSON, A.D. KOEHLER, J.K. HITE, K.D. HOBART, U.S. Naval Research Laboratory	**EM-WeA7 Invited** Challenges and Directions for Dielectric Interconnect Materials for the 10nm node and Beyond, **J.D. BIELEFELD**, J. BLACKWELL, S. BOJARSKI, M. CHANDHOK, J. CLARKE, C. JEZEWSKI, N. KABIR, S.W. KING, M. KRYSAK, D.J. MICHALAK, M. MOINPOUR, A. MYERS, J. PLOMBON, M. RESHOTKO, K. SINGH, J. TORRES, R. TURKOT, H. YOO, Intel Corporation
4:40 pm	**EM+AS+MS+SS-WeA8** High-Temperature Characteristics of Ti/Al/Pt/Au Contacts to GaN at 600°C in Air, **MINMIN HOU**, D.G. SENESKY, Stanford University	Invited talk continued.
5:00 pm	**EM+AS+MS+SS-WeA9 Invited** Schottky Contacts and Dielectrics in GaN HEMTs for Millimeter-Wavelength Power Amplifiers, **BRIAN DOWNEY**, Naval Research Laboratory	**EM-WeA9** Pore Sealing of Low-k Films by UV Assisted CVD Processes, **PRIYANKA DASH**, D. PADHI, Applied Materials
5:20 pm	Invited talk continued.	**EM-WeA10** Copper Deposition and *In Situ* Chamber Cleaning using Pulsed-CVD Technique, **FABIEN PIALLAT**, J. VITIELLO, Altatech, France
5:40 pm	**EM+AS+MS+SS-WeA11** Nitrogen as a Source of Negative Fixed Charge for Enhancement Mode Al2O3/GaN Device Operation, **MUHAMMADADI NEGARA**, R. LONG, D. ZHERNOKLETOV, P.C. MCINTYRE, Stanford University	**EM-WeA11** Study of UV Impact on PECVD Non-Porogen ULK (Ultra low κ) SiCOH Film Nano-Structures, Film Mechanical and Electrical Properties, **ZHIGUO SUN**, J. SHU, S. SRIVATHANAKUL, H. LIU, GLOBALFOUNDRIES U.S. Inc.
6:00 pm	**EM+AS+MS+SS-WeA12** Activation of Mg-Implanted GaN Facilitated by an Optimized Capping Structure, **JORDAN GREENLEE**, B.N. FEIGELSON, T.J. ANDERSON, K.D. HOBART, F.J. KUB, Naval Research Laboratory	**EM-WeA12** Bandgap Narrowing in Low-K Dielectrics, **XIANGYU GUO**, University of Wisconsin-Madison, S.W. KING, Intel Corporation, P. XUE, University of Wisconsin-Madison, J.-F. DE MARNEFFE, M. BAKLANOV, IMEC, Belgium, V. AFANAS'EV, Catholic University of Leuven, Belgium, Y. NISHI, Stanford University, J.L. SHOHET, University of Wisconsin-Madison

	Helium Ion Microscopy Focus Topic Room: 210F - Session HI-WeA GFIS Based Nanostructuring **Moderators:** Shinichi Ogawa, AIST, Tom Wirtz, Luxembourg Institute of Science and Technology (LIST)	In-Situ Spectroscopy and Microscopy Focus Topic Room: 211B - Session IS+SS+NS+BI+VT+MN+AS-WeA In situ Imaging of Liquids using Microfluidics **Moderators:** Xiao-Ying Yu, Pacific Northwest National Laboratory, Stephen Nonnenmann, University of Massachusetts - Amherst
2:20 pm	**HI-WeA1** Nitrogen and Helium Gas Field Ion Source for Nanofabrication, **MAREK SCHMIDT**, Japan Advanced Institute of Science and Technology, Japan, K. NAGAHARA, O. TAKECHI, M. AKABORI, Japan Advanced Institute of Science and Technology, A. YASAKA, Hitachi High-Technologies Corporation, T. SHIMODA, H. MIZUTA, Japan Advanced Institute of Science and Technology	**IS+SS+NS+BI+VT+MN+AS-WeA1 Invited** *In Situ* Multimodal Biological Imaging using Micro- and Nanofluidic Chambers, **JAMES EVANS**, C. SMALLWOOD, Pacific Northwest National Laboratory
2:40 pm	**HI-WeA2** Helium-Ion Milling of Gold Nanoantennas: Toward Plasmonics with Nanometer Precision, **ANDRÉ BEYER**, H. VIEKER, Bielefeld University, Germany, H. KOLLMANN, Oldenburg University, Germany, X. PIAO, N. PARK, Seoul National University, Korea, M. SILIES, C. LIENAU, Oldenburg University, Germany, A. GÖLZHÄUSER, Bielefeld University, Germany	Invited talk continued.
3:00 pm	**HI-WeA3** Interactions of Focused Helium and Neon Ion-beams with Nanostructures, **CHUNG-SOO KIM**, R.G. HOBBS, V.R. MANFRINATO, A. AGARWAL, K.K. BERGGREN, MIT, D. WEI, Carl Zeiss NTS	**IS+SS+NS+BI+VT+MN+AS-WeA3** Glyoxal Aqueous Surface Chemistry by SALVI and Liquid ToF-SIMS, **XIAO SUI**, Y. ZHOU, Z. ZHU, Pacific Northwest National Laboratory, J. CHEN, Shandong University, China, X.-Y. YU, Pacific Northwest National Laboratory
3:20 pm	**HI-WeA4** Polarization Control via He-ion Beam Induced Nanofabrication in Layered Ferroelectric Semiconductors, **ALEX BELIANINOV**, V. IBERI, A. TSELEV, M,. SUSNER, M. MCGUIRE, D.C. JOY, S. JESSE, A.J. RONDINONE, S.V. KALININ, O.S. OVCHINNIKOVA, Oak Ridge National Laboratory	**IS+SS+NS+BI+VT+MN+AS-WeA4** Investigating *Shewanella* Oneidensis Biofilm Matrix in a Microchannel by *In Situ* Liquid ToF-SIMS, **YUANZHAO DING**, Nanyang Technological University, Singapore, X. HUA, Y. ZHOU, J. YU, X. SUI, J. ZHANG, Z. ZHU, Pacific Northwest National Laboratory, B. CAO, Nanyang Technological University, Singapore, X.-Y. YU, Pacific Northwest National Laboratory
3:40 pm	**BREAK**	**BREAK**
4:00 pm	**BREAK**	**BREAK**
4:20 pm	**HI-WeA7** Fabrication of Nanoscale Electronics with a Focused Helium Ion Beam, **ETHAN CHO**, University of California, San Diego, M. MA, Univeristy of California, San Diego, C. HUYNH, Carl Zeiss Microscopy, LLC, R.C. DYNES, S.A. CYBART, Univeristy of California, San Diego	**IS+SS+NS+BI+VT+MN+AS-WeA7 Invited** Ultrafast Proton and Electron Dynamics in Core-Level Ionized Aqueous Solution, **BERND WINTER**, Helmholtz-Zentrum Berlin für Materialien und Energie/Elektronenspeicherring BESSY II, Germany
4:40 pm	**HI-WeA8** Creating and Imaging Nanosized Magnets using HIM and TEM Holography, **GREGOR HLAWACEK**, Helmholtz-Zentrum Dresden - Rossendorf, Germany, F. RÖDER, TU Dresden, R. BALI, S. WINTZ, R. HÜBNER, L. BISCHOFF, Helmholtz Zentrum Dresden Rossendorf, H. LICHTE, TU Dresden, K. POTZGER, J. LINDNER, J. FASSBENDER, Helmholtz Zentrum Dresden Rossendorf	Invited talk continued.
5:00 pm	**HI-WeA9** Understanding Device Functionality in CVD-grown $MoSe_2$ Laterally Tuned with a Focused Helium Ion Beam, **VIGHTER IBERI**, M.-W. LIN, X. LI, A. IEVLEV, S. JESSE, S.V. KALININ, A.J. RONDINONE, D.C. JOY, K. XIAO, O.S. OVCHINNIKOVA, Oak Ridge National Laboratory	**IS+SS+NS+BI+VT+MN+AS-WeA9** Water Dissociation in Metal Organic Frameworks with Coordinatively Unsaturated Metal Ions: MOF-74, **K. TAN**, The University of Texas at Dallas, S. ZULUAGA, Wake Forest University, E. FUENTESF, The University of Texas at Dallas, H. WANG, Rutgers University, P. CANEPA, Wake Forest University, J. LI, Rutgers University, T. THONHAUSER, Wake Forest University, Y.J. CHABAL, The University of Texas at Dallas
5:20 pm		**IS+SS+NS+BI+VT+MN+AS-WeA10** Competitive Co-Adsorption of CO_2 with H_2O, NH_3, SO_2, NO, NO_2, N_2, O_2, and CH_4 in M-MOF-74 (M= Mg, Co, Ni): The Role of Hydrogen Bonding, K. TAN, The University of Texas at Dallas, **S. ZULUAGA**, Wake Forest University, H. WANG, Rutgers University, Y. GAO, The University of Texas at Dallas, J. LI, Rutgers University, T. THONHAUSER, Wake Forest University, Y.J. CHABAL, The University of Texas at Dallas
5:40 pm		**IS+SS+NS+BI+VT+MN+AS-WeA11** Recent Progress in Analyser Development in the Field of High Pressure Photoelectron Spectroscopy, **HENRIK BERGERSEN**, J. ÅHLUND, VG Scienta AB, Sweden
6:00 pm		**IS+SS+NS+BI+VT+MN+AS-WeA12** *In Situ* STM Observation of Pd(110) Under the Hydrogen Pressure Between 10^{-6} Pa and 10^{-3} Pa, **JUN YOSHINOBU**, H. KIKUCHI, T. KOITAYA, K. MUKAI, S. YOSHIOMOTO, University of Tokyo, Japan

	MEMS and NEMS Room: 211A - Session MN+AM-WeA Emerging Materials & Fabrication Technologies toward Scalable & Additive Nanomanufacturing II **Moderators:** Susan Burkett, The University of Alabama, Philip Feng, Case Western Reserve University	Nanometer-scale Science and Technology Room: 212B - Session NS+EN+MG+SS+TF-WeA Nanoscale Catalysis and Surface Chemistry **Moderator:** Sidney Cohen, Weizmann Institute of Science, Israel
2:20 pm	**MN+AM-WeA1 Invited** Scalable Laser-Assisted Three Dimensional Printing of Nanomaterials, **COSTAS GRIGOROPOULOS**, University of California at Berkeley	**NS+EN+MG+SS+TF-WeA1** Effects of γ-Al_2O_3 Support on the Geometry and Electronic Structure of H-covered Pt Nanoparticles, **SAMPYO HONG**, T.S. RAHMAN, University of Central Florida
2:40 pm	Invited talk continued.	**NS+EN+MG+SS+TF-WeA2** Shape and Support Interaction of Size Selected Pt Nanoparticles in Presence of H_2, **MAHDI AHMADI**, F. BEHAFARID, University of Central Florida, B. ROLDAN CUENYA, Ruhr-University Bochum, Germany
3:00 pm	**MN+AM-WeA3 Invited** Material Requirements and Challenges for NEM Logic Relays, **TSU-JAE LIU**, University of California at Berkeley	**NS+EN+MG+SS+TF-WeA3** Fabrication and SERS Activity of Metal-loaded TiO_2 Nanometer ScaleParticles, **PAOLO REYES**, J.C. HEMMINGER, University of California Irvine
3:20 pm	Invited talk continued.	**NS+EN+MG+SS+TF-WeA4** Tailoring Surface Properties of Architectural Glass by Coating Ag and Mo Doped Titanium Oxide Thin Films, **RAVI RANJAN PANDEY**, C. KANT, K. SAINI, CSIR- National Physical Laboratory, India
3:40 pm	**BREAK**	**BREAK**
4:00 pm	**BREAK**	**BREAK**
4:20 pm	**MN+AM-WeA7 Invited** Microplasma-based Direct-write Patterning Processes for Additive Microfabrication, **CHRISTIAN ZORMAN**, Case Western Reserve University	**NS+EN+MG+SS+TF-WeA7 Invited** Pyridine Coordination Chemistry for Molecular Assemblies, **MILKO VAN DER BOOM**, Weizmann Institute of Science, Israel
4:40 pm	Invited talk continued.	Invited talk continued.
5:00 pm	**MN+AM-WeA9** Ni-induced Graphitization for Enhanced Long-term Stability of Ohmic Contact to Polycrystalline 3C-SiC, S. CHEN, L.E. LUNA, University of California at Berkeley, Z. YOU, Tsinghua University, C. CARRARO, **ROYA MABOUDIAN**, University of California at Berkeley	**NS+EN+MG+SS+TF-WeA9** Atomic Scale Iron Carbide Films on Au(111) and Cu(111) as a Iron Fischer-Tropsch Model Catalyst, **GILBÈRE MANNIE**, X. WEN, Y.W. LI, SynCat@Beijing, China, J.V. LAURITSEN, Interdisciplinary Nanoscience Center (iNANO), Denmark, H.J.W. NIEMANTSVERDRIET, SynCat@Beijing, China
5:20 pm	**MN+AM-WeA10** Fabrication of High Aspect Ratio Millimeter-Tall Free Standing Post Arrays using Carbon-Nanotube-Templated Microfabrication with a Sacrificial Hedge, **GUOHAI CHEN**, R. VANFLEET, R.C. DAVIS, Brigham Young University	**NS+EN+MG+SS+TF-WeA10** Fullerene Interaction with W Surfaces: Synthesis of Nanospheres with Tunable Bandgap, **EHSAN MONAZAMI**, University of Virginia, J.B. MCCLIMON, University of Pennsylvania, P. REINKE, University of Virginia
5:40 pm		**NS+EN+MG+SS+TF-WeA11** Enantiomeric Separations of Chiral Pharmaceuticals using Chiral Tetrahexahedral Au Nanoparticles, **NISHA SHUKLA**, D. YANG, A.J. GELLMAN, Carnegie Mellon University
6:00 pm		**NS+EN+MG+SS+TF-WeA12** Electroreduction Catalysis with Defect-Rich Metal Nanoparticles, **XIAOFENG FENG**, M. KANAN, Stanford University

	Plasma Science and Technology Room: 210B - Session PS+AS+SS-WeA **Plasma Surface Interactions** **Moderator:** Steven Vitale, MIT Lincoln Laboratory	Plasma Science and Technology Room: 210A - Session PS+TF-WeA **Plasma Deposition and Plasma Assisted ALD** **Moderator:** Sumit Agarwal, Colorado School of Mines
2:20 pm	**PS+AS+SS-WeA1** *In Situ* FTIR Diagnostics and Characterization of Etch By-Product Deposition on Chamber Walls and Wafer Surface during Halogen Etching of Silicon, **NEEMA RASTGAR**, S. SRIRAMAN, R. MARSH, A. PATERSON, Lam Research Corporation	**PS+TF-WeA1 Invited** Plasma Prize Talk: Plasma Processing of Materials: What makes Plasma Special and Future Outlook?, **RICHARD VAN DE SANDEN***, DIFFER
2:40 pm	**PS+AS+SS-WeA2** Particle as a Temperature Probe: Thermal Effects in Non-Thermal Plasmas, **THOMAS LOPEZ**, L. MANGOLINI, University of California Riverside	Invited talk continued.
3:00 pm	**PS+AS+SS-WeA3 Invited** Plasma-Surface Interactions at Low and High Pressure, **VINCENT DONNELLY**, University of Houston	**PS+TF-WeA3** Feature Scale Simulation of Atomic Layer Deposition via FPS3D, **PAUL MOROZ**, Tokyo Electron US Holdings, D.J. MOROZ, University of Pennsylvania
3:20 pm	Invited talk continued.	**PS+TF-WeA4** Plasma Enhanced Atomic Layer Deposition Applications using an Ion Source, **FRANK PAPA**, Gencoa USA, V. BELLIDO-GONZALEZ, H. LI, Gencoa Ltd, UK, HD. NGO, University of Applied Sciences Berlin, Germany, K. KRÖHNERT, Fraunhofer Institut IZM Berlin, Germany, O. EHRMANN, K.D. LANG, P. MACKOWIAK, PIOTR, TU Berlin, Germany
3:40 pm	**BREAK**	**BREAK**
4:00 pm	**BREAK**	**BREAK**
4:20 pm	**PS+AS+SS-WeA7** Measurements of IIEE Emitted Electrons from Chemically-Cleaned and Sputtered-Cleaned Semiconductor Surfaces, D. URRABAZO, **LAWRENCE OVERZET**, University of Texas at Dallas	**PS+TF-WeA7** Plasma-Assisted ALD of SiN_x: The Surface Chemistry Studied by Infrared Spectroscopy, **ROGER BOSCH**, L.E. CORNELISSEN, C.K. ANDE, W.M.M. KESSELS, Eindhoven University of Technology, The Netherlands
4:40 pm	**PS+AS+SS-WeA8** Effects of Hydrogen on Etching Processes for Transparent Conducting Films, **HU LI†**, K. KARAHASHI, Osaka University, Japan, M. FUKASAWA, K. NAGAHATA, T. TATSUMI, Sony Corporation, Japan, S. HAMAGUCHI, Osaka University, Japan	**PS+TF-WeA8** Structural Characterization of Surface Dielectric Barrier Discharges (SDBD) for Atmospheric Pressure Plasma Enhanced Spatial ALD (PE-S-ALD), **YVES CREYGHTON**, J. EMMELKAMP, F. ROOZEBOOM, TNO Technical Sciences, Netherlands
5:00 pm	**PS+AS+SS-WeA9** Mechanisms of Hydrocarbon Based Polymer Etch using Pulsed Plasmas, **BARTON LANE**, P. VENTZEK, M. MATSUKUMA, A. SUZUKI, A. KOSHIISHI, Tokyo Electron Limited	**PS+TF-WeA9 Invited** Plasma Deposited Barrier Coatings on Plastics: Plasma Characterization and Thin Film Analysis, **PETER AWAKOWICZ**, F. MITSCHKER, Ruhr-University Bochum, Germany, A. NAVE, INP-Greifswald, Germany, J. RÖPCKE, INP-Greifswald, G. GRUNDMEIER, Univ. of Paderborn
5:20 pm	**PS+AS+SS-WeA10** Role of Plasma Density in Damage Characterization and its Impact on Low-Damage Plasma Process Design, **KOJI ERIGUCHI**, M. KAMEI, Y. NAKAKUBO, K. ONO, Kyoto University, Japan	Invited talk continued.
5:40 pm	**PS+AS+SS-WeA11** Dry Deep Etching Of Bulk Titanium By Plasma Processes, **EDOUARD LAUDREL**, T. TILLOCHER, P. LEFAUCHEUX, GREMI CNRS/Université d'Orléans, France, B. BOUTAUD, Sorin Crm, France, R. DUSSART, GREMI CNRS/Université d'Orléans, France	**PS+TF-WeA11** Flexible, Durable, Self-Cleaning Optical Coatings for Optoelectronics, **THOMAS FUERST**, C.A. WOLDEN, Colorado School of Mines
6:00 pm	**PS+AS+SS-WeA12** Particle Transport with Wafer Potential Controlled by Dipole Electrostatic Chuck Electrodes, **MASAKI ISHIGURO**, M. SUMIYA, Hitachi High-Technologies Corp., Japan	**PS+TF-WeA12** Microwave Plasma Assisted Chemical Vapor Deposition of High Quality, Single Crystal Diamond Substrates, **SHREYA NAD**, Y. GU, J. ASMUSSEN, Michigan State University

*** PSTD Plasma Prize**
† Coburn & Winters Student Award Finalist

	Scanning Probe Microscopy Focus Topic Room: 212A - Session SP+2D+AS+NS+SS-WeA Probing Electronic and Transport Properties **Moderators:** Tae-Hwan Kim, Pohang University of Science and Technology, Jewook Park, Oak Ridge National Laboratory	Surface Science Room: 113 - Session SS+AS+EN-WeA Metals, Alloys & Oxides: Reactivity and Catalysis **Moderator:** Daniel Killelea, Loyola University Chicago
2:20 pm	**SP+2D+AS+NS+SS-WeA1 Invited** Geometric and Electronic Structures of Epitaxially Grown Pnictide 122, 111 and $Cu_xBi_2Se_3$ Samples, **YOUNG KUK**, Seoul National University, Republic of Korea	**SS+AS+EN-WeA1 Invited** Understanding Chemical Activity in Pt-Re Bimetallic Systems, **DONNA CHEN**, R.P. GALHENAGE, K. XIE, A.S. DUKE, University of South Carolina, H. YAN, Brookhaven National Laboratory
2:40 pm	Invited talk continued.	Invited talk continued.
3:00 pm	**SP+2D+AS+NS+SS-WeA3** Direct Measurement of Conductance from Topological Surface States in Topological Insulators, **CORENTIN DURAND**, X. ZHANG, S. HUS, M. MCGUIRE, I. VLASSIOUK, A.-P. LI, Oak Ridge National Laboratory	**SS+AS+EN-WeA3** Removal of Surface Carbon from Pt(111) by Hydrogenation via an Ethylidyne Intermediate, J.D. KROOSWYK, C.M. KRUPPE, **MICHAEL TRENARY**, University of Illinois at Chicago
3:20 pm	**SP+2D+AS+NS+SS-WeA4** Chiral Edge States of Topological Insulator in 1D, **TAE-HWAN KIM**, Pohang University of Science and Technology, Republic of Korea, S. CHEON, S.-H. LEE, Institute for Basic Science, Republic of Korea, H.W. YEOM, Pohang University of Science and Technology and Institute for Basic Science, Republic of Korea	**SS+AS+EN-WeA4** Density Functional Study of the Oxygen Chemistry and NO Oxidation Mechanism on Low-index Surfaces of $SmMn_2O_5$ mullite, X. LIU, Z.Z. CHEN, Huazhong University of Science and Technology, China, K.J. CHO, The University of Texas at Dallas, R. CHEN, **BIN SHAN**, Huazhong University of Science and Technology, China
3:40 pm	**BREAK**	**BREAK**
4:00 pm	**BREAK**	**BREAK**
4:20 pm	**SP+2D+AS+NS+SS-WeA7** Electronic Properties of Quasi-one-dimensional Defects in Monolayer h-BN, **CHUANXU MA**, J. PARK, Oak Ridge National Laboratory, L. LIU, G. GU, The University of Tennessee, A.P. BADDORF, A.-P. LI, Oak Ridge National Laboratory	**SS+AS+EN-WeA7 Invited** Medard W. Welch Award Lecture - Thermodynamics and Kinetics of Elementary Reaction Steps on Late Transition Metal Catalysts, **CHARLES CAMPBELL***, University of Washington
4:40 pm	**SP+2D+AS+NS+SS-WeA8** Real-Space Imaging of the Multiple Scattering in Single Layer Graphene: FT-STM/STS Studies, M. JUNG, S.-D. SOHN, J. PARK, K. LEE, **HYUNG-JOON SHIN**, Ulsan Natioanl Institute of Science and Technology, Republic of Korea	Invited talk continued.
5:00 pm	**SP+2D+AS+NS+SS-WeA9** Tunability of Single-Atom Electron Spin Relaxation Times and Their Characterization by Pump-Probe STM, **WILLIAM PAUL**, S. BAUMANN, IBM Research - Almaden, K. YANG, Chinese Academy of Sciences, N. ROMMING, University of Hamburg, Germany, T. CHOI, C.P. LUTZ, A. HEINRICH, IBM Research - Almaden	**SS+AS+EN-WeA9** Bridging Hydroxyl Formation from Water on Reduced TiO_2(110), **NIKOLAY PETRIK**, G.A. KIMMEL, Pacific Northwest National Laboratory
5:20 pm	**SP+2D+AS+NS+SS-WeA10 Invited** Imaging and Spectroscopy of Graphene Heterostructures, **BRIAN LEROY**, University of Arizona	**SS+AS+EN-WeA10** The Adsorption and Desorption of Small Hydrocarbons on Rutile TiO_2(110), **LONG CHEN**, R.S. SMITH, B.D. KAY, Z. DOHNALEK, Pacific Northwest National Laboratory
5:40 pm	Invited talk continued.	**SS+AS+EN-WeA11** Pd-Au *Single Atom Alloys* for the Activation of Diatomic Molecules, **FELICIA LUCCI**, E.C.H. SYKES, Tufts University Department of Chemistry
6:00 pm	**SP+2D+AS+NS+SS-WeA12** Correlated STM and Electron Transport Study of Individual Nanowires down to Atomic Scale, **S. QIN**, University of Science and Technology of China, T.H. KIM, Oak Ridge National Laboratory, Y. ZHANG, R. WU, University of California, Irvine, H.H. WEITERING, The University of Tennessee, Knoxville, C.K. SHIH, The University of Texas at Austin, A.-P. LI, Oak Ridge National Laboratory	**SS+AS+EN-WeA12** Pt/Cu Single Atom Alloys for Highly Selective Formic Acid Dehydrogenation, **MATTHEW MARCINKOWSKI**, C.J. MURPHY, M.L. LIRIANO, N.A. WASIO, F.R. LUCCI, E.C.H. SYKES, Tufts University Department of Chemistry

*** Medard W. Welch Award Winner**

	Surface Science Room: 112 - Session SS+AS-WeA Surface Dynamics, Non-Adiabaticity, and Single Molecule Phenomena **Moderator:** Eddy Tysoe, University of Wisconsin-Milwaukee	Thin Film Room: 114 - Session TF+AS+BI-WeA Thin Films for Biological and Biomedical Applications **Moderators:** Christophe Vallee, LTM, Univ. Grenoble Alpes, CEA-LETI, Angel Yanguas-Gil, Argonne National Lab
2:20 pm	**SS+AS-WeA1** Benchmarking Theory with Vibrational State Resolved Reactivity Measurements, **ARTHUR UTZ**, E. PETERSON, E. DOMBROWSKI, E. NICOTERA, E. HIGH, Tufts University	**TF+AS+BI-WeA1 Invited** On-chip Characterization of Engineered Nanomaterial Surface Properties by Real-time Affinity Monitoring, C. DESMET, A. VALSESIA, P. COLPO, European Commission, Joint Research Centre (JRC), **FRANCOIS ROSSI**, European Commission, Joint Research Centre (JRC), Italy
2:40 pm	**SS+AS-WeA2** Confirming the role of Hydrogen Bonding in Electron-promoted Desorption at Water Ice Surfaces., D. MARCHIONE, A.G.M. ABDULGALIL, M.P. COLLINGS, **MARTIN MCCOUSTRA**, Heriot-Watt University, UK	Invited talk continued.
3:00 pm	**SS+AS-WeA3 Invited** Strategic Applications of the Vibrational Dynamics of the Outer Layer of Metal Nanoparticles, **MARISOL ALCANTARA ORTIGOZA**, University of Central Florida	**TF+AS+BI-WeA3 Invited** Thin Film Technologies for Biomedical devices- Current State of Art and Future Opportunities, **MALLIKA KAMARAJUGADDA**, Medtronic plc
3:20 pm	Invited talk continued.	Invited talk continued.
3:40 pm	**BREAK**	**BREAK**
4:00 pm	**BREAK**	**BREAK**
4:20 pm	**SS+AS-WeA7** An Accurate Full-Dimensional Potential Energy Surface for H at Au(111): The Importance of Nonadiabatic Electronic Excitation in Energy Transfer and Adsorption, S.M. JANKE, A. KANDRATSENKA, **DANIEL AUERBACH**, A.M. WODTKE, Max Planck Institute for Biophysical Chemistry, Germany	**TF+AS+BI-WeA7** Titanium-Niobium Thin Films Deposited by Magnetron Sputtering on AISI 316L Stainless Steel Substrate, D. GONZALEZ, T.C. NIEMEYER, C.R.M. AFONSO, **PEDRO NASCENTE**, Federal University of Sao Carlos, Brazil
4:40 pm	**SS+AS-WeA8** STM Characterization of Quasi-one Dimensional C_{60} Nanostructures on Rippled Graphene, C. CHEN, H. ZHENG, A. MILLS, **CHENGGANG TAO**, Virginia Tech	**TF+AS+BI-WeA8** SAM-based Models of Cell Surfaces to Study the Interactions with Lectins and Bacterial Fimbriae, **ANDREAS TERFORT**, University of Frankfurt, Germany, K. LINDHORST, University of Kiel, Germany
5:00 pm	**SS+AS-WeA9** Classical and Quantum Description of Ion Desorption from Ionic Crystals, **LESZEK MARKOWSKI**, University of Wroclaw, Poland	**TF+AS+BI-WeA9** Improving the Long-Term Stability of Thin-Film Contact and Electrode Metallizations for Implantable Silicon Neural Interfaces, **BRIAN BAKER**, R. CALDWELL, University of Utah, H. MANDAL, Blackrock Microsystems, R. SHARMA, P. TATHIREDDY, L.W. RIETH, University of Utah
5:20 pm	**SS+AS-WeA10** Spin and Isotope Effects on Molecular-Hydrogen Adsorption on Pd(210), H. KOBAYASHI, S. OHNO, M. WILDE, University of Tokyo, Japan, M. MATSUMOTO, Tokyo Gakugei University, Japan, S. OGURA, **KATSUYUKI FUKUTANI**, University of Tokyo, Japan	**TF+AS+BI-WeA10** On-Surface Synthesis of Organic Nanostructures on Copper Surfaces, Q.T. FAN, University of Science and Technology of China, J.M. GOTTFRIED, Philipps-Universität Marburg, Germany, **JUNFA ZHU**, University of Science and Technology of China
5:40 pm	**SS+AS-WeA11** Eley-Rideal Typed Mechanism of Formate Synthesis by Hydrogenation of Carbon Dioxide on Cu Surfaces, J. QUAN, University of Tsukuba, Japan, T. OGAWA, Universityy of Tsukuba, Japan, T. KONDO, University of Tsukuba, Japan, G. WANG, Nankai University, China, **JUNJI NAKAMURA**, Univerisity of Tsukuba and ACT-C, Japan	**TF+AS+BI-WeA11** Carbon Nanotube-Templated, Porous Films for Thermal Isolation, J.M. LUND, D.B. SYME, R. VANFLEET, R.C. DAVIS, B.D. JENSEN, **BRIAN IVERSON**, Brigham Young University
6:00 pm		

	Thin Film Room: 111 - Session TF+AS+EM+EN+MN-WeA CV Infiltration Methods and Energetic and Thermal Properties of Thin Films **Moderators:** Richard Vanfleet, Brigham Young University, David Allred, Brigham Young University	Vacuum Technology Room: 230B - Session VT-WeA Vacuum Quality and Partial Pressure Analysis **Moderators:** Steve Borichevsky, AMAT VSE, Ted Martinez, SLAC National Accelerator Laboratory
2:20 pm	**TF+AS+EM+EN+MN-WeA1 Invited** The Many Avatars of PVD, **MURALI NARASIMHAN**, Applied Materials, Inc.	**VT-WeA1 Invited** Plasma Cleaning of SEMs and Large Vacuum Systems, **RONALD VANE**, XEI Scientific Inc.
2:40 pm	Invited talk continued.	Invited talk continued.
3:00 pm	**TF+AS+EM+EN+MN-WeA3** Reactive Foil Ignition by Laser Irradiation: Experimental and Modeling Results, **RYAN MURPHY**, C.D. YARRINGTON, Sandia National Laboratories, R.V. REEVES, Lawrence Livermore National Laboratory, D.P. ADAMS, Sandia National Laboratories	**VT-WeA3 Invited** Double Deflection and Enhanced Detection - The Use of a Novel Ion Optics for Metastable Rejection and Improved Detection in the Low ppb Range, **JONATHAN LESLIE**, MKS Instruments Spectra Products, UK
3:20 pm	**TF+AS+EM+EN+MN-WeA4** The Effects of a Heat Sink on Self-Sustained Propagating Reactions in Sputter-Deposited Bimetallic Multilayers, **DAVID ADAMS**, R.V. REEVES, M. HOBBS, Sandia National Laboratories	Invited talk continued.
3:40 pm	**BREAK**	**BREAK**
4:00 pm	**BREAK**	**BREAK**
4:20 pm	**TF+AS+EM+EN+MN-WeA7 Invited** Multilayers and Nano-Laminates: Science and Technology of these Nano Materials, **TROY BARBEE JR.**, Lawrence Livermorore National Laboratory	**VT-WeA7 Invited** The Deployment of a Commercial RGA to the International Space Station, **MATTHEW S. KOWITT**, Stanford Research Systems, D. HAWK, Orbital-ATK, D.J. ROSSETTI, Conceptual Analytics, M.S. WORONOWICZ, SGT Inc.
4:40 pm	Invited talk continued.	Invited talk continued.
5:00 pm	**TF+AS+EM+EN+MN-WeA9 Invited** Beyond Deep Silicon Etching – Generating High Aspect Ratio Microstructures by Infiltration of Carbon Nanotube Frameworks, **ROBERT DAVIS**, Brigham Young University	**VT-WeA9** Temperature-stable Quartz Oscillator Applicable to Pressure Gauges, Gas Sensing, Partial Pressure Measurement, and Plasma Diagnostics, **ATSUSHI SUZUKI**, AIST, Japan
5:20 pm	Invited talk continued.	**VT-WeA10** An Ultra-high Vacuum Processing System for Constructing Small Format Photodetectors, D.R. WALTERS, R.J. WAGNER, **JOHN NOONAN**, L. XIA, J. XIE, J. WANG, H. ZHAO, M. VIRGO, Argonne National Laboratory
5:40 pm	**TF+AS+EM+EN+MN-WeA11** The Influence of Thin Binder Films on Reaction Behavior in Reactive Powder Complexes, **ROBERT REEVES**, K.T. SULLIVAN, A.E. GASH, Lawrence Livermore National Laboratory	
6:00 pm	**TF+AS+EM+EN+MN-WeA12** Carbon Nanotube Sheets from Horizontally Aligned Carbon Nanotubes, **NATHAN BOYER**, D.B. SYME, J.T. ROWLEY, Brigham Young University, M. HARKER, R. CREIGHTON, S. CORNABY, Moxtek Inc., R. VANFLEET, B.D. IVERSON, Brigham Young University, L. PEI, Johns Hopkins University, R.C. DAVIS, Brigham Young University	

Anticipated Schedule
Wednesday Morning, October 21, 2015

TIME	SESSION	ROOM
8:00 am		
8:20 am		
8:40 am		
9:00 am		
9:20 am		
9:40 am		
10:00 am		
10:20 am		
10:40 am		
11:00 am		
11:20 am		
11:40 am		
12:00 pm		

Lunch

when _____

with _____

where _____

Anticipated Schedule
Wednesday Afternoon, October 21, 2015

TIME	SESSION	ROOM
1:00 pm		
1:20 pm		
1:40 pm		
2:00 pm		
2:20 pm		
2:40 pm		
3:00 pm		
3:20 pm		
3:40 pm		
4:00 pm		
4:20 pm		
4:40 pm		
5:00 pm		

THURSDAY SPECIAL EVENTS

7:30 a.m. Membership Committee Meeting and Breakfast — Arcadia Restaurant (H)

8:00 a.m. John A. Thornton Award Lecture: "PECVD Low and Ultralow Dielectric Constant Materials: From Invention and Research to Products," Alfred Grill, IBM Research Division, T.J. Watson Research Center — 211C (CC)

10:00 a.m. Session Coffee Break — Hall 1 (CC) 

12:20 p.m. Exhibit Hall Lunch/Finale — Hall 1 (CC) 

12:20 p.m. Plasma Science and Technology Division Coburn and Winters Award Ceremony — 211D (CC)

12:30 p.m. 2016 AVS Program Committee Chairs' Meeting and Lunch — Almaden (H)

12:30 p.m. AVS Business Meeting — 211A (CC)

6:00 p.m. Poster Session and Refreshments — Hall 3 (CC) 

6:00 p.m. Selective Deposition Reception and Networking Event — 210F (CC)

6:30 p.m. 2015/2016 Program Committee Reception and Dinner — Blossom Hill I-III (H)

7:00 p.m. *Surface Science Spectra* Editorial Board Dinner — Almaden (H)

10:00 a.m.-2:30 p.m. Equipment Exhibition..... Hall 1 (CC) 

CC = San Jose Convention Center
H = San Jose Marriott

 = New Attendee Networking Events

THURSDAY SHORT COURSES

8:30 a.m. Atomic Layer Deposition: Basic Principles, Characterizations and Applications

8:30 a.m. Fundamentals of Vacuum Technology (4 days)

8:30 a.m. Partial Pressure Analysis

8:30 a.m. Thin Film Nucleation, Growth, and Microstructural Evolution

LOCATION: All AVS Short Courses will be held at the San Jose Marriott (HQ)

COURSE HOURS: All AVS Short Course Hours: 8:30 a.m. – 5:00 p.m. – with 1.5 hour break for Lunch (Lunch not included)

NOTES

	2D Materials Focus Topic Room: 212C - Session 2D+EM+MG+NS+SE+SM+SS+TF-ThM Emergent 2D Materials **Moderators:** Paul Sheehan, Naval Research Laboratory, Feng Wang, University of California at Berkeley	Actinides and Rare Earths Focus Topic Room: 230A - Session AC+AS+MI-ThM Nuclear Power and Waste Remediation **Moderator:** David Shuh, Lawrence Berkeley National Laboratory
8:00 am	**2D+EM+MG+NS+SE+SM+SS+TF-ThM1** CVD Growth and Characterization of 2D MoS_2, $MoSe_2$, $MoTe_2$, WS_2, WSe_2, and $MoS_{2(1-x)}Se_{2x}$ Alloys, **DAVID BARROSO**, T. EMPANTE, A. NGUYEN, V. KLEE, I. LU, E. PRECIADO, C. LEE, C. HUANG, W. COLEY, S. NAGHIBI, G. VON SON, A. BROOKS, J. KIM, L. BARTELS, University of California, Riverside	**AC+AS+MI-ThM1 Invited** Applications of Synchrotron Methods to f-Element Research in the Nuclear Fuel Cycle, **MELISSA DENECKE**, The University of Manchester, UK
8:20 am	**2D+EM+MG+NS+SE+SM+SS+TF-ThM2** Investigation of Manganese Dioxide Nanosheets by STM and AFM, **LORANNE VERNISSE**, S. AFSARI, S.L. SHUMLAS, A.C. THENUWARA, D.R. STRONGIN, E. BORGUET, Temple University	Invited talk continued.
8:40 am	**2D+EM+MG+NS+SE+SM+SS+TF-ThM3 Invited** Two-Dimensional Early Transition Metal Carbides and Carbonitrides "MXenes": Synthesis, Properties and Applications, **MICHAEL NAGUIB**, Oak Ridge National Laboratory	**AC+AS+MI-ThM3 Invited** *Ab Initio* Study of Advanced Metallic Nuclear Fuels for Fast Breeder Reactors, **ALEXANDER I. LANDA**, Lawrence Livermore National Laboratory
9:00 am	Invited talk continued.	Invited talk continued.
9:20 am	**2D+EM+MG+NS+SE+SM+SS+TF-ThM5** Molecular Beam Epitaxy of Large area HfSe2($ZrSe_2$)/$MoSe_2$ van der Waals Heterostructures on AlN(0001)/Si substrates, **ATHANASIOS DIMOULAS**, P. TSIPAS, E. XENOGIANNOPOULOU, D. TSOUTSOU, K.E. ARETOULI, J. MARQUEZ-VELASCO, S.A. GIAMINI, N. KELAIDIS, NCSR DEMOKRITOS, Greece	**AC+AS+MI-ThM5** Shedding Light on Uranium Corrosion in Nuclear Waste Packages, **CHARILAOS PARASKEVOULAKOS**, University of Bristol, UK
9:40 am	**2D+EM+MG+NS+SE+SM+SS+TF-ThM6** Surface Investigation of WSe_2 Atomically Thin Film and Bulk Crystal Surfaces, **RAFIK ADDOU**, H. ZHU, University of Texas at Dallas, Y.-C. LIN, S.M. EICHFELD, J.A. ROBINSON, Penn State University, R.M. WALLACE, University of Texas at Dallas	**AC+AS+MI-ThM6** The Optical Properties of Uranium Carbide Measured by Spectroscopic Ellipsometry, **WIGBERT SIEKHAUS**, A.J. NELSON, C.K. SAW, Lawrence Livermore National Laboraatory
10:00 am	**BREAK - Complimentary Coffee in Exhibit Hall**	**BREAK - Complimentary Coffee in Exhibit Hall**
10:20 am	**BREAK - Complimentary Coffee in Exhibit Hall**	**BREAK - Complimentary Coffee in Exhibit Hall**
10:40 am	**BREAK - Complimentary Coffee in Exhibit Hall**	**BREAK - Complimentary Coffee in Exhibit Hall**
11:00 am	**2D+EM+MG+NS+SE+SM+SS+TF-ThM10** A Kinetic Study on the Adsorption of Polar (Water) and Non-Polar (Benzene) Molecules on CVD Graphene, **NILUSHNI SIVAPRAGASAM**, U. BURGHAUS, North Dakota State University	**AC+AS+MI-ThM10** Uranium Wet Oxidation in the Presence of Hydrogen Overpressure, **ANTONIOS BANOS**, University of Bristol, UK
11:20 am	**2D+EM+MG+NS+SE+SM+SS+TF-ThM11** Epitaxial Ultrathin $MoSe_2$ Layers Grown by Molecular Beam Epitaxy, **MING-WEI CHEN**, M.B. WHITWICK, O. LOPEZ-SANCHEZ, D. DUMCENCO, A. KIS, Ecole Polytechnique Fédérale de Lausanne (EPFL), Switzerland	**AC+AS+MI-ThM11** The Role of Am6p, 5f-Electrons in the Chemical Bond in AmO_2, YU.A. TETERIN, NRC "Kurchatov Institute", Russian Federation, K.I. MASLAKOV, Lomonosov Moscow State University, Russian Federation, M.V. RYZHKOV, Ural Department of RAS, Institute of Solid State Chemistry, Russian Federation, A.YU. TETERIN, K.E. IVANOV, NRC "Kurchatov Institute", Russian Federation, S.N. KALMYKOV, **V.G. PETROV**, Lomonosov Moscow State University, Russian Federation
11:40 am	**2D+EM+MG+NS+SE+SM+SS+TF-ThM12 Invited** A Two-Dimensional Oxide Quasicrystal, **S. FÖRSTER**, Institute of Physics, Martin-Luther-Universität Halle-Wittenberg, Germany, J.I. FLEGE, Institute of Physics, Univerisity of Bremen, Germany, K. MEINEL, R. HAMMER, M. TRAUTMANN, Institute of Physics, Martin-Luther-Universität Halle-Wittenberg, Germany, J. FALTA, Institute of Solid State Physics, University of Bremen, Germany, T. GREBER, Physik-Institut, University of Zürich, Switzerland, W. WIDDRA, Institute of Physics, Martin-Luther-Universität Halle-Wittenberg, Germany	**AC+AS+MI-ThM12** Resolving the Issues of 5f Covalency and Ionicity in UO2 and UF4, **JAMES TOBIN**, Lawrence Livermore National Laboratory
12:00 pm	Invited talk continued.	

Thursday Morning, October 22, 2015

	Additive Manufacturing/3D Printing Focus Topic Room: 211A - Session AM+EM+MS+TF-ThM Technologies Enabled by Additive Manufacturing/Future of Additive Manufacturing **Moderator:** Vincent Smentkowski, General Electric Global Research Center	Applied Surface Science Room: 212D - Session AS-ThM Practical Surface Analysis III: Multiple-technique Problem-solving and Structure-property Correlations **Moderators:** Michaeleen Pacholski, The Dow Chemical Company, Daniel Gaspar, Pacific Northwest National Laboratory
8:00 am	**AM+EM+MS+TF-ThM1 Invited** High Performance Additive Manufacturing (HPAM) - Direct Fabrication of Fully Functional, Mission Critical Devices, **TONY DECARMINE**, Oxford Performance Materials	**AS-ThM1** Correlation of Substrate Surface Chemistry and Roughness to Adhesion of Pressure Sensitive Adhesives, **MICHAELEEN PACHOLSKI**, T. POWELL, D. KEELY, W.B. GRIFFITH, The Dow Chemical Company
8:20 am	Invited talk continued.	**AS-ThM2** Surface and Interface Studies of Ultra-Low Wear (ULW) PTFE/Alumina Polymer Composites, **LEI ZHANG**, G.S. BLACKMAN, C.P. JUNK, L. AMSPACHER, K.G. LLOYD, J.R. MARSH, D.J. KASPRZAK, DuPont Central Research and Development
8:40 am	**AM+EM+MS+TF-ThM3 Invited** Additive Manufacturing Enabling Advanced Technologies, **TERESA CLEMENT**, Raytheon Company	**AS-ThM3** Investigation of Increased Glide Force of Prefilled Syringes Using Multiple Analytical Techniques, **XIA DONG**, Z. XIAO, C.A.J. KEMP, G.H. SHI, Eli Lilly and Company
9:00 am	Invited talk continued.	**AS-ThM4** Degradation of Polypropylene Surgical Mesh: An XPS, FTIR, and SEM Study, **BRIDGET ROGERS**, Vanderbilt University, R.F. DUNN, Polymer & Chemical Technologies, LLC., S.A. GUELCHER, Vanderbilt University
9:20 am	**AM+EM+MS+TF-ThM5 Invited** 4D Printing: Three Dimensional Printing with Material Composition as the Fourth Dimension, **DOUGLAS C. HOFMANN**, NASA Jet Propulsion Laboratory, California Institute of Technology	**AS-ThM5 Invited** ASSD 30th Anniversary Lecture: Evolution of the Nature and Application of Surface Analysis: Challenges, Pitfalls, and Opportunities Past, Present and Future, **DONALD BAER**, Pacific Northwest National Laboratory
9:40 am	Invited talk continued.	Invited talk continued.
10:00 am	**BREAK - Complimentary Coffee in Exhibit Hall**	**BREAK - Complimentary Coffee in Exhibit Hall**
10:20 am	**BREAK - Complimentary Coffee in Exhibit Hall**	**BREAK - Complimentary Coffee in Exhibit Hall**
10:40 am	**BREAK - Complimentary Coffee in Exhibit Hall**	**BREAK - Complimentary Coffee in Exhibit Hall**
11:00 am	**AM+EM+MS+TF-ThM10 Invited** The Future of Additive Manufacturing and Multifunctional Parts, **PHILL DICKENS**, University of Nottingham, UK, United Kingdom of Great Britain and Northern Ireland	**AS-ThM10 Invited** Unraveling the Dynamic Nature of Mixed-Metal Oxides Nanocatalysts: An *In Situ* Multiple-Technique Approach, **DARIO STACCHIOLA**, Brookhaven National Laboratory
11:20 am	Invited talk continued.	Invited talk continued.
11:40 am		**AS-ThM12** Correlation between Chemistry, Optical Properties, and Environmental Stability of DC Sputtered Rhenium Oxides, **NEIL MURPHY**, Air Force Research Laboratory, L. SUN, General Dynamics Information Technology, J.G. JONES, Air Force Research Laboratory, J.T. GRANT, General Dynamics Information Technology
12:00 pm		**AS-ThM13** Multi-Technique Surface Analysis of Geological Samples, Including sub-10 Micron Spectroscopic XPS Imaging, **PAUL MACK**, Thermo Fisher Scientific, UK

	Spectroscopic Ellipsometry Focus Topic Room: 112 - Session EL+EM+EN-ThM Spectroscopic Ellipsometry: Novel Applications and Theoretical Approaches **Moderators:** Tino Hofmann, University of Nebraska - Lincoln, Vimal Kamineni, Globalfoundries, Ny, Usa	Electronic Materials and Processing Room: 210E - Session EM+MS-ThM III-N Nitrides for Optoelectronic Applications **Moderators:** Rachael Myers-Ward, U.S. Naval Research Laboratory, Aubrey Hanbicki, U.S. Naval Research Laboratory
8:00 am	**EL+EM+EN-ThM1 Invited** Multi-Spectral Polarimetric Imaging and Biomedical Applications, **BERNARD DREVILLON**, A. PIERANGELO, LPICM-CNRS, Ecole Polytechnique, France	**EM+MS-ThM1** Hollow Cathode Plasma-Assisted Atomic Layer Deposition of Wurtzite InN and $In_xGa_{1-x}N$ Thin Films with Low Impurity Content, **ALI HAIDER**, S. KIZIR, C. OZGIT-AKGUN, E. GOLDENBERG, M. ALEVLI, A. KEMAL OKYAY, N. BIYIKLI, Bilkent University, Turkey
8:20 am	Invited talk continued.	**EM+MS-ThM2** Infrared Nanoscopy of Indium-rich InGaN Epilayers, **YOHANNES ABATE,** D. SEIDLITZ, N. DIETZ, Georgia State University, I. FERGUSON, Missouri University of Science and Technology
8:40 am	**EL+EM+EN-ThM3** Anisotropic Optical Properties of Rhombohedral and Tetragonal $BiFeO_3$ Phases, **DANIEL SCHMIDT**, National University of Singapore, L. YOU, Nanyang Technological University, Singapore, X. CHI, National University of Singapore, J. WANG, Nanyang Technological University, Singapore, A. RUSYDI, National University of Singapore	**EM+MS-ThM3** Surface Treatment and Characterization of InN (0001), S.P. PARK, T. KAUFMAN-OSBORN, K. SARDASHTI, University of California San Diego, S.M. ISLAM, D. JENA, University of Notre Dame, **HYUNWOONG KIM**, A.C. KUMMEL, University of California San Diego
9:00 am	**EL+EM+EN-ThM4** Temperature Dependent Structural and Optical Properties of SnO_2 Thin Film, **JUNBO GONG**, R.C. DAI, Z.P. WANG, Z.M. ZHANG, Z.J. DING, University of Science and Technology of China	**EM+MS-ThM4** State-Of-The-Art High Efficiency Thermoelectric Material: III-Nitrides as a Wide Bandgap Semiconductor, B. KUCUKGOK, N. LU, University of North Carolina at Charlotte, **NIKOLAUS DIETZ**, Georgia State University, I. FERGUSON**,** Missouri University of Science and Technology
9:20 am	**EL+EM+EN-ThM5** Determining Curvature Radius of a Curved Surface by use of Mueller Matrix Ellipsometry, **WEIQI LI**, H. JIANG, C.W. ZHANG, X.G. CHEN, S.Y. LIU, Huazhong University of Science and Technology, China	**EM+MS-ThM5 Invited** Nanofabrication of Advanced Nanophotonic Structures by Nanoimprinting, **STEFANO CABRINI**, Lawrence Berkeley National Laboratory (LBNL)
9:40 am	**EL+EM+EN-ThM6** Cavity-Enhanced Optical Hall Effect in AlInN/GaN-based HEMT Structures Detected at Terahertz Frequencies, **S. KNIGHT**, University of Nebraska-Lincoln, S. SCHÖCHE, J.A. Woollam Co. Inc., V. DARAKCHIEVA, P. KÜHNE, Linköping University, Sweden, J.-F. CARLIN, N. GRANDJEAN, Ecole Polytechnique Fédérale de Lausanne (EPFL), Switzerland, C.M. HERZINGER, J.A. Woollam Co. Inc., M. SCHUBERT, T. HOFMANN, University of Nebraska-Lincoln	Invited talk continued.
10:00 am	**BREAK - Complimentary Coffee in Exhibit Hall**	**BREAK - Complimentary Coffee in Exhibit Hall**
10:20 am	**BREAK - Complimentary Coffee in Exhibit Hall**	**BREAK - Complimentary Coffee in Exhibit Hall**
10:40 am	**BREAK - Complimentary Coffee in Exhibit Hall**	**BREAK - Complimentary Coffee in Exhibit Hall**
11:00 am	**EL+EM+EN-ThM10 Invited** Biosensor based on Imaging Ellipsometry and its Biomedical Applications, Y. NIU, **GANG JIN**, Institute of Mechanics, Chinese Academy of Sciences, China	**EM+MS-ThM10 Invited** Advanced III-Nitride Device for RF Switch Applications: A Record 2THz Fco Super-Lattice Castellated Field Effect Transistor (SLCFET) for Low Loss RF Switching, **S. GUPTA**, R. HOWELL, E. STEWART, J. PARKE, B. NECHAY, M. KING, H. CRAMER, J. HARTMAN, R. FREITAG, M. SNOOK, I. WATHUTHANTHRI, G. HENRY, K. RENALDO, Northrop Grumman ES
11:20 am	Invited talk continued.	Invited talk continued.
11:40 am	**EL+EM+EN-ThM12** Screening Breast Cancer by Joint Detection of Tumor Marker Carbohydrate Antigen 15-3 and Carbohydrate Antigen 242 with Biosensor Based on Imaging Ellipsometry, **YU NIU**, G. JIN, Institute of Mechanics, Chinese Academy of Sciences, China	**EM+MS-ThM12** Developing Periodically Oriented Gallium Nitride for Frequency Conversion, **JENNIFER HITE**, R. GOSWAMI, J.A. FREITAS, M.A. MASTRO, I. VURGAFTMAN, J.R. MEYER, U.S. Naval Research Laboratory, C.G. BROWN, University Research Foundation, F.J. KUB, S.R. BOWMAN, C.R. EDDY, JR., U.S. Naval Research Laboratory
12:00 pm	**EL+EM+EN-ThM13** Decomposition of Angle Resolved Spectroscopic Mueller Matrices from Scarabaeidae Beetles, **ROGER MAGNUSSON**, Linköping University, Sweden, R. OSSIKOVSKI, E. GARCIA-CAUREL, LPICM-CNRS, Ecole Polytechnique, France, K. JÄRRENDAHL, H. ARWIN, Linköping University, Sweden	**EM+MS-ThM13** Electronic and Optical Device Applications based on III-Nitride Films Grown by Plasma-Assisted ALD, B. TEKCAN, **SAMI BOLAT**, C. OZGIT-AKGUN, N. BIYIKLI, A.K. OKYAY, Bilkent University, Turkey

	Electronic Materials and Processing **Room: 211C - Session EM-ThM** **Interconnects II** **Moderators:** Andy Antonelli, Nanometrics, Sean King, Intel Corporation	**Helium Ion Microscopy Focus Topic** **Room: 211B - Session HI+AS+SS+NS-ThM** **Focused Ion Beam Technology (08:00-10:00)/Fundamentals of Helium Ion Microscopy (11:00-12:20)** **Moderators:** Gregor Hlawacek, Helmholtz-Zentrum Dresden - Rossendorf, Leonidas Ocola, Argonne National Laboratory
8:00 am	**EM-ThM1 Invited** John A. Thornton Memorial Award Lecture - PECVD Low and Ultralow Dielectric Constant Materials: From Invention and Research to Products, **ALFRED GRILL**, IBM Research Division, T.J. Watson Research Center	**HI+AS+SS+NS-ThM1** Ga+ Ion Beam Nanofabrication Techniques of 3D Micro- and Nano- Fluidic Devices, **LEONIDAS OCOLA**, Argonne National Laboratory
8:20 am	Invited talk continued.	**HI+AS+SS+NS-ThM2** Adding 3D to Conventional SEM or FIB Surface Imaging Information - *In situ* Surface Sensing and Nanoprofilometry for Focused Electron and Ion Beam Induced Processes Verification, **ANDRE LINDEN**, Raith America, Inc., A. RUDZINSKI, M. LEVERMANN, T. MICHAEL, Raith GmbH, E. MAYNICKE, RWTH Aachen
8:40 am	**EM-ThM3** Moving Across the Periodic Table: Amorphous Hydrogenated Boron Carbide for Low-*k* Dielectric Applications, **MICHELLE PAQUETTE**, B.J. NORDELL, T.D. NGUYEN, S.S. PUROHIT, A.N. CARUSO, University of Missouri-Kansas City, W.A. LANFORD, University at Albany-SUNY, P. HENRY, S.W. KING, Intel Corporation	**HI+AS+SS+NS-ThM3 Invited** Nanofabrication Using Gas-Assisted Focused Ion Beams, **CHAD RUE**, FEI Company
9:00 am	**EM-ThM4** Enhancing Mechanical and Fracture Properties of ULK Materials with Filled Pores, S.G. ISAACSON, Stanford University, K. LIONTI, W. VOLKSEN, T.P. MAGBITANG, IBM Almaden Research Center, **REINHOLD DAUSKARDT**, Stanford University, G. DUBOIS, IBM Almaden Research Center	Invited talk continued.
9:20 am	**EM-ThM5 Invited** Status Update on a New Class of Solution Processable Low-k Dielectric Coatings for Use as ILD with K < 2.4, **HASH PAKBAZ**, N. HACKER, SBA Materials, Z. TOKEI, M. BAKLANOV, IMEC, KU Leuven Belgium	**HI+AS+SS+NS-ThM5** The Psychology and Applications of a Bipolar Plasma Focused Ion Beam, **ROD BOSWELL**, ANU, Australia, N. SMITH, P. TESCH, N. MARTIN, Oregon Physics
9:40 am	Invited talk continued.	**HI+AS+SS+NS-ThM6** Advanced FIB Applications with New Ion Species and Large Area Capabilities, **SVEN BAUERDICK**, L. BRUCHHAUS, Raith GmbH, Germany, J. FRIDMANN, Raith America, Inc., P. MAZAROV, A. NADZEYKA, R. JEDE, Raith GmbH, Germany
10:00 am	**BREAK - Complimentary Coffee in Exhibit Hall**	**BREAK - Complimentary Coffee in Exhibit Hall**
10:20 am	**BREAK - Complimentary Coffee in Exhibit Hall**	**BREAK - Complimentary Coffee in Exhibit Hall**
10:40 am	**BREAK - Complimentary Coffee in Exhibit Hall**	**BREAK - Complimentary Coffee in Exhibit Hall**
11:00 am	**EM-ThM10** The Effect of Vacuum Ultraviolet Irradiation on TDDB of Low-K Dielectrics using Synchrotron Radiation, **DONGFEI PEI**, M. NICHOLS, University of Wisconsin-Madison, S.W. KING, J. CLARKE, Intel Corporation, Y. NISHI, Stanford University, J.L. SHOHET, University of Wisconsin-Madison	**HI+AS+SS+NS-ThM10 Invited** SIMS on the Helium Ion Microscope : a Powerful Tool for High-resolution High-sensitivity Nano-Analytics, **TOM WIRTZ**, D. DOWSETT, Luxembourg Institute of Science and Technology (LIST), Luxembourg, S. SIJBRANDIJ, Carl Zeiss Microscopy
11:20 am	**EM-ThM11** Influence of Porosity on VUV Induced Damage to Low-K Dielectrics, **FARAZ CHOUDHURY**, University of Wisconsin-Madison, J.-F. DE MARNEFFE, M. BAKLANOV, IMEC, Belgium, S.W. KING, Intel Corporation, Y. NISHI, Stanford University, J.L. SHOHET, University of Wisconsin-Madison	Invited talk continued.
11:40 am	**EM-ThM12** An Electron Paramagnetic Resonance Study of Processing Effects in Porous Low-κ Dielectrics, **MICHAEL MUTCH**, P.M. LENAHAN, Pennsylvania State University, S.W. KING, Intel Corporation	**HI+AS+SS+NS-ThM12** Nanometer TOF-RBS and TOF-SIMS in a Helium/Neon Ion Microscope, **NICO KLINGNER**, R. HELLER, G. HLAWACEK, S. FACSKO, J. VON BORANY, Helmholtz-Zentrum Dresden - Rossendorf, Germany
12:00 pm	**EM-ThM13** The Effects of VUV Radiation on Low-k Organosilicate Glass (SiCOH) as Measured with Electron-Spin Resonance, **PANPAN XUE**, H. ZHENG, W. LI, University of Wisconsin-Madison, J.-F. DE MARNEFFE, IMEC, M. BAKLANOV, IMEC, Belgium, V. AFANAS'EV, Catholic University of Leuven, Belgium, Y. NISHI, Stanford University, J.L. SHOHET, University of Wisconsin-Madison	**HI+AS+SS+NS-ThM13** Improving Pattern Fidelity in Helium Ion Beam Lithography using Pixel Dose Optimization, **NIMA KALHOR**, TU Delft, Netherlands, W. MULCKHUYSE, TNO Technical Sciences, Netherlands, P. ALKEMADE, TU Delft, Netherlands, D. MAAS, TNO Technical Sciences, Netherlands

	MEMS and NEMS Room: 210B - Session MN-ThM	Nanometer-scale Science and Technology Room: 212B - Session NS+MN-ThM
	Atomic Layer Nanostructures and 2D NEMS **Moderators:** Tse Nga (Tina) Ng, PARC (Palo Alto Research Center), a Xerox Company, Sushma Kotru, The University of Alabama	**Nanopatterning and Nanolithography/Nanoscale Mechanics** **Moderators:** Stephane Evoy, University of Alberta, Jeremy Robinson, Naval Research Laboratory
8:00 am	**MN-ThM1 Invited** Piezoelectric and Phase Change Properties of Two-Dimensional Materials, **EVAN REED**, Stanford University	**NS+MN-ThM1** Electron Stimulated Desorption and Raman Investigations of HafSOx Inorganic Resists, **RYAN FREDERICK**, G. HERMAN, Oregon State University
8:20 am	Invited talk continued.	**NS+MN-ThM2** Fundamental Limits of Material Toughening with Molecularly Confined Polymers, **SCOTT ISAACSON**, Stanford University, K. LIONTI, W. VOLKSEN, T.P. MAGBITANG, IBM Almaden Research Center, R.H. DAUSKARDT, Stanford University, G. DUBOIS, IBM Almaden Research Center
8:40 am	**MN-ThM3 Invited** Novel Graphene Devices Based on Laser-Scribing Technology, H. TIAN, **QIAN-YI XIE,** N.-Q. DENG, L.-Q. TAO, X.-F. WANG, W.-T. MI, Y.-X. LI, H.-M. ZHAO, Y.-T. LI, Y. SHU, Y. YANG, TIAN-LING REN, Tsinghua University, China	**NS+MN-ThM3 Invited** Nanomanufacturing from Silicon to DNA, **JAMES LIDDLE**, Center for Nanoscale Science and Technology, National Institute of Standards and Technology, Gaithersburg, MD 20899-6203
9:00 am	Invited talk continued.	Invited talk continued.
9:20 am	**MN-ThM5** Ultrathin Hexagonal Boron Nitride (h-BN) Nanomechanical Resonators, **XU-QIAN ZHENG**, J. LEE, P.X.-L. FENG, Case Western Reserve University	**NS+MN-ThM5** Pattern Formation by Ion Beam Sputtering on Thermally Treated Ge Surfaces Implanted with Si Ions, **ANGÉLICAGUADALUPE HERNÁNDEZ**, Y. KUDRIAVTSEV, CINVESTAV-IPN, Mexico
9:40 am	**MN-ThM6** Microfabricated MoS_2 and MoS_2/Graphene Aerogel based Sensor for NO_2 Gas Detection, **HU LONG**, University of California at Berkeley, M. WORSLEY, Lawrence Livermore National Laboratory, A. HARLEY-TROCHIMCZYK, C. CARRARO, R. MABOUDIAN, University of California at Berkeley	**NS+MN-ThM6** Poor Q-factor? - No Problem: Nano-Optomechanical Mass Sensing in Ambient Conditions, **SWAPAN ROY**, V.T.K. SAUER, A. VENKATASUBRAMANIAN, W.K. HIEBERT, University of Alberta and The National Institute for Nanotechnology, Canada
10:00 am	**BREAK - Complimentary Coffee in Exhibit Hall**	**BREAK - Complimentary Coffee in Exhibit Hall**
10:20 am	**BREAK - Complimentary Coffee in Exhibit Hall**	**BREAK - Complimentary Coffee in Exhibit Hall**
10:40 am	**BREAK - Complimentary Coffee in Exhibit Hall**	**BREAK - Complimentary Coffee in Exhibit Hall**
11:00 am		**NS+MN-ThM10 Invited** Frequency Division Using a Micromechanical Resonance Cascade, K. QALANDAR, M. SHARMA, B. GIBSON, **KIMBERLY TURNER**, University of California, Santa Barbara
11:20 am		Invited talk continued.
11:40 am		**NS+MN-ThM12 Invited** Single-Molecule Analysis with Nanomechanical Systems, **MICHAEL ROUKES**, California Institute of Technology
12:00 pm		Invited talk continued.

	Plasma Science and Technology **Room: 210A - Session PS+2D-ThM** **Plasma Processing for 2D Materials** **Moderator:** Eric Joseph, IBM T.J. Watson Research Center	**Selective Deposition as an Enabler of Self-Alignment Focus Topic** **Room: 210F - Session SD+AS+EM-ThM** **Fundamentals of Selective Deposition** **Moderators:** Scott Clendenning, Intel Corporation, Suvi Haukka, ASM Microchemistry Ltd., Finland
8:00 am	**PS+2D-ThM1 Invited** Low Pressure Plasma Cleaning and Doping of CVD Graphene, **DANIIL MARINOV**, LPP-CNRS, Ecole Polytechnique, France, G. CUNGE, LTM - CEA/LETI, France, D. FERRAH, CEA, LETI, MINATEC Campus, France, E.V. JOHNSON, LPICM-CNRS, Ecole Polytechnique, France, J.-P. BOOTH, LPP-CNRS, Ecole Polytechnique, France	**SD+AS+EM-ThM1** Fundamental Examinations of Surface Chemistry-Driven Approaches to Selective Area Atomic Layer Deposition, W. ZHANG, J.-R. CHEN, **JAMES ENGSTROM**, Cornell University
8:20 am	Invited talk continued.	**SD+AS+EM-ThM2** Mechanistic Understanding of Surface-Selective Chemical Vapor Deposition of Copper Films Using a Molecular Inhibitor, **ELHAM MOHIMI**, S. BABAR, B. TRINH, G.S. GIROLAMI, J.R. ABELSON, University of Illinois at Urbana Champaign
8:40 am	**PS+2D-ThM3** Sensing Cleanliness of PMMA Transferred CVD Grown Graphene, **CHRISTIAN TEICHERT**, M.C. KRATZER, Montanuniversität Leoben, Austria, B.C. BAYER, University of Cambridge, UK	**SD+AS+EM-ThM3 Invited** Selective Deposition of Copper-Manganese Alloy for Interconnects, **ROY GORDON**, Harvard University
9:00 am	**PS+2D-ThM4 Invited** Plasma Processes of Graphene and Related 2d Materials for Energy Applications, **INDRAJIT SHOWN**, L.-C. CHEN, National Taiwan University, Taiwan, Republic of China	Invited talk continued.
9:20 am	Invited talk continued.	**SD+AS+EM-ThM5 Invited** Selective Growth of First Row Transition Metal Films by Atomic Layer Deposition, **CHARLES WINTER**, Wayne State University
9:40 am		Invited talk continued.
10:00 am	**BREAK - Complimentary Coffee in Exhibit Hall**	**BREAK - Complimentary Coffee in Exhibit Hall**
10:20 am	**BREAK - Complimentary Coffee in Exhibit Hall**	**BREAK - Complimentary Coffee in Exhibit Hall**
10:40 am	**BREAK - Complimentary Coffee in Exhibit Hall**	**BREAK - Complimentary Coffee in Exhibit Hall**
11:00 am	**PS+2D-ThM10** Engineering Chemical Functionality in Graphene, **SANDRA HERNANDEZ**, P.E. SHEEHAN, S. TSOI, P. DEV, J.T. ROBINSON, C. JUNKERMEIER, K.E. WHITENER, W.K. LEE, T.L. REINECKE, S.G. WALTON, Naval Research Laboratory	**SD+AS+EM-ThM10** Etching and Chemical Functionalization of Silicon Nitride Surfaces for Selective Deposition, L.-H. LIU, T. PEIXOTO, W. CABRERA, D. DICK, J.-F. VEYAN, University of Texas at Dallas, D.J. MICHALAK, R. HOURANI, Intel Corporation, M.D. HALLS, Schrodinger, Inc., S.P. PUJAR, H. ZUILHOF, Wageningen University, Netherlands, **YVES J. CHABAL**, University of Texas at Dallas
11:20 am	**PS+2D-ThM11** Formation of Aromatic Nitrogen Groups in Graphene Films by Post-Growth Treatment in Late-Afterglows of Nitrogen Microwave Plasmas, **LUC STAFFORD**, Universite de Montreal, Canada	**SD+AS+EM-ThM11** Area Selective Deposition of Ultrathin Magnetic Cobalt Films via Atomic Layer Deposition, **JOHN EKERDT**, H. NALLAN, T. NGO, S. CHOPRA, Z. ZHANG, University of Texas at Austin
11:40 am	**PS+2D-ThM12** *N*-Doped Micropatterns in Graphene by Low Energy Nitrogen-Ion Irradiation, **ALESSANDRO SALA**, Elettra-Sincrotrone Trieste, Italy, G. ZAMBORLINI, Forschungszentrum Juelich GmbH, Germany, T.O. MENTES, A. LOCATELLI, Elettra-Sincrotrone Trieste, Italy	**SD+AS+EM-ThM12** Area-Selective Al_2O_3 Pattern Grown by Atomic Layer Deposition, **SEUNGGI SEO**, H. JUNG, I.K. OH, H. KIM, Yonsei University, Republic of Korea
12:00 pm		

	Surface Modification of Materials by Plasmas for Medical Purposes Focus Topic **Room: 211D - Session SM+AS+BI+PS-ThM** **Plasma Processing of Biomaterials** **Moderators:** Deborah O'Connell, University of York, UK, Satoshi Hamaguchi, Osaka University, Japan	**Scanning Probe Microscopy Focus Topic** **Room: 212A - Session SP+AS+NS+SS-ThM** **Probing Chemical Reactions at the Nanoscale** **Moderators:** Stephen Nonnenmann, University of Massachusetts - Amherst, Shengyong Qin, University of Science and Technology of China
8:00 am	**SM+AS+BI+PS-ThM1 Invited** Potential of Low Temperature Plasma Sources in Cancer Treatment, **J.-M. POUVESLE**, GREMI CNRS/Université d'Orléans, France, G. COLLET, CNRS, E. ROBERT, GREMI CNRS/Université d'Orléans, France, L. RIDOU, CNRS-CBM, France, S. DOZIAS, T. DARNY, GREMI CNRS/Université d'Orléans, France, B. EL HAFNI-RAHBI, C. KIEDA, CNRS-CBM, France	**SP+AS+NS+SS-ThM1 Invited** *In Situ* Scanning Tunneling Microscopy on Perovskite Oxide Surfaces for Oxygen Electrocatalysis, **BILGE YILDIZ**, Massachusetts Institute of Technology
8:20 am	Invited talk continued.	Invited talk continued.
8:40 am	**SM+AS+BI+PS-ThM3** Plasma Polymerized Polypyrrole Thin Films and Their Use in Drug Release Control, C. LI, National Yang Ming University, Taiwan, Republic of China, **YUNG TE LEE**, National Central University, Taiwan, Republic of China, J.H. HSIEH, Ming Chi University of Technology, Taiwan, Republic of China	**SP+AS+NS+SS-ThM3** Adsorption of Trimethyl Acetic Acid on (1x2) Reconstructed TiO_2(110), **KENNETH PARK**, K. ZHU, Y. XIA, Z. ZHANG, Baylor University
9:00 am	**SM+AS+BI+PS-ThM4** Thin Film Metallic Glass: A Novel Coating for Various Biomedical Applications, **CHIA-CHI YU**, Y. TANATSUGU, S. CHYNTARA, C.M. LEE, W. DIYATMIKA, J.P. CHU, National Taiwan University of Science and Technology, Taiwan, Republic of China, M.J. CHEN, S.H. CHANG, W.C. HUANG, Mackay Memorial Hospital Tamsui Campus, Taiwan, Republic of China	**SP+AS+NS+SS-ThM4** Anticorrelation between Surface and Subsurface Point-Defects and Influence on Redox Chemistry at TiO_2(110), **I. LYUBINETSKY**, Y. YOON, Y. DU, Pacific Northwest National Laboratory, J.C. GARCIA, Worcester Polytechnic Institute, Z. ZHU, Z.-T. WANG, N.G. PETRIK, G.A. KIMMEL, Z. DOHNALEK, M.A. HENDERSON, R. ROUSSEAU, Pacific Northwest National Laboratory, N.A. DESKINS, Worcester Polytechnic Institute
9:20 am	**SM+AS+BI+PS-ThM5 Invited** Plasma Surface Functionalization of Nano-structured Materials for Biomedical Applications, **M. NAGATSU**, H. CHOU, A. VISWAN, T. ABUZAIRI, M. OKADA, M.A. CIOLAN, Shizuoka University, Japan, N.R. POESPAWATI, R.W. PURNAMANINGSIH, University of Indonesia, A. SAKUDO, University of the Ryukyus, Japan, S. BHATTACHARJEE, Indian Institute of Technology, Kanpur, India	**SP+AS+NS+SS-ThM5** Dissociation of Water on Oxygen Pre-Covered Cu(110) Observed with Scanning Tunneling Microscopy, **ZONGQIANG PANG**, Lawrence Berkeley National Laboratory (LBNL)
9:40 am	Invited talk continued.	**SP+AS+NS+SS-ThM6** Probing Local Electrochemical Activity within Yttria-Stabilized-Zirconia *via In Situ* High-Temperature Atomic Force Microscopy, **JIAXIN ZHU**, University of Massachusetts - Amherst, C. PEREZ, T. OH, R. KUNGAS, J. VOHS, D. BONNELL, University of Pennsylvania, S.S. NONNENMANN, University of Massachusetts - Amherst
10:00 am	**BREAK - Complimentary Coffee in Exhibit Hall**	**BREAK - Complimentary Coffee in Exhibit Hall**
10:20 am	**BREAK - Complimentary Coffee in Exhibit Hall**	**BREAK - Complimentary Coffee in Exhibit Hall**
10:40 am	**BREAK - Complimentary Coffee in Exhibit Hall**	**BREAK - Complimentary Coffee in Exhibit Hall**
11:00 am	**SM+AS+BI+PS-ThM10 Invited** Tailoring Biomaterials-cell Interaction through Reactive Surface Modification, **SALVADOR BORROS**, Institut Químic de Sarrià, Ramon Llull University, Barcelona, Spain	**SP+AS+NS+SS-ThM10 Invited** Probing the Structure and Dynamic Behaviors of Ferroelectric Domain Walls with Atomic Resolution in Real Time, **XIAOQING PAN**, University of California, Irvine
11:20 am	Invited talk continued.	Invited talk continued.
11:40 am	**SM+AS+BI+PS-ThM12** Analysis of Amino Group Formation on Polystyrene Surfaces by Nitrogen-Hydrogen-Based Plasma Irradiation, **KENSAKU GOTO**, D. ITSUKI, M. ISOBE, S. SUGIMOTO, S. MIYAMOTO, A. MYOUI, H. YOSHIKWA, S. HAMAGUCHI, Osaka University, Japan	
12:00 pm	**SM+AS+BI+PS-ThM13** Tailoring the Surface Properties of Three-Dimensional, Porous Polymeric Constructs for Biomedical Applications Using Plasma Processing, **MORGAN HAWKER**, A. PEGALAJAR-JURADO, E.R. FISHER, Colorado State University	

	Surface Science Room: 113 - Session SS+AS+EM+EN-ThM Semiconductor Surfaces and Interfaces - I **Moderator:** Yves J. Chabal, University of Texas at Dallas	Thin Film Room: 111 - Session TF+AS+NS+SA-ThM Thin Film: Growth and Characterization, Optical and Synchrotron Characterization I **Moderators:** Divine Kumah, North Carolina State University
8:00 am	**SS+AS+EM+EN-ThM1** Reaction of 1,2,3-Benzenetriol with the Ge(100)-2x1 Surface, **TANIA SANDOVAL**, S.F. BENT, Stanford University	**TF+AS+NS+SA-ThM1 Invited** Oxynitride Thin Films by Reactive Radiofrequence Magnetron Sputtering - Versatile Materials for Optical Applications, **ANGELIQUE BOUSQUET**, A. FARHAOUI, F. ZOUBIAN, C. TAVIOT-GUEHO, J. CELLIER, E. TOMASELLA, Institut de Chimie de Clermont-Ferrand, France
8:20 am	**SS+AS+EM+EN-ThM2** Ethylenediamine Grafting on Oxide-free H-, F-, and Cl- terminated Si(111) Surfaces, **TATIANA P. CHOPRA***, R.C. LONGO, K.J. CHO, University of Texas at Dallas, M.D. HALLS, Schrodinger, Inc., P. THISSEN, Karlsruhe Institute of Technology, Germany, Y.J. CHABAL, University of Texas at Dallas	Invited talk continued.
8:40 am	**SS+AS+EM+EN-ThM3** Reaction of Phenylhydrazine with Cl-Si(111) Surface by Wet Chemistry and with Clean Silicon Surface in UHV, A.V. TEPLYAKOV, **FEI GAO**, University of Delaware	**TF+AS+NS+SA-ThM3 Invited** Surface Science in The Wild: Using Synchrotron Radiation and Lab Grown Thin Films to Understand The Behavior Of SiC in Accident Tolerant Nuclear Fuels, **JEFFERY TERRY**, Illinois Institute of Technology
9:00 am	**SS+AS+EM+EN-ThM4** Anomalously Low Surface Recombination Velocity for Fluorine Terminated Nanopatterned Si Surfaces, W.N. PENG, **JONGHAN PARK**, L.-H. LIU, R.C. LONGO, University of Texas at Dallas, D.J. MICHALAK, Intel Corporation, D.M. PAK, Y.J. LEE, J.X. HSU, K.J. CHO, Y.J. CHABAL, University of Texas at Dallas	Invited talk continued.
9:20 am	**SS+AS+EM+EN-ThM5 Invited** Molecular Functionalization of Semiconductor Surfaces: From Single Crystals to Quantum Dots, **STACEY BENT**, Stanford University	**TF+AS+NS+SA-ThM5** iTF Modulus Solution with xProbe Applications for Ultra-thin Film Systems (<=10nm), **ANQI QIU**, A. ROMANO, Hysitron, Inc.
9:40 am	Invited talk continued.	**TF+AS+NS+SA-ThM6** Real-time Study of Plasma Enhanced Atomic Layer Epitaxy of InN Films by Synchrotron X-ray Methods, **NEERAJ NEPAL**, V. ANDERSON, S.D. JOHNSON, B. DOWNEY, D. MEYER, U.S. Naval Research Laboratory, A. DEMASI, K.F. LUDWIG, Boston University, C. EDDY, U.S. Naval Research Laboratory
10:00 am	**BREAK - Complimentary Coffee in Exhibit Hall**	**BREAK - Complimentary Coffee in Exhibit Hall**
10:20 am	**BREAK - Complimentary Coffee in Exhibit Hall**	**BREAK - Complimentary Coffee in Exhibit Hall**
10:40 am	**BREAK - Complimentary Coffee in Exhibit Hall**	**BREAK - Complimentary Coffee in Exhibit Hall**
11:00 am	**SS+AS+EM+EN-ThM10** Periodic Trends in the Hydrogen Elimination Thermal Decomposition Reaction on Si(100)-2×1: Linear and Branched Alkyl Halides, Alcohols, and Amines, **ANDREW POHLMAN**, K.L. ROMOLINO, N.J. BURGENER, S.M. CASEY, University of Nevada	**TF+AS+NS+SA-ThM10** Nucleation and Growth of Few-Layer ALD Films on Various Substrates Studied by Low Energy Ion Scattering (LEIS), **MALCOLM HATHAWAY**, Harvard University, T. GREHL, P. BRUENER, ION-TOF GmbH, Germany, M. FARTMANN, Tascon GmbH, Germany, H. BRONGERSMA, ION-TOF GmbH, Germany
11:20 am	**SS+AS+EM+EN-ThM11** Diffusion of Arsenic Oxides During the Atomic Layer Deposition of Metal Oxide Films on GaAs(100) Surfaces, **ALEX HENEGAR**, T. GOUGOUSI, University of Maryland, Baltimore County	**TF+AS+NS+SA-ThM11** $Ni_{1-x}Pt_xSi$ Film Characterization for sub-32 nm CMOS Fabrication, **SURAJ PATIL**, R. RAI, S. BEASOR, L. ZHOU, GLOBALFOUNDRIES, NY, USA
11:40 am	**SS+AS+EM+EN-ThM12** Ultrafast Non-Equilibrium Effects in Ti Overlayers on P-Type GaAs(100) Investigated by Femtosecond XUV Photoemission Spectroscopy, **MIHAI E. VAIDA**, University of California, Berkeley, S.R. LEONE, University of California, Berkeley and Lawrence Berkeley National Laboratory	**TF+AS+NS+SA-ThM12** Growth of β-Tungsten Films Towards a Giant Spin Hall Effect Logic Device, **AVYAYA NARASIMHAM**, University at Albany-SUNY, R.J. MATYI, State University of New York, A. GREEN, University at Albany-SUNY, A.C. DIEBOLD, V. LABELLA, State University of New York
12:00 pm	**SS+AS+EM+EN-ThM13** Improving the Quality of p-type AlGaN Layers by Reactive-ion Etching, **JOY MCNAMARA**, K.L. PHUMISITHIKUL, A.A. BASKI, M.A. RESHCHIKOV, Virginia Commonwealth University, J. MARINI, F. SHAHEDIPOUR-SANDVIK, SUNY Polytechnic Institute	**TF+AS+NS+SA-ThM13** Aluminum Nitride Grown by Atomic Layer Epitaxy Characterized with Real-Time Grazing Incidence Small Angle X-ray Scattering, **VIRGINIA ANDERSON**, N. NEPAL, S.D. JOHNSON, US Naval Research Laboratory, A. DEMASI, Boston University, J.K. HITE, US Naval Research Laboratory, K.F. LUDWIG, Boston University, C.R. EDDY, JR, US Naval Research Laboratory

*** Morton S. Traum Award Finalist**

	Thin Film Room: 114 - Session TF+EM+NS+PS+SM-ThM **Plasma ALD and Nano-applications** **Moderators:** Christophe Vallee, LTM, Univ. Grenoble Alpes, CEA-LETI, Richard Vanfleet, Brigham Young University	Tribology Focus Topic Room: 230B - Session TR+TF-ThM **Nanolubricants and Coatings** **Moderator:** Tevis Jacobs, University of Pittsburgh
8:00 am	**TF+EM+NS+PS+SM-ThM1 Invited** Atomic Layer Deposition of Silicon Dielectrics: Precursors, Processes, and Plasmas, **DENNIS HAUSMANN**, Lam Research Corporation	**TR+TF-ThM1 Invited** Mechanical Mixing and Wear Formation in Metallic Tribocouples, **M. DIENWIEBEL**, P. STOYANOV, T. FESER, Karlsruhe Institut for Technology (KIT), Germany, R. MERZ, Insitut für Oberflächen und Schichtanalytik GmbH, Germany, P. ROMERO, Fraunhofer Institute for Mechanics of Materials IWM, Germany, F.C. WÄHLISCH, INM - Leibniz-Institute for New Materials, Germany, P. STEMMER, University of Duisburg-Essen, Germany, M. MOSELER, Fraunhofer Institute for Mechanics of Materials IWM, Germany, R. BENNEWITZ, INM - Leibniz-Institute for New Materials, Germany, A. FISCHER, University of Duisburg-Essen, Germany
8:20 am	Invited talk continued.	Invited talk continued.
8:40 am	**TF+EM+NS+PS+SM-ThM3 Invited** ALD Dielectrics for Power Electronics, **VEENA MISRA**, NCSU	**TR+TF-ThM3** Influence of MoDTC Degradation on Tribological Performances of Steel-Steel Contacts under Boundary Lubrication Conditions, **CLOTILDE MINFRAY**, M. DE FEO, M.I. DE BARROS BOUCHET, Ecole Centrale de Lyon - LTDS, France, B. THIEBAUT, Solaize Research Center, France, T. LE MOGNE, B. VACHER, J.M. MARTIN, Ecole Centrale de Lyon - LTDS, France
9:00 am	Invited talk continued.	**TR+TF-ThM4** Study of Properties on Bearings Coated with Tungsten Doped Diamond-Like Carbon Films, **RUIJUN WANG**, Chinese Academy of Agricultural Mechanization Sciences bv, China
9:20 am	**TF+EM+NS+PS+SM-ThM5** $Pb(Zr_xTi_{1-x})O_3$ Magnetoelectric Tunnel Junctions for Magnetoelectric RAM (MeRAM) Memory Applications, D. CHIEN, X. LI, K. WONG, P. KHALILI, K. WANG, **JANE P. CHANG**, University of California at Los Angeles	**TR+TF-ThM5 Invited** General Model for Tribology of Metallic Contacts, **MICHAEL CHANDROSS**, Sandia National Laboratories, S. CHENG, Virginia Tech, N. ARGIVAY, Sandia National Laboratories
9:40 am	**TF+EM+NS+PS+SM-ThM6** Plasma-Assisted ALD of High-Quality Molybdenum Oxide Films, **MARTIJN VOS**, B. MACCO, N.F.W. THISSEN, A.A. BOL, W.M.M. KESSELS, Eindhoven University of Technology, Netherlands	Invited talk continued.
10:00 am	**BREAK - Complimentary Coffee in Exhibit Hall**	**BREAK - Complimentary Coffee in Exhibit Hall**
10:20 am	**BREAK - Complimentary Coffee in Exhibit Hall**	**BREAK - Complimentary Coffee in Exhibit Hall**
10:40 am	**BREAK - Complimentary Coffee in Exhibit Hall**	**BREAK - Complimentary Coffee in Exhibit Hall**
11:00 am	**TF+EM+NS+PS+SM-ThM10 Invited** Status and Prospects of Plasma-Assisted Atomic Layer Deposition, **HARM KNOOPS**, Oxford Instruments Plasma Technology, UK, W.M.M. KESSELS, Eindhoven University of Technology, Netherlands	**TR+TF-ThM10** Ageing Kinetics and Stick Slip Movement in Naoparticle Friction, **DIRK DIETZEL**, M. FELDMANN, A. SCHIRMEISEN, Justus Liebig University Giessen, Germany
11:20 am	Invited talk continued.	**TR+TF-ThM11** Superlubric Sliding of Gold Nanoparticles on Graphite under Ambient Conditions, E. CIHAN, **MEHMET Z. BAYKARA**, Bilkent University, Turkey
11:40 am	**TF+EM+NS+PS+SM-ThM12** A Novel Plasma-Enhanced ALD Process for HfO_2 using $HfCp(NMe_2)_3$ and O_2 Plasma, **AKHIL SHARMA**, V. LONGO, A.A. BOL, W.M.M. KESSELS, Eindhoven University of Technology, The Netherlands	**TR+TF-ThM12** An Atomistic Investigation of Tribological Performance of Solvated Nanodiamonds, **FARSHAD SABERI-MOVAHED**, D. BRENNER, North Carolina State University, O.A. SHENDEROVA, International Technology Center
12:00 pm	**TF+EM+NS+PS+SM-ThM13** Conductive Hafnium Nitride Layers By Plasma-Assisted Atomic Layer Deposition, **SAURABH KARWAL**, B.L. WILLIAMS, W.M.M. KESSELS, M. CREATORE, Eindhoven University of Technology, The Netherlands	**TR+TF-ThM13** Monitoring the Gas-Phase Products of a Shear-Induced Reactions in Ultra-high Vacuum, **HEATHER ADAMS**, University of Wisconsin-Milwaukee, M.T. GARVEY, Illinois Applied Research Institute, O. FURLONG, Universidad Nacional de San Luis, Argentina, W.T. TYSOE, University of Wisconsin-Milwaukee

NOTES

	2D Materials Focus Topic Room: 212C - Session 2D+EM+MG+NS+SS+TF-ThA	Additive Manufacturing/3D Printing Focus Topic Room: 211A - Session AM+EM+MS+TF-ThA
	Heterostructures of 2D Materials **Moderators:** Stefan Förster, Martin-Luther-Universität Halle-Wittenberg, Michael Naguib, Oak Ridge National Laboratory	**Additive Fabrication for Electronic Devices and Systems** **Moderators:** Jim Fitz-Gerald, University of Virginia, Gregory Whiting, Palo Alto Research Center
2:20 pm	**2D+EM+MG+NS+SS+TF-ThA1** Dielectrics Layer Deposition on 2D Materials by Functionalization with Polar Titanyl Phthalocyanine, **JUNHONG PARK**, UC San Diego, S. FATHIPOUR, University of Notre Dame, I.J. KWAK, UC San Diego, H.C.P. MOVVA, UT-Austin, S. VISHWANATH, H. XING, Cornell University, S.K. BANERJEE, UT-Austin, A.C. SEABAUGH, University of Notre Dame, A.C. KUMMEL, University of California at San Diego	**AM+EM+MS+TF-ThA1 Invited** Additive Printing for Flexible Electronic Devices, A.C. PIERRE, **ANA CLAUDIA ARIAS**, University of California at Berkeley
2:40 pm	**2D+EM+MG+NS+SS+TF-ThA2** Direct Probing of the Electronic Structure of Bilayer Homo- and Hetero-Structures and Tracking their Evolution with Interlayer Twist-Angle, **NADER ZAKI**, P. YEH, W. JIN, R.M. OSGOOD, JR., Columbia University	Invited talk continued.
3:00 pm	**2D+EM+MG+NS+SS+TF-ThA3 Invited** *In Situ* Microscopy on 2D Materials: Heterostructures, Nanostructures, Novel Materials Systems, **PETER SUTTER**, University of Nebraska - Lincoln	**AM+EM+MS+TF-ThA3 Invited** Digital Microassembly for High-performance Printed Electronics, **EUGENE CHOW**, J.P. LU, G.L. WHITING, D.K. BIEGELSEN, S. RAYCHAUDHURI, A.R. VÖLKEL, J. VERES, P. MAEDA, I. MATEI, S. NELATURI, L.S. CRAWFORD, Palo Alto Research Center (PARC)
3:20 pm	Invited talk continued.	Invited talk continued.
3:40 pm		
4:00 pm	**2D+EM+MG+NS+SS+TF-ThA6** Direct Growth of Graphene/h-BN(0001) Multilayer Heterostructures for Novel Device Applications, S. DRIVER, D. BEATTY, B. OLANIPEKUN, S. REID, **JEFFRY KELBER**, University of North Texas	**AM+EM+MS+TF-ThA6 Invited** 3D Printed Bionic Nanomaterials, **MICHAEL MCALPINE**, University of Minnesota
4:20 pm	**2D+EM+MG+NS+SS+TF-ThA7** Al_2O_3 on Black Phosphorus by Atomic Layer Deposition: An *in situ* Interface S tudy, **HUI ZHU**, S. MCDONNELL, X. QIN, A. AZCATL, L. CHENG, R. ADDOU, J. KIM, UT-Dallas, P.D. YE, Purdue University, R.M. WALLACE, UT-Dallas	Invited talk continued.
4:40 pm	**2D+EM+MG+NS+SS+TF-ThA8** Topological Winding Number Change and Broken Inversion Symmetry in a Hofstadter's Butterfly, **MARC BOCKRATH**, UC Riverside	
5:00 pm	**2D+EM+MG+NS+SS+TF-ThA9** Compliant Substrate Epitaxy: Au on MoS_2, **YUZHI ZHOU**, C. DARYL, UC Berkeley	
5:20 pm	**2D+EM+MG+NS+SS+TF-ThA10 Invited** Direct Synthesis of 2D van der Waals Heterostructures, **JUDY CHA**, Yale University	
5:40 pm	Invited talk continued.	

	Applied Surface Science Room: 212D - Session AS+SS-ThA **Advances in 2D Chemical Mapping and Data Analysis** **Moderators:** Kathryn Lloyd, DuPont Corporate Center for Analytical Sciences, Svitlana Pylypenko, Colorado School of Mines	Spectroscopic Ellipsometry Focus Topic Room: 112 - Session EL+AS+BI+EM-ThA **Optical Characterization of Nanostructures and Metamaterials** **Moderators:** Bernard Drevillon, LPICM-CNRS, Ecole Polytechnique, France, Mathias Schubert, University of Nebraska - Lincoln
2:20 pm	**AS+SS-ThA1 Invited** ASSD 30th Anniversary Lecture: Why Do (or Don't) People use Chemical State XPS Imaging?, **JULIA FULGHUM**, K. ARTYUSHKOVA, University of New Mexico, A. BARLOW, P. CUMPSON, Newcastle University, UK	**EL+AS+BI+EM-ThA1** Electrostatic Coating with Ligandless Copper Nanoparticles, **LANCE HUBBARD**, A.J. MUSCAT, University of Arizona
2:40 pm	Invited talk continued.	**EL+AS+BI+EM-ThA2** Using Plasmonic Effects to Design Ellipsometric Targets with Sub-Angstrom Resolution, **SAMUEL O'MULLANE**, SUNY Polytechnic Institute, J. RACE, N. KELLER, Nanometrics, A.C. DIEBOLD, SUNY Polytechnic Institute
3:00 pm	**AS+SS-ThA3** X-ray Photoelectron Spectromicroscopy: Combining Spectral and Spatial Information for Materials Characterization, **ADAM ROBERTS**, Kratos Analytical Limited, UK, N. FAIRLEY, Casa Softaware Ltd, UK, J.R. MORA, University of Durham, UK	**EL+AS+BI+EM-ThA3** Enhanced Temperature Stability of Slanted Columnar Thin Films by ALD Overcoating, **ALYSSA MOCK**, D. SEKORA, T. HOFMANN, E. SCHUBERT, M. SCHUBERT, University of Nebraska - Lincoln
3:20 pm	**AS+SS-ThA4** Optimizing XPS Imaging Acquisition, **JON TREACY**, C. DEEKS, P. MACK, T.S. NUNNEY, Thermo Fisher Scientific, UK	**EL+AS+BI+EM-ThA4** Vector Magneto-Optical Generalized Ellipsometry on Heat Treated Sculptured Thin Films: A Study of the Effects of Al_2O_3 Passivation Coatings on Magneto-Optical Properties, **CHAD BRILEY**, A. MOCK, University of Nebraska-Lincoln, D. SCHMIDT, National University of Singapore, T. HOFMANN, E. SCHUBERT, M. SCHUBERT, University of Nebraska-Lincoln
3:40 pm	**BREAK**	**BREAK**
4:00 pm	**AS+SS-ThA6 Invited** Enhancing Chemical Contrast: Latest Trends in Hyperspectral Image Analysis, **BARRY WISE**, W. WINDIG, Eigenvector Research, Inc.	**EL+AS+BI+EM-ThA6 Invited** Spectroscopic Ellipsometry for Critical Dimensions Analysis, **VIMAL KAMINENI**, GLOBALFOUNDRIES, D. DIXIT, S. O'MULLANE, SUNY Polytechnic Institute, G. IDDAWELA, A. VAID, GLOBALFOUNDRIES, A.C. DIEBOLD, SUNY Polytechnic Institute
4:20 pm	Invited talk continued.	Invited talk continued.
4:40 pm	**AS+SS-ThA8** Unambiguous Molecular Identification with TOF-SIMS Imaging MS/MS, G.L. FISHER, J.S. HAMMOND, Physical Electronics USA, R.M.A. HEEREN, Maastricht University, The Netherlands, **SCOTT BRYAN**, Physical Electronics USA	**EL+AS+BI+EM-ThA8** Structural and Ellipsometric Analysis of the Topological Insulator Bi_2Se_3, **AVERY GREEN**, SUNY Polytechnic Institute
5:00 pm	**AS+SS-ThA9** Utilizing Chemical State Mapping to Reveal Spatially Distributed Dynamics in Model Nanostructured Battery Electrodes, **ALEXANDER PEARSE***, E. GILLETTE, S.B. LEE, G.W. RUBLOFF, University of Maryland, College Park	**EL+AS+BI+EM-ThA9** Visible Luminescence in the VLS Grown Self Ga Doped ZnS Nanostructures, **ARSHAD BHATTI**, H. HUSSAIN, M.A. JOHAR, S. REHMAN, M.A. SHEHZAD, M.A. HAFEEZ, COMSATS Institute of Information Technology, Pakistan
5:20 pm	**AS+SS-ThA10** Microstructural and Chemical Mapping of Discharged Hybrid CF_x–SVO Cathodes from Primary Li Batteries, D. REIFSNYDER HICKEY, University of Minnesota, **JEFFREY FENTON**, K. CHEN, P. YUREK, J. LESSER, G. JAIN, Medtronic plc	**EL+AS+BI+EM-ThA10** The Lateral Distribution of Optical Properties of Chalcogenide Glasses Measured by Spectroscopic Imaging Ellipsometry, **GREG HEARN**, Accurion Inc., P.H. THIESEN, CH. RÖLING, Accurion GmbH, Germany, A. MESHALKIN, E. ACHIMOVA, A. PRISACAR, G. TRIDUH, Academy of Sciences, Republic of Moldova
5:40 pm	**AS+SS-ThA11** A Novel Test Sample for the Spatially Resolved Quantification of Illicit Drugs on Fingerprints using Imaging Mass Spectrometry, **SHIN MURAMOTO**, T.P. FORBES, NIST, A.C. VAN ASTEN, Netherlands Forensic Institute, G. GILLEN, NIST	**EL+AS+BI+EM-ThA11** Can Front-Surface Metal Mirrors Be Protected from Oxidation by Vacuum Applied Polymer Films?, **DAVID ALLRED**, R.S. TURLEY, Brigham Young University, R.T. PERKINS, Utah Valley University

* **ASSD Student Award Finalist**

	Electronic Materials and Processing Room: 211C - Session EM+EN-ThA **Materials for Light Management** **Moderators:** Michael Filler, Georgia Institute of Technology, Sang M. Han, University of New Mexico	Electronic Materials and Processing Room: 210E - Session EM+MS-ThA **III-N Nitrides II** **Moderators:** Nikolaus Dietz, Georgia State University, Necmi Biyikli, Bilkent University, Institute of Materials Science and Nanotechnology, Bilkent, Ankara 06800 Turkey
2:20 pm	**EM+EN-ThA1 Invited** III-V Nanowires for Photonics and Solar Energy Applications, **ANNA FONTCUBERTA I MORRAL**, EPFL, Switzerland	**EM+MS-ThA1 Invited** Accelerating Adoption of Wide Band Gap Semiconductors though Manufacturing Innovation, **JOHN MUTH**, North Carolina State University
2:40 pm	Invited talk continued.	Invited talk continued.
3:00 pm	**EM+EN-ThA3** Formation of Wurtzite Phase by Si Doping and its Effect on the Optical Properties of GaAs Nanowires grown on Si Substrates by a Catalyst-free MBE-VLS Technique, **MARINA NAKANO**, K. SUGIHARA, D. OHORI, K. SAKAI, Univ. of Miyazaki, Japan, H. AMANO, Y. HONDA, Univ. of Nagoya, Japan, T. IKARI, A. FUKUYAMA, Univ. of Miyazaki, Japan	**EM+MS-ThA3 Invited** InGaN/GaN Nanostructures for Efficient Light Emission and White Light Emitting Diodes, Y. NAKAJIMA, **P. DANIEL DAPKUS**, Y. LIN, University of Southern California
3:20 pm	**EM+EN-ThA4** Nanowire Enabled 3-Dimensional Band Engineering for Efficient Next Generation Solar Cells, **ESTHER ALARCON LLADO**, Ecole Polytechnique Fédérale de Lausanne (EPFL), Switzerland, O. DEMICHEL, Universite de Bourgogne, France, A. FONCTUBERTA I MORRAL, Ecole Polytechnique Fédérale de Lausanne (EPFL), Switzerland	Invited talk continued.
3:40 pm	**BREAK**	**BREAK**
4:00 pm	**EM+EN-ThA6** Effect of Internal Electric Field on the Miniband formation of Multi Quantum Well Solar Cell Structures Investigated by a Photoreflectance and a Photothermal Spectroscopy, **TSUBASA NAKAMURA**, K. MATSUOCHI, T. MURAKAMI, H. SUZUKI, University of Miyazaki, Japan, K. TOPRASERTPONG, M. SUGIYAMA, Y. NAKANO, The University of Tokyo, Japan, T. IKARI, A. FUKUYAMA, University of Miyazaki, Japan	**EM+MS-ThA6** Tuning Bandgap Through Cation Ordering in New PV Materials, **STEVE DURBIN**, R.A. MAKIN, N. FELDBERG, Western Michigan University, J.P. MATHIS, N. SENABULYA, R. CLARKE, University of Michigan
4:20 pm	**EM+EN-ThA7 Invited** Controlling Light Absorption with Nanophotonics, **VIVIAN FERRY**, University of Minnesota	**EM+MS-ThA7** Comparison Studies of GaN Grown with Trimethylgallium and Triethylgallium for Optoelectronic Applications, **MUSTAFA ALEVLI**, Marmara University, Turkey, A. HAIDER, Bilkent University, Turkey, N. GUNGOR, Marmara University, Turkey, S. KIZIR, S. ALKIS, A.K. OKYAY, N. BIYIKLI, Bilkent University, Turkey
4:40 pm	Invited talk continued.	**EM+MS-ThA8** Growth Control of InGaN Alloys and Nanostructures by Migration-Enhanced, Plasma-Assisted MOCVD, **DANIEL SEIDLITZ**, I. SENEVIRATHNA, Y. ABATE, N. DIETZ, Georgia State University, A. HOFFMANN, Technical University Berlin, Germany
5:00 pm	**EM+EN-ThA9** Investigation and Manipulation of Plasmonic Modes in a Nanoparticle-Mediated Ultra-Thin Absorber/Metal Thin Film System, **BINXING YU**, J. WOO, M. KONG, D. O'CARROLL, Rutgers, the State University of New Jersey	**EM+MS-ThA9** Transition Metals Ion Implantation into AlInN/GaN Thin Films, **ABDUL MAJID**, University of Gujrat, Pakistan, J.J. ZHU, Chinese Academy of Science, China
5:20 pm	**EM+EN-ThA10** Symmetry-Breaking in Periodic Nanostructures for Enhanced Light Trapping in Organic Solar Cells, **SEOK JUN HAN**, S. GHOSH, O.K. ABUDAYYEH, E.J. MARTIN, J.K. GREY, S.M. HAN, S.E. HAN, University of New Mexico	**EM+MS-ThA10** Plasma Enhanced Atomic Layer Deposition of Al_2O_3 on AlGaN/GaN High Electron Mobility Transistors, **XIAOYE QIN**, R.M. WALLACE, University of Texas at Dallas
5:40 pm	**EM+EN-ThA11** Symmetry-Breaking in Light-Trapping Nanostructures on Silicon, **SANG EON HAN**, S.J. HAN, S. GHOSH, T. CAI, B. HOARD, S.M. HAN, University of New Mexico	**EM+MS-ThA11** GaN on Rare-earth Oxide Buffer –A New Player in GaN-on-Si Technology, **RYTIS DARGIS**, A. CLARK, Translucent Inc.

	Helium Ion Microscopy Focus Topic Room: 211B - Session HI+AS+NS-ThA **Imaging and Milling with He and Ne Ion Beams** **Moderators:** Richard Livengood, Intel Corporation, John A. Notte, Carl Zeiss Microscopy	Plasma Science and Technology Room: 210B - Session PS+AP+SE-ThA **Advanced Ion Implantation and Plasma Doping** **Moderator:** Aseem K. Srivastava, Applied Materials, Inc.
2:20 pm	**HI+AS+NS-ThA1 Invited** Focused Ion Beam Circuit Edit in the Nano-Device Age: A Search for the Ultimate Nano-Ion Beam, **SHIDA TAN**, Intel Corporation	**PS+AP+SE-ThA1 Invited** Evolutionary Trends in Ion Implantation, **ANTHONY RENAU**, Applied Materials, Varian Semiconductor Equipment
2:40 pm	Invited talk continued.	Invited talk continued.
3:00 pm	**HI+AS+NS-ThA3** Electrical Nano-Patterning of Graphene Film by Helium Ion Beam Irradiation, **SHINICHI OGAWA**, T. IIJIMA, Y. NAITOU, AIST, Japan	**PS+AP+SE-ThA3 Invited** Conformal Arsenic Doping using a Radial Line Slot Antenna Microwave Plasma Source, **HIROKAZU UEDA**, Tokyo Electron Limited, Japan, P. VENTZEK, Tokyo Electron America, Inc., M. OKA, Y. KOBAYASHI, Y. SUGIMOTO, Tokyo Electron Ltd., T. NOZAWA, Tokyo Electron Ltd., Japan, S. KAWAKAMI, Tokyo Electron Ltd.
3:20 pm	**HI+AS+NS-ThA4** Nanopores in Silicon Nitride Membranes, Graphene and CNM: Milling and Imaging Techniques at the Helium Ion Microscope, **DANIEL EMMRICH**, E. MARSCHEWSKI, Bielefeld University, Germany, A. NADZEYKA, F. NOUVERTNÉ, Raith GmbH, Germany, A. GÖLZHÄUSER, A. BEYER, Bielefeld University, Germany	Invited talk continued.
3:40 pm	**BREAK**	**BREAK**
4:00 pm	**HI+AS+NS-ThA6 Invited** Application of Focused Helium Ion Beams for Direct-write Lithography of Superconducting Electronics, **SHANE CYBART**, University of California San Diego	**PS+AP+SE-ThA6 Invited** Practical Application of Atom Probe to Analysis of Ion Implantation, **TY PROSA**, CAMECA Instruments Inc.
4:20 pm	Invited talk continued.	Invited talk continued.
4:40 pm	**HI+AS+NS-ThA8** A Novel Efficient Approach for Investigating the Ion Implantation Effect on Small Volume Copper, **ZHANG-JIE WANG**, Xi'an Jiaotong University, China, F.I. ALLEN, University of California, Berkeley, Z.W. SHAN, Xi'an Jiaotong University, China, P. HOSEMANN, University of California, Berkeley	**PS+AP+SE-ThA8** Optical Emission Spectroscopy to Determine Plasma Parameters in an Oxygen Inductively Coupled Plasma, **NATHANIEL LY**, J. BOFFARD, C.C. LIN, A.E. WENDT, University of Wisconsin - Madison, S. RADOVANOV, H. PERSING, A. LIKHANSKII, Applied Materials, Inc.
5:00 pm	**HI+AS+NS-ThA9** Helium Ion Microscopy Analysis of Itokawa Asteroid Particles Obtained from Hayabusa Mission, **VAITHIYALINGAM SHUTTHANANDAN**, Pacific Northwest National Laboratory, R.C. OGLIORE, K. NAGASHIMA, University of Hawai`i at Manoa	**PS+AP+SE-ThA9** Adhesion Improvement of Carbon Nitride Coatings on Steel Surfaces by Metal Ion Implantation using HiPIMS, **KONSTANTINOS BAKOGLIDIS**, G. GRECZYNSKI, S. SCHMIDT, L. HULTMAN, Linkoping University, Sweden
5:20 pm	**HI+AS+NS-ThA10** Multi-Beam Ion Microscopy and Nanofabrication at UC Berkeley, **F.I. ALLEN**, UC Berkeley, Lawrence Berkeley National Laboratory (LBNL), Biomolecular Nanotechnology Center/QB3, P. LUM, Biomolecular Nanotechnology Center/QB3, T.C. PEKIN, UC Berkeley and LBNL, Z.J. WANG, UC Berkeley and Xi'an Jiaotong University, Republic of China, R. THAYER, UC Berkeley, J. HONG, UC Berkeley and LBNL, A.A. OMRANI, UC Berkeley, M.F. CROMMIE, J. BOKOR, UC Berkeley and LBNL, N.H. PATEL, UC Berkeley, A.M. MINOR, UC Berkeley and LBNL, P. HOSEMANN, UC Berkeley	
5:40 pm		

	Plasma Science and Technology Room: 210A - Session PS-ThA Plasma Sources **Moderator:** Cheng-Che Hsu, National Taiwan University	Selective Deposition as an Enabler of Self-Alignment Focus Topic Room: 210F - Session SD+AS+EM+PS-ThA Process Development for Selective Deposition and Self-aligned Patterning **Moderators:** John Ekerdt, The University of Texas at Austin, Chuck Winter, Wayne State University
2:20 pm	**PS-ThA1** Control of Electron Heating and Ion Energy Distributions in Capacitive Plasmas by Voltage Waveform Tailoring based on a Novel Power Supply and Impedance Matching, **BIRK BERGER**, J. FRANEK, ST. BRANDT, West Virginia University, M. LIESE, M. BARTHEL, Barthel HF-Technik GmbH, Germany, E. SCHUENGEL, M. KOEPKE, J. SCHULZE, West Virginia University	**SD+AS+EM+PS-ThA1 Invited** Surface Chemistry Related to Selective Deposition, **SUVI HAUKKA**, ASM Microchemistry Ltd., Finland, J.W. MAES, ASM Belgium
2:40 pm	**PS-ThA2** Spectroscopic and Beam Current Characterisation of an RF Excited Argon Plasma Cathode Electron Beam Gun for Material Processing Applications, **SOFIA DEL POZO**, TWI Ltd. and Brunel University, United Kingdom of Great Britain and Northern Ireland, C.N. RIBTON, TWI Ltd., United Kingdom of Great Britain and Northern Ireland, D.R. SMITH, Brunel University	Invited talk continued.
3:00 pm	**PS-ThA3 Invited** Around the World of RF-Plasma Generation: A Brief Tour in 80 (half) Minutes, **NEIL BENJAMIN**, Lam Research Corporation	**SD+AS+EM+PS-ThA3 Invited** Selective Deposition - The New Patterning Paradigm?, **FLORIAN GSTREIN**, Intel Corporation
3:20 pm	Invited talk continued.	Invited talk continued.
3:40 pm	**BREAK**	**BREAK**
4:00 pm	**PS-ThA6** Electron Beam Generated Plasmas Produced in Fluorine-Containing Gases: Characterization of Plasma-Surface Interactions, **SCOTT WALTON**, D.R. BORIS, US Naval Research Laboratory, R.F. FERNSLER, Sotera Defense Solutions, Inc., S.C. HERNÁNDEZ, TZ.B. PETROVA, G.M. PETROV, US Naval Research Laboratory	**SD+AS+EM+PS-ThA6** Area-Selective Molecular Layer Deposition: Enhanced Selectivity via Selective Etching, **RICHARD CLOSSER**, D.S. BERGSMAN, F.H. MINAYE HASHEMI, S.F. BENT, Stanford University
4:20 pm	**PS-ThA7** Electron Beam Generated Plasmas Produced in Fluorine-Containing Gases: Characterizing Plasma Parameters, **DAVID BORIS**, G.M. PETROV, Naval Research Laboratory, R.F. FERNSLER, Sotera Defense Solutions, TZ.B. PETROVA, S.G. WALTON, Naval Research Laboratory	**SD+AS+EM+PS-ThA7** Nucleation and Steady State ALD of Metallic Tin Using $SnCl_4$ and a Silyl Pyrazine Reducing Agent, **ERIC STEVENS**, M.B. MOUSA, G.N. PARSONS, North Carolina State University
4:40 pm	**PS-ThA8 Invited** Microwave Plasma Source Technologies: A Fifty Year Evolution from Unwanted Discharges to Free Radical Sources, to Low Pressure and Temperature Plasma Processing, to Gem Quality Diamond Synthesis, **JES ASMUSSEN**, Michigan State University	**SD+AS+EM+PS-ThA8** Determination of the Minimum Saturating Dose during Atomic Layer Deposition of Alumina and Titania on Si(100) and Si(100)-H, D. DICK, University of Texas at Dallas, **JOSHUA BALLARD**, J. RANDALL, Zyvex Labs, Y.J. CHABAL, University of Texas at Dallas
5:00 pm	Invited talk continued.	**SD+AS+EM+PS-ThA9** Selective Growth of GeSbTe Phase-Changing Materials Utilizing Self-Aligned Confined Structure, **BYUNGJOON CHOI**, Seoul National University of Science and Technology, Republic of Korea, T. EOM, C.S. HWANG, Seoul National University, Republic of Korea
5:20 pm	**PS-ThA10** Insights to Scaling Remote Plasma Sources Sustained in NF_3 Mixtures, **SHUO HUANG**, University of Michigan, V. VOLYNETS, S. LEE, I.-C. SONG, S. LU, Samsung Electronics Co., Ltd., Republic of Korea, J.R. HAMILTON, J. TENNYSON, University College London, UK, M.J. KUSHNER, University of Michigan	**SD+AS+EM+PS-ThA10** Toward an All- Vapor Process for Area Selective Atomic Layer Deposition, **FATEMEHSADAT HASHEMI**, S.F. BENT, Stanford University
5:40 pm	**PS-ThA11** Numerical Simulations and Experimental Measurements for Penning Plasma Cell Source for Materials Processing, V. KUDRIAVTSEV, **PAT WARD**, L. MANDRELL, Intevac, Inc., D. VARGAS, S. MAHADEVAN, Esgee Technologies Inc., L. RAJA, University of Texas at Austin	**SD+AS+EM+PS-ThA11** Selective Deposition of ALD Metal oxides and Metal Thin Films by Fab-Friendly Surface Treatments, **KANDABARA TAPILY**, K.-H. YU, S. CONSIGLIO, R. CLARK, D. O'MEARA, C. WAJDA, G. LEUSINK, TEL Technology Center, America, LLC

	Surface Modification of Materials by Plasmas for Medical Purposes Focus Topic **Room: 211D - Session SM+AS+BI+PS-ThA** **Plasma Processing of Biomaterials and Biological Systems** **Moderators:** David Graves, University of California, Berkeley, Jean-Michel Pouvesle, GREMI CNRS/Université d'Orléans	**Scanning Probe Microscopy Focus Topic** **Room: 212A - Session SP+BI+NS+SS+TF-ThA** **Probing Material Growth on the Surface** **Moderators:** Stephanie Allen, The University of Nottingham, UK, Chuanxu Ma, Oak Ridge National Laboratory
2:20 pm	**SM+AS+BI+PS-ThA1 Invited** Matching Plasma Sources with Intended Biomedical Outcomes: Open Questions in Modeling of Plasma Surface Interactions, W. TIAN, University of Michigan, S.A. NORBERG, US Military Academy - West Point, A.M. LIETZ, University of Michigan, N.YU. BABAEVA, Joint Institute for High Temperatures, **MARK KUSHNER**, University of Michigan	**SP+BI+NS+SS+TF-ThA1 Invited** Tailoring the Growth of Organic Thin Films via Chemical Reactions at the Molecular Scale, **PENGPENG ZHANG**, Michigan State University
2:40 pm	Invited talk continued.	Invited talk continued.
3:00 pm	**SM+AS+BI+PS-ThA3 Invited** Plasma Processing of Biomimetic and Sintered Calcium Phosphates for Bone Regeneration and Repair, **CRISTINA CANAL**, Technical University of Catalonia, Spain	**SP+BI+NS+SS+TF-ThA3** Investigation of Initial Stages of Oxidation of Ni-Cr and Ni-Cr-Mo alloys by Scanning Tunneling Microscopy and Spectroscopy, **GOPALAKRISHNAN RAMALINGAM***, P. REINKE, University of Virginia
3:20 pm	Invited talk continued.	**SP+BI+NS+SS+TF-ThA4** Atomic Imaging and Oxide Physics via Monte-Carlo Methods, **ANTHONY GIANFRANCESCO**, UT/ORNL Bredesen Center, R.K. VASUDEVAN, A. TSELEV, M.D. BIEGALSKI, P. GANESH, A.P. BADDORF, S.V. KALININ, Oak Ridge National Lab
3:40 pm	**BREAK**	**BREAK**
4:00 pm	**SM+AS+BI+PS-ThA6 Invited** Plasma Processing of Biomaterials and Biomedical Devices, H.J. GRIESSER, T.D. MICHL, S.S. GRIESSER, M. JASIENIAK, H.H. MON, **BRYAN COAD**, University of South Australia	**SP+BI+NS+SS+TF-ThA6 Invited** Growth and Properties of Skyrmionic Nanowires and Thin Film, **ZHENG GAI**, Oak Ridge National Laboratory, J. YI, S. TANG, University of Tennessee, Oak Ridge National Laboratory, D. MANDRUS, University of Tennessee
4:20 pm	Invited talk continued.	Invited talk continued.
4:40 pm	**SM+AS+BI+PS-ThA8 Invited** Organs on a Chip – Biointerfaces in Stem Cell Research, **KEVIN HEALY**, University of California at Berkeley	**SP+BI+NS+SS+TF-ThA8** Sulfur-induced Structural Motifs on Cu(111) and Au(111) Surfaces, **HOLLY WALEN***, Iowa State University, D.-J. LIU, Ames Laboratory, J. OH, H. LIM, RIKEN, Japan, J.W. EVANS, Iowa State University, C.M. AIKENS, Kansas State University, Y. KIM, RIKEN, Japan, P.A. THIEL, Iowa State University
5:00 pm	Invited talk continued.	**SP+BI+NS+SS+TF-ThA9** Surface Strain-Modulated Binding of Adsorbates on TiO_2(110), D.V. POTAPENKO, **RICHARD OSGOOD, JR.**, Columbia University
5:20 pm	**SM+AS+BI+PS-ThA10** Effect of the Radical Species for Gene Transfection by Discharge Plasma Irradiation, **YOSHIHISA IKEDA**, M. JINNO, Ehime University, Japan	**SP+BI+NS+SS+TF-ThA10** STM/STS Investigation of Organic Charge Transfer Complex TTF-TCNQ on Noble Metal Surfaces at 4.3K, **SEOKMIN JEON**, P. DOAK, P. GANESH, B. SUMPTER, Oak Ridge National Laboratory, J.I. CERDA, Instituto de Ciencia de Materiales de Madrid, Spain, P. MAKSYMOVYCH, Oak Ridge National Laboratory
5:40 pm	**SM+AS+BI+PS-ThA11** Nonlinear Optical Spectroscopic Observation of Plasma-Treated Bio-Specimen, **KENJI ISHIKAWA**, R. FURUTA, K. TAKEDA, Nagoya University, Japan, T. NOMURA, T. OHTA, Meijo University, Japan, H. HASHIZUME, H. KONDO, Nagoya University, Japan, M. ITO, Meijo University, Japan, M. SEKINE, M. HORI, Nagoya University, Japan	

*** Morton S. Traum Award Finalist**

	Surface Science Room: 113 - Session SS+AS+EM+EN-ThA Atomistic Modeling of Surface Phenomena & Semiconductor Surfaces and Interfaces - II **Moderator:** Talat Rahman, University of Central Florida	Thin Film Room: 111 - Session TF+AS+NS+SA-ThA Thin Film: Growth and Characterization, Optical and Synchrotron Characterization II **Moderators:** Jay Hendricks, National Institute of Standards and Technology
2:20 pm	**SS+AS+EM+EN-ThA1 Invited** Ideas Old and New Applied to Non-Ideal Surface Adsorption and Reaction, **WILLIAM SCHNEIDER**, University of Notre Dame	**TF+AS+NS+SA-ThA1** Dynamic and Structural Stability of Cubic Vanadium Nitride, **ANTONIO B. MEI***, University of Illinois at Urbana-Champaign, O. HELLMAN, California Institute of Technology, N. WIREKLINT, Chalmers University of Technology, Sweden, C.M. SCHLEPÜTZ, Argonne National Laboratory, D.G. SANGIOVANNI, B. ALLING, Linköping University, Sweden, A. ROCKETT, University of Illinois at Urbana-Champaign, L. HULTMAN, Linköping University, Sweden, I. PETROV, J.E. GREENE, University of Illinois at Urbana-Champaign
2:40 pm	Invited talk continued.	**TF+AS+NS+SA-ThA2** Comparison of Solution Based Aluminum Oxide Phosphate Thin Films Deposited via Spin Coating vs. a Novel Mist Deposition System, **NISHIT MURARI**, R.H. MANSERGH, Y. HUANG, G. WESTERFIELD, D. KESZLER, J.F. CONLEY, Oregon State University
3:00 pm	**SS+AS+EM+EN-ThA3** Insights into the Oxidation of Stepped Cu Surfaces using Multiscale Investigations, Q. ZHU, W.A. SAIDI, **JUDITH YANG**, University of Pittsburgh	**TF+AS+NS+SA-ThA3** Electro-Optic Studies of $Pb_{0.95}La_{0.05}Zr_{0.54}Ti_{0.46}O_3$ Thin Films Deposited by Chemical Solution Deposition Method, **VAISHALI BATRA**, S. KOTRU, V.N. HARSHAN, The University of Alabama, M. VARAGAS, C.V. RAMANA, University of Texas at El Paso
3:20 pm	**SS+AS+EM+EN-ThA4** Reconciling Complimentary Analyses of Epitaxial Growth: Role of Transient Mobility for para-Hexaphenyl on Mica, **JOSUE MORALES-CIFUENTES**, T.L. EINSTEIN, University of Maryland, College Park, A. PIMPINELLI, Rice University	**TF+AS+NS+SA-ThA4** Electron Scattering at Surfaces of Expitaxial Metal Layers, **PENGYUAN ZHENG***, D. GALL, Rensselaer Polytechnic Institute
3:40 pm	**BREAK**	**BREAK**
4:00 pm	**SS+AS+EM+EN-ThA6** Probing 2-DEG at InN Surface by Electrolyte-Gated Raman Spectroscopy, E. ALARCON LLADO, Ecole Polytechnique Fédérale de Lausanne (EPFL), Switzerland, **TOMMASO BRAZZINI**, Lawrence Berkeley Lab, University of California, Berkeley, J.W. AGER, Lawrence Berkeley National Laboratory (LBNL)	**TF+AS+NS+SA-ThA6** Lattice Relaxation in Multilayered $Si_{1-x}Ge_x$/Si (001) Metamorphic Heterostructures, **TEDI KUJOFSA**, J.E. AYERS, University of Connecticut
4:20 pm	**SS+AS+EM+EN-ThA7** Surface Termination of Single Crystal Bi_2Se_3 Investigated by Low Energy Ion Scattering, **WEIMIN ZHOU**, J.A. YARMOFF, UC Riverside	
4:40 pm	**SS+AS+EM+EN-ThA8** Real-Time Imaging with Atomic-level Spatial Resolution of Silicon Oxidation, **BRYAN WIGGINS**, L.G. AVILA-BRONT, R. EDEL, S.J. SIBENER, University of Chicago	**TF+AS+NS+SA-ThA8** Growth Stress Evolution in Low Adatom Mobility Fe(Cr) Thin Films, **XUYANG ZHOU**, The University of Alabama, T. KAUB, R.L. MARTENS, The Univeristy of Alabama, G.B. THOMPSON, The University of Alabama
5:00 pm	**SS+AS+EM+EN-ThA9** Surface Band-Bending Upon Oxidation of Wurtzite and Zincblende InAs Depending on Surface Orientation and atomic Structure, **RAINER TIMM**, M. HJORT, J. KNUTSSON, O. PERSSON, A. TROIAN, S. LEHMANN, K.A. DICK, A. MIKKELSEN, Lund University, Sweden	**TF+AS+NS+SA-ThA9** Development of an Analytical Model for Langmuir-Blodgett Silica Microsphere Assembly and Investigation of Ge Back Filling of the Opal Template by Polymer-Assisted Deposition, **SARUN ATIGANYANUN**, M. ZHOU, S.E. HAN, S.M. HAN, University of New Mexico
5:20 pm	**SS+AS+EM+EN-ThA10** Control of Oxygen Defect Surface Injection in ZnO via Sub-Monolayer Sulfur Adsorption, **MING LI**, E. SEEBAUER, University of Illinois at Urbana-Champaign	**TF+AS+NS+SA-ThA10** The Determination of Porosity and Pore Size Distribution of The Al_2O_3 Antireflection Coating Deposited By Atomic Layer Deposition, **CHAO LI**, M. GOORSKY, University of California at Los Angeles
5:40 pm	**SS+AS+EM+EN-ThA11** Investigation of the Role of Electronic Defects and Grain Boundaries in Sputter Deposited CdS/CdTe Junctions and Solar Cells, **MOHIT TUTEJA**, University of Illinois at Urbana Champaign, P. KOIRALA, University of Toledo, J. SOARES, University of Illinois at Urbana Champaign, R. COLLINS, University of Toledo, A. ROCKETT, University of Illinois at Urbana Champaign	**TF+AS+NS+SA-ThA11** Tuning Static and Dynamic Magnetic Properties of FeGa/NiFe Multilayer Composites, **COLIN REMENTER**, Q. XU, K. FITZELL, Z. YAO, P. NORDEEN, G. CARMAN, Y. WANG, J.P. CHANG, University of California at Los Angeles

*** TFD James Harper Award Finalist**

	Thin Film Room: 114 - Session TF+PS-ThA **Thin Film Permeation Barriers and Membranes** **Moderators:** Mariadriana Creatore, Eindhoven University of Technology, Netherlands, Loren Rieth, University of Utah	Tribology Focus Topic Room: 230B - Session TR+AS+NS+SS-ThA **Molecular Origins of Friction** **Moderator:** Nicolas Argibay, Sandia National Laboratories
2:20 pm	**TF+PS-ThA1 Invited** Synthesis, Characterisation and Engineering of Moisture Barrier Films Deposited in a Roll-to-Roll High Current Dielectric Barrier Discharge, **HINDRIK DE VRIES**, FOM institute DIFFER, Netherlands	**TR+AS+NS+SS-ThA1 Invited** Atomic-Scale Mechanisms of Single Asperity Sliding, **ASHLIE MARTINI**, X. HU, University of California Merced, M.V.P. ALTOE, Lawrence Berkeley National Laboratory
2:40 pm	Invited talk continued.	Invited talk continued.
3:00 pm	**TF+PS-ThA3** Vacuum Deposited Moisture Barriers for Harsh Environment Conditions, **ANKIT SINGH**, H. KIM, A. BULUSU, S. GRAHAM, Georgia Institute of Technology	**TR+AS+NS+SS-ThA3** Investigation of Epitaxy and Friction in Model Boundary Films, **HONGYU GAO**, University of California Merced, W.T. TYSOE, University of Wisconsin-Milwaukee, A. MARTINI, University of California Merced
3:20 pm	**TF+PS-ThA4** Investigation on Nano-Porosity in Moisture Permeation Barrier Layers by Electrochemical Impedance Spectroscopy, **ALBERTO PERROTTA**, Eindhoven University of Technology, Netherlands, S.J. GARCIA ESPALLARGAS, Delft University of Technology, Netherlands, J.J. MICHELS, Max Planck Institute for Polymer Research, Germany, M. CREATORE, Eindhoven University of Technology, Netherlands	**TR+AS+NS+SS-ThA4** Temperature Dependence of Atomic-scale Friction on Two-dimensional Materials, **ZHIJIANG YE**, University of California Merced, X.Z. LIU, K. HASZ, R.W. CARPICK, University of Pennsylvania, A. MARTINI, University of California Merced
3:40 pm	**BREAK**	**BREAK**
4:00 pm	**TF+PS-ThA6 Invited** Thin-film Dielectrics for Chronic Nonhermetic Encapsulation of Electrically Active Neural Implants, **STUART COGAN**, The University of Texas at Dallas	
4:20 pm	Invited talk continued.	**TR+AS+NS+SS-ThA7 Invited** Single Molecule Experiments to Explore Friction and Adhesion, **R. PAWLAK**, S. KAWAI, A. BARATOFF, T. MEIER, University of Basel, Switzerland, W. OUYANG, Tsinghua University, China, T. GLATZEL, University of Basel, Switzerland, E. GNECCO, IMDEA-Nanociencia - Universidad Autónoma de Madrid, Spain, A. FILIPPOV, Donetsk Institute of Physics and Engineering, Ukraine, M. URBAKH, Tel Aviv University, Israel, E. MEYER, University of Basel, Switzerland
4:40 pm	**TF+PS-ThA8** Atmospheric Pressure Roll-to-Roll Plasma Enhanced CVD of High Quality Silica-like Bi-layer Moisture Barrier Films: The Influence of Input Energy, **FIONA ELAM**, FUJIFILM Manufacturing Europe B.V., Netherlands, A. MESHKOVA, S.A. STAROSTIN, DIFFER, Netherlands, J.B. BOUWSTRA, FUJIFILM Manufacturing Europe B.V., Netherlands, M.C.M. VAN DE SANDEN, H.W. DE VRIES, DIFFER, Netherlands	Invited talk continued.
5:00 pm	**TF+PS-ThA9** Use of Aluminum Oxide as a Permeation Barrier for Producing Thin Films on Aluminum Substrates, **JAMES PROVO**, Consultant, J. L. Provo Consulting	**TR+AS+NS+SS-ThA9** Effects of Humidity on the Adhesion and Friction of Carbon-Based Materials, **JUDITH HARRISON**, M. FALLET, K.E. RYAN, United States Naval Academy, T. KNIPPENBERG, High Point University, S.H. KIM, A. AL-AZIZI, Pennsylvania State University
5:20 pm	**FLASH NETWORKING SESSION PRESENTERS:** • **MARTIN NTWAEABORWA, University of the Free State, South Africa (TF-ThP25)** • **CHANYUAN LIU,University of Maryland, College Park (TF-ThP26)**	**TR+AS+NS+SS-ThA10** Single Asperity Tribochemical Wear of Silicon AFM Tips Sliding on Aluminum Oxide, **ERIN FLATER**, S. SORENSON, Luther College, N. ANSARI, A. PODA, W.R. ASHURST, Auburn University, B.P. BOROVSKY, St. Olaf College
5:40 pm		**TR+AS+NS+SS-ThA11** Molecular Simulation of Indentation as a Probe of Scanning Probe Tip Mechanical Properties, **J. DAVID SCHALL**, K. VUMMANENI, Oakland University, J.A. HARRISON, United States Naval Academy

Anticipated Schedule
Thursday Morning, October 22, 2015

TIME	SESSION	ROOM
8:00 am		
8:20 am		
8:40 am		
9:00 am		
9:20 am		
9:40 am		
10:00 am		
10:20 am		
10:40 am		
11:00 am		
11:20 am		
11:40 am		
12:00 pm		

Lunch

when

with

where

Anticipated Schedule
Thursday Afternoon, October 22, 2015

TIME	SESSION	ROOM
1:00 pm		
1:20 pm		
1:40 pm		
2:00 pm		
2:20 pm		
2:40 pm		
3:00 pm		
3:20 pm		
3:40 pm		
4:00 pm		
4:20 pm		
4:40 pm		
5:00 pm		

NOTES

2D Materials Focus Topic
Room: Hall 3 - Session 2D-ThP

2D Materials Focus Topic Poster Session
6:00 pm

2D-ThP1 Spin-Orbit Coupling in the Band Structure of Monolayer WSe_2(0001), **IORI TANABE**, University of Nebraska - Lincoln, D. LE, University of Central Florida, A.V. BARINOV, Sincrotrone Trieste, Italy, E. PRECIADO, M. ISARRARAZ, University of California - Riverside, T. KOMESU, University of Nebraska - Lincoln, L. BARTELS, University of California - Riverside, T.S. RAHMAN, University of Central Florida, P.A. DOWBEN, University of Nebraska - Lincoln

2D-ThP2 Ferroelectric Control of Monolayer MoS_2 via Direct Single-Layer Growth on $LiNbO_3$, **ARIANA NGUYEN**, E. PRECIADO, V. KLEE, D. SUN, I. LU, D. BARROSO, L. BARTELS, UC Riverside

2D-ThP3 Electrical Transport Property Enhancement of CVD Graphene on Pulsed Laser Deposited (PLD) Boron Nitride (BN) Grown on SiO_2/Si Substrate, **MDAHSAN UDDIN**, University of South Carolina, N. GLAVIN, Air Force Research Laboratory, A. SINGH, University of South Carolina, M. JESPERSEN, R. NAGUY, A.A. VOEVODIN, Air Force Research Laboratory, G. KOLEY, University of South Carolina and Clemson University

2D-ThP4 Thermally Conductive Graphene-Polymer Composites, **MICHAEL SHTEIN**, O. REGEV, Ben Gurion University, Israel

2D-ThP5 Low Temperature Raman and Photoluminescence Measurements of MoS_2 Layer Grown by Chemical Vapor Deposition, **BARBARA NICHOLS**, U.S. Army Research Laboratory, R. GHOSH, S.K. BANERJEE, University of Texas at Austin

2D-ThP6 CVD Growth of Single-Layer TMD Films Onto Pre-Fabricated Substrate Structures, B. DAVIS, E. PRECIADO, V. KLEE, A. NGUYEN, I. LU, D. BARROSO, S. NAGHIBI, I. LIAO, G. VON SON, D. MARTINEZ-TA, **LUDWIG BARTELS**, UC Riverside

2D-ThP7 MoS_2 Thin Films Deposited by Chemical Bath Deposition on Si and Glass Substrates, D.E. PEREZ-BARRAGAN, Escuela Superior de Ingenieria Quimica e Industrias Extractivas-IPN, Mexico, A. GARCIA-SOTELO, E. CAMPOS, Cinvestav-IPN, Mexico, **ORLANDO ZELAYA-ANGEL**, Centro de Investigación y de Estudios Avanzados del Instituto Politécnico Nacional, M. MELENDEZ-LIRA, Cinvestav-IPN, Mexico

2D-ThP8 Development of Arrays of Field Effect Transistors Based on CVD Graphene and TaN as Metal Electrode, **ALINE PASCON**, UNICAMP, Brazil, C.C. SILVA, University of Campinas, Brazil, J.F. SOUZA, UNICAMP, Brazil, L.T. KUBOTA, University of Campinas, Brazil, L.R.C. FONSECA, J.A. DINIZ, UNICAMP, Brazil

2D-ThP9 Growth of a Continuous MoS_2 Film by CVD, **LAN FEIFEI**, L. ZHANPING, Electronic Material Research Institute of Tianjin, China, X. YONGKUAN, C. HONGJUAN, Z. SONG, Electronic Material Research Institute of Tianjin, C. JIANLI, Electronic Material Research Institute of TianjinChen, W. ZAIEN, Electronic Material Research Institute of Tianjin, J. ZHENYU, Electronic Material Research Institute of Tianji

2D-ThP10 Electronic and Mechanical Properties of Graphene Grown Directly on Germanium via Chemical Vapor Deposition, **BRIAN KIRALY**, Northwestern University, R.M. JACOBBERGER, University of Wisconsin-Madison, A. MANNIX, G.P. CAMPBELL, M.J. BEDZYK, Northwestern University, M.S. ARNOLD, University of Wisconsin-Madison, M.C. HERSAM, Northwestern University, N.P. GUISINGER, Argonne National Laboratory

2D-ThP11 Conductance-Based Structural Characterization of Hybrid, 2-Dimensional, Molecule-Nanoparticle Arrays, **JOSHUA HIHATH**, C.E. MCCOLD, Q. FU, University of California, Davis, J.Y. HOWE, Hitachi High-Technologies Corporation

2D-ThP12 X-ray Analysis of Self-Assembled Metal Nanowires on Epitaxial Graphene, **GAVIN CAMPBELL**, S. KEWALRAMANI, I.J. BALLA, M.C. HERSAM, M.J. BEDZYK, Northwestern University

Actinides and Rare Earths Focus Topic
Room: Hall 3 - Session AC+AS+MI-ThP

AC Poster Session
6:00 pm

AC+AS+MI-ThP1 Nature of Chemical Bond in $Cs_2UO_2Cl_4$, **YURY TETERIN**, A.YU. TETERIN, K.E. IVANOV, NRC "Kurchatov Institute", Russian Federation, M.V. RYZHKOV, Ural Department of RAS, Institute of Solid State Chemistry, Russian Federation, K.I. MASLAKOV, S.N. KALMYKOV, V.G. PETROV, Lomonosov Moscow State University, Russian Federation, D.N. SUGLOBOV, V.G. Khlopin Radium Institute, Russian Federation

AC+AS+MI-ThP2 Study of Chemical Bond in $Cs_2NpO_2Cl_4$, YU.A. TETERIN, **ANTON TETERIN**, K.E. IVANOV, NRC "Kurchatov Institute", Russian Federation, M.V. RYZHKOV, Ural Department of RAS, Institute of Solid State Chemistry, Russian Federation, K.I. MASLAKOV, S.N. KALMYKOV, V.G. PETROV, Lomonosov Moscow State University, Russian Federation, D.N. SUGLOBOV, V.G. Khlopin Radium Institute, Russian Federation

AC+AS+MI-ThP3 The Study of the Pu6p, 5f-Electrons States in C $s_2PuO_2Cl_4$, YU.A. TETERIN, A.YU. TETERIN, K.E. IVANOV, NRC "Kurchatov Institute", Russian Federation, M.V. RYZHKOV, Ural Department of RAS, Institute of Solid State Chemistry, Russian Federation, **KONSTANTIN MASLAKOV**, Lomonosov Moscow State University, Russian Federation, D.N. SUGLOBOV, V.G. Khlopin Radium Institute, Russian Federation

Additive Manufacturing/3D Printing Focus Topic
Room: Hall 3 - Session AM-ThP

Additive Manufacturing/3D Printing Poster Session
6:00 pm

AM-ThP1 Anisotropic Evaluation of Mechanical Properties Related to Printing Direction and Development of Nanocomposite Materials to Establish Direct Digital Manufacturing, **HIROAKI SAKAGUCHI**, A. MATSUMURO, K. TAKEDA, Aichi Institute of Technology, Japan

AM-ThP2 A New Technique to Make an Insulating AlN Thin Film to be Conductive by Spontaneous via Holes formed by MOCVD and its Application to realize Vertical UV LED on n^+Si Substrate, **NORIKO KUROSE**, Y. AOYAGI, Ritsumeikan University, Japan

AM-ThP3 Novel Deep Si Etching Process for Green IOT, **TAKAHIDE MURAYAMA**, ULVAC Inc., Japan

AM-ThP4 High Resolution Two Photon and 3D Holographic Lithography Structure Production and Conversion to Higher Index Materials, **STEVEN KOOI**, MIT Institute for Soldier Nanotechnologies

Applied Surface Science
Room: Hall 3 - Session AS-ThP

Applied Surface Science Poster Session
6:00 pm

AS-ThP1 Applications of EMSL's Radiochemistry Annex (RadEMSL) in Understanding of the Chemical Fate and Transport of Radionuclides in Terrestrial and Subsurface Ecosystems, **MARK ENGELHARD**, Pacific Northwest National Laboratory

AS-ThP2 XPS and AES Characterization of Tribofilm Formation on Non-Metallic Coatings Using ZDDP and Ionic Liquid Lubricant Additives, **HARRY MEYER III**, J. QU, Z.B. CAI, C. MA, H. LUO, Oak Ridge National Laboratory

AS-ThP3 XPS Sputter Depth Profiling of Organometallic Multilayer Materials using Massive Argon Cluster Ions, **SIMON HUTTON**, Kratos Analytical Limited, UK, T. BENDIKOV, Weizmann Institute of Science, Israel, W. BOXFORD, S.C. PAGE, J.D.P. COUNSELL, A.J. ROBERTS, C.J. BLOMFIELD, S.J. COULTAS, Kratos Analytical Limited, UK

AS-ThP4 XPS Analysis and Sample Preparation for EBSD Analysis using Argon Gas Clusters, **ADAM BUSHELL**, Thermo Fisher Scientific, UK, R. SIMPSON, University of Surrey, UK, C.J. STEPHENS, C. DEEKS, T.S. NUNNEY, J.P.W. TREACY, Thermo Fisher Scientific, UK

AS-ThP5 Comprehensive Characterization High-k Dielectric Films Deposited by ALD using Multi-Technique Surface Analysis, **RICHARD WHITE**, Thermo Fisher Scientific, UK

AS-ThP6 XPS and ToF-SIMS Characterization Functionalized 3D Mesostructures fabricated by Direct Laser Writing, **MICHAEL BRUNS**, A. WELLE, A.S. QUICK, T. CLAUS, G. DELAITTRE, Karlsruhe Institute of Technology, Germany, T.S. NUNNEY, Thermo Fisher Scientific, UK, M. WEGENER, C. BARNER-KOWOLLIK, Karlsruhe Institute of Technology, Germany

AS-ThP7 Structure, Surface Analysis, Photoluminescent Properties and Decay Characteristics of Tb^{3+}-Eu^{3+} Co-Activated $Sr_2MgSi_2O_7$ Phosphor, **SIMON DHLAMINI,** University of South Africa, M. TSHABALALA, O.M. NTWAEABORWA, University of the Free State, South Africa

AS-ThP8 XPS Study of Many-Electron Interaction & Exchange Interaction of Local Moments in Ion Beam Synthesized Ternary Transition Metal Silicides, **WICKRAMAARACHCHIGE LAKSHANTHA**, M. DHOUBHADEL, F. MCDANIEL, B. ROUT, University of North Texas

AS-ThP9 Using ToF-SIMS to Characterize Surface Contamination in Sandia's Z Machine, **JAMES OHLHAUSEN**, B. CLARK, R. TANG, D. LAMPPA, D. SUSAN, R. SORENSEN, Sandia National Laboratories

AS-ThP10 Going Beyond Visualization: Exploiting Synergies Between Electron Microscopy and ToF-SIMS, **KATHRYN LLOYD**, C.D. CHAN, J.R. MARSH, D.J. WALLS, S. SUBRAMONEY, DuPont Corporate Center for Analytical Sciences

AS-ThP11 The Benefits of Using All of the Measured Mass Channels During MVSA of ToF-SIMS Data Sets, **VINCENT SMENTKOWSKI**, General Electric Global Research Center, M.R. KEENAN, Independent Scientist, H. ARLINGHAUS, ION-TOF GmbH

AS-ThP12 Electron Gun Tilting and Shifting with O-Ring Stack System, **IN-YONG PARK**, B. CHO, KRISS, Korea, C. HAN, KBSI, Korea, D. LEE, S.J. AHN, KRISS, Korea

AS-ThP13 Covalent Surface Modification of Silicon Oxide Substrate using Aliphatic Alcohols and Microwave Radiation, **AUSTIN LEE**, B.D. GATES, Simon Fraser University, Canada

AS-ThP14 Invited
The Phase Structures and Morphology of Air Plasma Sprayed NiCrAlY Coatings, **CHUANZHONG CHEN**, Shandong University, P.R. China, H.J. YU, Shandong University, China

AS-ThP16 XPS Analysis of Polycrystalline Samples $(Bi_3M)(Sb_3M)O_{14}$ type Pyrochlore with M = Cu, Co and Zn, **LAZARO HUERTA**, R. ESCAMILLA, M. ROMERO, Universidad Nacional Autonoma de Mexico, M. FLORES, Universidad de Guadalajara, Mexico, A. DURAN, Universidad Nacional Autonoma de Mexico

AS-ThP17 XPS Analysis of CN_x Thin Films, **NIKLAS HELLGREN**, Messiah College, R. HAASCH, University of Illinois at Urbana-Champaign, S. SCHMIDT, L. HULTMAN, Linköping University, Sweden, I. PETROV, University of Illinois at Urbana-Champaign

Spectroscopic Ellipsometry Focus Topic
Room: Hall 3 - Session EL-ThP

Spectroscopic Ellipsometry Poster Session
6:00 pm

EL-ThP1 Analysis of the Ellipsometric Spectra of $La_{1.9}$ $Ce_{0.1}$ CuO_4 films, **MINGLIN ZHAO**, J. LIAN, Z.Z. SUN, Shandong University, China, K. JIN, Chinese Academy of Sciences

EL-ThP2 Phonon Dispersion and Electronic Band Structure of NiO, **STEFAN ZOLLNER**, A. GHOSH, T. WILLETT-GIES, New Mexico State University, C. NELSON, University of New Mexico, L. ABDALLAH, New Mexico State University

EL-ThP3 Tribrid EC-QCMD-GSE Analysis: Surface Topography Effects on the Electrochromic Behavior of Methylene Blue, **DEREK SEKORA**, A.J. ZAITOUNA, R.Y. LAI, T. HOFMANN, M. SCHUBERT, E. SCHUBERT, University of Nebraska - Lincoln

Plasma Science and Technology
Room: Hall 3 - Session PS-ThP

Plasma Science and Technology Poster Session
6:00 pm

PS-ThP1 Effect of Embedded Radio Frequency Pulsing for Selective Etching of SiO_2 Contact Hole using $Ar/C_4F_8/O_2$ Gas Mixture in the 60/2 MHz Dual-frequency Capacitively Coupled Plasma System, **NAMHUN KIM**, Samsung Electronics, Republic of Korea, G.Y. YEOM, Sungkyunkwan University, Republic of Korea

PS-ThP2 Synthesis of B_4C And In Situ B_4C / ZrB_2 From Sugar Based Precursor, **ABDULLAH SELIM PARLAKYIGIT**, E. AKTAN, C. ERGUN, Istanbul Technical University, Turkey

PS-ThP3 High Power Pulsed Magnetron Sputtering: A Way to Broaden Industrial Implementation, **JAKE MCLAIN**, P. RAMAN, I.A. SHCHELKANOV, Center for Plasma Material Interactions, University of Illinois, USA, S. ARMSTRONG, Kurt J. Lesker Company, D.N. RUZIC, Center for Plasma Material Interactions, University of Illinois, USA

PS-ThP4 Non-thermal Plasma Synthesis of Hollow Silicon Carbide Nanoparticles, **DEVIN COLEMAN**, T. LOPEZ, O. YASAR-INCEOLGU, L. MANGOLINI, University of California - Riverside

PS-ThP5 Finite Element Modeling of Surface Wave Plasmas Excited by Microwave Slot Antennas for Processing of Thin Film Materials, **PAWEL PIOTROWICZ**, University of Illinois, D. ALMAN, B. JURCZYK, Starfire Industries, M. STOWELL, Applied Materials, I. SCHELKANOV, University of Illinois, D. CURRELI, University of Illinois at Urbana Champaign, D.N. RUZIC, University of Illinois

PS-ThP6 Instantaneous Generation of Many Flaked Particles in Mass-Production Plasma Etching Equipment, **YUJI KASASHIMA**, National Institute of Advanced Industrial Science and Technology (AIST), Japan

PS-ThP7 Plasma Chemical Transport of Borazine for 2D Atomic Layer Growth of Hexagonal Boron Nitride, **TAKESHI KITAJIMA**, T. NAKANO, National Defense Academy of Japan

PS-ThP8 Hybridization of CMOS/MEMS Processes for Silicon Photonics Technology, **KEIZO KINOSHITA**, T. SHIMIZU, Y. HAGIHARA, PETRA, Japan, T. HORIKAWA, AIST, Japan, K. TAKEMURA, T. MOGAMI, PETRA, Japan

PS-ThP9 A Low Cost Microplasma Generation Device for Detection of Volatile Organic Compounds Using Plasma Emission Spectroscopy, **PO-WEI YE**, C.C. HSU, National Taiwan University, Taiwan, Republic of China

PS-ThP10 The Development of a Pin-to-Droplet Plasma Generation Device for Detection of Metallic Ions in Aqueous Solutions, **MIN-CHUN CHEN**, C.C. HSU, National Taiwan University, Taiwan, Republic of China

PS-ThP11 Synthesis of GaN Nanoparticles using Non-Thermal Plasma with N_2 Gas and Ga Vapor, **JUNG-HYUNG KIM**, Korea Research Institute of Standards and Science, Republic of Korea, K.H. YOU, Korea Advanced Institute of Science and Technology, Republic of Korea, H. RUH, D.J. SEONG, Korea Research Institute of Standards and Science, Republic of Korea

PS-ThP12 Simulation of Deep Silicon Etching under Cryogenic ICP $SF_6/O_2/Ar$ Plasma Mixture using multi-Scale Approach, Y. HAIDAR, **AHMED RHALLABI**, A. PATEAU, A. MOKRANI, Université de Nantes, France, F. TAHER, Université Libanaise, Lebanon

PS-ThP13 Two Dimentional Visualization of Oxidation Effect of Scalable DBD Plasma Irradiation using KI-starch Solution, K. KOGA, T. AMANO, **THAPANUT SARINONT**, Kyushu University, Japan, T. KAWASAKI, Nippon Bunri University, Japan, G. UCHIDA, Osaka University, Japan, H. SEO, N. ITAGAKI, M. SHIRATANI, Y. NAKATSU, A. TANAKA, Kyushu University, Japan

PS-ThP14 Sensitivity Enhancement of RF Plasma Etch Endpoint Detection With K-means Cluster Analysis, **HONYOUNG LEE**, H. JANG, H. LEE, H. CHAE, Sungkyunkwan University, Republic of Korea

PS-ThP15 The Study on the Etching Characteristics of the High Aspect Ratio Amorphous Carbon Layer(ACL), **YONGHYUN KWON**, Z.H. GANG, K.S. SHIN, Samsung Electronics Co., LTD., Republic of Korea, G.Y. YEOM, Sungkyunkwan University, Republic of Korea

PS-ThP16 Carbon Dioxide and Methane Conversion Using Low Cost Microplasma Generation Devices, **YU-HSIN HUANG**, C.C. HSU, C.M. WANG, National Taiwan University, Taiwan, Republic of China

PS-ThP17 A MEMS Approach to Making Quantitative Measurements of IIEE Yields in the Presence of Moderate Electric Fields, **KEITH HERNANDEZ**, A. PRESS, D. URRABAZO, M.J. GOECKNER, L.J. OVERZET, University of Texas at Dallas

PS-ThP18 Spectroscopic Investigation of Hydrocarbon Plasmas for Coating Applications, **SARAH SIEPA**, Ruhr-University Bochum, Germany, S. GROSSE, M. GUENTHER, Robert Bosch GmbH, Germany, A. VON KEUDELL, Ruhr-University Bochum, Germany

PS-ThP19 From Plasma Reactor to Surface Level: Linking Plasma with Feature Profile Simulations, **SEBASTIAN MOHR**, A. DZARASOVA, Quantemol Ltd., UK, D. TSAMADOS, V. DESHPANDE, M. OULMANE, Synopsys LLC, Switzerland, J. TENNYSON, University College London, UK

PS-ThP20 Atomic Layer Etching of SiO_2 Using Self-Limited Fluorocarbon Films, **SANBIR KALER**, Q. LOU, V.M. DONNELLY, J. ECONOMOU, University of Houston

PS-ThP21 Amorphous Hydrogenated Boron Carbide: A New Color in the Materials Palette for Multiple Patterning, M.M. PAQUETTE, **BRADLEY NORDELL**, T.D. NGUYEN, S. DHUNGANA, A.N. CARUSO, University of Missouri-Kansas City, W.A. LANFORD, University at Albany-SUNY, P. HENRY, S.W. KING, Intel Corporation

PS-ThP22 Properties of a Magnetic Neutral-Loop Discharge Plasma, **WEIYI LI**, S. KIM, J. BLATZ, University of Wisconsin-Madison, Y. NISHI, Stanford University, J.L. SHOHET, University of Wisconsin-Madison

PS-ThP23 Impact of Charge Separation Grid Design on Wafer Level Device Performance in an Advanced Plasma Asher, H-A. PHAN-VU, **SHAWMING MA**, Mattson Technology

PS-ThP24 Fluorophore based Sensor for Oxygen Radicals in Processing Plasmas, F. CHOUDHURY, G. SABAT, M. SUSSMAN, University of Wisconsin-Madison, Y. NISHI, Stanford University, **J. LEON SHOHET**, University of Wisconsin-Madison

PS-ThP25 Mass Spectrometric Measurement of Plasma Assisted Catalysis, **JOHN REES**, Hiden Analytical Ltd, UK

PS-ThP26 Capacitively Coupled Indirect Plasma Discharge - 2 Dimensional Fluid Model Simulation Study, **PEI-SIOU LUO**, T.Y. CHANG, National Tsing Hua University, K.C. LEOU, National Tsing Hua University, Taiwan, Republic of China

PS-ThP27 Plasma Simulations with Adaptive Mesh Refinement and Hybrid Kinetic-Fluid Models, **VLADIMIR KOLOBOV**, R.R. ARSLANBEKOV, CFD Research Corporation

PS-ThP28 Meshed Shielding Grid Added Electron Beam Excited Plasma Apparatus for Neutral Nitriding of Precision Components, **PETROS ABRAHA**, Meijo University, Japan

PS-ThP29 Deposition of Silicon Nitride Coatings by Pulser Laser Deposition Technique, **JOHANS RESTREPO**, Universidad Nacional Autonoma de Mexico, E. CAMPS, Instituto Nacional De Investigaciones Nucleares, Mexico, S. MUHL, Universidad Nacional Autonoma de Mexico

Surface Modification of Materials by Plasmas for Medical Purposes Focus Topic
Room: Hall 3 - Session SM-ThP

Surface Modification of Materials by Plasmas for Medical Purposes Poster Session
6:00 pm

SM-ThP1 Replacing Self-Assembled Monolayers by Functional Plasma Polymers in Fabrication of Immunosensors, **LENKA ZAJICKOVA**, A. MANAKHOV, E. MAKHNEVA, D. KOVAR, Masaryk University, Czech Republic, G. DOROZINSKY, O. SHYNKARENKO, G. BEKETOV, Lashkaryov Institute of Semiconductor Physics, Ukraine, P. SKLADAL, Masaryk University, Czech Republic

SM-ThP2 Study on Zr-based Multilayer Coatings onto Biomedical Alloys Deposited by Magnetron Sputtering, **OMAR JIMENEZ**, M. FLORES, Universidad de Guadalajara, Mexico, L. OLMOS, Universidad Michoacana de San Nicolas de Hidalgo, Mexico, C. RIVERA, M. GONZALEZ, L. FLORES, Universidad de Guadalajara, Mexico

SM-ThP3 Microstructure and Biocompatibility Evaluation of Zirconia Coatings Grown by Plasma Electrolytic Oxidation Technique, **BIH-SHOW LOU**, Chang Gung University,Taiwan, Taiwan, Republic of China, S.F. LU, National Taipei University of Technology, Taiwan, Taiwan, Republic of China, J.W. LEE, Ming Chi University of Technology, Taiwan, Taiwan, Republic of China, Y.C. YANG, National Taipei University of Technology, Taiwan, Taiwan, Republic of China

Scanning Probe Microscopy Focus Topic
Room: Hall 3 - Session SP-ThP

Scanning Probe Microscopy Poster Session

6:00 pm

SP-ThP1 Extreme Magnetic Properties of Co Atoms on MgO Films, **CHRISTOPHER LUTZ**, S. BAUMANN, A. HEINRICH, W. PAUL, T. CHOI, IBM Research - Almaden

SP-ThP2 High Resolution qPlus NC-AFM with a New Cryogen-Free Variable Temperature UHV SPM, C. TROEPPNER, M. ATABAK, S. MOLITOR, J. KOEBLE, **BJOERN PIGLOSIEWICZ**, J. CHROST, Oxford Instruments

SP-ThP3 Surface Reconstruction for Accuracy Improvement in Nanoparticle Size Characterization, **JAMES SU**, N.N. CHU, C.T. LIN, P.L. CHEN, M.H. SHIAO, C.N. HSIAO, F.Z. CHEN, Instrument Technology Research Center, National Applied Research Laboratories, Taiwan, Republic of China

Thin Film
Room: Hall 3 - Session TF-ThP

Thin Films Poster Session

6:00 pm

TF-ThP1 Polycrystalline Silicon Thin Films at Low Temperature using SiF_4 / SiH_4 Mixture, **MONIRUZZAMAN SYED**, Lemoyne Owen College, T. INOKUMA, S. HASEGAWA, Kanazawa University, Japan

TF-ThP2 The Nano-power Generator Fabricated with Thin Atomic Layer Deposited Films, **GIOVANNA SCAREL**, James Madison University

TF-ThP3 Influence of Deposition Time on the Microstructure of Electrodeposited ZnO Films and p-Si/n-ZnO Heterojunction Diode Fabrication, **SALIHA ILICAN**, Y. CAGLAR, S.A. AKSOY, M. CAGLAR, Anadolu University, Turkey

TF-ThP4 X-ray and Morphological Studies of the Nanostructure Mg Doped ZnO Films Deposited by Microwave Assisted Chemical Bath Deposition Method, **MUJDAT CAGLAR**, Anadolu University, Turkey, K. GORGUN, Eskisehir Osmangazi University, Turkey, Y. CAGLAR, S. ILICAN, Anadolu University, Turkey

TF-ThP5 Nanostructure Sb doped ZnO Films deposited by Sol Gel Dip Coating, **YASEMIN CAGLAR**, S. ILICAN, M. CAGLAR, S. RUZGAR, Anadolu University, Turkey

TF-ThP6 Polymer/SiO_2 Bilayer Dielectrics for copper phthalocyanine-based organic field-effect transistors, **SERIF RUZGAR**, M. CAGLAR, Anadolu University, Turkey

TF-ThP7 The Effect of Nickel Content on Structural and Optical Properties of ZnO Films by Sol Gel Process, **SEVAL AKSOY**, Y. CAGLAR, M. CAGLAR, S. ILICAN, Anadolu University, Turkey

TF-ThP8 Effect of Applied Voltage on the Structural and Morphological Properties of Electrodeposited ZnO Films, **PINAR BILGIC OZDEN**, Y. CAGLAR, Anadolu University, Turkey

TF-ThP9 Growth of yttrium-doped ZnO Thin Films over Sapphire Substrates using Pulsed Laser Deposition, **KALLOL PRADHAN**, K.D. DASARI, R.K. KATIYAR, University of Puerto Rico-Rio Piedras, Puerto Rico

TF-ThP10 Self-Assembled ZnO Nanoparticles Embedded in a Silicon Oxide Matrix Produced by Reactive RF Sputtering*, A. LARA-SANCHEZ, Facultad de Ingenieria, Universidad Autonoma de Chihuahua, Mexico, A. HERNANDEZ-HERNANDEZ, Escuela Superior de Apan, Universidad Autonoma del Estado de Hidalgo, Mexico, A. GARCIA-SOTELO, E. CAMPOS, S. GALLARDO-HERNANDEZ, Departamento de Física-Cinvestav-IPN, Mexico, M. ZAPATA-TORRES, J.L. FERNANDEZ-MUÑOZ, CICATA-IPN, Legaria, E. VALAGUEZ-VELAZQUEZ, UPIITA-IPN, **MIGUELANGEL MELENDEZ-LIRA**, Departamento de Física-Cinvestav-IPN, Mexico

TF-ThP11 Development of Dispersed C60/TiAlN Nano-Composite Thin Films with Superior Mechanical Properties, **YUKI ISHIYAMA**, A. MATSUMURO, Aichi Institute of Technology, Japan

TF-ThP12 Interface of Mo/Si Multilayer formed by Magnetron Sputtering for Extreme Ultraviolet Lithography, **CHAO-TE LEE**, D. CHIANG, P.-K. CHIU, H.P. CHEN, C.N. HSIAO, National Applied Research Laboratories, Taiwan, Republic of China, H.-B. ZHANG, C.-C. JAING, Minghsin University of Science and Technology, Taiwan, Republic of China

TF-ThP13 Influence of Cu Doping on the Electrical Transport Properties of Transparent ZnO Nanocrystalline Films Prepared by Sol-Gel Spin Coating Process, **CHUNG-YUAN KUNG**, Department of Electrical Engineering, National Chung Hsing University, Taichung, Taiwan, Taiwan, Republic of China, S.L. YOUNG, H.H. LIN, Department of Electronic Engineering, Hsiuping University of Science and Technology, Taichung, Taiwan, Taiwan, Republic of China

TF-ThP14 Design and Fabrication of MgF_2 Protected Aluminum Mirrors for the DUV Spectral Range, **HUNG-PIN CHEN**, W.H. CHO, C.N. HSIAO, National Applied Research Laboratories, Taiwan, Republic of China, C.C. LEE, National Central University, Taiwan

TF-ThP15 Reliability Analysis of Zinc Tin Oxide Thin Film Transistor under Mechanical Stress and NBIS (Negative Biased Illuminated Stress) Condition, **SUNGMIN KIM**, H.J. KIM, Seoul National University, South Korea

TF-ThP17 Laser Surface Modification of AZ31B-H24 for Improved Corrosion Resistance, **MICHAEL MELIA**, University of Virginia, N. BIRBILIS, Monash University, Australia, J.R. SCULLY, J.M. FITZ-GERALD, University of Virginia

TF-ThP18 Enhanced Mechanical Properties of Boron Doped Amorphous Carbon Films by UV Laser Annealing, **CHULMIN YOUN**, T. CHOI., Sejong University, Republic of Korea, J.Y. YANG, TES Co. Ltd., Republic of Korea, K.P. PARK, G.H. HUR, TES Co., Ltd., Republic of Korea

TF-ThP19 Influence of Zn(O,S) Buffer Layers on the Performance of $Cu_2ZnSn(S,Se)_4$ Earth-abundant Thin Film Solar Cells, H. HONG, **JAEYEONG HEO**, Chonnam National University, Republic of Korea

TF-ThP20 Preparation and Characterization of Sol Gel Derived Nanostructure Er Doped ZnO Films, **GONCA ILGU**, S. ILICAN, Anadolu University, Turkey

TF-ThP21 Effects of Oxygen Concentration and Post-Annealing Oxidation on the Anti-Bacteria Property of TaN-(Ag,Cu) and TaON-(Ag,Cu), J.H. HSIEH, Ming Chi University of Technology, Taiwan, Republic of China, Y.-C. LAI, National Chiao Tung University, Taiwan, Republic of China, S.J. LIAO, Y.C. LIN, **SHUHAN WU**, Ming Chi University of Technology, Taiwan, Republic of China, C. LI, National Yang Ming University, Taiwan, Republic of China

TF-ThP22 Low-Temperature Atomic Layer Deposition of Platinum Using (Methylcyclopentadienyl)trimethylplatinum and Ozone, **HUAZHI LI**, N. SULLIVAN, P. CHINOY, Arradiance

TF-ThP23 Phase Transition of Organic Molecule under Vacuum for Organic Light Emitting Diode, S. SHIM, J.-T. KIM, **NAK-KWAN CHUNG**, J.-Y. YUN, Korea Research Institute of Standards and Science

TF-ThP24 Investigation of Oxygen Flow Rate on Performance of IGZO Thin Film Transistor, **ANUP SAHOO**, G. WU, Chang Gung University, Taiwan, Republic of China

TF-ThP25 Flash Networking Poster: Surface Characterization and Luminescent Properties of Pulsed Laser Deposited Dysprosium-Doped Rare-Earth Oxyorthosilicates Thin Films, **MARTIN NTWAEABORWA**, S.N. OGUGUA, H.C. SWART, University of the Free State, South Africa

TF-ThP26 Flash Networking Poster: Selective Atomic Layer Deposition for Electrically Connecting Graphene Flakes, **CHANYUAN LIU**, X. HAN, W. BAO, A.J. PEARSE, L. HU, G.W. RUBLOFF, University of Maryland, College Park

TF-ThP27 Hydrogen Flow Effect on the Compositional and Optical Properties of SiO_x films deposited by HFCVD, **JOSE LUNA LOPEZ**, D.E. VAZQUEZ VALERDI, A. BENÍTEZ LARA, G. GARCÍA SALGADO, J.A. CARRILLO LÓPEZ, J.A.D. HERNANDEZ DE LA LUZ, BUAP, Mexico

TF-ThP28 Effect of a Substrate Temperature on the Properties of the RF-sputtered Indium Selenide Thin Films as a Buffer Layer for CIGS Photovoltaics, **MYOUNGHAN YOO**, N.H. KIM, Chosun University, Republic of Korea

TF-ThP29 Nd:YAG Laser (λ_o = 532 nm) Annealed CIGS Thin Films with Various Laser Powers and Their Structural/Optical/Electrical Properties, **YOUNG-KIL JUN**, Chosun University, Republic of Korea, C.I. PARK, Hyobjin Jeongbo Co., Inc., Republic of Korea, N.H. KIM, Chosun University, Republic of Korea

TF-ThP33 Stress-curvature Relationship for Configurations with Thin and Anisotropic Substrates undergoing Large Deformations, **SAISHARAN INJETI**, R. ANNABATTULA, Indian Institute of Technology Madras, India

TF-ThP34 Doping of High-aspect Ratio Silicon Structures using Thin Film Dopant Sources Grown by Plasma-assisted Atomic Layer Deposition, **BODO KALKOFEN**, Otto von Guericke University Magdeburg, Germany, A.A. AMUSAN, Otto von Guericke University, Magdeburg, Germany, M. LISKER, IHP, Frankfurt (Oder), Germany, Y.S. KIM, Lam Research Corporation, E.P. BURTE, Otto von Guericke University, Magdeburg, Germany

TF-ThP35 Nano-Patterning for Control Cell Growth, F. EROGBOGBO, **JERUSALEM DARKERA**, San Jose State University

TF-ThP36 Kurt J. Lesker- TORUS "Mag Keeper" Sputtering Sources- "Enabling Thin Film Coating Technology for a Better World", **JASON HREBIK**, Kurt J. Lesker Company

TF-ThP37 Optoelectronic and Nanophotonic Framework Enabled by Ultrathin, Smooth, Low Loss and Stable Doped Silver Films, **CHENG ZHANG**, L. CHEN, D. ZHAO, D. GU, T. GEORGE, H. KIM, L.J. GUO, University of Michigan-Ann Arbor

TF-ThP38 Temperature-Dependent Reactions at the Interface Between Transparent Conducting Oxides and ALD TiO2, **ISVAR CORDOVA**, Duke University, Q. PENG, University of Alabama, J. GLASS, Duke University

TF-ThP39 Femtosecond X-Ray Magnetic Circular Dichroism Spectroscopy at an X-Ray Free Electron Laser, **DANIEL HIGLEY**, K. HIRSCH, E. YUAN, E. JAL, G.L. DAKOVSKI, A.A. LUTMAN, J. MACARTHUR, A.H. REID, T. LIU, SLAC National Accelerator Laboratory, J. JOSEPH, Lawrence Berkeley National Laboratory, A. TSUKAMOTO, Nihon University, H.A. DURR, W.F. SCHLOTTER, SLAC National Accelerator Laboratory

Tribology Focus Topic
Room: Hall 3 - Session TR-ThP

Tribology Poster Session
6:00 pm

TR-ThP1 Adhesion of Hard Coating on Neutral Nitrided Tool Steel Surfaces, P. ABRAHA, Meijo University, Japan, **TAKUMA MATSUDA**, Meijo UnUniversity, Japan

TR-ThP2 Neutral Nitriding of Austenite Stainless Steel at Low Temperature, **JUN TAMURA**, P. ABRAHA, Meijo University, Japan

TR-ThP3 Non-Oxidized Metallic Transfer Film Formation Originated from Metallic Nanoparticles Embedded in Diamond-like Carbon under Sliding in Air, **TAKANORI TAKENO**, H. MIKI, T. TAKAGI, K. ADACHI, Tohoku University, Japan

TR-ThP4 Achieving Very Low Friction with Molybdenum Disulfide Nanoparticles Embedded into Hydrogenated Amorphous Carbon Coatings, **KAZUKI IKOMA**, K. ADACHI, T. TAKENO, Tohoku University, Japan

TR-ThP5 Study of Wear-corrosion Mechanisms of CoCrMo Alloys Alone and Coated with TiAlN Coatings, **MARTIN FLORES**, O. JIMENEZ, Universidad de Guadalajara, Mexico, E. ANDRADE, Universidad Nacional Autonoma de México

TR-ThP6 Frictional Property Optimization of Metal Oxide Thin Films by a Combinatorial Optimization of Crystal Orientation for Tribology (COCOT) Technique, **MICHIKO SASAKI**, M. GOTO, A. KASAHARA, M. TOSA, National Institute for Materials Science, Japan

FRIDAY SPECIAL EVENTS

8:00 a.m. IUVSTA Highlight Seminar — 212D (CC)

CC = San Jose Convention Center
H = San Jose Marriott

NOTES

	2D Materials Focus Topic Room: 212C - Session 2D+EM+IS+NS+PS+SP+SS-FrM Surface Chemistry of 2D Materials: Functionalization, Membranes, Sensors **Moderators:** Peter Sutter, University of Nebraska - Lincoln, Judy Cha, Yale University	Electronic Materials and Processing Room: 211C - Session EM+AS+EN+NS-FrM Nanoparticles for Electronics and Photonics **Moderators:** Jessica Hilton, Mantis Deposition, Joseph G. Tischler, U.S. Naval Research Laboratory
8:20 am	**2D+EM+IS+NS+PS+SP+SS-FrM1** Chemically Modifying Graphene for Surface Functionality, **PAUL SHEEHAN**, S. TSOI, S.C. HERNÁNDEZ, S.G. WALTON, T.L. REINECKE, K.E. WHITENER, J.T. ROBINSON, Naval Research Laboratory, R. STINE, Nova Research	**EM+AS+EN+NS-FrM1 Invited** Elimination of Bias-stress Effect in Ligand-free Quantum Dot Field-effect Transistors, **MATT LAW**, UC Irvine
8:40 am	**2D+EM+IS+NS+PS+SP+SS-FrM2** Structural Phase Stability Control of Monolayer $MoTe_2$ with Adsorbed Atoms and Molecules, **YAO ZHOU**, E.J. REED, Stanford University	Invited talk continued.
9:00 am	**2D+EM+IS+NS+PS+SP+SS-FrM3 Invited** Selective Nanochemistry on Graphene/Silicon Carbide: Substrate Functionalization and Polycyclic Aromatic Hydrocarbons Formation, **PATRICK SOUKIASSIAN**, CEA, France	**EM+AS+EN+NS-FrM3** Transfer of Charge and Transfer of Electronic Excitation Energy between Quantum Dots., **KAREL KRAL**, Institute of Physics, Academy of Sciences of Czech Republic, v.v.i., Czech Republic, M. MENSIK, Institute of Macromolecular Chemistry, Academy of Sciences of Czech Republic, v.v.i., Czech Republic
9:20 am	Invited talk continued.	**EM+AS+EN+NS-FrM4** Selective Nucleation of Quantum Dots on Spontaneously Nanopatterned Surfaces, **DAVIDE DEL GAUDIO**, S. HUANG, L. AAGESEN, K. THORNTON, R.S. GOLDMAN, University of Michigan, Ann Arbor
9:40 am	**2D+EM+IS+NS+PS+SP+SS-FrM5** Intrinsic Wettability of Graphene, **HAITAO LIU**, Department of Chemistry, University of Pittsburgh	**EM+AS+EN+NS-FrM5 Invited** Tailor-made Gas Phase based Nanoparticles with Functional Properties, **GERT TEN BRINK**, B. KOOI, G. PALASANTZAS, University of Groningen, The Netherlands
10:00 am	**2D+EM+IS+NS+PS+SP+SS-FrM6** Au-doped Graphene As a Promising Electrocatalyst for the Oxygen Reduction Reaction in Hydrogen Fuel Cells: Prediction from First Principles, **SERGEY STOLBOV**, University of Central Florida, M. ALCANTARA ORTIGOZA, Tuskegee University	Invited talk continued.
10:20 am	**2D+EM+IS+NS+PS+SP+SS-FrM7** Spontaneous Deposition of Palladium Nanoparticles on Graphene through Redox Reaction, **XIAORUI ZHANG**, W. OOKI, Y.R. KOSAKA, T. KONDO, J. NAKAMURA, University of Tsukuba, Japan	**EM+AS+EN+NS-FrM7** Gas Phase Synthesis and Soft Landing of Bare Ionic Nanoparticles Prepared by Reactive Magnetron Sputtering, **GRANT JOHNSON**, T. MOSER, N. BROWNING, J. LASKIN, Pacific Northwest National Laboratory
10:40 am	**2D+EM+IS+NS+PS+SP+SS-FrM8** Gradient Electrochemical Response of Template Synthesized Thickness Sorted MoS_2 Nanosheets for Cellular Level Free Radical Detection, **ANKUR GUPTA**, T. SELVAN, S. DAS, S. SEAL, University of Central Florida	**EM+AS+EN+NS-FrM8** Compositional Control and Doping Uniformity in Spray Pyrolyzed CZTS Nanoparticles and Films, **STEPHEN EXARHOS**, A. ALVAREZ, J. HERNANDEZ, L. MANGOLINI, University of California - Riverside
11:00 am	**2D+EM+IS+NS+PS+SP+SS-FrM9** Methanol Synthesis on Defect-Laden Single-Layer MoS_2 Supported on Cu(111): Results of a First Principles Study, D. LE, **TAKATB. RAWAL**, T.S. RAHMAN, University of Central Florida	**EM+AS+EN+NS-FrM9** Ultra High Sensitive CO Sensors with Less Overhead: Influence of Doping Methods and Dopants on the CO Sensitivity of Cu, Pt and Pd Doped SnO_2 Pellets, **KARTHIK TANGIRALA**, M.A. OLVERA, CINVESTAV-IPN, Mexico
11:20 am	**2D+EM+IS+NS+PS+SP+SS-FrM10** The Happy Marriage of Graphene and Germanium: Graphene Achieves Exceptional Conductivity and Protects Germanium from Oxidizing, **RICHARD ROJAS DELGADO**, University of Wisconsin-Madison, F. CAVALLO, University of New Mexico, R.M. JACOBBERGER, J.R. SANCHEZ PEREZ, D. SCHROEDER, M.A. ERIKSSON, M.S. ARNOLD, M.G. LAGALLY, University of Wisconsin-Madison	**EM+AS+EN+NS-FrM10** A New Surfactant for Directed Deposition of Carbon Nanomaterials, **HANNA NILSSON**, University of Maryland, L. DE KNOOP, Chalmers University, J. TICEY, B. MEANY, Y. WANG, University of Maryland, E. OLSSON, Chalmers University, J. CUMINGS, University of Maryland
11:40 am		

	Plasma Science and Technology Room: 210A - Session PS+SE-FrM **Atmospheric Pressure Plasma Processing II** **Moderator:** Mohan Sankaran, Case Western Reserve University	Plasma Science and Technology Room: 210B - Session PS+SS+TF-FrM **Atomic Layer Etching (ALE) and Low-Damage Processes II** **Moderator:** Toshihisa Nozawa, Tokyo Electron Ltd.
8:20 am		**PS+SS+TF-FrM1 Invited** Atomic Layer Etching of Silicon Dioxide to Enable Self-aligned Contact Integration, B. FINCH, **HARMEET SINGH**, Lam Research Corporation
8:40 am		Invited talk continued.
9:00 am	**PS+SE-FrM3 Invited** Scaling Atmospheric Pressure Plasma Sources for Manufacturing-Scale Applications, **STEVEN SHANNON**, North Carolina State University	**PS+SS+TF-FrM3** High Performance Self Align Contact Etching with Newly developed Quasi-ALE, **AKIHIRO TSUJI**, Tokyo Electron Miyagi Limited, Japan, M. TABATA, H. WATANABE, T. KATSUNUMA, Tokyo Electron Miyagi Limited, M. HONDA, Tokyo Electron Miyagi Limited, Japan
9:20 am	Invited talk continued.	**PS+SS+TF-FrM4** Fluorocarbon Based Atomic Layer Etching of Si_3N_4 and Selectivity of SiO_2 over Si_3N_4, **CHEN LI**, D. METZLER, G.S. OEHRLEIN, University of Maryland, College Park, C.S. LAI, M. DANEK, E.A. HUDSON, A. DULKIN, Lam Research Corporation
9:40 am	**PS+SE-FrM5** Improving of Harvest Period and Crop Yield of *Arabidopsis Thaliana L.* using Nonthermal Atmospheric Air Plasma, **KAZUNORI KOGA**, T. SARINONT, T. AMANO, H. SEO, N. ITAGAKI, M. SHIRATANI, Kyushu University, Japan	**PS+SS+TF-FrM5** Chamber Wall Effect for Fluorocarbon Assisted Atomic Layer Etching of SiO_2 Using Cyclic Ar/C_4F_8 Plasma, **MASATOSHI KAWAKAMI**, Hitachi High-Technologies, Japan, D. METZLER, C. LI, G.S. OEHRLEIN, University of Maryland, College Park
10:00 am	**PS+SE-FrM6** Numerical Modelling of Atmospheric Pulsed Streamers over Water; Electrodynamics at the Interface, **ALEX LINDSAY**, S. SHANNON, North Carolina State University, D.B. GRAVES, University of California at Berkeley	**PS+SS+TF-FrM6 Invited** Potential Solutions for Atomic Precision Etching, **OLIVIER JOUBERT**, LTM-CNRS, France, E. DESPIAU-PUJO, LTM, France, G. CUNGE, LTM - CEA/LETI, France, L. VALLIER, J. DUBOIS, A. TAVERNIER, Univ. Grenoble Alpes-CNRS-CEA/Minatec-LTM, France, O. LUERE, S. BANNA, Y. ZHANG, Applied Materials
10:20 am	**PS+SE-FrM7** Application of Atmospheric Pressure Plasma treatment on Carbon Fiber Reinforced Plastics for Adhesive Bonding, **TIMO HOFMANN**, J. SCHÄFER, Bundeswehr Research Institute for Material, Fuels and Lubricants, Germany, T. LÖBEL, German Aerospace Center (DLR), T. MEER, Airbus Group Innovations, J. REHBEIN, J. HOLTMANNSPÖTTER, Bundeswehr Research Institute for Material, Fuels and Lubricants, Germany	Invited talk continued.
10:40 am	**PS+SE-FrM8** Atmospheric Plasma Deposition of Transparent Organosilicate Multifunctional Coatings on Plastics in Air, **SIMING DONG**, Z. ZHAO, R.H. DAUSKARDT, Stanford University	**PS+SS+TF-FrM8** Molecular Dynamics Simulations of Atomic Layer Etching by Low Energy Ions, **JUN-CHIEH WANG**, S. RAUF, J.A. KENNEY, L. DORF, K.S. COLLINS, Applied Materials Inc.
11:00 am	**PS+SE-FrM9** Atmospheric Plasma Deposition of Anti-Reflection Coatings on Silicon in Open Air, **MICHAEL HOVISH**, R.H. DAUSKARDT, Stanford University	**PS+SS+TF-FrM9** Atomic Layer Etching of InGaAs using Cl_2/Ar Ion Beam, **JINWOO PARK**, D.H. YUN, H.S. KIM, G.Y. YEOM, Sungkyunkwan University, Republic of Korea
11:20 am	**PS+SE-FrM10** Polymer Thin Film Deposition using Atmospheric Pressure Single Plasma Jet or Plasma Jet Array from a Plasma Gun Device, **CÉLINE VIVIEN**, IEMN CNRS/Université Lille 1, France, E. ROBERT, J.-M. POUVESLE, GREMI CNRS/Université d'Orléans, France	**PS+SS+TF-FrM10** InGaN Quantum Nanodisks Fabrication by Bio-Template and Neutral Beam Etching, **Y.-C. LAI**, National Chiao Tung University, Taiwan, Republic of China, A. HIGO, C. THOMAS, C.Y. LEE, T. TANIKAWA, K. SHOJIKI, S. KUBOYA, R. KATAYAMA, Tohoku University, Japan, T. KIBA, Hokkaido University, Japan, I. YAMASHITA, Nara Institute of Science and Technology, Japan, A. MURAYAMA, Hokkaido University, Japan, P.YU. YU, National Chiao Tung University, Taiwan, Republic of China, S. SAMUKAWA, Tohoku University
11:40 am	**PS+SE-FrM11** XPS to Investigating Spatial and Temporal Modification of Polymeric Platforms for Micro-Fluidic Devices, **MARSHAL DHAYAL**, CSIR Centre for Cellular and Molecular Biology (CCMB), India	**PS+SS+TF-FrM11** Towards a Nanoscale Plasma Etching Precision: Molecular Dynamics Simulations of Si-Cl Interactions, **PAULIN BRICHON**, Univ. Grenoble Alpes-CNRS-CEA/Minatec-LTM,38000 Grenoble-France, E. DESPIAU-PUJO, LTM, France, O. MOUREY, Univ. Grenoble Alpes-CNRS-CEA/Minatec-LTM,38000 Grenoble-France, G. CUNGE, LTM - CEA/LETI, France, O. JOUBERT, Univ. Grenoble Alpes-CNRS-CEA, France

	Scanning Probe Microscopy Focus Topic Room: 212A - Session SP+AS+MI+NS+SS-FrM **Probe-Sample Interactions** **Moderator:** Carl Ventrice, Jr., SUNY Polytechnic Institute	Thin Film Room: 111 - Session TF+MI-FrM **Thin Films for Light Trapping, Plasmonic, and Magnetic Applications** **Moderators:** Angel Yanguas-Gil, Argonne National Laboratory
8:20 am	**SP+AS+MI+NS+SS-FrM1 Invited** Direct Visualization of Magnetoelectric Domains in Hexagonal Manganites, **WEIDA WU**, Rutgers University	**TF+MI-FrM1 Invited** Designing and Deposition of Multilayer Selective Surface for Tuning Absorption and Reflection of Solar Spectra, Z. REN, **FENG CAO**, University of Houston
8:40 am	Invited talk continued.	Invited talk continued.
9:00 am	**SP+AS+MI+NS+SS-FrM3** Kelvin Probe Force Microscopy Studies of Magnetic Atoms on Ultrathin Insulating MgO Film, **TAEYOUNG CHOI**, W. PAUL, S. BAUMANN, C.P. LUTZ, A. HEINRICH, IBM Almaden Research Center	**TF+MI-FrM3 Invited** Femtomagnetism in FePt Nanoparticles for Heat Assisted Magnetic Recording, J-Y. BIGOT, J. KIM, M. VOMIR, Institut de Physique et Chimie des Matériaux de Strasbourg: Université de Strasbourg and CNRS, France, O. MOSENDZ, S. JAIN, **DIETER WELLER**, HGST a Western Digital company
9:20 am	**SP+AS+MI+NS+SS-FrM4** Nanoscale Schottky Barrier Height Mapping Utilizing Ballistic Electron Emission Microscopy, C. DURCAN, W. NOLTING, College of Nanoscale Science and Engineering, **VINCENT LABELLA**, SUNY Polytechnic Institute	Invited talk continued.
9:40 am	**SP+AS+MI+NS+SS-FrM5** Electron Transport Studies of Metal Films Utilizing Ballistic Electron Emission Microscopy, **CHRISTOPHER DURCAN**, SUNY College of Nanoscale Science and Engineering, V. LABELLA, SUNY Polytechnic Institute	**TF+MI-FrM5** Self-cleaning Multi-functional Coatings with Good Robustness, High Transmittance and Superamphiphobicity, **JUNHUI HE**, Z. GENG, Technical Institute of Physics and Chemistry, Chinese Academy of Sciences, China
10:00 am	**SP+AS+MI+NS+SS-FrM6** Utilizing Ballistic Electron Emission Microscopy to Study Sidewall Scattering of Electrons, **WESTLY NOLTING**, C. DURCAN, R. BALSANO, College of Nanoscale Science and Engineering, University of Albany, V. LABELLA, College of Nanoscale Science and Engineering, SUNY Polytechnic Institute	**TF+MI-FrM6** Application of High Refractive Index Layers to Perfect Absorbers for Solar and Thermal Radiations, **MOTOFUMI SUZUKI**, K. NISHIURA, S. MASUNAKA, K. NAMURA, Kyoto University, Japan
10:20 am	**SP+AS+MI+NS+SS-FrM7 Invited** Progress in Nanoscale Magnetic Resonance Imaging, **DANIEL RUGAR**, IBM Research Division	**TF+MI-FrM7** Antireflection Coatings for Tandem Solar Cells, **BO YUAN**, University of Delaware, B. THIBEAULT, University of California at Santa Barbara, K. DOBSON, University of Delaware, A. BARNETT, University of New South Wales, Australia, R.L. OPILA, University of Delaware
10:40 am	Invited talk continued.	**TF+MI-FrM8** Preparation and X-ray Characterization of Highly Oriented Magnetic and Magnetoelectric Thin Films, **RADOMIR KUZEL**, Charles University in Prague, Czech Republic, J. BURSIK, M. SOROKA, K. KNIZEK, Academy of Sciences of the Czech Republic
11:00 am	**SP+AS+MI+NS+SS-FrM9** Reactive Intermediates Created and Analyzed by Scanning Probe Microscopy, **B. SCHULER**, IBM Research - Zurich, Switzerland, N. PAVLIČEK, IBM Research - Zurich, S. COLLAZOS, CIQUS, Universidade de Santiago de Compostela, N. MOLL, S. FATAYER, IBM Research - Zurich, D. PÉREZ, E. GUITÁN, CIQUS, Universidade de Santiago de Compostela, G. MEYER, IBM Research - Zurich, D. PEÑA, CIQUS, Universidade de Santiago de Compostela, L. GROSS, IBM Research - Zurich	**TF+MI-FrM9** Size Effects on the Order-Disorder Phase Transition Temperature in FeNiPt Nanoparticles, G. SUTHERLAND, D. WOOD, Brigham Young University, A. WARREN, K. COFFEY, University of Central Florida, **RICHARD VANFLEET**, Brigham Young University
11:20 am	**SP+AS+MI+NS+SS-FrM10** The Negative Stiffness and Positive Damping of Squeezed Air in Dynamic Atomic Force Microscopy, X. YU, M. TAO, **NANCY BURNHAM**, Worcester Polytechnic Institute	**TF+MI-FrM10** A Comparison of Heptane Solvent Annealing versus Thermal Annealing Block Copolymers for Bit Patterned Advanced Media, **ALLEN OWEN**, A. MONTGOMERY, H. SU, S. GUPTA, University of Alabama
11:40 am		

Friday Morning, October 23, 2015

Tribology Focus Topic
Room: 230B - Session TR+AS+BI+NS-FrM

Nanoscale Wear and Biotribology
Moderator: J. David Schall, Oakland University

IUVSTA Highlight Seminar
Room: 212D

Moderator: Prof. David N. Ruzic, Scientific Director of IUVSTA, University of Illinois at Urbana-Champaign, USA

8:20 am	**TR+AS+BI+NS-FrM1 Invited** 2D or not 2D? The Impact of Nanoscale Roughness and Substrate Interactions on the Tribological Properties of Graphene, **JAMES BATTEAS**, Texas A&M University	**8:00 am**	**Dr. BONNIE TYLER, National Physics Laboratory, United Kingdom,** "Recent Advances in Applied Surface Science"
8:40 am	Invited talk continued.	**8:30 am**	**Dr. GIACOMO CECCONE, European Commission Unit Nanobiosciences,** Italy, and Dr. Anouk Galtayries, Chimie ParisTech, France, Needs and Challenges of Vacuum Techniques in Biointerfaces Analysis"
9:00 am	**TR+AS+BI+NS-FrM3 Invited** Atomic–Scale Wear and Wear Reduction Mechanisms Elucidated by *In Situ* Approaches, R.W. CARPICK, University of Pennsylvania, **TEVIS JACOBS**, University of Pittsburgh	**9:00 am**	**Dr. REINHARD HORST SCHWARZ, University of Lisbon, Portugal,** "Electronic Materials for Energy Harvesting and Energy Storage"
9:20 am	Invited talk continued.	**9:30 am**	**Dr. CHRISTIAN TEICHERT, Montanuniversität Leoben, Austria,** "Nanometer Sized Structures are still Up-to-Date"
9:40 am	**TR+AS+BI+NS-FrM5 Invited** Influence of Polysaccharide Conformation on Friction and Adhesion, **ROWENA CROCKETT**, Empa, Switzerland	**10:00 am**	**Prof. TIMO GANS, University of York, United Kingdom,** "Recent Highlights and Trends in Plasma Science and Technology"
	Invited talk continued.	**10:30 am**	**BREAK**
10:20 am	**TR+AS+BI+NS-FrM7 Invited** Tribological Rehydration of Cartilage: A New Insight into an Old Problem, **DAVID BURRIS**, A.C. MOORE, University of Delaware	**10:45 am**	**Prof. IVAN PETROV, University of Illinois at Urbana-Champaign, USA,** "Advances in Surface Engineering"
10:40 am	Invited talk continued.	**11:15 am**	**Prof. MARIA C. ASENSIO, Synchrotron SOLEIL, University Paris-Saclay,** France, "Building Surfaces without Bulk: Last Highlights from Surface Science Division Beyond Graphene"
11:00 am	**TR+AS+BI+NS-FrM9** Biomimetic Aspects of Lubrication with Polymer Brushes and Gels, C. MATHIS, L. ISA, **NICHOLAS SPENCER**, ETH Zürich, Switzerland	**11:45 am**	**Prof. CHRISTOPH EISENMENGER-SITTNER, Vienna University of Technology, Austria,** "Highlights and Challenges in Thin Film Deposition"
11:20 am		**12:15 pm**	**Dr. JAY HENDRICKS, National Institute of Standards and Technology, USA,** ""Highlights of Next Generation Vacuum Science and Technology"
11:40 am			

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AVS-62
EXHIBIT PROGRAM

Exhibit Hall Special Events • Exhibitor Profiles • Exhibitor Product Locator • Exhibit Schedule
Sponsors • Corporate Members • Free Attractions

EXHIBIT HALL EVENTS

EXHIBIT HALL SCHEDULE

Oct. 20	Tuesday	10am - 5:00pm
Oct. 21	Wednesday	10am - 4:30pm
Oct. 22	Thursday	10am - 2:30pm

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EXHIBIT HALL ATTRACTIONS

- Instrumentation,Equipment & Services
- Technology Spotllight Sessions
- Journals/Books/Publishers/Consulting
- Professional Literature
- AVS Store: Gifts/Souvenirs
- Career Center / Employment Services
- AVS Membership & Education Booth
- Free Morning Coffee & Lunch
- Free Afternoon Refreshments
- Art Zone Display & Competition
- Photo Booth & Caricatures
- BlackJack Tournament
- Raffle Drawings
- Ask The Experts - Vacuum Technology
- E-Mail Pavilion with Printing Capabilities

Special Events & Attractions

Welcome Mixer - Monday 5:30pm - 7:30pm

Convention Center Grand Concourse

Monday, October 19 5:30 - 7:30

NETWORKING at its best! The Welcome Mixer offers food and refreshments and the opportunity to casually interface with fellow AVS attendees and exhibitors from around the world. Everyone is welcome at the Mixer! **Sponsored in part by AIP Journal of Applied Physics.**

Ask The Experts (ATE) BOOTH 439

Hosted by the AVS Vacuum Technology Division. An unbiased, open forum staffed by experts in various aspects of vacuum technology to discuss and help solve vacuum related issues. Challenge our experts and receive a free souvenir while supplies last!!

Sponsored by: SAES Getters, MKS Instruments and Kimball Physics

Career Center BOOTH 126

Make the right connections at AVS.

Post job openings or search available positions. The AVS Career Center provides the opportunity for attendees and exhibitors to find a perfect match.

Interview Rooms Available

5th Annual Foosball Tournament

Join the competition in Booth 342. Great Prizes!! Sign up begins at Tuesday morning, October 20 in the Exhibit Hall at booth 342. Hosted and Sponsored by Gamma Vacuum.

1st Place Takes Home the Grand Prize !!

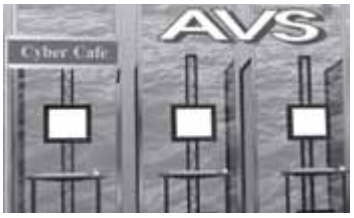
Double Down BlackJack Tournament

Sign up at the Welcome Mixer Monday evening or in **Booth 1023** in the Exhibit Hall Tuesday morning. The player with the most chips at the end of each round moves on in the tournament. This is a no-cash tournament.

There's no buy in. Each player will be given $5000 in chips to start each round. The final round will be on Thursday and the person with the most chips at the end of the tournament wins a great prize !

Generously Sponsored by RF VII

E-Mail Pavilion BOOTH 238



A convenient place for attendees to keep in touch with the outside world. Check your e-mail, flights, print boarding passes, etc.

Generously sponsored by Specs Surface Nano Analysis, Inc.

Special Events & Attractions

Caricaturists BOOTH 339

Visit the Special Events booth for your FREE AVS-62 Souvenir. Our caricature artists will be available during all Exhibit Hall hours. You will find your ticket in your registration kit. **Ticket must be validated at the R.D. Mathis Booth 733 who generously sponsored this event.**

AVS Store, Membership & Educational Material BOOTH 839

- **Videos**
- **Books**
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Exhibitor Technology Spotlight Sessions BOOTH 116

Keep up with the latest technology in the industry! Exhibitors showcase new products, services and applications during 20 minute presentations. Sessions are scheduled during the technical session breaks.

TIME	PRESENTING COMPANY
	TUESDAY
10:20AM	Ask The Experts - AVS Vacuum Tech. Div.
10:40AM	Nanonics
12:40PM	Thermo Scientific
1:00PM	SPECS Surface Nano Analysis, Inc.
1:20PM	Kratos Anaytical, Inc.
1:40PM	Physical Electronics
2:00PM	Asylum Research
4:00PM	CS Clean Systems
	WEDNESDAY
10:20AM	Kurt J. Lesker Company
10:40AM	RASIRC
12:40PM	SPI Supplies
1:00PM	Dupont™ Kalrez® and Vespel®
1:20PM	NiCoForm, Inc.
1:40PM	Prevac sp. z o.o.
2:00PM	Yield Engineering Systems, Inc.
4:00PM	Brooks Automation

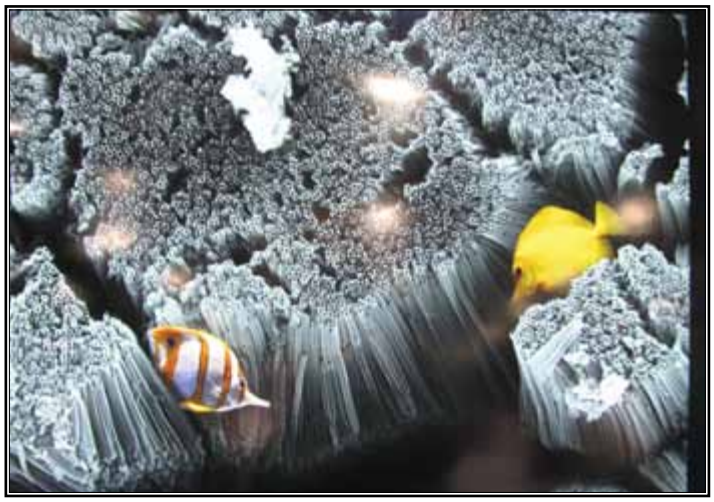
Special Events & Attractions

ART ZONE / CONTEST — BOOTH 1033

See graphic designs in the form of art from fellow AVS attendees who will compete in our fourth annual art contest. Take a look at this amazing display and don't forget to vote! Prizes will be announced at the Exhibit Finale on Thursday.

CASH PRIZES !!!

Generously Sponsored by Duniway Stockroom



RAFFLE ZONE — BOOTH 1027

Find your entry tickets in your registration packet. There are daily raffle tickets - PLUS.. the GRAND PRIZE RAFFLE for Thursday!!! Drop your tickets in the appropriate raffle drums located in Booth 1709 in the Exhibit Hall. **Raffle Prize Preview...**

GRAND PRIZE WILL BE AWARDED ON THURSDAY DURING THE EXHIBIT FINALE

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Exhibitor Quick Reference Guide

Booth	Company
941	A&N Corporation
435	Accurion GmbH
1032	**Agilent Technologies, Vacuum Products Division**
423	**AIP Publishing**
520	AJA International, Inc.
327	Aldrich Materials Science
836	American Institute of Physics
427	**Anasys Instruments**
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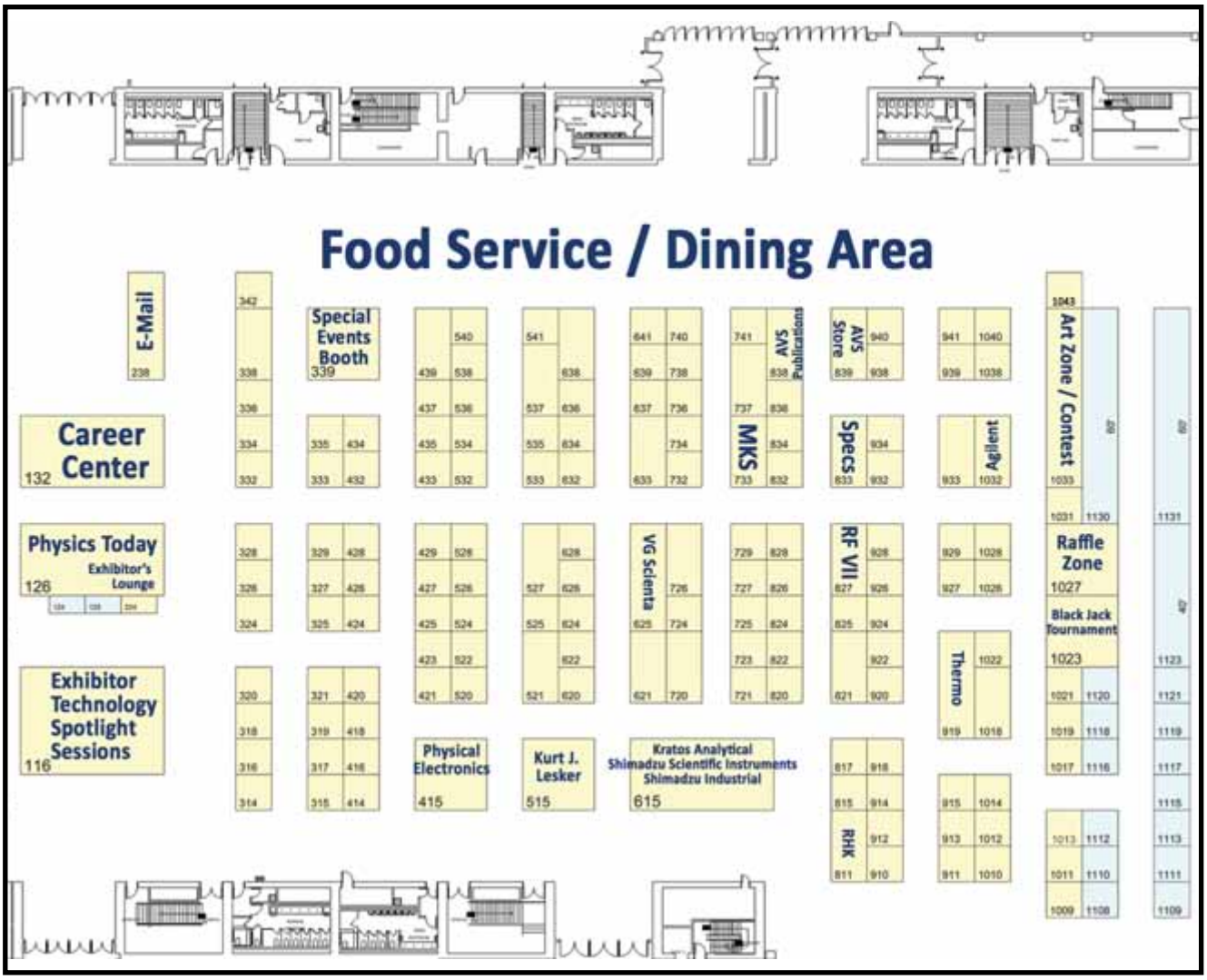
339	AVS Special Events Booth 1
1032	AVS Special Events Booth 1
839	AVS Store & Membership
420	Bay Seal Company
914	BCE - Belilove Company
620	**BellowsTech, LLC**
1018	Brooks Automation
329	Camco Furnace
319	**CAMECA Instruments, Inc.**
636	Capitol Vacuum
834	Centrotherm
1011	Cornell Nanoscale Facility
628	COSMOTEC, Inc.
723	CRC Press / Taylor & Francis
1014	CS Clean Systems, Inc.
425	Denton Vacuum LLC
720	**Duniway Stockroom Corp.**
317	Dupont™ Kalrez® and Vespel®
624	Eagle Instrument Services
418	Ebara Technologies
338	Edwards Vacuum
1017	Elsevier BV
725	EP Laboratories, Inc.
721	Evans Analytical Group
738	Extrel
634	Film Sense
538	FMG Enterprises, Inc.
338	**Gamma Vacuum**
424	Geowell Vacuum Co., Ltd.
522	Glas-Col, LLC
910	GNB Corporation
824	HeatWave Labs Inc.
821	Hiden Analytical, Inc.
641	Hine Automation
429	Horiba Scientific
915	Huntington Mechanical Labs
1019	HVA, LLC
737	**Impedans Ltd.**
421	INFICON
318	InstruTech, Inc.
1022	Integrated Surface Technologies
224	Intel Corporation
532	Intlvac Thin Films
621	**ION-TOF USA**
521	J.A. Woollam Co., Inc.
929	**Kashiyama-USA Inc.**
535	Kaufman & Robinson, Inc.
817	**Kimball Physics Inc.**
615	**Kratos Analytical**
526	KSM Vacuum Products
926	Kurdex Corporation
515	**Kurt J. Lesker Company**
334	Labtec Sales, Inc.
740	Larson Electronic Glass
638	Mantis Deposition, Inc.
428	Materials Science, Inc.
928	McAllister Technical Services
826	MDC Vacuum Products, LLC
934	MICROCERTEC - CTVM
633	**MKS Instruments**
1009	MTI Corporation
315	Nanolab Technologies
939	Nano-Master, Inc.
416	Nanonics Imaging Ltd
325	nanoRANCH
621	NanoScan AG
637	NiCoForm, Inc.
916	NIST
940	NIST/CNST
820	Nonsequitur Technologies
533	**Nor-Cal Products, Inc.**
736	Oerlikon Leybold Vacuum USA, Inc.
536	Omley Industries, Inc.
1021	Oregon Physics LLC
1031	Osaka Vacuum USA, Inc.
724	Oxford Instruments
1026	Oxford Instruments - Industrial
938	Park Systems
426	PCT Systems, Inc.
927	Pfeiffer Vacuum Technology, Inc.
528	**PHPK Technologies**
415	**Physical Electronics**
132	**Physics Today** (Exhibitor Lounge)
320	Phytron, Inc.
1012	Plasma Sensors
828	Plasmaterials, Inc.
626	Precision Ceramics USA, Inc.
534	Precision Plus Vacuum Parts
434	Prevac sp. z o.o.
432	Process Materials Inc.
541	Quantum Deisgn
733	**R.D. Mathis Company**
912	Raith America, Inc.
437	RASIRC
433	**RBD Instruments, Inc.**
913	Refining Systems
524	Renishaw, Inc.
827	**RF VII Inc.**
811	**RHK Technology Inc.**
1010	Ricor-USA, Inc.
540	Rocky Mountain Vacuum Tech., Inc.
335	**SAES Group**
324	scia Systems GmbH
622	**Scientific Instrument Services, Inc.**
1043	SEMATECH
832	**Semicore Equipment, Inc.**
1038	Seren Industrial Power Systems, Inc.
615	**Shimadzu Industrial Equipment**
615	**Shimadzu Scientific Instruments**
632	Solid Sealing Technology, Inc.
833	**SPECS Surface Nano Analysis, Inc.**
314	SPI Supplies
732	Staib Instruments
727	Strem Chemicals, Inc.
729	**Super Conductor Materials**
911	Synergy Systems Corporation
336	T&C Power Conversion, Inc.
822	TDK-Lambda Americas
326	Team Nanotec GmbH
932	Telemark
639	TGM Inc.
919	**Thermo Scientific**
316	Torreyvac Inc.
825	Transfer Engineering & Mfg, Inc.
527	**UC Components**
515	UHV Design Ltd.
525	Ultratech/Cambridge NanoTech
537	Universal Vacuum Technology, LLC
1040	Vacuum Engineering & Materials
933	Vacuum Research Corporation
328	Valqua America, Inc.
332	VAT
625	VG Scienta, Inc.
924	XEI Scientific
333	Yield Engineering Systems, Inc.
922	Yugyokuen Ceramics Co., Ltd.
920	Zeon Chemicals L.P.

Exhibit Hall Floor Plan

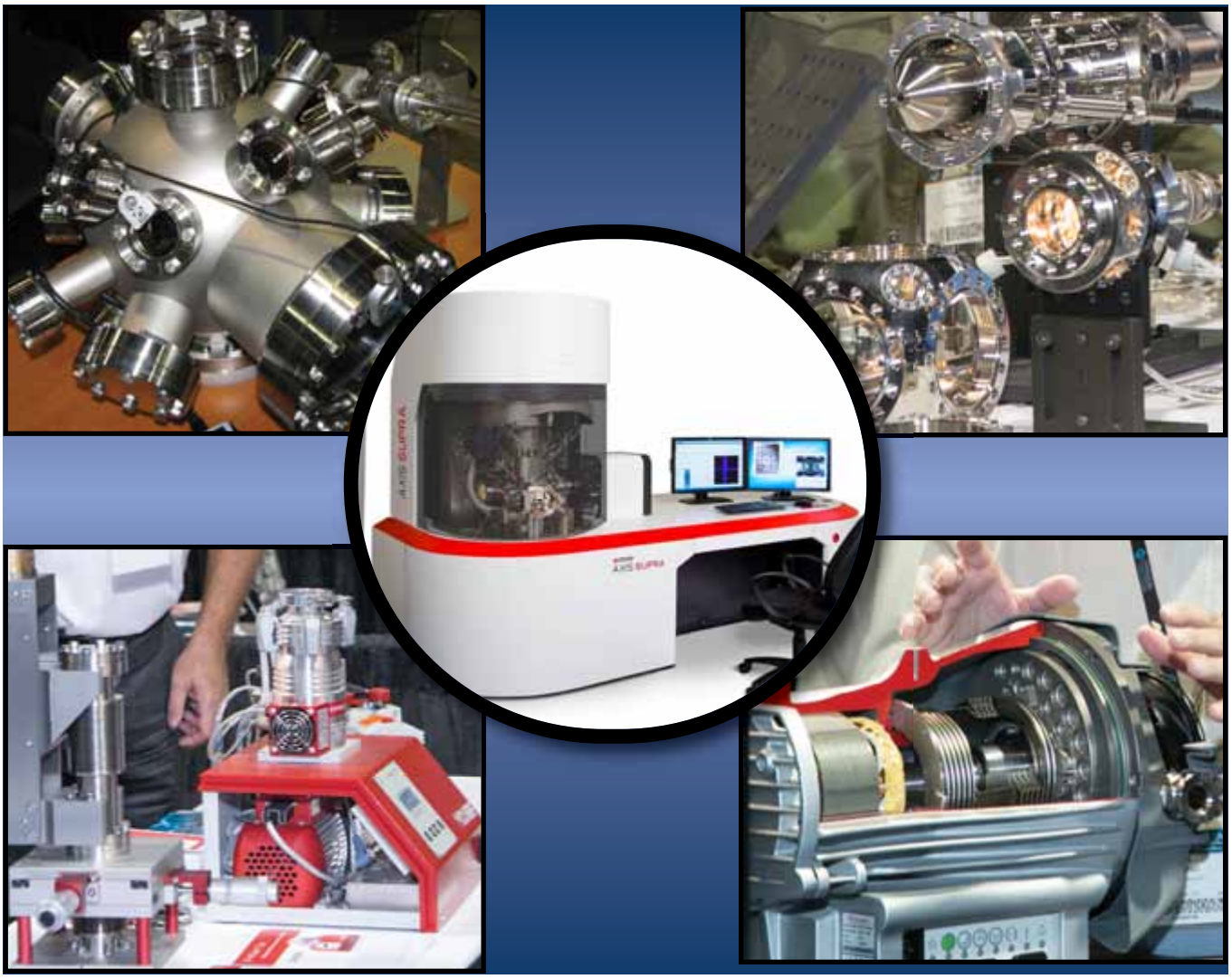


ENTRANCE

PRODUCT LOCATOR

Not sure what company offers what you're looking for?

The Product Locator will help you find the vendors you need. Product categories are listed alphabetically followed by the supplier(s) and their corresponding booth location.



Analytical	Booth
Applied Surface Technologies	734
Brooks Automation	1018
CAMECA Instruments, Inc.	319
EP Laboratories, Inc.	725
Evans Analytical Group	721
FMG Enterprises, Inc.	538
Horiba Scientific	429
Huntington Mechanical Labs	915
ION-TOF USA	621
J.A. Woollam Co., Inc.	521
McAllister Technical Services	928
MKS Instruments	633
MTI Corporation	1009
Nanolab Technologies	315
NIST	916
NIST/CNST	940
Oregon Physics LLC	1021
Oxford Instruments	724
Pfeiffer Vacuum Technology, Inc.	927
Physical Electronics	415
RASIRC	437
Renishaw, Inc.	524
RHK Technology Inc.	811
SPECS Surface Nano Analysis, Inc.	833
Staib Instruments	732

Analytical Instrumentation	Booth
Accurion GmbH	435
Anasys Instruments	427
Asylum Research an Oxford Instruments Company	726
Brooks Automation	1018
CAMECA Instruments, Inc.	319
Extrel	738
FMG Enterprises, Inc.	538
Hiden Analytical, Inc.	821
Horiba Scientific	429
Impedans Ltd.	737
INFICON	421
ION-TOF USA	621
J.A. Woollam Co., Inc.	521
Kimball Physics Inc.	817
Kratos Analytical	615
Mantis Deposition, Inc.	638
MKS Instruments	633
NIST/CNST	940
Nonsequitur Technologies	820
Osaka Vacuum USA, Inc.	1616
Osaka Vacuum USA, Inc.	1031
Oxford Instruments	724

Analytical Instrumentation (Continued)	Booth
Physical Electronics	415
Plasma Sensors	1012
Prevac sp. z o.o.	434
RASIRC	437
RBD Instruments, Inc.	433
Renishaw, Inc.	524
RF VII Inc.	827
RHK Technology Inc.	811
Ricor-USA, Inc.	1010
Scientific Instrument Services, Inc.	622
Shimadzu Scientific Instruments	615
SPECS Surface Nano Analysis, Inc.	833
Staib Instruments	732
TDK-Lambda Americas	822
Team Nanotec GmbH	326
Thermo Scientific	919
Torreyvac Inc.	316
VG Scienta, Inc.	625
Yugyokuen Ceramics Co., Ltd.	922

Atomic Layer Deposition Systems	
Arradiance	741
Hiden Analytical, Inc.	821
Integrated Surface Technologies	1022
Kurdex Corporation	926
McAllister Technical Services	928
NIST/CNST	940
N2 Biomedical	1013
Oxford Instruments	724
RASIRC	437
Ricor-USA, Inc.	1010
Strem Chemicals, Inc.	727
Ultratech/Cambridge NanoTech	525

Auger Electron Spectrometers	
Kratos Analytical	615
Oxford Instruments	724
Physical Electronics	415
Prevac sp. z o.o.	434
RASIRC	437
RBD Instruments, Inc.	433
Ricor-USA, Inc.	1010
SPECS Surface Nano Analysis, Inc.	833
Staib Instruments	732
Thermo Scientific	919
VG Scienta, Inc.	625

Continued...

Continued...

Custom Vacuum Systems	Booth
A&N Corporation	941
Edwards Vacuum	338
Extrel	738
FMG Enterprises, Inc.	538
HeatWave Labs Inc.	824
Hiden Analytical, Inc.	821
Hine Automation	641
HVA, LLC	1019
Impedans Ltd.	737
Intlvac Thin Films	532
Kimball Physics Inc.	817
Kurdex Corporation	926
Kurt J. Lesker Company	515
Mantis Deposition, Inc.	638
McAllister Technical Services	928
MDC Vacuum Products, LLOC	826
MKS Instruments	633
Nano-Master, Inc.	939
Nor-Cal Products, Inc.	533
N2 Biomedical	1013
Oerlikon Leybold Vacuum USA, Inc.	736
Omley Industries, Inc.	536
PHPK Technologies	528
Plasma Sensors	1012
Prevac sp. z o.o.	434
RF VII Inc.	827
RHK Technology Inc.	811
Ricor-USA, Inc.	1010
Rocky Mountain Vacuum Tech., Inc.	540
scia Systems GmbH	324
Semicore Equipment, Inc.	832
Staib Instruments	732
Torreyvac Inc.	316
Transfer Engineering & Manufacturing, Inc.	825
Valqua America, Inc.	328
VG Scienta, Inc.	625

Detectors / Multipliers	
Extrel	738
Hiden Analytical, Inc.	821
Horiba Scientific	429
RBD Instruments, Inc.	433
Scientific Instrument Services, Inc.	622
SPECS Surface Nano Analysis, Inc.	833
SPI Supplies	314
Torreyvac Inc.	316

E-Beam Gun Power Supplies	Booth
INFICON	421
Kimball Physics Inc.	817
Kurt J. Lesker Company	515
Mantis Deposition, Inc.	638
Prevac sp. z o.o.	434
Staib Instruments	732
Telemark	932
Torreyvac Inc.	316
Universal Vacuum Technology, LLC	537

E-Beam Gun Sweeps	
Impedans Ltd.	737
Kimball Physics Inc.	817
Prevac sp. z o.o.	434
Telemark	932
Torreyvac Inc.	316

E-Beam Guns	
HeatWave Labs Inc.	824
Kimball Physics Inc.	817
Kurt J. Lesker Company	515
Mantis Deposition, Inc.	638
McAllister Technical Services	928
Oregon Physics LLC	1021
Prevac sp. z o.o.	434
Staib Instruments	732
Super Conductor Materials	729
Telemark	932
Torreyvac Inc.	316
Yugyokuen Ceramics Co., Ltd.	922

Electroforming Services	
BellowsTech, LLC	620
NiCoForm, Inc.	637

Electroforms: Custom	
BellowsTech, LLC	620
NiCoForm, Inc.	637

Equipment, Used	
Capitol Vacuum	636
Duniway Stockroom Corp.	720
Eagle Instrument Services	624
Ebara Technologies	418
Hine Automation	641
Kurdex Corporation	926
Osaka Vacuum USA, Inc.	1031
Pfeiffer Vacuum Technology, Inc.	927
RBD Instruments, Inc.	433
RF VII Inc.	827
Semicore Equipment, Inc.	832

Magnetron Sputtering Equipment	Booth
AJA International, Inc.	520
Impedans Ltd.	737
Intlvac Thin Films	532
Kurdex Corporation	926
Kurt J. Lesker Company	515
Mantis Deposition, Inc.	638
Materials Science, Inc.	428
MTI Corporation	1009
Nano-Master, Inc.	939
N2 Biomedical	1013
Ricor-USA, Inc.	1010
scia Systems GmbH	324
SPI Supplies	314
Torreyvac Inc.	316

Mass Flow Controller/Accessories	
Horiba Scientific	429
MKS Instruments	633
MTI Corporation	1009
Nor-Cal Products, Inc.	533
RASIRC	437
Torreyvac Inc.	316

Materials / Standards	
AJA International, Inc.	520
Aldrich Materials Science	327
AT&M Six Nine Materials Co., Ltd.	815
CAMECA Instruments, Inc.	319
Kurt J. Lesker Company	515
MICROCERTEC - CTVM	934
MTI Corporation	1009
NIST	916
NIST/CNST	940
Plasmaterials, Inc.	828
Precision Ceramics USA, Inc.	626
Process Materials Inc.	432
R.D. Mathis Company	733
RASIRC	437
Refining Systems	913
Scientific Instrument Services, Inc.	622
SPI Supplies	314
Super Conductor Materials	729
Team Nanotec GmbH	326
Torreyvac Inc.	316
Vacuum Engineering & Materials	1040
Yugyokuen Ceramics Co., Ltd.	922
Zeon Chemicals L.P.	920

Materials Testing	Booth
Accurion GmbH	435
Aldrich Materials Science	327
Anasys Instruments	427
Applied Surface Technologies	734
AT&M Six Nine Materials Co., Ltd.	815
CAMECA Instruments, Inc.	319
Cornell Nanoscale Facility	1011
EP Laboratories, Inc.	725
Horiba Scientific	429
ION-TOF USA	621
J.A. Woollam Co., Inc.	521
Kimball Physics Inc.	817
Nanolab Technologies	315
NIST	916
NIST/CNST	940
Oregon Physics LLC	1021
Precision Ceramics USA, Inc.	626
Quantum Deisgn	541
RASIRC	437
RHK Technology Inc.	811
SPECS Surface Nano Analysis, Inc.	833
SPI Supplies	314
Staib Instruments	732
Torreyvac Inc.	316

Microscopy	
Accurion GmbH	435
Anasys Instruments	427
Asylum Research an Oxford Instruments Co.	726
AT&M Six Nine Materials Co., Ltd.	815
CAMECA Instruments, Inc.	319
Cornell Nanoscale Facility	1011
Horiba Scientific	429
Mantis Deposition, Inc.	638
MTI Corporation	1009
Nanolab Technologies	315
Nanonics Imaging Ltd	416
NanoScan AG	621
NIST/CNST	940
Park Systems	938
Pfeiffer Vacuum Technology, Inc.	927
Quantum Deisgn	541
Refining Systems	913
Renishaw, Inc.	524
RHK Technology Inc.	811
Ricor-USA, Inc.	1010
Shimadzu Scientific Instruments	615
SPECS Surface Nano Analysis, Inc.	833
SPI Supplies	314
Team Nanotec GmbH	326
Thermo Scientific	919
Torreyvac Inc.	316

Continued...

Continued...

Sputtering Deposition System	Booth
Nor-Cal Products, Inc.	533
N2 Biomedical	1013
Oerlikon Leybold Vacuum USA, Inc.	736
Oxford Instruments	724
Process Materials Inc.	432
RASIRC	437
RF VII Inc.	827
Ricor-USA, Inc.	1010
Rocky Mountain Vacuum Tech., Inc.	540
scia Systems GmbH	324
Semicore Equipment, Inc.	832
SPECS Surface Nano Analysis, Inc.	833
SPI Supplies	314
Torreyvac Inc.	316
VG Scienta, Inc.	625

Thickness Monitors/Measurement	
Accurion GmbH	435
Hiden Analytical, Inc.	821
Horiba Scientific	429
INFICON	421
J.A. Woollam Co., Inc.	521
Kurt J. Lesker Company	515
Nanolab Technologies	315
NIST	916
NIST/CNST	940
Oxford Instruments	724
Prevac sp. z o.o.	434
RASIRC	437
RBD Instruments, Inc.	433
SPI Supplies	314
Telemark	932

Thin Film Vacuum Coating	
Aldrich Materials Science	327
Arradiance	741
AT&M Six Nine Materials Co., Ltd.	815
FMG Enterprises, Inc.	538
Hiden Analytical, Inc.	821
Hine Automation	641
Impedans Ltd.	737
Intlvac Thin Films	532
Kurdex Corporation	926
Kurt J. Lesker Company	515
Mantis Deposition, Inc.	638
Materials Science, Inc.	428
Nano-Master, Inc.	939
NIST	916
NIST/CNST	940
Nor-Cal Products, Inc.	533

Thin Film Vacuum Coating (Continued)	Booth
N2 Biomedical	1013
Oerlikon Leybold Vacuum USA, Inc.	736
Prevac sp. z o.o.	434
RBD Instruments, Inc.	433
Oxford Instruments	724
RF VII Inc.	827
Ricor-USA, Inc.	1010
Rocky Mountain Vacuum Tech., Inc.	540
scia Systems GmbH	324
SPECS Surface Nano Analysis, Inc.	833
SPI Supplies	314
Strem Chemicals, Inc.	727
Super Conductor Materials	729
Telemark	932
Torreyvac Inc.	316
Ultratech/Cambridge NanoTech	525
VG Scienta, Inc.	625
Yield Engineering Systems, Inc.	333

ToF SIMS Instruments	
Hiden Analytical, Inc.	821
ION-TOF USA	621
Physical Electronics	415
SPECS Surface Nano Analysis, Inc.	833

Tubing/Piping/Bellows Assemblies	
A&N Corporation	941
Applied Vacuum Technology, LLC.	321
Atlas Technologies	414
BellowsTech, LLC	620
Duniway Stockroom Corp.	720
Ebara Technologies	418
KSM Vacuum Products	526
Larson Electronic Glass	740
MDC Vacuum Products, LLOC	826
MICROCERTEC - CTVM	934
MKS Instruments	633
NiCoForm, Inc.	637
Nor-Cal Products, Inc.	533
Omley Industries, Inc.	536
Scientific Instrument Services, Inc.	622
Vacuum Research Corporation	933
Valqua America, Inc.	328

UV VIS	
Horiba Scientific	429
Thermo Scientific	919

Continued...

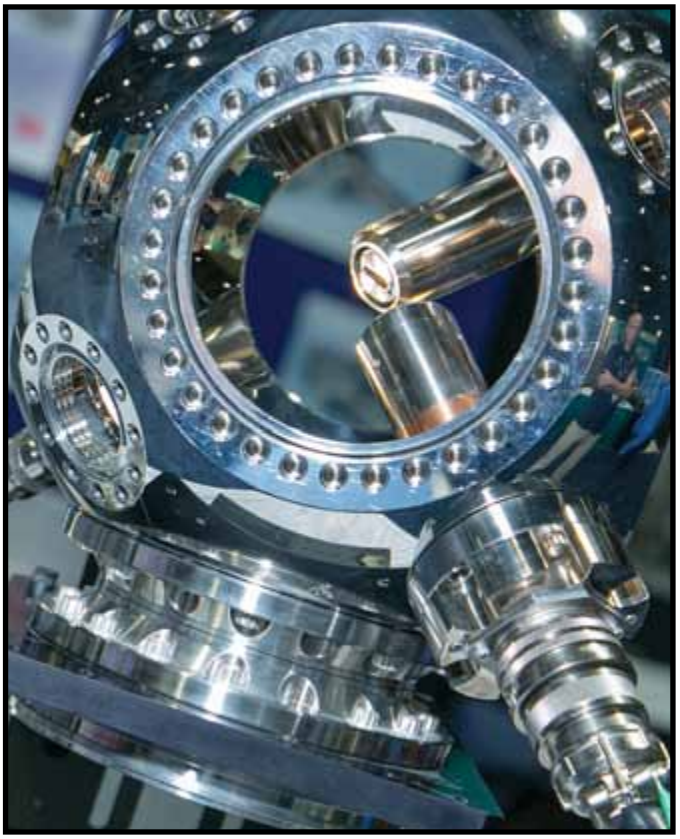
Vacuum System Accessories	Booth
A&N Corporation	941
Agilent Technologies, Vacuum Products Division	938
Applied Vacuum Technology, LLC.	321
Atlas Technologies	414
BCE - Belilove Company	914
BellowsTech, LLC	620
Brooks Automation	1018
Capitol Vacuum	636
COSMOTEC, Inc.	628
Duniway Stockroom Corp.	720
Ebara Technologies	418
Edwards Vacuum	338
Extrel	738
FMG Enterprises, Inc.	538
Geowell Vacuum Co., Ltd.	424
Glas-Col, LLC	522
HeatWave Labs Inc.	824
Hiden Analytical, Inc.	821
Hine Automation	641
Huntington Mechanical Labs	915
HVA, LLC	1019
INFICON	421
Instrutech, Inc.	318
Kaufman & Robinson, Inc.	535
Kimball Physics Inc.	817
KSM Vacuum Products	526
Kurdex Corporation	926
Kurt J. Lesker Company	515
McAllister Technical Services	928
MDC Vacuum Products, LLOC	826
MICROCERTEC - CTVM	934
MKS Instruments	633
MTI Corporation	1009
NiCoForm, Inc.	637
Nonsequitur Technologies	820
Nor-Cal Products, Inc.	533
Oerlikon Leybold Vacuum USA, Inc.	736
Omley Industries, Inc.	536
Osaka Vacuum USA, Inc.	1031
Pfeiffer Vacuum Technology, Inc.	927
PHPK Technologies	528
Precision Plus Vacuum Parts	534
Prevac sp. z o.o.	434
R.D. Mathis Company	733
RBD Instruments, Inc.	433
RF VII Inc.	827
RHK Technology Inc.	811
Ricor-USA, Inc.	1010
Rocky Mountain Vacuum Tech., Inc.	540

Vacuum System Accessories	Booth
SAES Group	335
Scientific Instrument Services, Inc.	622
Semicore Equipment, Inc.	832
Solid Sealing Technology, Inc.	632
SPI Supplies	314
Staib Instruments	732
Telemark	932
TGM Inc.	639
Torreyvac Inc.	316
Transfer Engineering & Manufacturing, Inc.	825
UC Components	527
Universal Vacuum Technology, LLC	537
Vacuum Research Corporation	933
VAT	332
VG Scienta, Inc.	625
XEI Scientific	924
Yugyokuen Ceramics Co., Ltd.	922

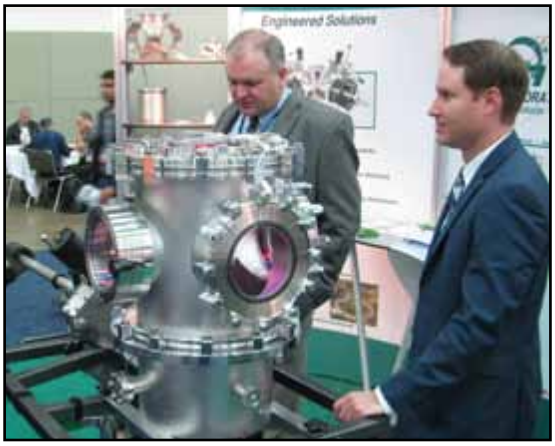
Vacuum System Replacement Parts	
Agilent Technologies, Vacuum Products Division	1032
Atlas Technologies	414
BellowsTech, LLC	620
Brooks Automation	1018
Capitol Vacuum	636
COSMOTEC, Inc.	628
Ebara Technologies	418
Edwards Vacuum	338
Extrel	738
FMG Enterprises, Inc.	538
Geowell Vacuum Co., Ltd.	424
HeatWave Labs Inc.	824
Hine Automation	641
Huntington Mechanical Labs	915
KSM Vacuum Products	526
Kurdex Corporation	926
MDC Vacuum Products, LLOC	826
MICROCERTEC - CTVM	934
NiCoForm, Inc.	637
Nor-Cal Products, Inc.	533
Precision Plus Vacuum Parts	534
Prevac sp. z o.o.	434
RBD Instruments, Inc.	433
RF VII Inc.	827
SAES Group	335
Scientific Instrument Services, Inc.	622
Torreyvac Inc.	316
Transfer Engineering & Manufacturing, Inc.	825
UC Components	527
Universal Vacuum Technology, LLC	537
VAT	332

Continued...

Valves



X-Ray Photoelectron Spectrometers



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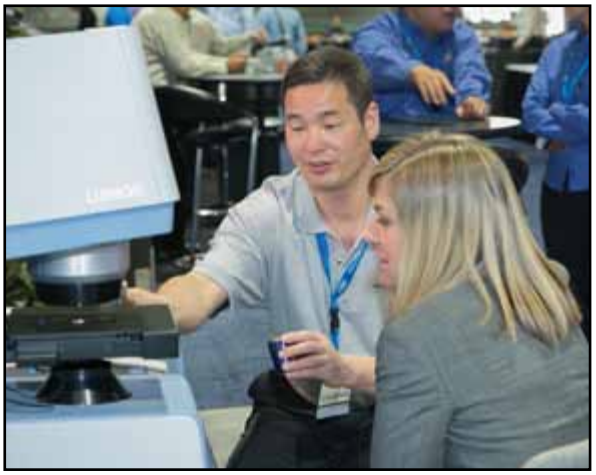

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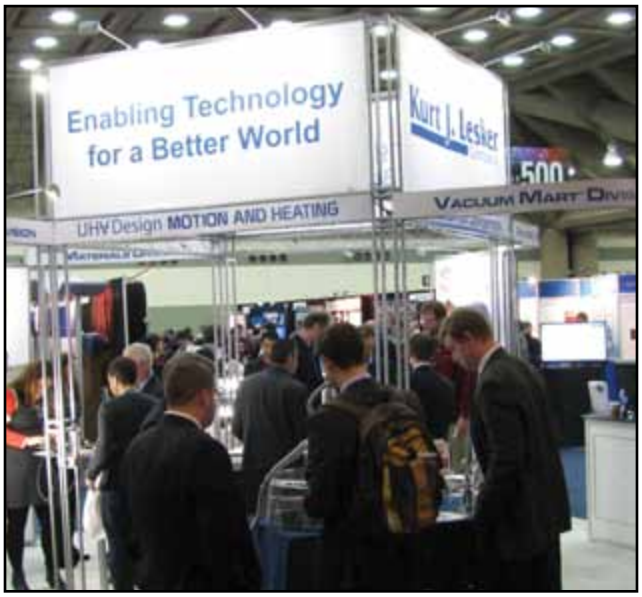

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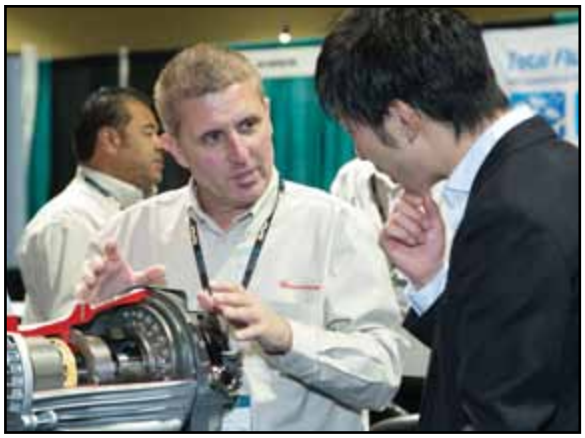

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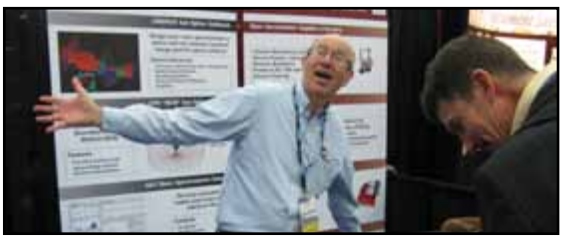

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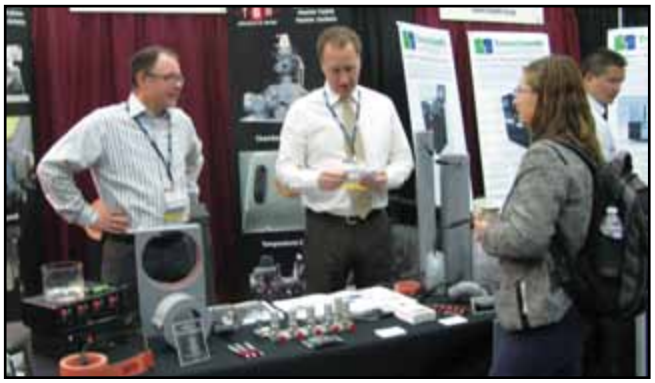

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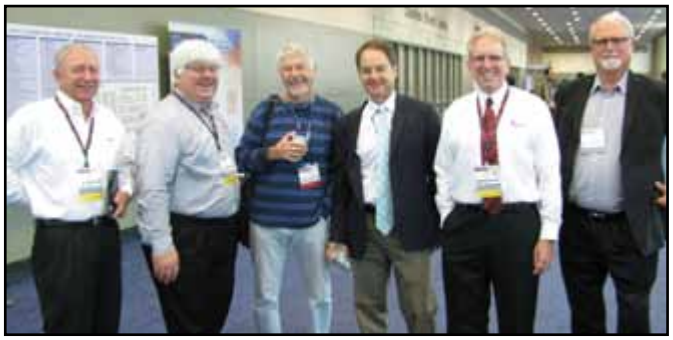

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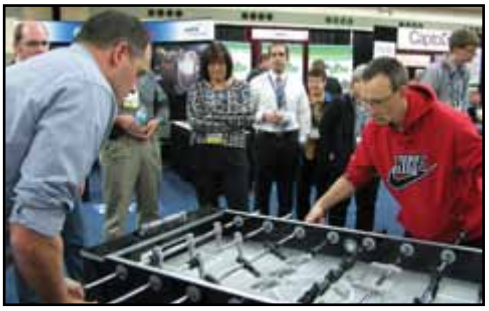

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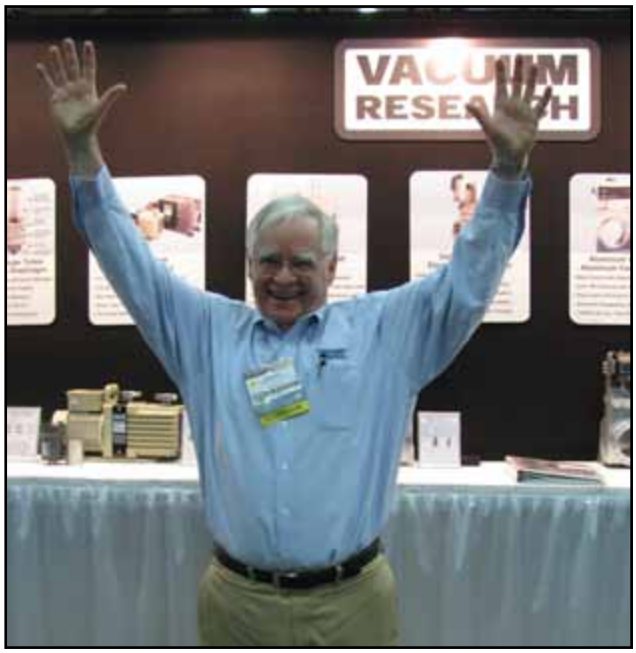

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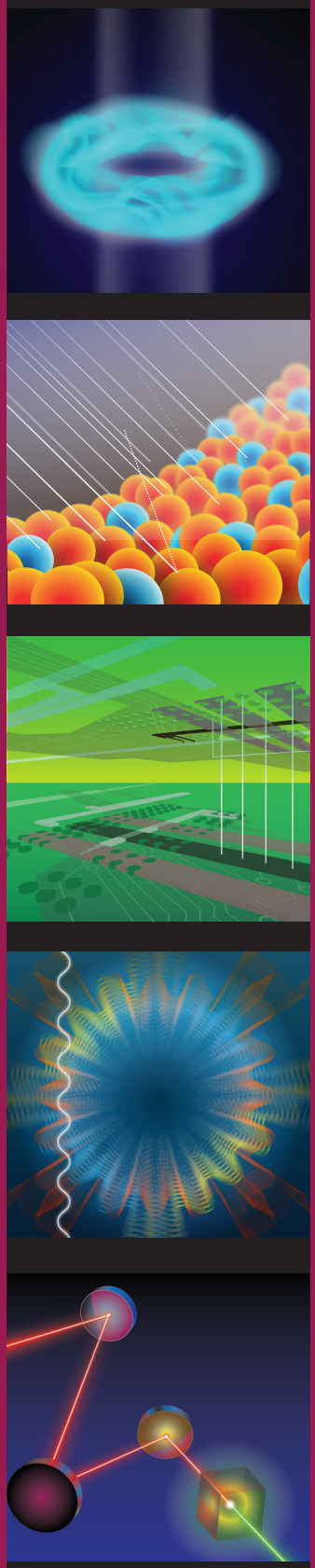

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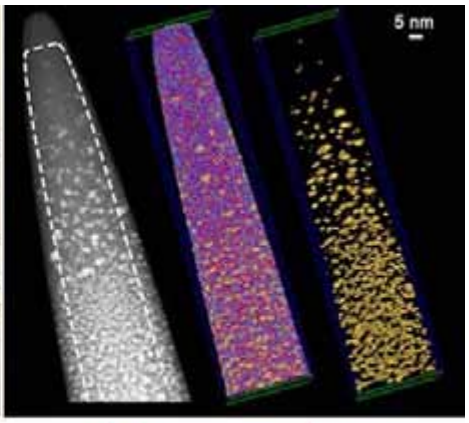

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Cost: $100 / $35 (student)

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Atom Probe Tomography (APT) is powerful and unique characterization technique that can provide quantitative three-dimensional compositional imaging and analysis of materials with part-per-million sensitivity and sub-nanometer spatial resolution. Atom probe tomography is very much complementary with established surface-sensitive and bulk analysis techniques such as SIMS, Auger analysis with a spatial resolution close to high resolution transmission electron microscopy, in 3D. This unique capability, combined with correlative electron microscopy, is helping to understand phenomena such as grain boundary segregation and diffusion, materials degradation and failure, microstructural evolution, defect migration and cluster formation, and nucleation and growth of materials with buried interfaces through 3D chemical imaging. The organizers of this tutorial aims to introduce the fundamentals and practical aspects of this powerful capability to interested students, faculties and researchers from universities, industry and national laboratories with special focus on the application of APT to understand interfacial and nanoscale science phenomena in metals, semiconductors, insulators, geological and biological materials, as well as to provide a forum to discuss the recent advances in the application of APT. All fundamental aspects related to understanding information that APT can uniquely provide which is complementary to other analytical techniques, how to prepare specimens from any solid material, how to conduct an APT experiment and methods to analyze the APT data to get the specific information about your material will be introduced. This tutorial will be fairly comprehensive crash course to any researchers who are curious to see if APT can be the right technique to get what they have not been able to achieve with other characterization instruments.

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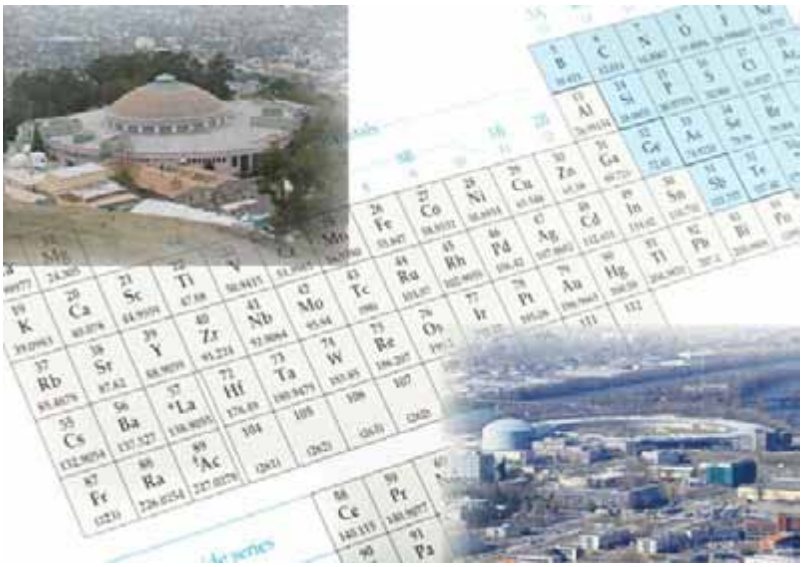

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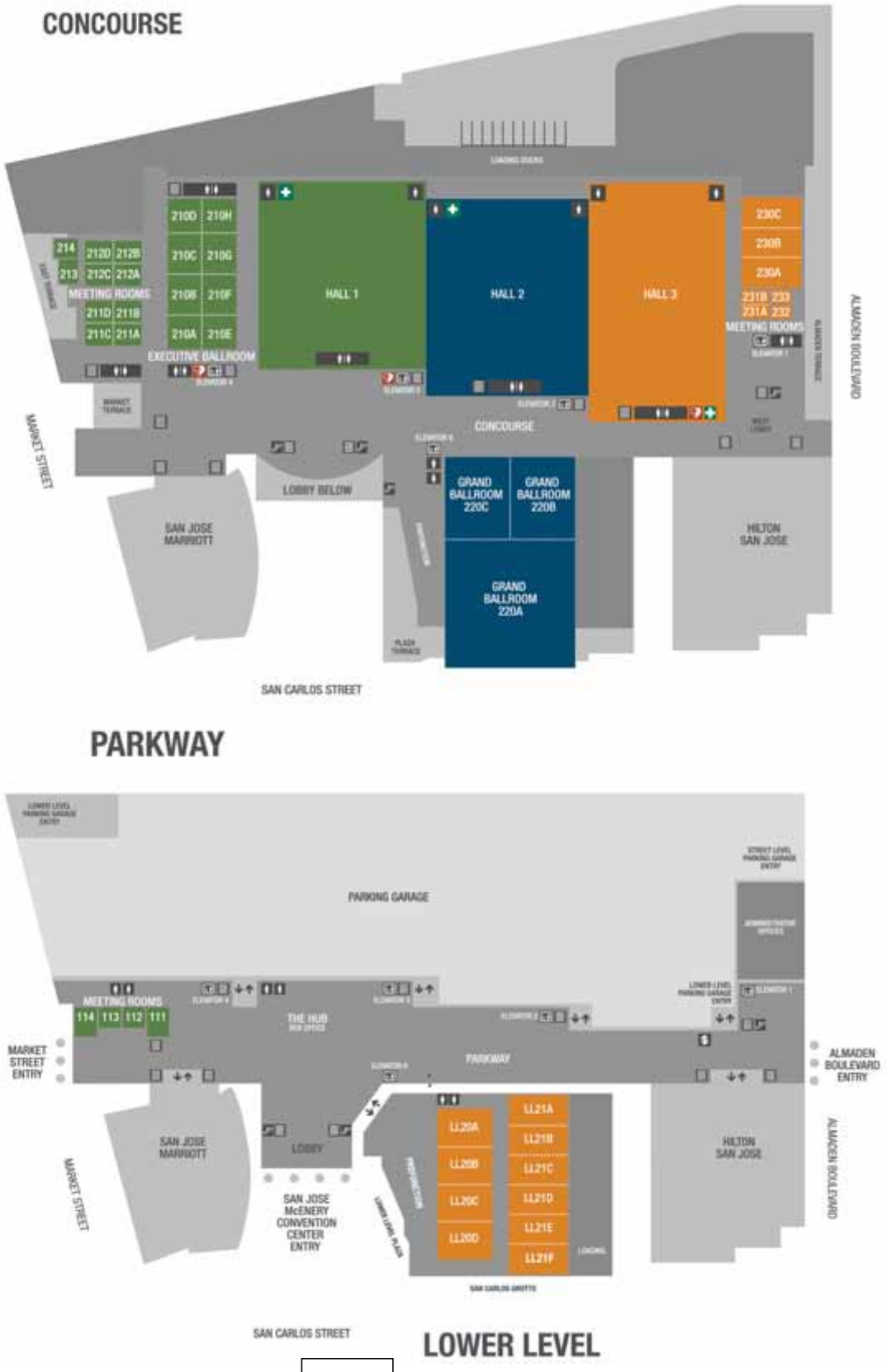

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Addressing cutting-edge issues associated with materials, processing, and interfaces in both the research and manufacturing communities. The weeklong Symposium fosters a multidisciplinary environment that cuts across traditional boundaries between disciplines.

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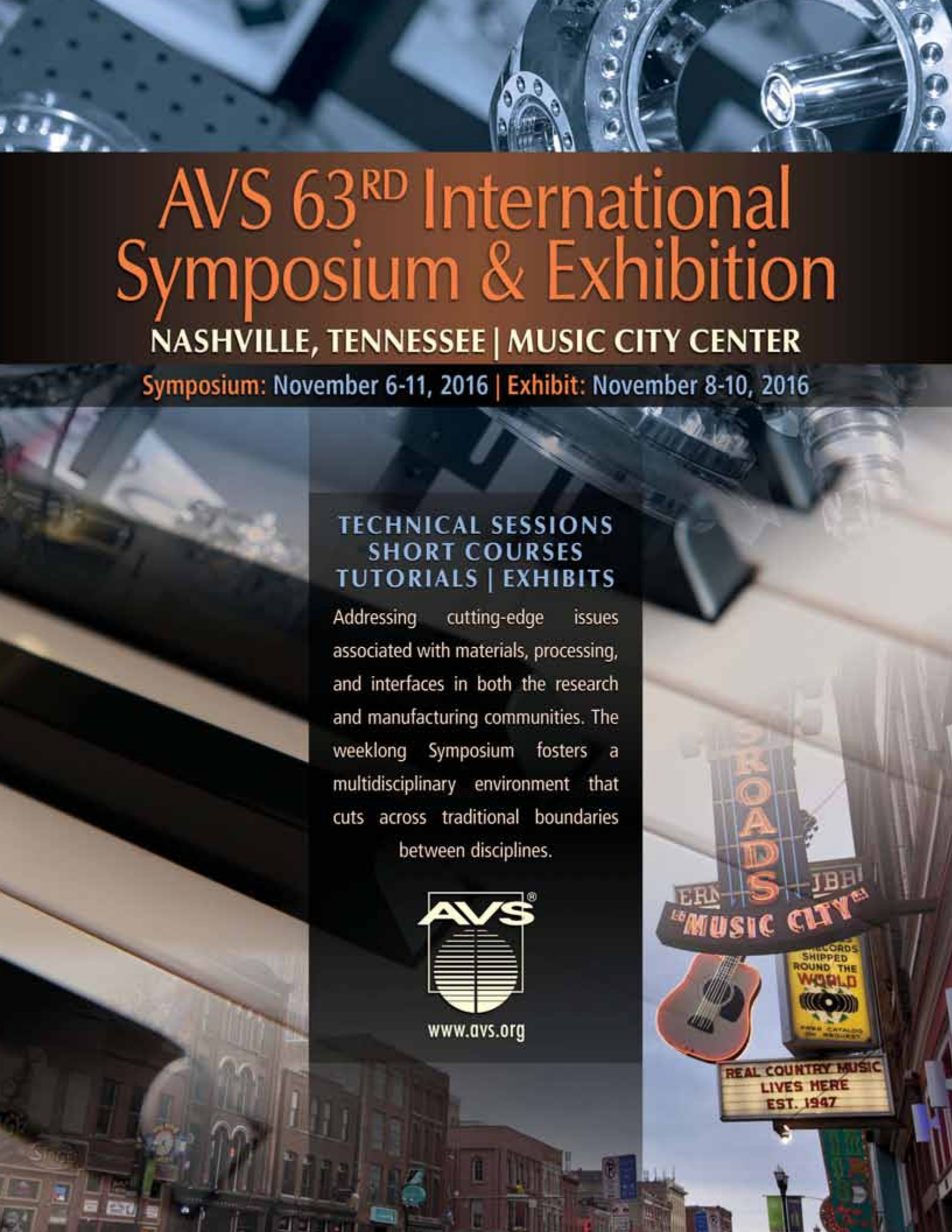

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Manufacturers of High Temperature and High Vacuum Equipment Since 1984

Standard high vacuum furnaces operating at 10^{-6} Torr or better, from 1200-2100° C
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Small

- Model "G" Class Vacuum Furnace
- Benchtop Model, Front or Top Loading
- Rapid prototyping or small batch runs
- Footprint: 51" Width x 26" Depth x 20" Height (130cm Width x 66cm Depth x 51cm Height)
- Work Zone: ø6" X 10" Depth (ø152mm x 254mm Depth)

Medium

- Model "B" Class Vacuum Furnace
- Ideal for expedient small part production
- Compact and simple to move into place.
- Footprint: 65" Width x 28" Depth x 50" Height (165cm Width x 71cm Depth x 127cm Height)
- Work Zone: ø12" X 18" Height (ø305mm X 457mm Height)

Large

- Model "J" Class Vacuum Furnace
- Hoist operated chamber, ergonomic loading
- Multiple hot zones for temperature uniformity
- Footprint: 75" Width x 36" Depth x 110"+ Height (191cm Width x 92cm Depth x 280cm Heigh)
- Work Zone: ø18-20" X 24-48" Height (ø450mm-508mm x 610mm-1220mm Height)

For more information please visit us at booth #329.
Our knowledgeable engineers will be happy to discuss your process needs.

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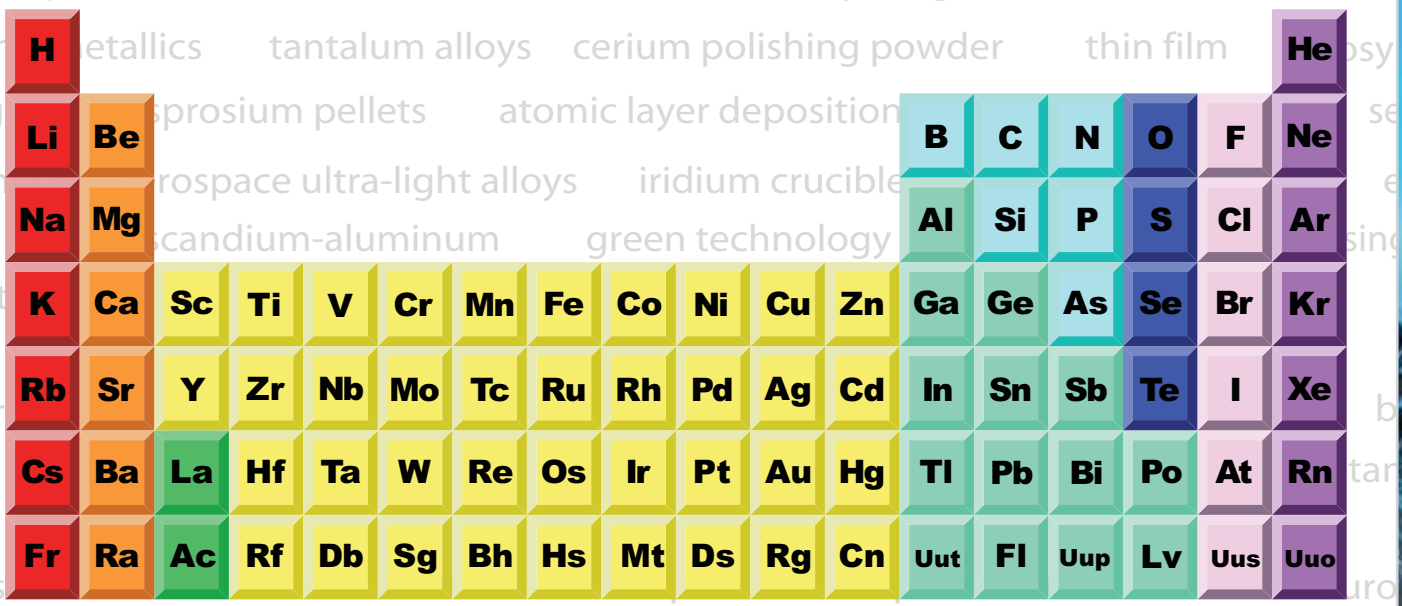

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