Technical & Exhibitor Program

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

AVS 61ST INTERNATIONAL SYMPOSIUM & EXHIBITION

November 9-14, 2014 ⇔ Baltimore, Maryland

Baltimore 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: October 20, 2014
Early Registration Deadline: October 20, 2014

Start using the AVS 61 App
Username: your e-mail address
Password: AVS61

EXHIBIT HOURS:

Tuesday, November 11	*10:00 a.m. - 5:00 p.m.*
Wednesday, November 12	*10:00 a.m. - 4:30 p.m.*
Thursday, November 13	*10:00 a.m. - 2:30 p.m.*

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New

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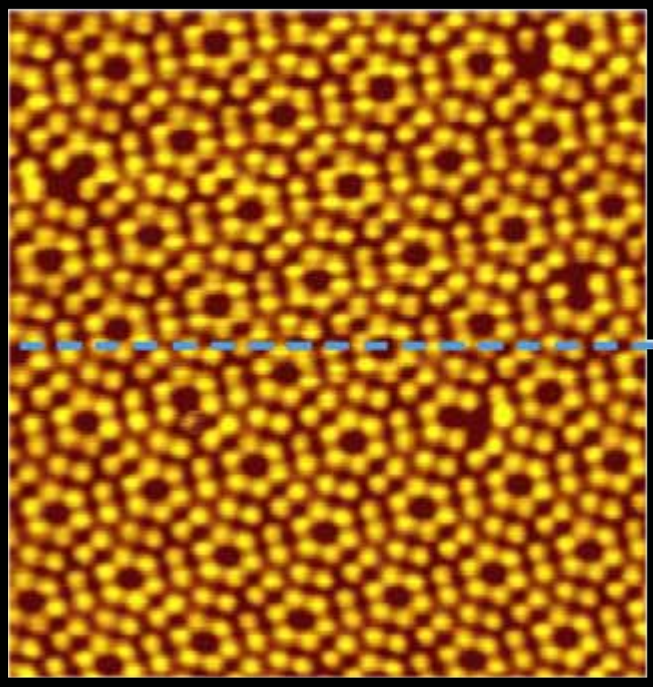
Cryogen Free - Closed Cycle Cryostat Scanning Probe Microscope

Come See the PanScan Freedom-LT in Booth # 1521



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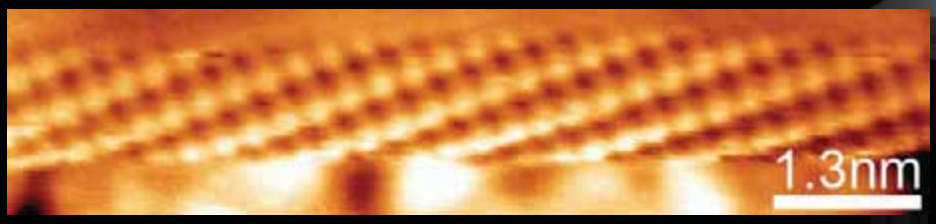
CCC stability at 18K Si image courtesy of B. Choi (RHK)



Carbon Nanotube imaged at 15K courtesy of G. Nazin Group (Univ. of OR)

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Greetings

On behalf of the AVS community, we welcome you to Baltimore Maryland and the AVS 61st International Symposium & Exhibition (AVS-61). We wish you a productive and stimulating week filled with discussions and new insights. We are pleased to have Professor Tobin Marks, Vladimir N. Ipatieff Professor of Chemistry and Professor of Materials Science and Engineering at Northwestern University, and Adjunct Professor at Texas A&M University Qatar (TAMUQ), present the plenary lecture entitled "New Materials Strategies for Hybrid Electronic Circuitry." Professor Marks' lecture focuses on the challenging design, characterization, and realization of new materials for creating unconventional electronics – and hence touches almost every AVS Division/ Group.

Materials, surfaces, and interfaces that advance device technologies and aim at practical use are a prevailing theme of the Symposium. The technical program was assembled from 1276 abstracts which formed 143 oral sessions compiled by 29 Divisions, Groups, and Focus Topics. AVS-61 has 290 invited speakers, and two evenings of poster presentations where stimulating and passionate scientific discussions will be facilitated with low temperature libations. Highlights of the sessions follow.

Biointerfaces and Devices sessions are devoted to protein adsorption and the blood/biomaterial interface, biosensors, nonlinear optical spectroscopy and microscopy, and characterization of biointerfaces under vacuum or ambient. Other areas include biomateriomics, analytical challenges in the pharmaceutical industry, and surface modification of materials by plasmas for medical purposes.

Electronic, Magnetic, and Photonic Devices sessions include transparent electronics, complex oxides, high-k oxides, nitrides, advanced interconnects, plasmonic semiconductors, and manufacturing devices on paper and textiles. Sessions devoted to processing science by atomic layer etching, atomic layer deposition, and plasmas are scheduled. Other areas include selective deposition and self-aligned patterning as well as materials characterization in the semiconductor industry.

Nanoscale Devices. Researchers from around the globe will present their work on topics ranging from fabricating atomically precise devices to exploiting nanomaterials for applications in photonics, plasmonics, catalysis, and imaging. Sessions devoted to heat, mass transport and mechanics are offered.

For many new materials, the time from discovery to deployment (time to market) is greater than 20 years, the **Accelerating Materials Discovery for Global Competitiveness** Focus Topic will address this issue.

Energy Frontiers sessions will focus on the capture, conversion, and storage of energy in all of its forms with an emphasis on the processes governing energy flow at surfaces and interfaces.

Surface and Interface Theory and Characterization sessions include atomistic modeling of surface phenomena, atom probe tomography, spectroscopic ellipsometry, helium ion microscopy, *in-situ* spectroscopy and microscopy, scanning probe microscopy, fundamentals of Quartz Crystal Microbalance, synchrotron analysis, conservation studies of heritage materials, and tribology.

Researchers working in the areas of **thin films, plasma science and technology, advanced surface engineering, and actinides and rare earths** realize that AVS provides THE Annual Symposium to present your newest research. Over the past few years, the AVS Annual Symposium & Exhibition has become a home to learn about the newest research being performed by the graphene community; at AVS-61, we broadened our traditional graphene Focus Topic into 2D Materials.

In conjunction with the technical program, we have an extensive equipment exhibition as well as many networking and career advancement events. We are confident you will benefit by attending the full week and networking with the AVS community. If this is your first time attending the AVS Symposium, we encourage you to learn about AVS membership benefits. The only way to find out what AVS has to offer is to experience the AVS community and there is no better time to start than this week!

Thank you for your participation and contribution to this year's AVS Symposium and thanks to all the dedicated volunteers and the outstanding AVS staff who have worked to create the exciting technical program and exhibition.

We look forward to seeing you in Baltimore, Maryland!

Vincent S. Smentkowski "Vin"
2014 Program Chair
General Electric Global Research Center

Anthony Muscat
2014 Program Vice-Chair
The University of Arizona

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SYMPOSIUM

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HQ HOTEL

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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***	$630.00	$760.00
Non-Member**	$750.00	$905.00
Student Member*** *	$210.00	$255.00
Student Non-Member** *	$250.00	$305.00
Early Career Member*** *	$315.00	$385.00
Early Career Non-Member** *	$375.00	$455.00
Technical Specialist Member	$300.00	$365.00
Technical Specialist Non-Mem	$345.00	$420.00
One Day	$375.00	$455.00
Two Day	$650.00	$730.00
Exhibits Only	Free	$20.00

Pre-registration deadline: October 20, 2014
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 2015 AVS membership— report to the AVS Booth 1720.

***Full Week, Student, Early Career & Technical Specialist member registration fee INCLUDES your 2015 membership renewal dues. For more information report to the AVS Booth 1720.

EXHIBIT HOURS

Tuesday, November 11	10:00 a.m. to 5:00 p.m.
Wednesday, November 12	10:00 a.m. to 4:30 p.m.
Thursday, November 13	10:00 a.m. to 2:30 p.m.

OFFICE LOCATIONS

Symposium Registration	Charles Street Lobby
Short Course Registration	Charles Street Lobby
Staff Offfice/Press	Charles Street Lobby
AVS Store	Exhibit Hall Booth 1720
Career Center	Exhibit Hall Booth 1121
Publications Booth	Exhibit Hall Booth 1621
Presenters Preview	306

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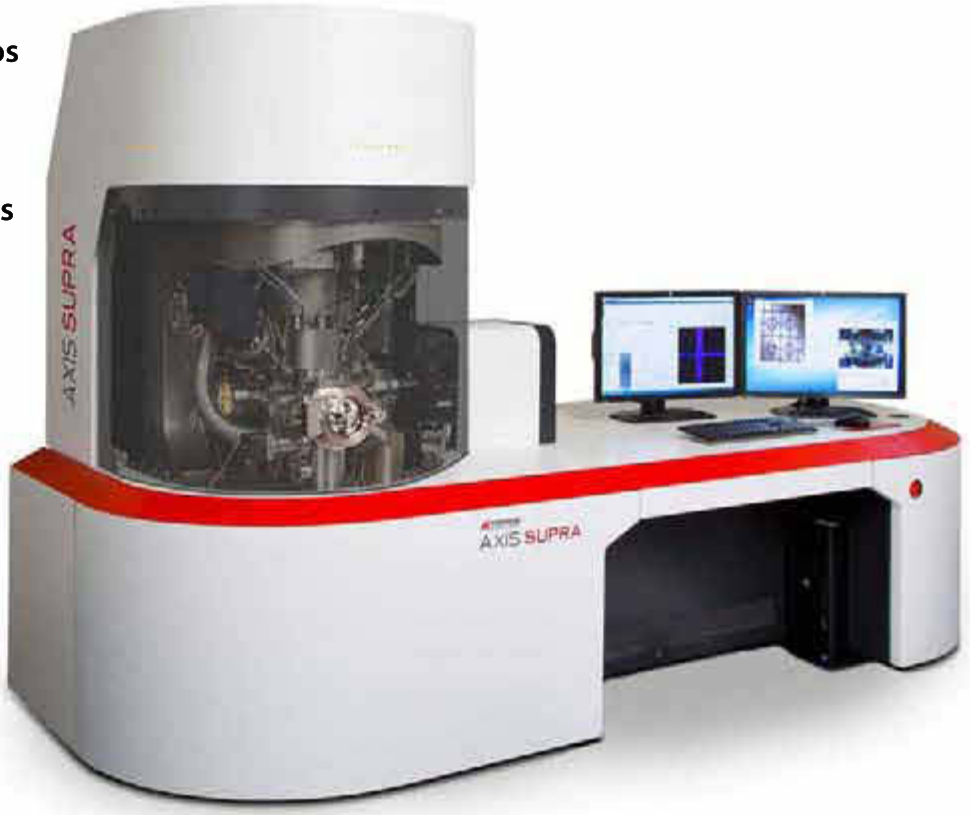

For a live demonstration of the AXIS Supra and ESCApe software visit booth 401

www.kratos.com

Room/ Day	301	302	303	304	305	307	308	309	310
SuA									
MoM	**AC+AS+MI+SA +SS** Spectroscopy, Microscopy and Dichroism of Actinides and Rare Earths	**SE+EM+EN+PS +TF** New Developments in Atmospheric Pressure Plasma Deposition & Thin Films for Energy Applications	**VT** Vacuum Measurement, Calibration, and Primary Standards	**NS+SE** Delivering Energy and Mass at the Nanoscale	**TF+PS+SE** Advanced PVD Methods	**TF+PS** Atmospheric, Roll-to-Roll and other Manufacturing Advances in ALD	**PS** Current Challenges of Plasma Etching Technologies	**SS+AS+EN** Mechanistic Insights into Surface Reactions: Catalysis, ALD, etc.	**2D+EM+NS+PS +SS+TF** 2D Materials Growth and Processing
MoA	**AC+AS+MI+SA +SS** Theoretical Modeling of f Electron Systems	**SE+PS+TF** Pulsed Plasmas in Surface Engineering	**VT** Vacuum Measurement, Applications of UHV and Ultraclean Processes	**NS+EN** Nanophotonics and Plasmonics	**TF** Self-Assembled Monolayers, Layer-by-Layer Assemblies, & Hydrophobic/ Amphiphobic Thin Films	**TF+PS** ALD Surface Reactions and Precursors	**PS** Advanced FEOL/Gate Etching	**SS+EN** Metals, Alloys and Oxides: Structure, Reactivity & Catalysis	**2D+AS+EM+NS +SS** Dopants, Defects, and Interfaces in 2D Materials
TuM	**AC+AS+MI+SA +SS** Synchrotron Radiation & Laboratory Based Investigations of Actinides and Rare Earths	**SE+NS+TR** Nanostructured Thin Films and Coatings	**VT** Gas Dynamics, Modeling, and Pumping Systems	**NS+HI** Nanopatterning and Nanolithography	**TF+SE** Energetic Thin Films/Optical Characterization	**TF+PS** ALD for Emerging Applications	**PS** Plasma Surface Interactions I	**SS+AS+EN** Synthesis, Structure and Characterization of Oxides	**2D+AS+BI+PS+ SS** 2D Materials: Surface Chemistry, Functionalization, Bio and Sensor Applications
TuL									
TuA	**MN+NS** Multi-Scale Phenomena and Bio-Inspired MEMS/NEMS	**MG** Multi-scale Modeling in the Discovery of Advanced Materials	**VT** Vacuum Quality Analysis, Outgassing, and Control	**NS+AS+SS** Nanowires and Nanotubes: Advances in Growth & Characterization	**TF+AS+EM** Thin Film: Growth and Characterization II	**TF+EN+PS** ALD for Energy	**PS** Advanced BEOL/Interconnect Etching	**SS+NS** Nanostructures: Growth, Reactivity and Catalysis	**2D+AS+HI+MC +NS+PS+SP+SS** 2D Materials Characterization including Microscopy & Spectroscopy
TuP									
WeM	**MN** Optomechanics, Photonics, and Quantum Nanosystems	**MG** Design of New Materials	**VT** Accelerator and Large Vacuum Systems I	**NS** Nanoscale Catalysis and Surface Chemistry	**PS1** Plasma Based Ion Implantation and Ion-Surface Interactions	**TF+MS+PS** Applied ALD: Nanoelectronics and Emerging Applications	**PS2** Plasma Modeling	**SS+AS+EN** Dynamic Processes of Single Atoms and Molecules at Surfaces	**2D+EM+NS+SS +TF** Novel 2D Materials
WeL									
WeA	**MN+PS** Emerging Materials and Fabrication Technologies for MEMS/NEMS	**MS+TF** Overview: Applications and Manufacturing of Devices on Paper and Textiles	**VT** Accelerator and Large Vacuum Systems II	**NS+AS** Nanoscale Imaging and Materials Characterization	**PS+2D** Plasma Processing for 2D Materials, Coating, & Surface Modification	**TF+EM+EN** Thin Film & Nanostructured Coatings for Light Trapping, Extraction, & Plasmonic Applications	**PS** Plasma Diagnostics, Sensors, and Control	**SS** Chirality and Enantioselectivity on Surfaces	**2D+AS+EM+MI +MN+NS+TF** Properties of 2D Materials
ThM	**AP+AS+MC+ NS+SS** APT Analysis of Semiconductors, Magnetic and Oxide Materials	**MS+PS+TF** Processes for Mesoscale Structure on Paper and Textiles	**TR+NS** Bridging Scales in Tribology	**EL+AS+EM+ EN+SS** Spectroscopic Ellipsometry for Photovoltaics & Instrument Development	**PS1+TF** Plasma Deposition and Plasma Assisted ALD	**TF+PS** Advanced CVD and Chemical Vapor Infiltration Methods	**PS2+TF** Atomic Layer Etching (ALE) & Low-Damage Processing	**SS+TF** Organic Layers on Surfaces	**2D+AS+HI+NS +SS** Nanostructures including 2D Heterostructures, Patterning of 2D Materials
ThL									
ThA	**AP+AS+EN+NS +SS** APT and FIM Analysis of Catalysts and Nanomaterials	**MS+PS+TF** Functionalization of Paper and Textiles & Their Applications	**TR** Tribology in Unique Environs	**EL+AS+EM+ MC+SS** Optical Characterization of Nanostructures and Metamaterials	**PS** Plasma Processing of Nanoparticles and Nanomaterials	**TF** Thin Film for Permeation Barriers and Membranes	**PS+SE** Atmospheric Pressure Plasma Processing; Fundamental and Applications	**SS+AS+NS** Semiconductor Surfaces and Interfaces 1	**2D+EM+MI+ MN+NS+SS+TF** Novel Quantum Phenomena in 2D Materials
ThP									
FrM	**AP+AS+NS+SS** Correlative Surface and Interface Analysis with APT		**TR** Applications of Novel Materials In Tribology	**EL+AS+BI+EM +SS** Application of SE for the Characterization of Organic and Biological Materials	**PS1** Plasma Sources	**TF+AS** Thin Film Characterization	**PS2** Plasma Surface Interactions II	**SS+EM** Semiconductor Surfaces and Interfaces 2	**2D+EM+MS+ NS** 2D Materials: Device Physics and Applications

at a Glance

311	312	313	314	315	316	317	318	Hall ABC	Hall D
						BP+BI+AS Biomaterials Plenary Session			
MI+EM Interfacial Effects in Oxide Heterostructures	**SA** Synchrotron Studies of Processes in Energy Conversion, Electronic Devices & Other Materials I	**MC+AP+AS** Characterization of 3D Structures, 2D Films and Interconnects	**EM+MI+NS** Complex Oxides and Their Interfaces	**SS+EN** Photocatalysis and Photochemistry at Surfaces	**AS+MC** Quantitative Surface Analysis	**BI+AS** Biomolecules & Biomaterials Interfaces			
MI Topological Insulators/ Rashba Effect	**SA** Synchrotron Studies of Processes in Energy Conversion, Electronic Devices & Other Materials II	**MC+2D+AP+AS** Characterization of III-Vs (2:00-3:20 pm)/ Photovoltaics, EUV Masks, etc. (3:40-4:40 pm)	**EM** Nanoparticles for Electronic Materials	**EN+EM+MN+ NS+TR** Energy Harvesting with Nanostructures	**AS+BI+MC+SS** The Liquid Interface & Depth Profiling and Sputtering with Cluster Ion Beams	**BI+AS+NS** Bio/Nano Interfaces			
MI+MG Advanced Materials Discovery	**SA** Characterization of Nanostructured and LD Materials Using Synchrotron-Based Methods	**IS+AS+MC+SS** Ambient Pressure X-ray Photoelectron Spectroscopy (AP-XPS)	**EM** Advanced Interconnects and Materials	**EN+AS+EM +SE** Fuel Formation and Thermal Transport	**AS+BI+VT** Ambient Ionization Mass Spectrometry	**BI+AS+MN +NS** Biosensors		**EW** Exhibitor Technology Spotlight Session	
								EW Exhibitor Technology Spotlight Sessin	
MI+MG Development of Multiferroic Materials (2:20-5:00 pm) / MIND Panel Discussion (5:00-6:30 pm)	**SA** Free Electron Laser and Synchrotron Studies at the Molecule-Surface Interfaces	**IS+AS+MC+SS** Environmental Electron Microscopies	**EM+2D** High-k Dielectrics for Advance Semiconductor	**EN+EM+NS** Charge Storage Materials and Devices	**AS+MC+SS** Analysis of Modified Surfaces	**BI+AS** Characterization of Biointerfaces		**EW** Exhibitor Technology Spotlight Session	
									POSTER SESSIONS AC, EM, EN, MC, MI, PS, SA, SE, SS, VT
EM1 Mtls & Dev. for High Power Electr. (8:20-11:00am) / 2D Electr. Mtls & Devices (11:00 am-12:20 pm)	**SS+AS** Atomistic Modeling of Surface Phenomena	**IS+AS+MC+SS** In-Situ X-ray Absorption and Raman Spectroscopy	**EM2** High-K Dielectrics from Non-Classical Channels	**EN+AS+EM +SE** Thin Film Photovoltaics	**AS+BI+MC** Chemical Imaging in 2D and 3D	**BI+AS** Nonlinear Optical & Vibrational Spectroscopy	**SD** Fundamentals of Selective Deposition	**EW** Exhibitor Technology Spotlight Session	
								EW Exhibitor Technology Spotlight Session	
EM+EN+TF Thin Films and Materials for Energy Storage	**SP+AS+BI+NS +SS** Advances in Scanning Probe Microscopy	**IS+2D+MC+NS +SP+SS** In-Situ Scanning Microscopy	**EM** High-K Dielectrics for 2D Semiconductor	**EN+AS+EM** Organic-Inorganic Interfaces for Energy	**AS+BI+MC** Practical Surface Analysis I	**BI+MG** Design and Discovery: Biointerfaces	**SD** Process Development for Selective Deposition & Self-Aligned Patterning	**EW** Exhibitor Technology Spotlight Session	
EM1 Materials for Light Management	**SP+2D+AS+EM +MC+NS+SS** Probing Electronic and Transport Properties	**CS** Conservation Studies of Heritage Materials	**EM2** High-K Dielectrics for ReRAM and RAM	**SM+AS+BI+PS** Plasma Processing of Antimicrobial Materials and Devices	**HI+2D+AS+BI +MC** Fundamental Aspects and Imaging with the Ion Microscope	**QC+AS+BI +MN** Fundamentals and Method Development of QCM		**EW** Exhibitor Technology Spotlight Session	
								EW Exhibitor Technology Spotlight Session	
EM1 Materials for Quantum Computation	**SP+AS+BI+NS +SS** Probing Chemical Reactions at the Nanoscale	**CS** Conservation Studies of Heritage Materials 2	**EM2** Hybrid and Organic Electronics	**SM+AS+BI+PS** Plasma Processing of Biomemetic Materials	**HI+2D+AS +MC** Nanoengineering with Helium Ion Beams	**QC+AS+BI +MN** Applications of QCM			
									POSTER SESSIONS 2D, AP, AS, BI, EL, HI, IS, MN, MS, NS, QC, SP, TF, TR
EM+EN Nitrides for LED and PV Device Applications	**SP+AS+BI+EM +NS+SE+SS** Probe-Sample Interactions and Emerging Instrument Formats	**CS** Conservation Studies of Modern Heritage Materials 3	**EM+NS+TF** Transparent Electronics		**AS+MC+SS** Practical Surface Analysis II				

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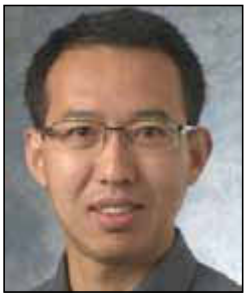
Advanced Surface Engineering (SE)

Steve Pachuta
Applied Surface Science (AS)

Luke Hanley
Biomaterial Interfaces & Biomat. Plenary (BI/BP)

Steve Durbin
Electronic Materials & Processing (EM)

Peter Fischer
Magnetic Interfaces & Nanostructures (MI)



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Bridget Rogers
Manufacturing Science & Technology (MS)

Paul Sheehan
Nanometer-Scale Science & Technology (NS)

Satoshi Hamaguchi
Plasma Science & Technology (PS)

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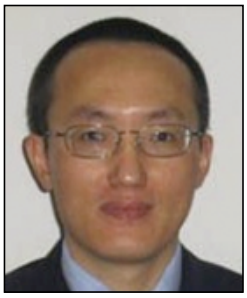
Atom Probe Tomography (AP)

Michael Filler
Energy Frontiers (EN)

Gregory Hlawacek
Helium Ion Microscopy (HI)



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In situ Spectroscopy & Microscopy (IS)

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Materials Characterization Semiconductor Industry (MC)

An-Ping Li
Scanning Probe Microscopy (SP)

Florin Gstrein
Selective Deposition & Etching (SD)

Tino Hofmann
Spectroscopic Ellipsometry (EL)

Maya Kiskinova
Novel Trends in Synchrotron & FEL-Based Analysis (SA)

David Schall
Tribology (TR)

Ivan Oleynik
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The AVS 61 App will allow all Symposium to review the technical program, abstracts, exhibition details, meetings/special events, other travel and logistical details, a photo gallery (where you may submit photos for posting), and other links to our Technical/ Publications Library. You can use the app to create a personal schedule, send messages to other attendees, and receive push notifications on Symposium events. The app is available for Apple and Droid products as well as via a mobile website.

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Please contact AVS61app@avs.org should you need any assistance using the App.

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EXCITING 2014 EVENTS

Welcome Mixer for Attendees & Exhibitors

Will take place on Monday from 5:30–7:30 pm in the **Ballroom III of the Baltimore Convention Center**. 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 1720

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 1121

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 1621

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 1116

See the entries in the 2014 art contest and vote for your favorites. Winners will take home cash prizes! Generously sponsored by RD Mathis. **To enter the contest, stop by the Staff Office (Charles Street Lobby) 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

Full week attendees who pay for a full week registration (Full, Student, Early Career, 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. **Come to the Exhibit Finale on Thursday for your free lunch!**

AVS Raffle Zone – Booth 1709

Be sure to enter your raffle tickets to participate in the daily raffles being held Tuesday–Thursday in the Exhibit Hall Raffle Zone Booth 1709! Thanks to our generous sponsors we have some really exciting prizes this year.

Ask The Experts – Booth 823

The AVS Vacuum Technology Division and Duniway Stockroom, SAES Getters and MKS are sponsoring an Ask The Experts (ATE) booth which will offer a special open forum to discuss and help solve vacuum related issues. Are you experiencing: Puttering Pumps? Garbled Gauges? Spurious Species? Come and Ask the Experts. Come challenge our experts and receive a free gift while supplies last!

Students and Early Career Members

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

AVS Companion Tours

AVS offers tours of Maryland and the surrounding area for your enjoyment. For additional information, contact Marilyn Ruzic, Tour Coordinator, companiontours@avs.org or visit www.avs.org

Free Caricature

Visit Booth 401 (Shimadzu Scientific) to get your ticket validated for a free caricature in the special events booth in the exhibit hall.

Free Massage

Visit Booth 413 (Super Conductor Materials) in the Exhibit Hall to get your ticket validated for a free massage!

Walters Art Museum

Attendees at the American Vacuum Society 61st International Symposium and Exhibition in Baltimore, Maryland are welcome to visit the Walters Art Museum. The Walters is free and open Wednesday, Friday, Saturday and Sunday from 10am until 5pm; on Thursday, the Walters is open late from 10am until 9pm. Information on visiting is available here: http://thewalters.org/visit/

Symposium Registration Cancellation Policy

All Symposium cancellation/refund requests must be submitted by **November 2, 2014,** in writing to:

Yvonne Towse, Registration Coordinator
AVS
125 Maiden Lane, 15th Floor
New York, NY 10038
Fax: 212-248-0245
Email: yvonne@avs.org

Cancellations and refunds will be processed after the close of the show. All cancellations and refunds will be issued in the form of a check and assessed a $25 cancellation fee. All refunds will be processed within 30 days following the meeting.

Other 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.
- No one under the age of 12 (including infants and toddlers) will be permitted on the show floor.

Symposium Lost Badge Policy

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

AVS Membership Renewal Feature

The 2015 membership renewal dues will be included within the symposium registration fees for all Full, Student, Early Career, Technical Specialist, Honorary, and Emeritus members. No further action will be required and 2015 membership will take effect on January 1, 2015. Any questions, see Angela Klink at the AVS Store (Booth 1720) 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 any time 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, and http://scitation.aip.org/content/avs/journal/bip/info/authors. Visit the journal websites to see the scope of each journal. Any questions as to which journal's scope best fits your manuscript, please email publications@avs.org. Please submit your *JVST A & B* articles at http://jvsta.peerx-press.org or http://jvstb.peerx-press.org and Biointer*phases* articles at http://biointerphases.peerx-press.org. For more information, stop by the AVS Publications Booth 1621 in the Exhibit Hall during the week of the Symposium or contact:

Nancy Schultheis
AVS Publications Office
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919-361-2787 Fax: 919-361-1378
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Complimentary AVS Membership Offer

If you have paid the Full, Student, Early Career or Technical Specialist non-member registration fee, you will receive a complimentary AVS membership for 2015. For more information, stop by AVS Booth 1720 in the Exhibit Hall during the week of the Symposium or contact:

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Internet Access E-mail Pavilion – Booth 112

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 112 in the exhibit hall for free internet access. The E-Mail Pavilion is generously sponsored by Specs Surface Nano Analysis, Inc.

Additional Notes

- AVS will be providing PCs 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 306 to test the equipment prior to their presentation.

GENERAL INFORMATION

Hotel Reservations

AVS is pleased to offer special rates at two Baltimore hotels—Sheraton Inner Harbor (Headquarters) and the Hyatt Regency Baltimore 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 7, 2014; Closes: October 20, 2014).*

Cancellation Policy: All reservation cancellations must be received by the AVS Housing Bureau by October 20, 2014. If you need to cancel after October 14, 2014, you must do so directly with the hotel and provide a 72 hour notice to avoid being charged one night's room and tax.

Hotel	Room Rates	Self-Parking
Sheraton Inner Harbor 300 South Charles Street Baltimore, MD 21201	Single/Double: $189	$28 per day
Hyatt Regency Baltimore 300 Light Street Baltimore, MD 21202	Single/Double: $189	$28 per day

Airports

Baltimore is serviced by three major airports: Baltimore-Washington International Airport (BWI) in Maryland, and Washington Dulles International Airport (IAD) and Ronald Reagan Washington National Airport (DCA) in Northern Virginia.

BWI is located 10 miles south of the city and is the primary airport for travelers to Baltimore. Washington Dulles International Airport is 61 miles from Baltimore and Ronald Reagan Washington National Airport is 42 miles from Baltimore.

Directions

Baltimore Washington International Airport or Interstate 95 to Sheraton Inner Harbor:

> Take Interstate 95 North to Interstate 395, which is 2.5 miles after crossing Interstate 695. Travel north 1 mile on I-395N and continue onto Howard Street proceed .2 miles and turn right onto Pratt Street proceed .2 miles then turn right onto Charles Street proceed .2 miles and the hotel is on the right.

Baltimore Washington International Airport to Hyatt Regency Baltimore:

> Start out going West on I-195 West for 1.1 miles. Merge onto MD-295 North via Exit 2A toward Baltimore / I-695 for 8.0 miles. You will pass 2 stadiums on the Right. Turn Right onto West Pratt Street for 0.4 miles. Then turn Right onto Light Street and end at 300 Light St.

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Shuttles

Shuttle rides from BWI to any Baltimore Inner Harbor hotel is approximately $15 each direction. AVS recommends Super Shuttle, 800-258-3826. Pick-up is every 30 minutes at the ground transportation desk (baggage claim areas 3, 4 and 5). Look for the blue vans with yellow lettering saying Super Shuttle.

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Taxi rides from BWI to any Baltimore Inner Harbor hotel is approximately $35each direction.

Taxi rides from DCA to any Baltimore Inner Harbor hotel is approximately $125 each direction.

Taxi rides from IAD to any Baltimore Inner Harbor hotel is approximately $170 each direction.

Avis Rental Car

Avis has extended a discount offer to AVS 61 attendees. Attendees may call Avis at 1 (800) 525-7537 to make reservations. Attendees should provide reservation agents with this AWD number (D017181) to ensure they receive the best available car rental rates.

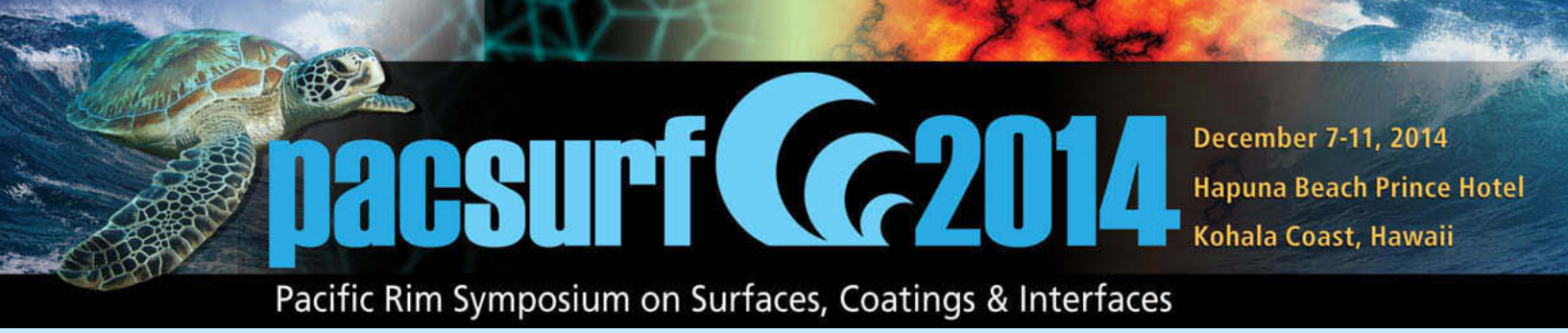
Public Transportation

Trains arrive and depart from Penn Station, located at 1500 N. Charles Street in downtown Baltimore. Amtrak trains run seven days a week, connecting Baltimore to cities along the Northeast Corridor. Amtrak also runs to BWI. For fares and schedules, please visit www.amtrak.com.

The Mass Transit Administration (MTA) operates bus, Metro, Light Rail and MARC train services. The local bus system covers the downtown neighborhoods and parts of Baltimore's suburbs. The Metro system operates seven days a week downtown. The Light Rail system also operates seven days a week and runs from Penn Station to BWI. MARC commuter trains operate weekdays from Baltimore to Washington, D.C. and depart from Penn Station. For fares and schedules, please visit www.mtamaryland.com.

Climate

As fall comes to and end be prepared for cooler weather. Plan for layers and bring a winter coat just in case.



PacSurf is a new international symposium on surfaces, coating, and interfaces being organized by a scientific advisory board that has representatives from 11 different countries around the Pacific Rim. Symposium attendees will interact during morning and evening sessions that will include plenary, invited, and contributed presentations.

Focus Areas & Invited Speakers

The **Plenary Address** on "Bio-Molecular and Cellular Assemblies at Interfaces" will be given by **Prof. Joachim Spatz**, the Director of the Max Planck Institute for Intelligent Systems.

Biomaterial Interfaces (BI):

Eun Ha Choi, Kwangoon Univ., Korea, "Diagnostics of Nonthermal Atmospheric Pressure Plasma Jet and Dielectric Barrier Discharge Sources for Plasma Bioscience and Medicine by Collisional Radiative Model and Stark Broadening Method"

Y. Hayamizu, Tokyo Institute of Technology, Japan, "Engineering of bio-nano interfaces with self-assembled peptides"

Greg Fridman, Drexel Univ., USA, "Short-Pulsed Uniform Atmospheric Pressure Dielectric Barrier Discharges in Medical and Biological Surface Treatment"

Lara Gamble, Univ. of Washington, USA, "SIMS of Cells and Tissues: Blasting Our Way to New Knowledge About Biology"

Y. Yanase, Hiroshima University, Japan, "SPR imaging sensor for visualization of individual cell reactions and clinical diagnosis of allergy"

Kevin Healy, Univ. of California, Berkeley, USA, "Why Biointerfaces are Important in Stem Cell Research"

Laurence Meagher, CSIRO, Australia, "Engineered Surfaces for Stem Cell Expansion"

Dae Won Moon, DGIST, Korea, "Multimodal Nanobio Imaging on Neuronal Cells and Tissues"

Cynthia Whitchurch, UTS, Australia, "Slime Versatility: Diverse Roles of Slimes in Bacterial Biofilms"

Suk Jae Yoo, Plasma Technology Research Center, Korea

Energy Harvesting & Storage (EH):

Eray Aydil, Univ. of Minnesota, USA, "Thin Film Solar Cells from Colloidal Dispersions of Copper Zinc, Tin Sulfide Nanocrystals"

Francisco-Servando Aguirre-Tostado, CIMAV-Unidad Monterrey, Mexico, "XPS Analysis of Nano Structured Thin-film Chalcogenides Deposited by Solution-based Methods for Solar Cell Applications."

Stacey Bent, Stanford Univ., USA, "Understanding and Improving Solar Energy Conversion through Interface Engineering"

T. Sakurai, Tsukuba University, Japan, "Study of energy level alignment at electrode interfaces in organic solar cells"

Gianluigi Botton, McMaster Univ., Canada, "New Insights into Energy-Related Materials from Advanced Electron Microscopy Methods"

Leticia M. Torres-Martínez, Universidad Autonoma de Nuevo Leon, Mexico, "Effect of Different Synthesis Routes of NaTaO3 and the Presence of Metal-based Nanoparticles as Co-catalyst on the Hydrogen Production."

T. Fujita, Tohoku university, Japan, "TEM observation of nano porous gold in reaction environments"

Elder de la Rosa, Centro de Investigaciones en Optica, Mexico, "Quantum Dot Sensitized TiO2 Solar Cells Prepared by the Silar and Electrophoresis Method"

Masaharu Oshima, Univ. of Tokyo, Japan, "Soft X-ray Operando Spectroscopy for Polymer Electrolyte Fuel Cells and Li Ion Batteries"

Miquel Salmeron, Lawrence Berkeley Lab, USA, "Fundamental Aspects of Charge Transport in PbS Nanoparticle Arrays for Photovoltaic Applications"

Mayo Villagran, UNAM, "Laser processing and photoacoustic characterization of nanomaterials and thin films."

Nanomaterials (NM):

Beatriz Roldan Cuenya, Univ. of Central Florida, USA, "Nanocatalysts at Work"

Vicki H. Grassian, Univ. of Iowa, USA, "Adsorption of Environmentally and Biologically Relevant Molecules on Nanoparticles Surfaces and Its Impact on Nanoparticle Behavior"

K. Nakatsuji, Tokyo Institute of Technology, Japan, "Low-dimensional electronic system on metal-adsorbed germanium surfaces"

Takhee Lee, Seoul National Univ., Korea, "Molecular- and Polymer-based Electronic Devices on Rigid and Flexible Substrates"

Joerg Patscheider, EMPA, Switzerland, "Nanocomposite Coatings - Playing with Nanostructures to Achieve New Properties"

David Williams, The Univ. of Auckland, New Zealand

Miguel José Yacamán, Univ. of Texas San Antonio, USA, "What is Next on Atomic Resolution TEM-STEM Analysis of Surfaces and Interfaces?"

Dapeng Yu, Peking Univ., China, "High Spatial/Energy Resolution Cathodoluminescence Spectroscopy: A Powerful Tool for Delicate Characterization of the Optical Properties of Low-dimensional Materials Modified by Elastic Straint Gradient"

Wan Soo Yun, Sungkyunkwan Univ., Korea, "Nanomaterials and Nanogap for Biomolecular Detection"

Zhiyong Zhang, Peking Univ., China, "Scaling Carbon Nanotube Transistor Down to sub-10 nm"

Thin Films (TF):

Shixuan Du, Institute of Physics, CAS, China, "A Universal Synergistic Intercalation Mechanism in Graphene"

Charles Fadley, Univ. of California at Davis, USA, "Revealing Interfaces and Buried Layers in Multilayer Structures with Hard X-ray and Standing-Wave Photoemission"

T. Okuda, Hiroshima University, Japan

Md. Zakir Hossain, Gunma University, Japan, "Chemical modification of epitaxial grapheme on SiC"

Suneel Kodambaka, UCLA, USA, "In Situ STM and LEEM Studies of Growth Kinetics of 2D Layered Materials"

Chang-Lyoul Lee, Advanced Photonics Research Institute, Korea, "Polymer (Organic) Photovoltaic Devices and Sensor and Self-Assembly Based on Polymers"

N. Itagaki, Kyushu University, Japan, "Sputtering growth of ZnO-based semiconductors with band gap tenability over the entire visible spectrum"

Lain-Jong Li, Academia Sinica, Taiwan, "Growth of Large-Area 2D Monolayers"

Yunqi Liu, Institute of Chemistry, CAS, China, "Organic Thin Film Transistors: Materials, Device Interfaces and Performances"

Sandra Rodil, IIM-UNAM, Mexico, "Metal Oxide Thin Films for Medical Implants"

Yi Shi, Nanjing Univ., China

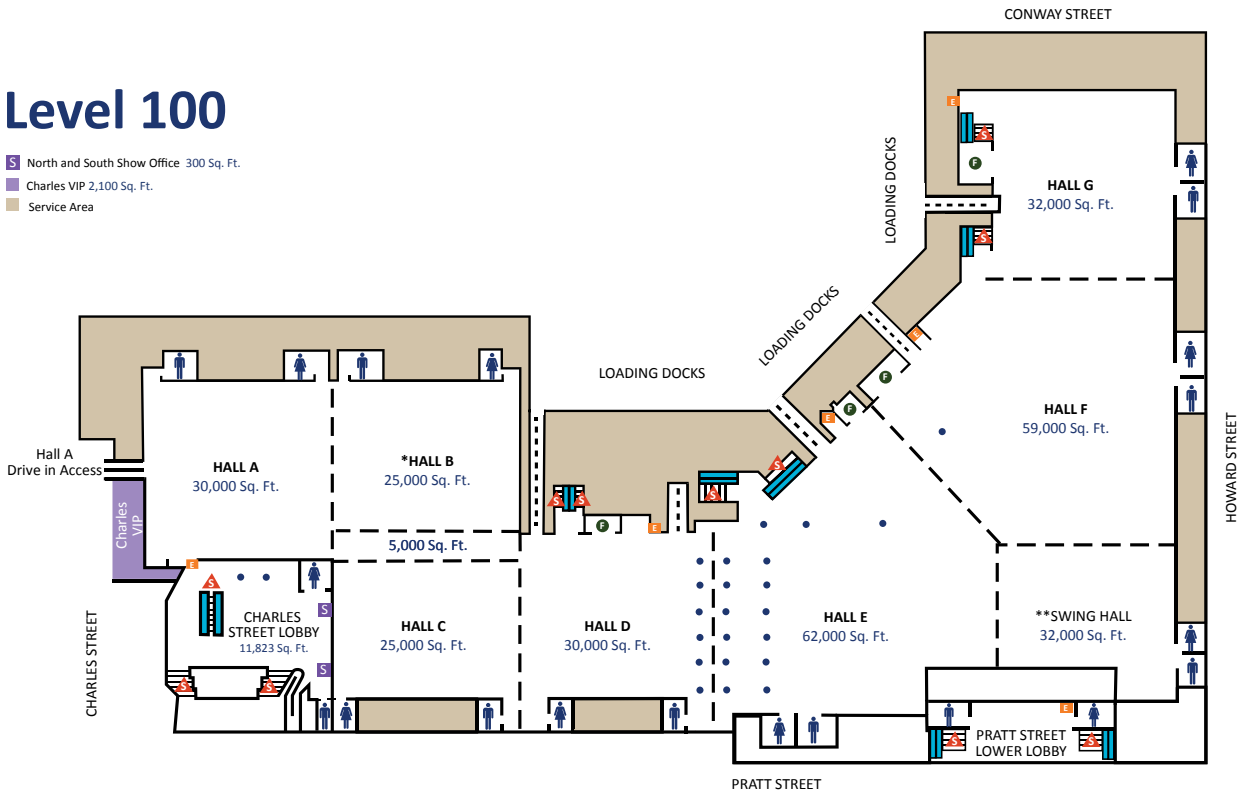
For all details please visit **www.pacsurf.org** or contact: Della Miller, della@avs.org, 530-896-0477.

BALTIMORE CONVENTION CENTER

BALTIMORE CONVENTION CENTER

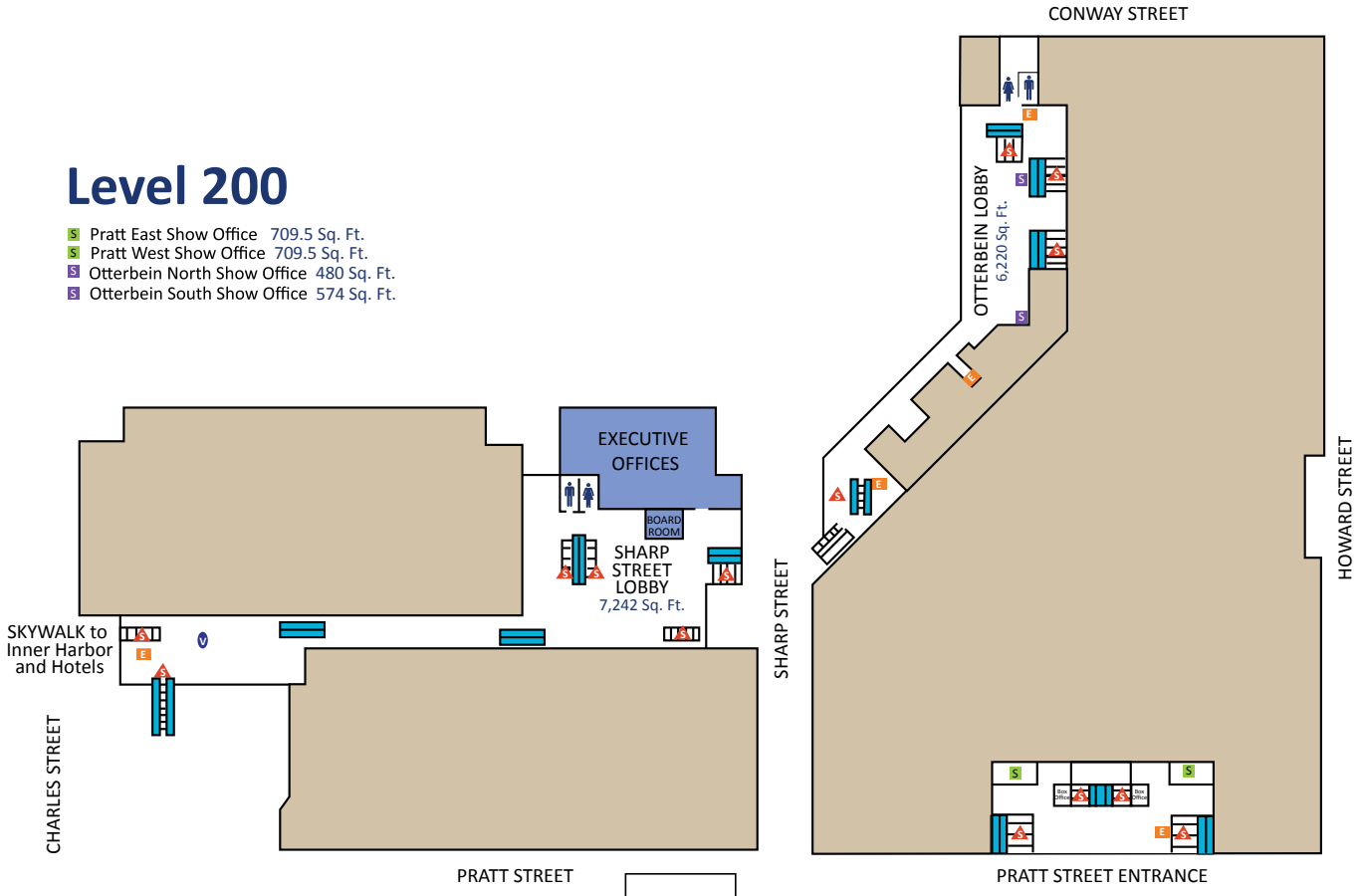
Level 100

S North and South Show Office 300 Sq. Ft.
Charles VIP 2,100 Sq. Ft.
Service Area

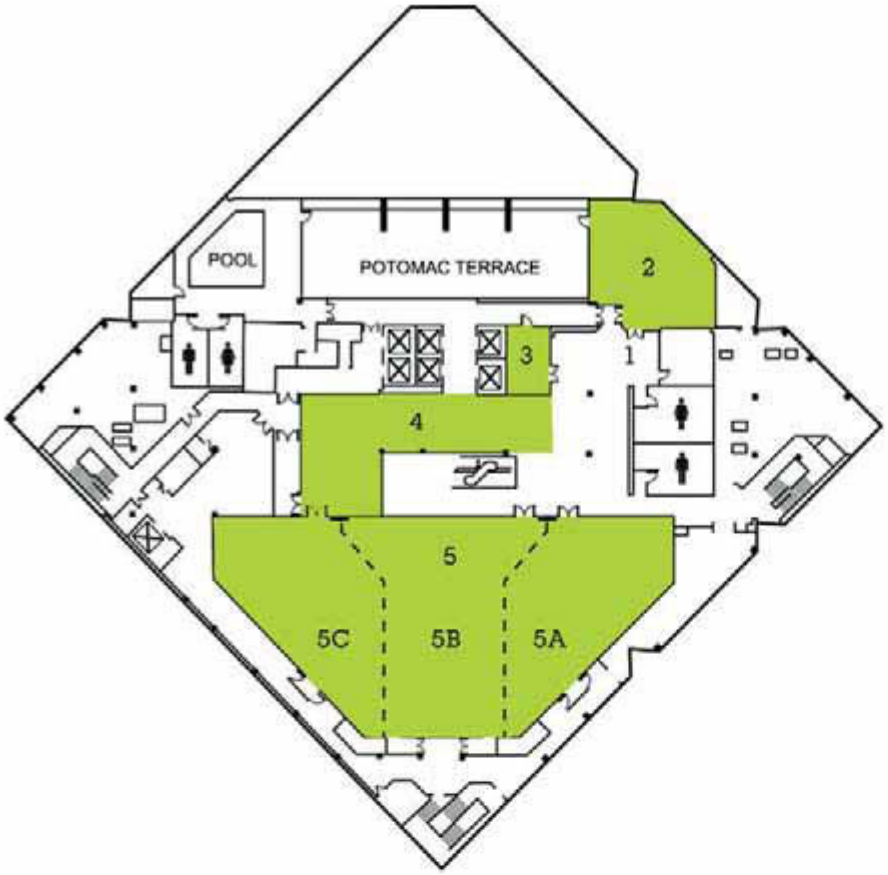


Level 200

S Pratt East Show Office 709.5 Sq. Ft.
S Pratt West Show Office 709.5 Sq. Ft.
S Otterbein North Show Office 480 Sq. Ft.
S Otterbein South Show Office 574 Sq. Ft.



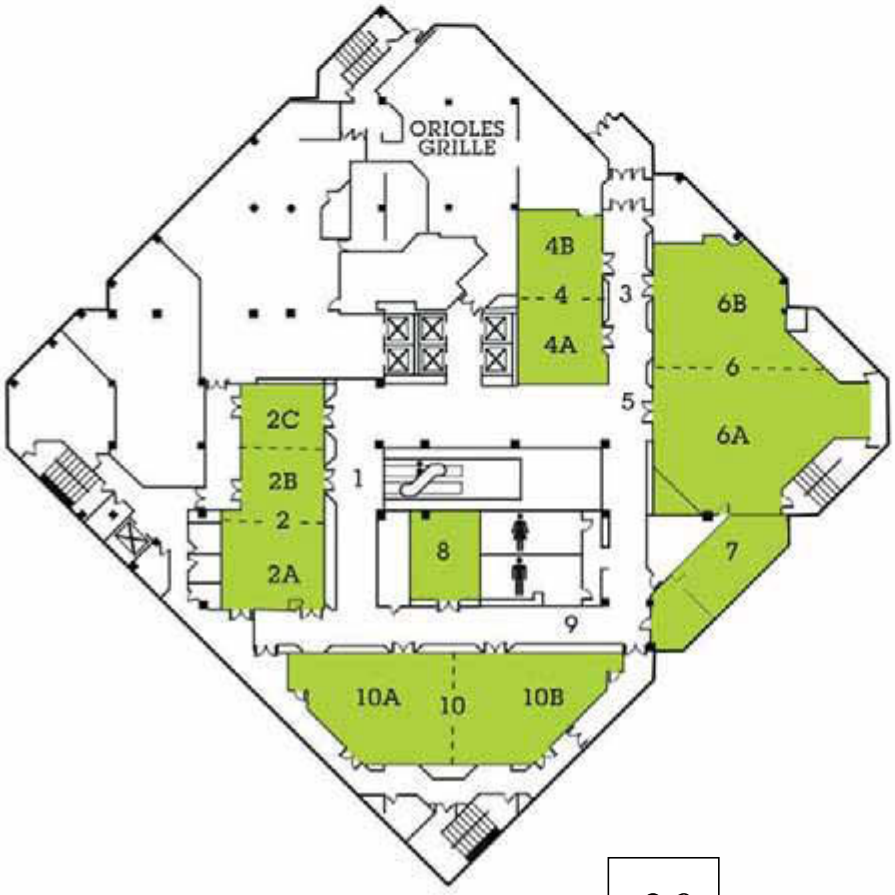
SHERATON INNER HARBOR



THIRD FLOOR

KEY

Room 1 - Potomac Gallery
Room 2 - Potomac Room
Room 3 - Patapsco
Room4 - Chesapeake Gallery
Room 5 - Chesapeake Ballroom
Room 5A - Chesapeake Ballroom I
Room 5B - Chesapeake Ballroom II
Room 5C - Chesapeake Ballroom III



SECOND FLOOR

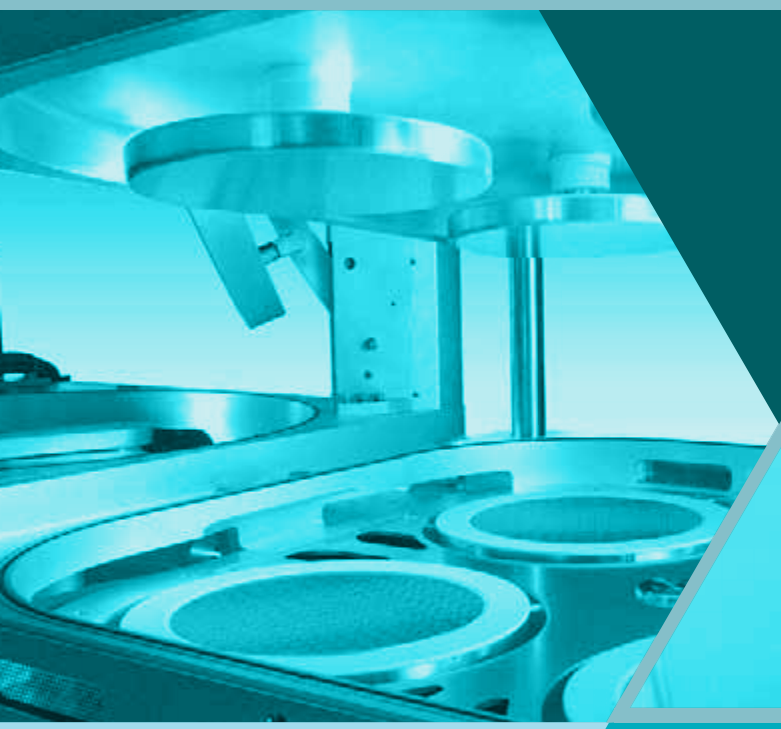
KEY

Room 1 - Severn Gallery
Room 2 - Severn Room
Room 2A - Severn Room I
Room 2B - Severn Room II
Room 2C - Severn Room III
Room 3 - Camden Gallery
Room 4 - Camden Room
Room 4A - Camden Room I
Room 4B - Camden Room II
Room 5 - Harborview Gallery
Room 6 - Harborview Ballroom
Room 6A - Harborview Ballroom I
Room 6B - Harborview Ballroom II
Room 7 - Board Room
Room 8 - Sassafras
Room 9 - Loch Raven Gallery
Room 10 - Loch Raven Room
Room 10A - Loch Raven Room I
Room 10B - Loch Raven Room II

Lam RESEARCH

Transforming atomic-scale engineering with market-leading deposition, etch, strip, and wafer cleaning technologies

Learn how our innovative solutions can help you achieve success on the wafer



Innovative **Technology**
Trusted **Productivity**
Fast **Solutions**

AVS Short Course Registration Form

November 9-14, 2014
Baltimore Convention Center
Baltimore, Maryland

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, 11/10–13	$1,495/$400
Total Pressure Gauging Techniques, 11/14	$575/$100
Vacuum System Design, 11/14	$575/$100
Materials and Interface Characterization:	
X-ray Photoelectron Spectroscopy (XPS or ESCA) & Auger Electron Spectroscopy (AES), 11/10	$575/$100
Focused Ion Beams (FIB) and Secondary Ion Mass Spectrometry (SIMS), 11/11	$575/$100
*Major Analytical Techniques other than XPS, AES, FIB, SIMS, 11/12	NA/NA
Comprehensive Course on Surface Analysis and Depth Profiling by XPS or ESCA, AES, FIB & SIMS, 11/10-11	$850/$200
Comprehensive Course on Surface Analysis and Depth Profiling by XPS or ESCA, AES, FIB & SIMS, and other Major Techniques, 11/10-12	$1,300/$300
Materials Processing:	
Atomic Layer Deposition; Basic Principles, Characterizations and Applications, 11/13	$575/$100
Photovoltaics: The Engineering, Technology and Application of Solar Cells, 11/10	$575/$100
Plasma Etching and RIE: The Fundamentals, 11/12	$575/$100
Sputter Deposition, 11/13	$675/$100
Surface Preparation for Thin Film Deposition, 11/11	$575/$100

**Course only available w/ 3-day Comprehensive Course on Surface Analysis*

Subtotal:
2014 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

Cardholder Name:_____

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:_____

Tutorial	**(Regular/Student)**
Design and Analysis of UHV Systems Using the Test-Particle Montecarlo Code MOLFLOW+, 11/9	$100/$35
Tip Reliability in Atomic Force Microscopy: The Science of Nanoscale Wear, with Applications to Nanometrology and Nanofabrication, 11/9	$100/$35
Atomic Modeling and the Computational Design of New Materials, Surfaces and Interfaces, 11/14	$100/$35
Quartz Crystal Microbalance with Dissipation Monitoring (QCM-D): Technology & Applications, 11/14	$100/$35

For more information and to register for these tutorials, please visit http://www.avs.org/Meetings-Exhibits/Information/Tutorial

Biomaterial Interfaces Division Plenary Session

Sunday, November 9, 2014, 3:00–6:00 p.m., Room 317, Baltimore Convention Center, followed by a reception

The Biomaterial Interfaces Division program will commence with the Biomaterials Plenary which has the theme "Analytical Challenges in the Pharmaceutical Industry." The aims are to explore the challenges and opportunities in locating and quantifying drugs and metabolites in both animal tissues during the drug development process, and in materials in the pharmaceutical formulation process. This is essential to turn drugs into medicines and novel delivery devices. We have four outstanding plenary speakers who will cover the most recent developments in the application of surface analysis to study these complex systems and their multifaceted analytical challenges. They bring unique perspectives from the cutting edge of academia and the pharmaceutical industry. The Plenary will be co-sponsored by the Applied Surface Science Division and will close with the opportunity for further discussions at our traditional industry sponsored Plenary Reception.

Electronic Materials and Processing Division Industrial Forums

The Electronic Materials and Processing Division (EMPD) will host two industrial forums 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 both forums.

Careers at Lam Research

Monday, November 10, 2014, 6:00 p.m., Room 314, Baltimore Convention Center

Sponsored by Lam Research Corporation. 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. Andy Antonelli will describe Lam Research Corporation, its technical thrusts as well as challenges, its products, future direction, and career opportunities.

Moore's Law and Careers at Intel

Tuesday, November 11, 2014, 6:45 p.m. immediately following the EMPD Business Meeting, Room 314, Baltimore Convention Center

Sponsored by Intel Corporation. In 1965, Intel co-founder Gordon Moore declared that the number of transistors on a chip would double roughly every two years. Four decades later, the silicon microelectronics industry has turned this prediction into a maxim that has helped bring the world products that have changed the way we live, work and play. However, many have questioned whether the aggressive trend dictated by "Moore's Law" can continue to be sustained. Dr. Satyarth Suri joined Intel in 2002 and is currently a Senior Staff Engineer in Intel's Components Research Group. Dr. Suri's talk will illustrate that while the future is not crystal clear, numerous paths exist to extend Moore's Law for several more decades. Dr. Suri will further highlight Intel's silicon technology leadership and career opportunities at the world's largest semiconductor manufacturer.

SPECIAL SESSIONS/WORKSHOPS

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

Monday, November 10, 2014, 7:30 p.m., Room 305, Baltimore 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 three finalists are Yizhuo He, University of Georgia, Merve Taner Camci, Bilkent University and Alexander Kozen of University of Maryland.

The three 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:

"Gas Cluster Ion Sources: Shiny New Toy or Tool for Opening Up New Frontiers in Surface Analysis?"

Speaker: Peter Cumpson, MSE Director of Research at Newcastle University, Director of the National EPSRC XPS User's Service (NEXUS) at Newcastle University

Tuesday, November 11, 2014, 8:00 p.m., Chesapeake I, Sheraton Inner Harbor Hotel

The Tuesday ASSD/ASTM E42 workshop will relay the latest information on the use of cluster ion sources for depth profiling of materials, which has allowed the sputter profiling of organic materials, which could not previously be done. The current state of the art in the technique will be presented, which will be followed by discussion of the potential pitfalls and limitations.

Surface Science Morton M. Traum Presentation

Thursday, November 13, 2014, 12:30 p.m., Room 309, Baltimore 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 2014 Winner will be announced in the Traum Student Award Ceremony.

Special Event at the Walters Art Museum

Friday, November 14, 2014, 2:00 p.m.

Attendees of the Conservation Studies of Heritage Materials Focus Topic are also invited to attend a special tour of the Walters fall 2014 exhibition, Rye to Raphael, with the exhibition curator, Dr. Jo Briggs, and Walters Conservation Scientist, Dr. Glenn Gates. Participants are asked to meet Glenn at the Center Street Lobby at 2:00 p.m. on Friday, November 14. The exhibition tour will last approximately one hour. This will be followed by a tour of the scientific analysis facilities at the Walters, highlighting scientific discoveries of objects in the collection, and will conclude with a small wine and cheese reception in the Walters Parlor from 4:00 p.m. until 5:00 p.m.

The Walters Art Museum is one of only a few museums in the world to present a panorama of art from the third millennium B.C. to the early 20th century. The thousands of treasures range from mummies to arms and armor, from old master paintings to Art Nouveau jewelry. The Walters' Egyptian, Greek, Roman, Byzantine, Ethiopian and Western Medieval art collections are among the finest in the nation, as are the museum's holdings of Renaissance and Asian art and a spectacular reserve of illuminated manuscripts and rare books.

AVS attendees welcome at all Professional Leadership Committee sponsored events
Admission is free to all events; registration required for the Sunday event only.

Professional Leadership Committee 2014: Susan Burkett, Heather Canavan, Charles "Chip" Eddy Jr., Mikel "Micky" Holcomb, Heather Korff, Lynnette Madsen, Sally McArthur, Kevin Robbie, Bridget Rogers, Matthew Wagner

AVS-61 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 61st International Symposium and Exhibition.

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.

See: http://www.avs.org/Meetings-Exhibits/Information/Career-Center

Sunday, November 9, 2014 (Open to Public, Registration required)

5:15-6:30 pm	Tutorial on Entrepreneurship (Room 314 Convention Center)
2:00-6:00 pm	Career Center (Registration Area): submit resumes and job postings for **Job Fair**

Monday, November 10, 2014 (Open to AVS attendees)

7:30 am-5:00 pm	Career Center (Registration Area): submit resumes and job postings for **Job Fair**
1:15-2:00 pm	Welcome to AVS! (Room 314 Convention Center)

Tuesday, November 11, 2014 (Open to AVS attendees)

10 am-5:00 pm	Career Center (Exhibit Hall): **Job Fair**
12:30-2:00 pm	Job Information Forum & Lunch (Room 314 Convention Center)

Wednesday, November 12, 2014 (Open to AVS attendees)

10:00 am-4:30 pm	Career Center (Exhibit Hall): **Job Fair**
12:30-2:00 pm	Lunch with the Feds/Federal Funding Town Hall (Room 314 Convention Center)

Thursday, November 13, 2014 (Open to AVS attendees)

10:00 am-5:00 pm	Career Center (Exhibit Hall from 10:00-2:30, Registration Area from 2:30-5:00 pm)
12:30-2:00 pm	Work-Life Satisfaction & Lunch (Room 314 Convention Center)

AVS Professional Leadership

Room 314 Convention Center

AVS attendees welcome at all events—no additional fee or registration required. Come join the discussion!

Sunday, November 9, 2014 (Free and Open to the Public, Registration required)

5:15 pm Tutorial on Entrepreneurship (Room 314 Convention Center)

Tutorial: Entrepreneurship (Sunday 5:15 – 6:30 pm)

Everyone Welcome – Come join the discussion!

Organizer and Moderator: **Mikel "Micky" Holcomb, West Virginia University**
Sponsors: AVS Professional Leadership Committee & the Manufacturing Science & Technology Group (MSTG)

5:15 pm **Why Get Involved with Commercialization? Prof. Angus Kingon,** Brown University

Angus Kingon is Professor of Engineering, and University Professor of Entrepreneurship and Organizational Studies. He is the Academic Director of the Commerce, Organizations and Entrepreneurship Program, and the co-Director in the graduate Masters-level Program on Innovation Management and Entrepreneurship (PRIME) at Brown University. He specializes in technology commercialization and technology entrepreneurship, and has developed interventions to promote the commercialization of emerging science in several countries. He has developed teaching methods for technology entrepreneurship and commercialization that have been adopted around the world, and also adapted for corporate use. At the same time, Professor Kingon maintains an active research program in ceramic and electronic materials and nanotechnology. He has published about 340 papers in refereed journals, edited 7 books, published 8 book chapters, and has 15 issued patents. Some of his research has been commercialized, for example in conjunction with Motorola for use in mobile phones. He was the co-winner of the Price Foundation Award as Innovative Entrepreneurship Educator for 2006. He is a Fellow of the Center for Innovation Management Studies, and a Fellow of the American Ceramic Society.

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

AVS Professional Leadership

Room 314 Convention Center

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

Monday, November 10, 2014 (Open to AVS attendees)

8:00 am-5:00 pm	Career Center (Registration Area): submit resumes and job postings for **Job Fair**
1:15-2:00 pm	Welcome to AVS! (Room 314 Convention Center)

Welcome to AVS! – A Brief Introduction to YOUR New Professional Society

Organizer: **Charles Eddy, Naval Research Laboratory**
Sponsors: AVS Professional Leadership Committee

Lunch is provided for all AVS attendees!

Wonder about the Mission and Vision of AVS?
Want to know how to get involved?
Would you like to hear from AVS members and leaders?

Then, come learn about the benefits and opportunities of YOUR newest Professional Society!

- This "Welcome to AVS!" event will introduce you to the mission, vision and organization of AVS as well as highlight its major activities –
    - Publishing (Editor-in Chief Eray Aydil),
    - Symposia and Conferences (Chair Chip Eddy),
    - Education (Chair John Lannon),
    - Membership (Chair Dave Surman), and
    - Professional Development (Chair Susan Burkett).
- Come hear about the benefits now available to you as an AVS member – both at the meeting this week and throughout the whole year!
- Meet with key leaders in AVS and find out how you can get involved!

Welcome! We're really glad you're here and we want you to stay!

AVS Professional Leadership

Room 314 Convention Center

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

Tuesday, November 11, 2014 (Open to AVS attendees)

10 am-5:30 pm	Career Center (Exhibit Hall): **Job Fair**
12:30-2:00 pm	Job Information Forum & Lunch (Room 314 Convention Center)

Job Information Forum & Lunch

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

Lunch is provided for all AVS attendees!

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. Anna Belu
Editor, *Biointerphases*
Sr. Principal Scientist and Technical Fellow, Medtronic

From Academia in a Teaching-focused College
Prof. Craig Benson
Professor, Montgomery College Department of Chemistry

From a National Laboratory
Dr. Connie Li
Research Scientist, Materials Science & Technology Division, Naval Research Laboratory

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AVS Professional Leadership

Room 314 Convention Center

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

Wednesday, November 12, 2014 (Open to AVS attendees)

10 am-5:30 pm	Career Center (Exhibit Hall): **Job Fair**
12:30-2:00 pm	Lunch with the Feds/Federal Funding Town Hall (Room 314 Convention Center)

Lunch with the Feds / Federal Funding Town Hall

Organizers: **Lynnette Madsen, National Science Foundation**
Sponsor: AVS Professional Leadership Committee

12:30 p.m. Pick up box **lunch in room 314** (provided at no charge to AVS attendees)

Key leaders from several federal agencies will provide insight into their priorities and current issues, and then will field questions from the audience. This is an event not to be missed!

For example,

Dr. Lewis E. Sloter, II, Associate Director, Materials & Structures, Office of the Assistant Secretary of Defense for Research and Engineering, will discuss the needs of the DoD.

Dr. Ellen D. Williams, nominated by President Obama to be the next Director of the Advanced Research Projects Agency-Energy (ARPA-E), will talk about the issues of technology and clean energy.

2:00 p.m. Adjourn

Credit: ACerS

CHANGING WHAT'S POSSIBLE

AVS Professional Leadership

Room 314 Convention Center

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

Thursday, November 13, 2014 (Open to AVS attendees)

10 am-2:00 pm	Career Center (Exhibit Hall): last chance for the **Job Fair**
12:30-2:00 pm	Work-Life Satisfaction & Lunch (Room 314)

Work-Life Satisfaction

Organizer: **Micky Holcomb, West Virginia University**
Sponsor: AVS Professional Leadership Committee

Lunch is provided for all AVS attendees!

Given the work environments and expectations in science, and the fact that a career in science is very often a way of life and far more than a job, work-life balance satisfaction can be elusive. Scientists must find the personal work-life balance strategies that work for them within the systems in which they work.

This interactive program will help students, faculty and industrial representatives:

* Define for themselves what work-life satisfaction is and is not.

* Examine how their current choices impact work-life balance and identify changes that will have the biggest impact on personal and professional satisfaction.

* Identify 7 keys to achieving and maintaining work-life satisfaction.

* Craft a personalized plan to improve work-life balance satisfaction.

This program was originally developed by the Association for Women in Science (AWIS) through a grant from the Elsevier Foundation.

CAREER CENTER

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, 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 61st International Symposium and Exhibition.

The Job Fair continues grow each year. 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 email 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: 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 October 3, 2014 ($500).**

Career Center Registration: 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. **(FREE prior to 10/24; $50 After 10/24)**.

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

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

Potential Employers:

- Submit registration form by **October 3, 2014** – *registration form is available online*
- Email job postings by **October 24**, or bring 2 copies of each job posting onsite
- **NEW!** Include on your registration form the "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)

JOB SEEKERS:

- **NEW!** Include on your résumé: Program #, day, time, and location if you are giving a talk; Email your résumé by ***October 17*** **(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 email for interivew appointments **(*frequently each day*)**
- Be available for onsite/informal interviews
- Bring EXTRA, clean copies of your résumé to hand out as needed

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 email message if they wish to schedule an interview. *It is important to check your email often each day so you do not miss any interview opportunities*.

Advance résumés may be emailed to: Heather Korff, heather@avs.org

AVS Career Center Online Registration and Information:

http://www.avs.org/Meeting-Exhibits/Information/Career-Center

Click on Meetings/Events/Services and then Career Center (there is a section for Employers and Job Seekers in addition to the Employer registration form)

Advance Submission Deadlines:

Job Fair Table:	**October 3, 2014**
Job Postings:	**October 24, 2014**
Résumés/CVs:	**October 17, 2014**

Hours/Location November 9–13, 2014

Sunday	**2:00 pm - 6:00 pm**	**Career Center Registration Area**
Monday	**7:30 am - 5:30 pm**	**Career Center Registration Area**
Tuesday	**10:00 am - 5:00 pm**	**Exhibit Hall Booth 1121**
Wednesday	**10:00 am - 4:30 pm**	**Exhibit Hall Booth 1121**
Thursday	**10:00 am - 2:30 pm**	**Exhibit Hall Booth 1121**
Thursday	**2:00 pm - 5:00 pm**	**Career Center Registration Area**

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

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

Visit the AVS STORE

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AVS Apparel & Logo Items

Visit the AVS Store at **Booth 1720**

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

Not interested in Making a Purchase?

Stop by to learn more about AVS Membership Benefits and how to Get Involved.

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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.

GET INVOLVED
www.avs.org

Stop by the Membership Booth 1720 Tuesday-Thursday in the Exhibit Hall to learn about your AVS membership benefits and how to get involved.

If you are new to AVS, don't miss the Welcome to AVS Workshop (Monday, 1:15 p.m., Room 314) or the New Member Mixer (Monday, 5:00 p.m., Ballroom III)

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

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
- Florida International University
- 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

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

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AVS would like to acknowledge the following companies who have generously provided support for AVS-61 events.

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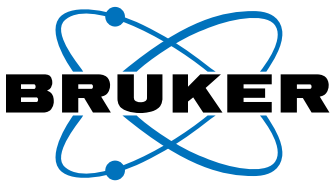

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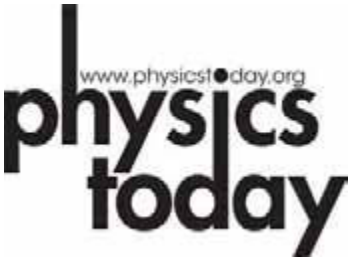

AVS CORPORATE MEMBERS

AVS wishes to thank the following Corporate Members for their support. For information on benefits or to become a corporate member please contact Angela Klink; angela@avs.org or refer to the AVS website: www.avs.org

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- **Capitol Vacuum Parts**
- **CeramTec North America**
- **Denton Vacuum LLC**
- **Duniway Stockroom Corp.**
- **EP Laboratories, Inc.**
- **Evans Analytical Group**
- **FMG Enterprises, Inc.**
- **Gamma Vacuum**
- **Helium Leak Testing, Inc.**
- **Innovative Vacuum Solutions, Inc.**
- **INTELLIVATION LLC**
- **ION-TOF USA Inc.**
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- **Kratos Analytical**
- **Kurt J. Lesker Company**
- **Lam Research Corporation**
- **MKS Instruments Inc.**
- **Nordiko Technical Services Limited**
- **Pfeiffer Vacuum Technology**
- **Physical Electronics**
- **Plasmaterials Inc.**
- **Plasma-Therm**
- **Precision Plus Vacuum Parts**
- **Process Materials Inc.**
- **R.D. Mathis Company**
- **RBD Instruments, Inc.**
- **RF VII Inc.**
- **RHK Technology Inc.**
- **SAES Getters USA, Inc.**
- **SPECS Surface Nano Analysis GmbH**
- **SPI Supplies**
- **Staib Instruments, Inc.**
- **Super Conductor Materials Inc.**
- **Ted Pella, Inc.**
- **Thermo Fisher Scientific**
- **UC Components Inc.**
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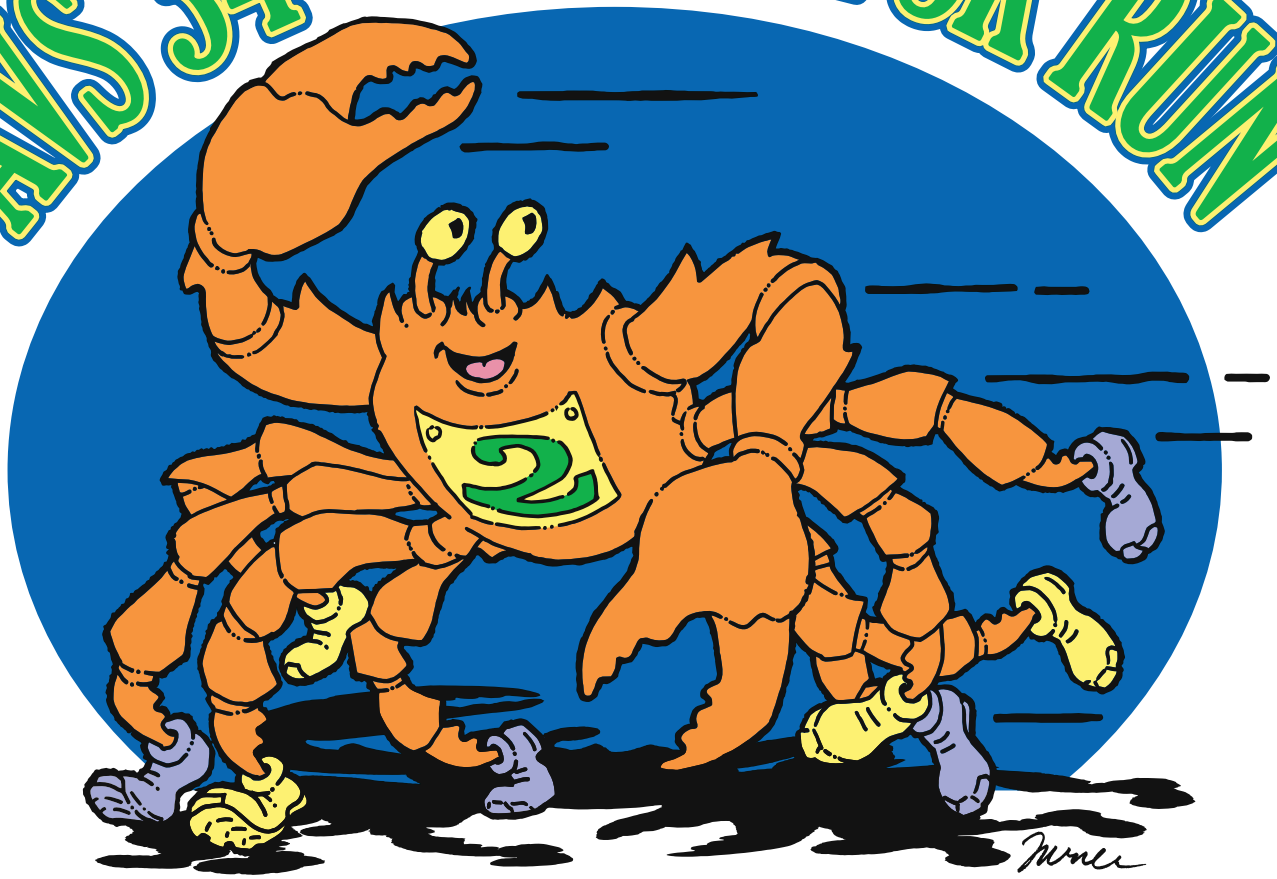
AVS 34TH ANNUAL 5K RUN



Wednesday, November 12, 2014
Baltimore, Maryland

WHEN: The race will be held at **6:15 a.m., Wednesday, November 12, 2014** (to allow runners to make first sessions).

REGISTRATION: The $30 entry fee includes a **run t-shirt**, **race number**, and **awards**. **Register Sunday-Tuesday** at the Run Registration Desk (Charles St. Lobby, Baltimore Convention Center).

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

DETAILS & AWARDS:
This year's course will be announced at the Run Desk when you pick up your registration. 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, unemployed, research organization, manufacturer, etc.) or Division/Group must have 3 team members to qualify. Times are handicapped by age and sex. In the interest of enhancing the already billowing AVS membership, non-AVS members will be time penalized. The **awards ceremony** will be held at the Run registration desk (Charles St. Lobby, Baltimore Convention Center) Wednesday at 12:30 p.m.

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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

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

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

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

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

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)

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)

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)


AVS
Awards Ceremony & Reception
AVS 61st Annual Awards Ceremony
Wednesday, November 12, 2014
Celebrate with AVS awardees in the
Ballroom I of the Baltimore 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, November 12, 2014 at 6:30 p.m. in a Ballroom of the Baltimore Convention Center to be followed immediately by an Awards Reception. This year, AVS honors the following awardees:

Patricia A. Thiel, Medard W. Welch Award

Gary E. McGuire and Olga A. Shenderova, Albert Nerken Award

Hans-Joachim Freund, Gaede-Langmuir Award

Joshua Zide, Peter Mark Memorial Award

Ewald E. Chaban, George T. Hanyo Award

The newly elected AVS Fellows

The 2014 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.

PATRICIA A. THIEL
Iowa State University

"2014 AVS Medard Welch Award Lecture – Quasicrystals to Nanoclusters: It's All on the Surface"

Tuesday, 4:20 pm, Room 309

Prof. Patricia A. Thiel, Iowa State University, "For seminal contributions to the understanding of quasicrystalline surfaces and thin-film nucleation and growth"

Patricia A. Thiel is the John D. Corbett Professor of Chemistry, and a Distinguished Professor of Materials Science and Engineering at Iowa State University. She is also a Faculty Scientist in the Ames Laboratory. She is known for her research on the formation and evolution of nanostructures on surfaces, and surface properties and structures of quasicrystals. She earned her B.A. in Chemistry at Macalester College in 1975, and her Ph.D. in Chemistry at the California Institute of Technology in 1981. After postdoctoral work at the University of Munich as an Alexander von Humboldt Fellow, she joined the technical staff at Sandia National Laboratories, at Livermore, then moved to Iowa State University in 1983, where she was recognized with awards from the Camille and Henry Dreyfus Foundation and the A. P. Sloan Foundation, and by an NSF Presidential Young Investigator Award. More recently, she has been elected a Fellow of 4 major scientific societies. She has been an Invitation Fellow of the Japanese Society for the Promotion of Science, has received an Honorary Degree from the Institut National Polytechnic de Lorraine in France, and has received a DOE Award for Outstanding Scientific Accomplishment in Materials Chemistry. In 2010, she received both the David J. Adler Lectureship Award from the American Physical Society, and the Arthur W. Adamson Award from the American Chemical Society. She has served on numerous boards and committees for major scientific organizations, and has been a member of editorial advisory boards for 10 journals. She is currently Associate Editor of the *Journal of Chemical Physics.* She has authored or edited about 300 scientific publications.

ALBERT NERKEN AWARD

The Albert Nerken Award was established in 1984 by Veeco Instruments, Inc. in recognition of its founder, Albert Nerken, a founding member of AVS. Albert Nerken's work was in the field of high vacuum and leak detection and he made contributions to the commercial development of the instrumentation. The Albert Nerken Award is presented to recognize outstanding contributions to the solution of technological problems in areas of interest to AVS. The award consists of a cash award, a plaque, and an honorary lectureship at a regular session of the International Symposium.

OLGA A. SHENDEROVA
Adámas Nanotechnologies Inc.

"2014 AVS Albert Nerken Award Lecture – Brilliant Nanodiamond Particles"

Wednesday, 2:20 pm, Room 304

Drs. Gary E. McGuire and **Olga A. Shenderova,** International Technology Center (ITC) and Adámas Nanotechnologies Inc., "For insights into nanodiamond synthesis and development of processing, science, and applications thereof"

OLGA A. SHENDEROVA

Olga A. Shenderova received her M.S. with honor (1987) in Physics of metals and PhD (1991) in Physics & Mathematics from the St. Petersburg State Polytechnical University (SPbSPU), Russian Federation. Her doctoral research was devoted to atomistic simulation of radiation defects in aluminum. Then she worked as a faculty member at the Physical Metallurgical Department of SPbSPU where she did modeling of non-metallic inclusions formation in steel and Ni alloys for their reinforcement. She started her post-doctoral appointment followed by the position of Research Assistant Professor under the supervision of Dr. Donald Brenner, Materials Science and Engineering Department, North Carolina State University (NCSU) in 1995. At NCSU she performed atomistic modeling of structure, mechanical and electronic properties of grain boundaries in diamond films, nanodiamond (ND) particles and ND-carbon nanotube composites. Since 2001 she has worked at the International Technology Center (ITC) on applied research in the areas of field emission devices, diffractive optics and phototherapy bandages. She was among the very first in the USA to recognize the long term potential of ND particles (2002). From the beginning she initiated an active campaign to promote the potential of ND through books, review articles, and conferences and generated the first available technical reference book on ND particles in English (2006). In 2003 she began experimental work with ND particles and became the Head of Nanodiamond Laboratory at ITC. Her research activities were directed toward fundamental studies of detonation ND (DND) structure and properties, development of a new generation of DND particles in terms of controlled size, surface chemistry and purity. Dr. Shenderova in collaboration with Dr. Gary McGuire and other colleagues developed a diversity of DND processing techniques that became the basis for commercial DND products: deagglomeration to small size aggregates and primary particles; fractionation to narrow size particle distributions; environmentally benign detonation soot purification from sp^2 carbon using ozone; controlled surface functionalization including use of an atmospheric pressure plasma

system; dispersion in polar and non-polar solvents. She led studies on nitrogen content and state in DNDs and demonstrated how N doping in DND can be controlled by varying the carbon precursor. She and collaborators developed ND-based polymer composites with increased mechanical properties, wear resistance, thermal stability, and adhesion plus greater resistance to degradation when exposed to UV and high energy ionizing radiation. She also developed DND slurries in DMSO/methanol solvents which is the preferred means for seeding of substrates for growth of CVD diamond films. In collaboration with Professor M.I. Ivanov (Yekaterinburg) she developed ND-based formulations with significantly enhanced lubricating properties and scaled up the production capacity of the ND-based lubricant additive. In the biomedical field her team demonstrated use of ND as a means of delivery of genetic material, drugs and other biomedical materials to cells and tissue, particularly using the ballistic delivery method. Her most recent achievement includes large-scale production of fluorescent NDs containing NV centers (National Institute of Health-funded) for in vitro and in vivo biological imaging. In 2010 she founded the company Adámas Nanotechnologies, Inc. to commercialize the developed ND technologies providing more than a dozen types of novel ND products and serves as President of the company.

She has given more than 100 invited talks and authored over 130 papers in peer reviewed journals, 15 book chapters, and edited 5 books related to nanodiamonds. She has more than 20 patents\patent applications. She organized the first international symposium on nanodiamond particles outside of Russia (MRS Spring 2012 meeting). She is a member of the Editorial Board of the *Journal of Diamond and Related Materials* and earlier played this role for the *Journal of Vacuum Science and Technology B*.

GARY E. McGUIRE

Gary E. McGuire received his BA (1968) from Pfeiffer College and PhD (1972) in Inorganic Chemistry from the University of Tennessee under the supervision of Dr. George Schweitzer. His doctoral research which was conducted in the Physics Division of Oak Ridge National Laboratory in the laboratory of Dr. Thomas Carlson focused on both x-ray photoelectron spectroscopy of inorganic compounds and UV spectroscopy of gas phase molecules at a time when the field of electron spectroscopy was in its infancy. He went on to a post-doctoral appointment under the supervision of Dr. Bob Clausing, Metals and Ceramics Division, Oak Ridge National Laboratory where he performed some of the earliest studies of grain boundaries of irradiated metal alloys using Auger electron spectroscopy. Later he joined Texas Instruments where he was involved in surface characterization of semiconductor materials. Throughout his career, he continued to use surface analysis techniques in the characterization and development of new semiconductor, display, ferroelectric and nanocomposite materials and novel devices. He held management positions at Tektronix and the Microelectronic Center of North Carolina and was founder of the International Technology Center (ITC), a non-profit research corporation. At ITC, he initiated and supervised a variety of projects including development of an atmospheric pressure plasma system, a wide field of view photon-sieve based lens, high current back-gated field emission cathodes, and high thermal conductivity interface materials.

Over the last 13 years he has collaborated with Dr. Olga Shenderova and others on the development of nanodiamond and its applications as well as hybrid structures where the synergy between sp^2 and sp^3 bonded carbon materials provides enhanced properties beyond what can be achieved with a single carbon-based nanomaterial. This includes use of nanodiamond in inter-level dielectrics of integrated circuits to increase thermal stability, polymer nanocomposites with improved mechanical properties, resistance to degradation when exposed to high energy ionizing radiation, and enhanced attenuation of UV radiation. In 2010 Adámas Nanotechnologies Inc. was established to commercialize many of the innovative nanomaterials which originated from the collaborative effort.

He served as Editor of *JVST B* from 1991 to 2010, Editor of *Journal of Electron Spectroscopy and Related Phenomena* from 1984 to 1997 and was one of the founding Editors of *Surface Science Spectra* in 1992. He has served in numerous capacities for the AVS including President in 1997. He is an Honorary Member and Fellow of the AVS.

GAEDE LANGMUIR AWARD

The Gaede-Langmuir Award was established in 1977 by an endowing grant from Dr. Kenneth C.D. Hickman. It is presented to recognize and encourage outstanding discoveries and inventions in the sciences and technologies of interest to AVS. The award is conferred biennially as a suitable candidate may be identified. It consists of a cash award, a commemorative plaque stating the nature of the award, and an honorary lectureship at a regular session of the International Symposium.

HANS-JOACHIM FREUND

Dr. Hans-Joachim Freund, Fritz Haber Institute of the Max Planck Society, "For seminal contributions to the understanding and development of novel physical and chemical concepts about the behavior of atoms, molecules and electrons at catalytically-active surfaces"

Hans-Joachim (Hajo) Freund (born 1951) studied physics and chemistry at the University of Cologne and received his PhD in 1978 with a thesis on quantum chemical calculations and photoelectron-spectroscopic studies on transition metal carbonyl compounds in comparison with carbon monoxide adsorbates. Between 1979 and 1981 he worked in the Physics Department at the University of Pennsylvania as a postdoctoral fellow of the German Science Foundation on synchrotron studies of the electronic structure of adsorbates on metal sur-faces. He finished his habilitation in 1983 at Cologne University and accepted in the same year a position as associate professor at the University Erlangen-Nürnberg. In 1987 he moved to a position as professor of physical chemistry at the Ruhr-Universität Bochum, where he started to develop an approach to study model catalysts based on thin oxide film supported metal nano particles, an approach now used throughout the world. In 1995 he accepted a position as scientific member and director at the Fritz-Haber-Institut der Max-Planck-Gesellschaft in Berlin where he is head of the Department of Chemical Physics. Here the entire department is dedicated to study model catalysts, applying a large number of techniques and instruments, some of which were newly developed within the department to investigate oxide surfaces and oxide metal interfaces. New materials, such as two-dimensional alumina, silica, and alumosilicate, as well as transition metal oxides have been synthesized and characterized also in collaboration with theory groups. The electronic properties of metal and oxide clusters have been studied using scanning probe techniques, in-cluding a home built photon-STM and other ensemble averaging techniques, such as micro-calorimetry. He serves as Adjunct Professor of the Ruhr-Universität in Bochum, the Freie Universität, Technische Universität, and Humboldt Universität in Berlin in physics and chemistry, and as Honorary Professor of Physics

at University of Birmingham, UK. In 1995 he received the Gottfried Wilhelm Leibniz Award of the German Science Foundation (DFG). In 2011 he received the Karl-Ziegler-Award of the German Chemical Society and the Karl-Ziegler Foundation. In 2012 Hajo Freund was awarded the Blaise Pascal Medal in Material Science of the European Academy of Sciences and received the Award for Service 2012 of the EuCheMS. He is Centenary Lecturer of the Royal Society of Chemistry, United Kingdom 2006/2007 and is the recipient of the Gabor A. Somorjai Award of the American Chemical Society in 2007. Since 1996, he is a regular member of the Chemical Sciences Section of the Academia Europea, the Berlin-Brandenburgische Akademie der Wissenschaften since 1998, the Academia Brasileira de Ciencias since 2004, the German National Academy of Sciences Leopoldina since 2009, and the Chemical section of the Hungarian Academy of Sciences since 2013 as Corresponding Member. Hajo Freund holds an honorary Doctorate from University Aix Marseille, France since 2013. He is Fellow of the American Physical Society since 2001. He is member of several scientific societies; member of several advisory boards of scientific journals, has published close to 700 scientific papers with more than 28.000 cita-tions and given more than 650 invited talks. He has held a number of named lectureships over the years, such as the Bernstein Lecture 2013/2014 of the University of Wisconsin-Madison, the Robert-Bunsen-Lecture 2012 of the German Bunsen Society for Physical Chemistry, the Dinesh O. Shah Lecture in Surface Science 2012, University of Florida, the Kistiakowsky Lecture at Harvard and the Arthur D. Little Lecture at MIT in 2011, the Ipatieff and Malcolm Dole Lectureships at Northwestern in 2008/2005, the Hassel Lecture of the Norwegian Chemical Society in 2008, the William Draper Harkins Lecture at Chicago in 2002, and the Frontiers in Chemistry Lectures at Texas A&M in 2001. He is a founding member of the Scientific Council of the European Research Council. Hajo Freund has educated more than 120 PhD students and collaborated with more than 70 postdoctoral associates. Many former members of his group hold higher academic positions worldwide.

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.

JOSHUA ZIDE
University of Delaware

"Peter Mark Memorial Award Lecture – Novel Semiconductor and Epitaxial Nanocomposite Materials for Electronic and Photonic Applications"

Monday, 3:40 pm, Room 314

Dr. Joshua Zide, University of Delaware, "For pioneering work in the growth and characterization of novel electronic and photonic materials"

Dr. Joshua Zide is an Associate Professor in the Materials Science and Engineering Department at the University of Delaware. Joshua received his BS with Distinction in Materials Science and Engineering from Stanford University. He earned his Ph.D. in Materials at the University of California, Santa Barbara under the supervision of Prof. Art Gossard. This thesis work focused on the growth of metal/semiconductor nanocomposites, primarily for applications in thermoelectric power generation. During his graduate career, he received the Goldsmid Award of the International Thermoelectric Society.

After completing his PhD, Joshua began his independent career at the University of Delaware, where his primary research interest is the nanoscale engineering of novel semiconductor and composite electronic materials for energy conversion and electronic devices. More specifically, his principal focus is on the growth of new materials by molecular beam epitaxy. He has broadened the study of rare-earth based nanoparticles within III-V semiconductors (both by molecular beam epitaxy and more recently by other growth techniques). Joshua is also a pioneer on the growth of dilute bismuthides, in which the incorporation of bismuth into III-V semiconductors causes anomalously narrow bandgaps. His focus is on the growth of InP-based bismuthide materials.

Applications of these materials include thermoelectrics, terahertz sources and detectors (based on ultrafast photoconductive switches), metamaterials for terahertz modulators, technologies for high-efficiency solar cells (both tunnel junctions for multijunction solar cells and more recently upconversion structures for efficient spectrum utilization), and mid-infrared optoelectronics on an InP platform. His work on bismuthides earned him a Office of Naval Research Young Investigator Award in 2009, while his novel alternative approach for the synthesis of nanocomposites is supported by a Department of Energy Early Career Award (2012). Joshua was also named the North American Molecular Beam Epitaxy Young Investigator in 2011. He has served as a program committee member for numerous conferences and a guest editor for both the *Journal of Vacuum Science and Technology B* and the *Journal of Electronic Materials.* He has authored or co-authored over 50 peer-reviewed publications and several 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.

EWALD E. CHABAN

Mr. Ewald E. Chaban, AT&T Bell Laboratories, "For outstanding and creative contributions to surface science instrumentation, including the development of reverse-view LEED and photoemission optics"

E. E. "Ed" Chaban is a former Member of Technical Staff in the Surface Physics Research Department of AT&T Bell Laboratories, Murray Hill, NJ. He was born in the Soviet state of Georgia in 1935 and moved/escaped to Germany in September 1943 during World War II. While in Germany he competed for an apprenticeship with the German company, Magnet-Schultz and was hired by them as a technician/machinist. This enabled further employment after immigra-

tion to the US in 1953 and ultimately at Bell Labs in the 1960's. In late 1969 he joined Homer Hagstrum's Research Department at Bell Labs, Murray Hill and remained until retirement in 2005. During that time he invented many new research tools (such as custom designs, laboratory equipment, and UHV chambers) for AVS scientists. This enabled a large body of seminal research already recognized by four AVS Medard Welch Awards [Homer D. Hagstrum (1974), Mark J. Cardillo (1987), David E. Aspnes (1998), and Yves J. Chabal (2012)], the AVS Gaede-Langmuir Award [Alfred Y. Cho (1988)], and the AVS Albert Nerkin Award [John E. Rowe (2011)]. In addition, he worked on designs for the design and construction of the U4A & B beam lines at the National Synchrotron Light Source at Brookhaven National Labs and a unique molecular beam scattering apparatus for Prof. Bruce Doak of Arizona State University. His reverse-view LEED optics was adopted by the small company, Princeton Research Instruments and is available commercially (http://www.prileeduhv.com). This instrument was also displayed in AVS-59 in Tampa, Florida. His design of a simple UHV copper gasket removal tool ("Removal of Metal UHV Gaskets," *Journal of Vacuum Science & Technology*, 12, 654 (1975). http://dx.doi.org/10.1116/1.568642) was adopted by the Kurt Lesker company and displayed at a number of AVS meetings over the past 25 years. The importance of Ed's contributions have been recognized by his co-workers with the co-authorship of 48 peer-reviewed publications from 1973 to 2002 with over 2967 Citations and an h-index = 25. He currently lives in Newark, Delaware and knows Robert Opila former chair of the AVS Applied Surface Science division.

AVS GRADUATE STUDENT AWARDS

2014 NATIONAL STUDENT AWARD FINALISTS

There are five (5) top-level named Graduate Student Awards and three (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:

Swapnadip Ghosh, University of New Mexico
Jiechang Hou, University of Pennsylvania
Deep Jariwala, Northwestern University
Jingjing Qiu, University of Florida
Priya Raman, University of Illinois, Urbana-Champaign
Huiliang Wang, Stanford University
Shiran Zhang, University of Notre Dame
Yingjie Zhang, University of California, Berkeley

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

AVS Fellows are members who have made outstanding contributions in areas of interest to AVS.

2014 AVS FELLOWS

Robert W. Carpick, University of Pennsylvania
Gregory S. Herman, Oregon State University
Carol Jean Hirschmugl, University of Wisconsin, Milwaukee
Graham J. Leggett, University of Sheffield, United Kingdom
John S. Lewis, III, RTI International
Matthew Linford, Brigham Young University
Roya Maboudian, University of California, Berkeley
David R. Mullins, Oak Ridge National Laboratory
Lawrence Overzet, University of Texas at Dallas
Joerg Patscheider, EMPD, Switzerland
L. Ramdas Ram-Mohan, Worcester Polytechnic Institute
Paul E. Sheehan, US Naval Research Laboratory
Colin Wolden, Colorado School of Mines
Martin Wuest, INFICON AG, Liechtenstein

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 2014 winner will be announced in the Traum Student Award Ceremony, to be held on Thursday, November 13 at 12 Noon in Room 309, Baltimore 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		
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 will be announced on Thursday, November 13 during the afternoon break.

Past winners:

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

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 61st 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		
2002	E.L. Biizdaca	2007	David Wisbey	2011	Juan Colon-Santana		
2003	Tiffany Kaspar	2007	John Strachan	2012	Chloe Baldasseroni		

Paul H. Holloway Young Investigator Award

The Thin Film Division is pleased to announce Dr. Andrea Illiberi, of the Dutch Institute for Applied Scientific Research (TNO) as the 2014 awardee of the Paul H. Holloway Young Investigator Award. Dr. Illiberi has been given the award for his ground-breaking contributions to the development of innovative atmospheric vapor-phase-deposition techniques, based on a deep understanding of surface and interfacial processes during the growth of nanometer-scale thin films and materials.

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	2012	Franklin Tao, University of Notre Dame
2010	O. Martin Ntwaaborwa, Univ. of the Free State, South Africa	2013	Per Eklund, Linköping University
2011	Sumit Agarwal, Colorado School of Mines		

DIVISION AWARDS

Nanometer-scale Science and Technology Division Student Award

The Nanometer-scale Science and Technology Division (NSTD) Student Award was established in 1998 to bring recognition to outstanding dissertation work by students giving oral presentations in NSTD sessions at AVS International Symposia. In addition to presenting their work in the standard NSTD sessions, student finalists will also present their talks at the NSTD student competition. The NSTD student competition is open to the public and will be held at noon on Wednesday of the symposium in the same room as the standard NSTD sessions. The winner will be selected based on the quality of the talk, the responses to questions, and the level of the research. The winner will be announced at the close of the student competition.

Past winners:

2002	Jeremy Steinshinder	2006	Dirk Weber	2011	Justice Alaboson
2003	Cheol-Soo Yang	2007	Jacob Palmer	2012	David Reid
2004	Qiguang Li	2008	Qing Hua	2013	Cédric Baroo
2005	Kiu-Yuen Tse	2009	Mehmet Baykara		
2006	Tracie Colburn	2010	Farzad Behafarid		

Nanometer-scale Science and Technology Division 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 2014 Awardee is Dawn Bonnell, the Henry Robinson Towne Professor of Materials Science and Engineering at the University of Pennsylvania.

Past winners:

2001	Nancy Burnham	2010	Roland Wiesendanger	2013	Joseph Lyding
2004	Harold Craighead	2011	Phaedon Avouris		
2009	Joseph Stroscio	2012	Flemming Besenbacher		

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EXHIBIT HALL EVENTS

The AVS Exhibition offers a vibrant display of the latest products and services available in the industry. Exhibitor Technology Spotlight Sessions take place during session breaks during exhibit days in addition to a variety of other activities including free caricatures, massages, photo booth, Blackjack Tournament, raffles, career center, e-mail pavilion, free coffee, lunches and much more.

FREE EXHIBIT HALL ATTRACTIONS

AVS Career Center
AVS Membership & Education Booth
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
Free Massages
History Display
BlackJack Tournament
Foosball Tournament

EXHIBIT FINALE

THURSDAY
12:20PM - 2:20PM
EVENTS:
•Free Lunch & Refreshments
•Foosball Championship Finale
•Double Down Blackjack Tournament Finale
•Art Zone Contest Prize Winners
•Raffle Drawings & MORE!

Join us !

Double Down BlackJack Tournament

Foosball Tournament

EXHIBIT SCHEDULE

Nov. 11	Tuesday	10am - 5:00pm
Nov. 12	Wednesday	10am - 4:30pm
Nov. 13	Thursday	10am - 2:30pm

EXHIBITING COMPANIES

Bold listings reflect our Sponsors and Corporate Members

Booth	Company
319	A&N Corporation
518	Accurion Inc.
1311	**Agilent Technologies, Vacuum Products Division**
1325	**AIP Publishing**
202	**AJA International, Inc.**
1327	**American Institute of Physics - Physics Today Survey Booth**
1516	Angstrom Sun Technologies Inc.
519	Applied Surface Technologies
1317	Applied Vacuum Technology, Inc.
307	**Asylum Research an Oxford Instruments Company**
1606	Atlas Technologies
823	AVS Ask the Experts Vacuum Technology Division
1116	AVS Art Zone & Contest
1715	AVS BlackJack Tournament
1121	AVS Career Center
1719	AVS Chapters
112	AVS E-Mail Pavilion
716	AVS Technology Spotlight Sessions
1501	AVS Foosball Tournament
1717	AVS Future Sites
1707	AVS History Booth
1621	AVS Publications
1709	AVS RAFFLE ZONE
119	AVS Special Events Booth 1
1615	AVS Special Events Booth 2
1720	AVS Store & Membership
1500	**BellowsTech, LLC**
108	Blue Wave Semiconductors, Inc.
507	Brooks Automation
1313	**Bruker Nano Surfaces Division**
1515	**CAMECA Instruments, Inc.**
1605	**Capitol Vacuum**
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316	**CeramTec North America**
213	COSMOTEC, Inc.
1416	CRC Press Taylor & Francis
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506	**Duniway Stockroom Corp.**
510	Dupont™ Kalrez® and Vespel®
415	Eagle Instrument Services
1412	Ebara Technologies
1501	Edwards Vacuum
1410	Elsevier BV
1612	Ensure Scientific Group
1413	Extrel CMS
1425	Film Sense
1421	FOCUS GmbH
1509	Friatec N.A. LLC
1501	**Gamma Vacuum**
1510	Geowell Vacuum Co., Ltd.
411	Glas-Col, LLC
1506	Hanbell Vacuum Technology Co., Ltd.
211	HeatWave Labs Inc.
311	Hiden Analytical, Inc.
1701	Hine Automation
107	HIS Vacuum Components
1427	Hitachi High Technologies America, Inc.
317	Horiba Scientific
517	Huntington Mechanical Labs
1610	HVA, LLC
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1406	INFICON
1403	Inland Vacuum Industries, Inc.
1407	Insplorion AB
420	InstruTech, Inc.
1119	Intel Corporation
1418	Intercovamex S.A. de C.V.
511	Intlvac Thin Films
407	**ION-TOF USA**
1411	IOP Publishing, Inc.
221	**J.A. Woollam Co., Inc.**
1419	J.B. Anderson & Son, Inc.
418	Kashiyama-USA Inc.
1611	KDF
1507	Kimball Physics Inc.
401	**Kratos Analytical**
301	**Kurt J. Lesker Company**
1607	Labtec Sales Partners LLC
1513	Lehighton Electronics Inc.
102	Linde Electronics and Specialty Gases
1522	Maney Publishing
513	Mantis Deposition, Inc.
1405	Mass-Vac, Inc.
101	McAllister Technical Services
320	McVac Manufacturing
106	MDC Vacuum Products, LLC
1603	Meaglow Ltd.
614	**MKS Instruments**
1409	Nanonics Imaging Ltd
1520	nanoRANCH/Micromatter
1705	National Nanotechnology Infrastructure Network (NNIN)
1524	Neocera, LLC
103	NIST/CNST
1426	NIST/ORM
1401	Nonsequitur Technologies
207	Nor-Cal Products, Inc.
1703	Oerlikon Leybold Vacuum USA, Inc.
1609	Omley Industries, Inc.
1508	Oregon Physics LLC
1616	Osaka Vacuum USA, Inc.
306	**Oxford Instruments**
206	**Pfeiffer Vacuum Technology, Inc.**
1601	**PHPK Technologies**
201	**Physical Electronics**
709	**Physics Today Exhibitor Lounge**
512	Phytron, Inc.
1518	Plasma Sensors
200	**Plasmaterials, Inc.**
416	Precision Ceramics USA, Inc.
1402	**Precision Plus Vacuum Parts**
310	Prevac sp. z o.o.
610	**R.D. Mathis Company**
312	**RBD Instruments, Inc.**
1319	Renishaw, Inc.
700	**RF VII Inc.**
1521	**RHK Technology Inc.**
514	Rocky Mountain Vacuum Tech., Inc.
1512	**SAES Getters USA**
417	**Scientific Instrument Services, Inc.**
516	Scientific Instruments, Inc.
104	Semiconsoft, Inc.
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401	**Shimadzu Scientific Instruments**
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410	**SPI Supplies**
406	Springer (New York)
421	**Staib Instruments**
1526	Strem Chemicals, Inc.
413	**Super Conductor Materials**
109	Synergy Systems Corporation
219	T&C Power Conversion, Inc.
1321	Telemark
1614	TGM Inc.
1301	Thermo Scientific
1608	TMPI Precision Cleaning Services
1423	Torreyvac Inc.
209	Transfer Engineering & Mfg, Inc.
214	**UC Components**
301	UHV Design Ltd.
217	Ultratech/Cambridge NanoTech
210	Vacuubrand, Inc.
606	**Vacuum Research Corp.**
110	**Vacuum Technology & Coating - Cowan & Company LLC**
1420	Vacuum Technology, Inc.
1417	Vergason Technology, Inc.
318	**VG Scienta**
1702	VG Scienta Ltd.
212	**XEI Scientific**
1404	Yugyokuen Ceramics Co., Ltd.
1307	**Zeon Chemicals L.P.**
1511	Zhejiang Value Mechanical & Electrical Products Co., Ltd.

EXHIBITOR TECHNOLOGY SPOTLIGHT SESSIONS

Stage Area of Exhibit Hall (Booth 716) • Baltimore Convention Center

Exhibitor Workshops are a series of 20-minute interactive presentations scheduled during the technical session breaks on Tuesday and Wednesday 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 & Free AVS-61 Souvenirs while they last!

TUESDAY, November 11

10:20am **Brooks Automation**
High Speed Water Vapor Cryopumps: Increasing Tool Throughput and Process Yield with Polycold PFC and MaxCool Products.
Presenter: Chris Rebecchi

10:40am **Bruker**
Stylus Profilometry – Bruker's DektakXTL delivers Innovation in Flexibility and Ease of Use
Presenter: Eric Rufe

12:40pm **Thermo Scientific**
New Developments in Surface Analysis from Thermo Fisher Scientific
Presenter: Tim Nunney

1:00pm **Physical Electronics**
The latest innovations in our XPS, AES, and TOF-SIMS products will be presented.
Presenter: Scott Bryan

1:20pm **Kratos Analytical**
Latest Developments and Applications of X-ray Photoelectron Spectroscopy
Presenter: Chris Blomfield

1:40pm **Bruker**
Stylus Profilometry – Bruker's DektakXTL delivers Innovation in Flexibility and Ease of Use
Presenter: Eric Rufe

4:00pm **Oxford Instruments Asylum Research**
What's New in AFM for Nanoelectrical and Nanomechanical Characterization
Presenter: Keith Jones

WEDNESDAY, November 12

10:20am **Dupont™ Kalrez® and Vespel®**
Product Advancements to Reduce Semiconductor Manufacturing Contamination
Presenter: Mark Heller

10:40pm **SPI Supplies**
Wet Cell II for Analysis at the Liquid Vacuum Interface
Presenter: Junhang Luo

WEDNESDAY, November 12

12:40pm **Staib**
An Auger Electron Analyzer System for In Situ Growth Monitoring
Presenter: W.Laws Calley III

1:00pm **CS Clean Systems, Inc.**
Safe and Efficient - Dry Bed Exhaust Gas Abatement of Toxic Gases I
Presenter: Sam Yee

1:20pm **Nanonics**
The Workstation For Your 2D Characterization Needs - The First Low Temperature MultiProbe SPM-NSOM System Integrated with Raman
Presenter: David Lewis

1:40pm **Prevac sp. z.o.o.**
Trends and Solutions of Control Electronics for Surface Analysis and Science
Presenter: Jacek Latkowski

4:00pm **FOCUS GmbH**
FOCUS beyond PEEM and NanoESCA
Presenter: Dieter Pohlenz

THURSDAY, November 13

10:20am **INFICON**
An Entirely New Generation of Cold Cathode Gauges
Presenter: Martin Wüest

10:40am **Thermo Scientific**
Raman Imaging Microscopy Characterization of Carbon Nano Material
Presenter: Alex Rzhevskii

ASK THE EXPERTS !!!!!!

Troubleshooting Mysteries?

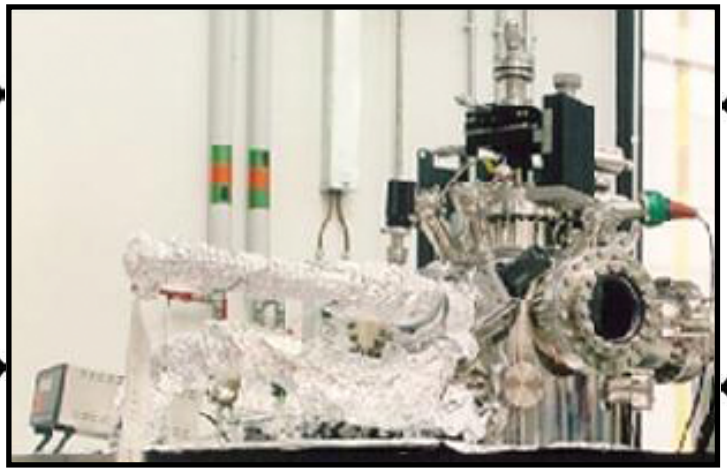
Contamination Problems?

System Configuration Questions?

Just want to make your vacuum better?

What is the best gauge for the 10-11 Torr Range?

How do I control, eliminate water?



What is my RGA telling me?

How do I detect a Virtual Leak?

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! Ask the Experts is an unbiased, open forum with the resources and the desire to discuss and help solve vacuum related issues.

Ask the Experts!... Exhibit Hall Booth #823

Sponsored by Duniway Stockroom, SAES Getters & MKS Instruments

Hosted by the AVS Vacuum Technology Division

saes getters

DUNIWAY STOCKROOM CORP.

mks Technology for Productivity

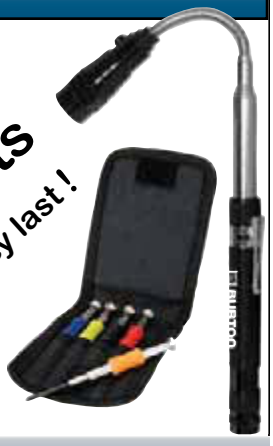


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Exhibit Hall • Booth 823

SYMPOSIUM PLENARY LECTURE

"New Materials Strategies for Hybrid Electronic Circuitry"

Monday, November 10, 2014, Noon
Ballroom II, Baltimore Convention Center

Tobin J. Marks, Northwestern University

This lecture focuses on the challenging design, characterization, and realization of new materials for creating unconventional electronic as well as excitonic circuitry. Fabrication methodologies to achieve these goals include high-throughput, large-area printing techniques. Materials design topics to be discussed include: 1. Rationally designed high-mobility p- and n-type organic semiconductors for printed organic CMOS, 2. Polycrystalline and amorphous oxide semiconductors for transparent and mechanically flexible electronics, 3. Self-assembled and printable high-k nanodielectrics enabling ultra-large capacitance, low leakage, high breakdown fields, minimal trapped interfacial charge, and device radiation hardness, 4. Combining these materials sets to fabricate a variety of high-performance thin-film transistor-based circuitry.

Tobin Marks is Vladimir N. Ipatieff Professor of Chemistry and Professor of Materials Science and Engineering at Northwestern University, and Adjunct Professor TAMUQ. He received a B.S. degree in Chemistry from the University of Maryland (1966) and Ph.D. from MIT (1971) in Inorganic Chemistry. His research interests include transition metal and f-element organometallic chemistry; catalysis; vibrational spectroscopy; nuclear magnetic resonance; synthetic facsimiles of metalloprotein active sites; carcinostatic metal complexes; solid state chemistry and low-dimensional molecular metals; nonlinear optical materials; polymer chemistry; tetrahydroborate coordination chemistry; macrocycle coordination chemistry; laser-induced chemistry and isotope separation; molecular electro-optics; metal-organic chemical vapor deposition; polymerization catalysis; printed flexible electronics; solar energy; and transparent conductors. He received Doctor of Science degrees honoris causa, from the Hong Kong University of Science and Technology in 2011, the University of South Carolina in 2011, and the Ohio State University in 2012.

Peer-reviewed publications: 1125; h-index = 128 (on 61,100 citations); Issued US Patents: 222.

TECHNICAL PROGRAM

The AVS 61st International Symposium & Exhibition will be held at the Baltimore Convention Center, Baltimore, MD, November 9–14, 2014. 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 150oral sessions, more than 1,300 talks over 300 invited speakers & 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, November 11–13. There are many attractions in the exhibit hall, including Exhibitor Technology Spotlight Sessions, the AVS Membership & Store, Career Center, Vacuum Technology Division's "Ask The Experts", E-Mail Pavilion, Free neck and back massages, Free Caricatures, Art Zone/Contest, Free coffee, refreshments, lunches, daily raffles, the AVS History Booth and much more!

SHORT COURSES AND TUTORIALS

The Baltimore 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 as well as technologists who are interested in new thin film materials and emerging technologies to prepare them, who need to know about their characterization and who aim at their practical use. Three oral sessions, co-sponsored by other AVS Divisions and Focus Topics, and a poster session provide a well balanced mix of fundamentals and applications of surface engineering. These sessions particularly emphasize on the basics and use of atmospheric pressure plasmas, innovations in pulsed plasmas in surface engineering, new developments in nanostructured thin film and coatings, and on thermoelectric thin films and surface engineering for energy conversion. Presentations on novel coating materials, new processes for their synthesis, as well as on new approaches to their design and modeling, process diagnostics and growth control, and, property characterizations have been collected, representing a large diversity of recent developments in surface engineering. The increasing demand of creating new knowledge and identifying advanced methods in energy harvesting and conversion are also explicitly addressed. The complete program is aiming at bringing together specialists from various disciplines. It starts on Monday morning with a joint session of five Divisions and Focus Topics on New Developments in Atmospheric Pressure Plasma Deposition and Thin Films for Energy Applications. This session is co-sponsored by the Electronic Materials and Processing and Plasma Science and Technology Divisions, as well as by the Energy Frontiers and the Tribology Focus Topics. It offers two invited talks: the first one will be given by Professor Akira Ando from Tohoku University, Japan, on "Gas-Liquid Mixed Phase Plasma at Atmospheric Pressure". The second one by Professor Christopher Muratore from the University of Dayton, U.S.A., is entitled "Hot 'n Flaky: Thermal Properties of Layered Atomic Structures" and will introduce the audience to the field of thermal management in nanoscale structures. The Monday afternoon session is dedicated to Pulsed Plasmas in Surface Engineering and is also a joint session (co-sponsored by the Plasma Science and Technology and the Thin Films Divisions). Dr. Matjaz Panjan from Lawrence Berkeley National Laboratory, U.S.A., is the invited speaker of this session. He will provide a detailed insight into the "Understanding the Physics of Magnetron Discharges: Ionization Zones and Their Role in Transport of Charged Particles". The program will be continued on Tuesday morning with another joint session on Nanostructured Thin Films. This session is co-sponsored by the Nanometer-Scale Science and Technology Division and the Tribology Focus Topic. Dr. Etienne Bousser from the Ecole Polytechnique de Montreal, Canada, presents in an invited talk newest developments on "Multifunctional Protective Coatings for Aerospace Applications." The program of the Advanced Surface Engineering Division will be completed by a poster session on Tuesday afternoon. In addition to these topics, the Advanced Surface Engineering Session co-sponsors additional sessions with other Divisions and Focus Topics.

CODE	SESSION
SE+EM+EN+PS+TF-MoM	New Developments in Atmospheric Pressure Plasma Deposition and Thin Films for Energy Applications *Akira Ando, Tohoku University, Japan* *Christopher Muratore, Univ. of Dayton*
SE+PS+TF-MoA	Pulsed Plasmas in Surface Engineering *Matjaž Panjan, Lawrence Berkeley National Laboratory*
SE+NS+TR-TuM	Nanostructured Thin Films and Coatings *Etienne Bousser, Ecole Polytechnique de Montreal, Canada*
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 run the gamut 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 are presenting a diverse program highlighting advances in the core topics of electron spectroscopy and surface mass spectrometry—including gas cluster beam depth profiling and 2D and 3D organic imaging—combined with new sessions on analysis of modified surfaces, design and characterization of liquid surfaces and interfaces, and practical surface analysis. Invited speakers include Wolfgang Werner (Technische U Wien) on quantitative analysis of nanostructured surfaces, Nicholas Winograd (Penn State U) on 3D nanoscale chemical imaging, Lynn Walker (Carnegie Mellon U) on fluid-fluid interfaces, and Mark Strobel (3M) and Anna Belu (Medtronic) on industrial applications of surface science. We are teaming with Vacuum Technology Division to host a session on

all aspects of ambient ionization mass spectrometry, with invited speakers including Akos Vertes (George Washington U) on ambient laser techniques for cell and tissue analysis, and Zheng Ouyang (Purdue U) on miniature mass spectrometers. ASSD is strongly supporting the AVS Focus Topics in 2014 and will be contributing to Focus Topics in Scanning Probe Microscopy, Spectroscopic Ellipsometry, In Situ Microscopy & Spectroscopy, Materials Characterization in the Semiconductor Industry, and others. Our Thursday evening poster session will cover all aspects of applied surface science. ASSD will again co-sponsor the Sunday night Biomaterials Plenary Session, and earlier on Sunday we will co-sponsor Quantitative Surface Analysis 15, a discussion-based mini-symposium which will serve as a prelude to the next day's Quantitative Surface Analysis session. During the week we will co-sponsor sessions with Biomaterial Interfaces, Energy Frontiers, Magnetic Interfaces and Nanostructures, Surface Science, Nanometer-scale Science and Technology, Thin Films, and Vacuum Technology Divisions. All are welcome to attend the Tuesday evening ASSD business meeting, featuring brief capsule presentations by our student award finalists, and a workshop (co-sponsored by the ASTM-E42 Committee on Surface Analysis).

CODE	SESSION
AS+MC-MoM	Quantitative Surface Analysis *Wolfgang Werner, Vienna University of Technology, Austria*
AS+BI+MC+SS-MoA	The Liquid Interface & Depth Profiling and Sputtering with Cluster Ion Beams *Alexander Shard, Natl. Physical Lab., UK* *Lynn Walker, Carnegie Mellon Univ.*
AS+BI+VT-TuM	Ambient Ionization Mass Spectrometry *Zheng Ouyang, Purdue University* *Akos Vertes, George Washington Univ.* *Mitch Wells, FLIR Mass Spectrometry* *Justin Wiseman, Prosolia Inc.*
AS+MC+SS-TuA	Analysis of Modified Surfaces *Mark Strobel, 3M Company*
AS+BI+MC-WeM	Chemical Imaging in 2D and 3D *Bonnie Tyler, Natl. Physical Lab., UK* *Nicholas Winograd, Penn State Univ.*
AS+BI+MC-WeA	Practical Surface Analysis I *Anna Belu, Medtronic, Inc.* *Lara J. Gamble, Univ. of Washington*
AS-ThP	Applied Surface Science Poster Session
AS+MC+SS-FrM	Practical Surface Analysis II

BIOMATERIAL INTERFACES

The Biomaterial Interfaces Division program features topics related to progress in biointerface science and engineering including characterization and studies at the nanoscale. This year's sessions are focused on bio/nano interfaces & technology; biosensors; biomolecules & biomaterials interfaces; aqueous interfaces studied with non-linear optical and vibrational spectroscopy; other methods of characterizing biointerfaces; and high throughput biomaterials discovery.

The Biomaterial Interfaces Division program will commence on Sunday afternoon with the Biomaterials Plenary (BP). This year's theme is "Analytical Challenges in the Pharmaceutical Industry." The aims are to explore the challenges and opportunities in locating and quantifying drugs and metabolites in both animal tissues during the drug development process, and in materials in the pharmaceutical formulation process. This is essential to turn drugs into medicines and novel delivery devices. We have four outstanding plenary speakers who will cover the most recent developments in the application of surface analysis to study these complex systems and their multifaceted analytical challenges. They bring unique perspectives from the cutting edge of academia and the pharmaceutical industry. The Plenary will be co-sponsored by the Applied Surface Science Division and will close with the opportunity for further discussions at our traditional industry sponsored Plenary Reception.

CODE	SESSION
BP+BI+AS-SuA	Biomaterials Plenary Session *Marcus E. Brewster, Johnson & Johnson, Belgium* *Richard Caprioli, Vanderbilt University School of Medicine* *Martyn Davies, Univ. of Nottingham and Molecular Profiles Ltd., UK* *Mauro Ferrari, Houston Methodist Research Institute*
BI+AS-MoM	Biomolecules & Biomaterials Interfaces *John Brennan, McMaster Univ., Canada*
BI+AS+NS-MoA	Bio/Nano Interfaces *Preston Snee, Univ. of Illinois at Chicago*
BI+AS+MN+NS-TuM	Biosensors *John Rogers, University of Illinois at Urbana Champaign* *Paul Sheehan, Naval Research Lab.*
BI+AS-TuA	Characterization of Biointerfaces *Carol Hirschmugl, Univ. of Wisconsin Milwaukee*
BI+AS-WeM	Nonlinear Optical & Vibrational Spectroscopy *Dennis Hore, Univ. of Victoria, Canada* *Sylvie Roke, Ecole Polytechnique Fédérale de Lausanne (EPFL), Switzerland*
BI+MG-WeA	Design and Discovery: Biointerfaces *Markus Buehler, MIT* *Clemens van Blitterswijk, Maastricht University, The Netherlands*
BI-ThP	Biomaterial Interfaces Poster Session

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 61, EMPD will sponsor fourteen oral sessions containing over 100 talks and a poster session on materials synthesis, processing, characterization, and structure-property relationships. Researchers from around the world will present their work on a diverse spectrum of devices, including advanced logic and ultra-dense memory devices; organic and transparent electronics; high-efficiency solar cells; nanoparticle-based electronics; and quantum computers. The symposium topics span electronic/optoelectronic/photonic/photovoltaic properties, interface and defect engineering, and newly emerging materials properties and processing techniques. Seven sessions are devoted to high-k dielectrics, advanced interconnects, complex oxides, and

high-power materials. We also offer sessions on materials and processing challenges related to transparent electronics, energy storage, light management, and quantum computing. Traditionally, EMPD has maintained an excellent list of distinguished invited speakers. This year, we will host well over 30 invited speakers, and among them are Susanne Stemmer (U.C. Santa Barbara), Joshua Zide (University of Delaware, *Peter Mark Memorial Award Winner), Daniel Edelstein (IBM), Rainer Timm (Lund University), Tsunenobu Kimoto (Kyoto University), Shriram Ramanathan (Harvard University), KyeongJae Cho (U.T. Dallas), Theresa Mayer (Penn State University), Gang Chen (MIT), Malcolm Carroll (Sandia National Laboratories), Bernard Kippelen (Georgia Institute of Technology), Martin Strassburg (Opto Semiconductors GmbH), and Gregory Herman (Oregon State University).

CODE	SESSION
EM+MI+NS-MoM	Complex Oxides and Their Interfaces *Catherine Dubourdieu, Institut des Nanotechnologies de Lyon (INL) - CNRS - ECL, France* *Lane Martin, Univ. of California, Berkeley* *Susanne Stemmer, Univ. of California at Santa Barbara*
EM-MoA	Nanoparticles for Electronic Materials *Cathal Cassidy, Okinawa Institute of Science and Technology, Japan* ***Joshua Zide, University of Delaware****
EM-TuM	Advanced Interconnects and Materials *Daniel Edelstein, IBM* *Carl V. Thompson, MIT*
EM+2D-TuA	High-k Dielectrics for Advance Semiconductor *Malcolm Bevan, Applied Materials Inc.* *Paul Hurley, Tyndall National Inst., Ireland* *Rainer Timm, Lund University, Sweden*
EM-TuP	Electronic Materials and Processing Poster Session
EM1-WeM	Materials and Devices for High Power Electronics (8:20–11:00 am)/Two Dimensional Electronic Materials & Devices (11:00 am–12:20 pm) *Tsunenobu Kimoto, Kyoto University, Japan* *Jeong-Sun Moon, HRL Laboratories, LLC* *Primit Parikh, Transphorm Inc.* *Eric Pop, Stanford Univ., Univ. of Illinois, Urbana-Champaign*
EM2-WeM	High-K Dielectrics from Non-Classical Channels *Suman Datta, Penn State University* *Alexander Demkov, Univ. of Texas at Austin* *Shriram Ramanathan, Harvard University*
EM+EN+TF-WeA	Thin Films and Materials for Energy Storage *Kyeongjae Cho, UT Dallas*
EM-WeA	High-K Dielectrics for 2D Semiconductor *Massimo Fischetti, Univ. of Texas at Dallas* *Moon Kim, University of Texas at Dallas* *Theresa Mayer, Penn State University*
EM1-ThM	Materials for Light Management *Gang Chen, MIT* *Paul Stradins, Natl. Renewable Energy Lab.*
EM2-ThM	High-K Dielectrics for ReRAM and RAM *An Chen, GLOBALFOUNDRIES* *Daniele Ielmini, Politecnico di Milano, Italy* *Ming Liu, Chinese Acad. of Sciences, China* *Nirmal Ramaswamy, Micron Technology* *Jianhua (Joshua) Yang, HP Labs*
EM1-ThA	Materials for Quantum Computation *Malcom Carroll, Sandia National Labs.*
EM2-ThA	Hybrid and Organic Electronics *Antoine Kahn, Princeton University* *Bernard Kippelen, Georgia Inst. of Technology*
EM+EN-FrM	Nitrides for LED and PV Device Applications *Alexander Gurary, Veeco Instruments, Inc.* *Martin Strassburg, OSRAM Opto Semiconductors GmbH, Germany* *Chih-Chung Yang, National Taiwan Univ., Taiwan, Republic of China*
EM+NS+TF-FrM	Transparent Electronics *Elvira Fortunato, FCT-UNL and CEMOP-UNINOVA, Portugal* *Gregory Herman, Oregon State University*

MAGNETIC INTERFACES AND NANOSTRUCTURES

The Magnetic Interfaces and Nanostructures Division (MI) program features pioneering, controversial, introductory and emerging results in topical areas related to magnetic interfaces and nanostructures. The 2014 MI program topics include: (1) topological insulators, Rashba systems and Heusler alloys; (2) interface effects in oxide heterostructures; (3) Advanced magnetic materials discovery; and (4) Novel probes in magnetic imaging and characterization. The 2014 program highlights electron spin related phenomena at the crossroad of basic and applied science.

MI also organizes a panel discussion on current trends and future directions of magnetism research to assist MIND in identifying the most pressing topics in its areas of interest.

We are co-sponsoring the Actinides and Rare Earths (AC), Electron Materials and Processing (EM), Accelerating Materials Discovery for Global Competitiveness (MG), Synchrotron Analysis (SA) and Scanning Probe Microscopy (SP), Thin Film (TF) focus topics. Noted invited speakers anchor each of these 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+EM-MoM	Interfacial Effects in Oxide Heterostructures *Stefano Gariglio, Univ. of Geneva, Switzerland* *Mengkun Liu, UC San Diego* *Karthik Raman, Indian Institute of Science, India*
MI-MoA	Topological Insulators/Rashba Effect *Jürgen Henk, Martin Luther University Halle-Wittenberg, Germany* *Koji Miyamoto, Hiroshima Synchrotron Radiation Center, Japan*
MI+MG-TuM	Advanced Materials Discovery *Richard Hennig, Univ. of Florida, Gainesville* *Ichiro Takeuchi, University of Maryland*
MI+MG-TuA	Development of Multiferroic Materials (2:20–5:00 pm) MIND Panel Discussion (5:00–6:30 pm) *Christian Binek, University of Nebraska-Lincoln* *James Rondinelli, Drexel University*
MI-TuP	Magnetic Interfaces Poster Session

*Peter Mark Memorial Award Winner

MANUFACTURING SCIENCE AND TECHNOLOGY

This year MSTG is introducing a new area in Manufacturing of Functional Paper and Textiles. Our oral sessions present topics in mesoscale structure development, materials processing, characterization, metrology, and processing equipment needed to address the challenge of manufacturing devices and structures on inexpensive, green scaffolds for applications in electronics, energy, biotechnology, sensing and security. Our poster session contains presentations on all areas of manufacturing science and technology, from microelectronics to MEMS and functional paper and textiles.

CODE	SESSION
MS+TF-WeA	Overview: Applications and Manufacturing of Devices on Paper and Textiles *Robert Moon, US Forest Service-Forest Products Laboratory* *Masaya Nogi, Osaka University, Japan* *Andrew Steckl, University of Cincinnati* *Junyong Zhu, USDA Forest Products Lab*
MS+PS+TF-ThM	Processes for Mesoscale Structure on Paper and Textiles *Philip Bradford, North Carolina State Univ.* *Qi Zhou, KTH Royal Institute of Technology, Sweden*
MS+PS+TF-ThA	Functionalization of Paper and Textiles & Their Applications *Mato Knez, CIC nanoGUNE, Spain* *Orlando Rojas, North Carolina State Univ.* *Srikanth Singamaneni, Washington Univ., St. Louis*
MS-ThP	Manufacturing Science and Technology Poster Session

MEMS AND NEMS

The MN program will highlight recent advances in the emerging areas of micro/nanoelectromechanical systems (MEMS/NEMS), ranging from fundamental studies of new materials and functional nanostructures, the science and technologies of novel solid-state devices, integrated micro- and nano-systems, interfacing MEMS/NEMS with other physical, chemical, and biological systems, to novel applications of MEMS/NEMS. This year's sessions will cover a broad spectrum of many interesting areas which are thematically related to characterization of surfaces and interfaces in MEMS/NEMS, probing dynamical surface and interfacial effects in MEMS/NEMS, multi-scale interactions and dynamics of materials with focus directed towards fabrication of MEMS enabled magnetics, along with a session on micro/nanophotonics and optomechanics including fully integrated silicon optoelectronic systems, multiplexed nanomechanical optically actuated devices, and quantum effects in single crystal diamond nanophotonic and nanomechanical devices. The core topics of discussions also include biology-inspired devices and medical applications, the effects of chemical and biomolecular binding events on the surfaces of MEMS/NEMS oscillators, highlights of novel applications of polymeric MEMS devices, emerging fabrication and manufacturing technologies for enabling devices using advanced materials such as SiC and diamond, the use of inkjet printing in processing organic materials for sensors and actuators, and controlling mechanical actuation in photonic MEMS/NEMS using light.

CODE	SESSION
MN+NS-TuA	Multi-Scale Phenomena and Bio-Inspired MEMS/NEMS *Mark Allen, University of Pennsylvania* *Hongrui Jiang, Univ. of Wisconsin–Madison*
MN-WeM	Optomechanics, Photonics, and Quantum Nanosystems *Marko Loncar, Harvard University*
MN+PS-WeA	Emerging Materials and Fabrication Technologies for MEMS/NEMS *Tse Nga (Tina) Ng, PARC (Palo Alto Research Center), a Xerox Company*
MN-ThP	MEMS and NEMS Posters

NANOMETER-SCALE SCIENCE AND TECHNOLOGY

This division (NS) explores the science and technology that emerges when material is shrunk to the nanoscale. Researchers from around the globe will present their work on topics ranging from fabricating atomically precise devices to exploiting nanomaterials for applications in nanophotonics, catalysis, and flexible devices. We will explore both methods for synthesizing nanostructures and the tools for understanding nanoscale phenomena. We have invited leading figures to provide perspective from the forefront of their respective fields and to highlight the sessions on Nanophotonics and Plasmonics, Advances in the Growth and Characterization Nanowires and Nanotubes, Delivering Energy and Mass at the Nanoscale, Nanoscale Catalysis and Surface Chemistry, Nanopatterning and Nanolithography, Nanoscale Imaging and Materials Characterization, and Nanomechanics. Additional co-sponsored sessions include areas such as manufacturing nanoscale devices, nanostructures for energy conversion and storage, nanotribology, graphene synthesis and applications, transparent conductors, printable electronics, and in-situ scanning probe microscopy and spectroscopy.

CODE	SESSION
NS+SE-MoM	Delivering Energy and Mass at the Nanoscale *Paul Braun, Univ. of Illinois at Urbana-Champaign* *Gregory Meyers, The Dow Chemical Company*
NS+EN-MoA	Nanophotonics and Plasmonics *Harry Atwater, California Inst. of Technology* *Teri Odom, Northwestern University*
NS+HI-TuM	Nanopatterning and Nanolithography *Deirdre Olynick, Lawrence Berkeley Natl. Lab.*
NS+AS+SS-TuA	Nanowires and Nanotubes: Advances in Growth and Characterization *Michael Filler, Georgia Institute of Technology*
NS-WeM	Nanoscale Catalysis and Surface Chemistry *Dawn Bonnell, University of Pennsylvania* *Charles Sykes, Tufts University*
NS+AS-WeA	Nanoscale Imaging and Materials Characterization *Andrea Centrone, National Institute of Standards and Technology (NIST)* ***Olga Shenderova, Adámas Nanotechnologies Inc.******
NS-ThP	Nanoscience Division Poster Session

*Albert Nerken Award Winner

PLASMA SCIENCE AND TECHNOLOGY

The 2014 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 new applications in plasma processing. The core program includes fourteen oral sessions and a poster session, as well as additional joint sessions with other Divisions, Technical Groups, and Focus Topics. The week begins with the session entitled "Current Challenges of Plasma Etching Technologies," which addresses leading-edge technologies in plasma etching at the forefront of the semiconductor industry. The same industrial issues are also discussed in the succeeding sessions "Advanced FEOL/Gate Etching" and "Advanced BEOL/Interconnect Etching" whereas fundamental scientific issues on plasma processing are discussed in sessions "Plasma Surface Interactions." 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," and "Plasma Sources." Recently plasma processing in atmospheric pressure environments has been widely used and the PSTD offers a venue for discussion on such plasmas in session "Atmospheric Pressure Plasma processing: Fundamental and Applications." This year we feature plasma based ion implantation as emerging technology and have created a new session "Plasma Based Ion Implantation and Ion-Surface Interaction." Other modern applications of plasma technologies such as plasma-assisted atomic layer deposition (ALD), atomic layer etching (ALE), nanoparticle/nanostructure synthesis, and modification/functionalization of 2D materials such as graphene, are also featured in sessions "Plasma Deposition and Plasma Assisted ALD," "ALE and Low-Damage Processing," "Plasma Processing of Nanoparticles and Nanomaterials," and "Plasma Processing for 2D Materials, Coating, and Surface Modification." The Poster Session of the PSTD, which is scheduled on Tuesday evening, provides an ideal venue for in-depth discussion on all topics above.

There are multiple finalists for the 2014 Coburn and Winters Student Award, who present throughout the week. The winner is scheduled to be announced in the Coburn and Winters Student Award ceremony in Room 308 at 12:20 PM on Thursday. Dr. Peter Ventzek will deliver the Plasma Prize invited lecture in the "Plasma Modeling" session on Wednesday morning, who received the 2013 Plasma Prize. The 2014 Plasma Prize winner will be announced at the PSTD Business Meeting in Room 308 at 6:00 PM on Tuesday, immediately following the afternoon session. All PSTD members are welcome and encouraged to join the PSTD Business Meeting, which is a once-a-year opportunity to discuss with other PSTD members face-to-face how best the PSTD could serve its members.

CODE	SESSION
PS-MoM	Current Challenges of Plasma Etching Technologies *Masanobu Honda, Tokyo Electron Miyagi Limited, Japan*
PS-MoA	Advanced FEOL/Gate Etching *Chang-Jin Kang, Samsung Electronics, Republic of Korea* *Vahid Vahedi, Lam Research Corp*
PS-TuM	Plasma Surface Interactions I *Jean Paul Allain, Univ. of Illinois at Urbana-Champaign*
PS-TuA	Advanced BEOL/Interconnect Etching *Hisataka Hayashi, Toshiba Corporation Center for Semiconductor Research & Development, Japan*
PS-TuP	Plasma Science and Technology Poster Session
PS1-WeM	Plasma Based Ion Implantation and Ion-Surface Interactions *Allen McTeer, Micron Technology* *Joseph Olson, Applied Materials, Varian Semiconductor Equipment* *Bo Vanderberg, Axcelis Technologies, Inc.*
PS2-WeM	Plasma Modeling *Peter Ventzek, Tokyo Electron America, Inc.*
PS+2D-WeA	Plasma Processing for 2D Materials, Coating, and Surface Modification *Emilie Despiau-Pujo, LTM, Univ. Grenoble Alpes/CNRS/CEA-Leti Minatec, France*
PS-WeA	Plasma Diagnostics, Sensors, and Control *Alex Paterson, Lam Research Corp*
PS1+TF-ThM	Plasma Deposition and Plasma Assisted ALD *Naho Itagaki, Kyushu University, Japan* *Hyungjun Kim, Yonsei University, Korea*
PS2+TF-ThM	Atomic Layer Etching (ALE) and Low-Damage Processing *Gottlieb Oehrlein, Univ. of Maryland, College Park*
PS+SE-ThA	Atmospheric Pressure Plasma Processing; Fundamental and Applications *Fiorenza Fanelli, Institute of Inorganic Methodologies and Plasmas – National Research Council, Italy* *Koichi Sasaki, Hokkaido University, Japan*
PS-ThA	Plasma Processing of Nanoparticles and Nanomaterials *Lorenzo Mangolini, University of California, Riverside*
PS1-FrM	Plasma Sources *Rod Boswell, Australian National University, Australia*
PS2-FrM	Plasma Surface Interactions II *Matthew Goeckner, University of Texas at Dallas*

SURFACE SCIENCE

SS provides a forum for cutting-edge research that involves 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, 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 form adsorption and reaction to catalysis. Film growth is another key theme, explored from a fundamental perspective, through the development of new growth processing methods for materials preparation. Surface chemical modification is an important focus. 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, 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.

CODE	SESSION
SS+AS+EN-MoM	Mechanistic Insights into Surface Reactions: Catalysis, ALD, etc. *Francisco Zaera, Univ. of California – Riverside*
SS+EN-MoM	Photocatalysis and Photochemistry at Surfaces *Sergei Novikov, Univ. of Nottingham, UK*
SS+EN-MoA	Metals, Alloys and Oxides: Structure, Reactivity & Catalysis *Brian Hayden, University of Southampton*
SS+AS+EN-TuM	Synthesis, Structure and Characterization of Oxides *David Mullins, Oak Ridge National Lab.*
SS+NS-TuA	Nanostructures: Growth, Reactivity and Catalysis *Frances Ross, IBM T.J. Watson Research Center* ***Patricia Thiel, Iowa State University****
SS-TuP	Surface Science Poster Session
SS+AS+EN-WeM	Dynamic Processes of Single Atoms and Molecules at Surfaces *Hong-Jun Gao, Chinese Academy of Science, China* *Alec Wodtke, Max Planck Institute for Biophysical Chemistry*
SS+AS-WeM	Atomistic Modeling of Surface Phenomena *Manos Mavrikakis, Univ. of Wisconsin – Madison*
SS-WeA	Chirality and Enantioselectivity on Surfaces *Robert M. Hazen, Carnegie Institution* *Rasmita Raval, University of Liverpool*
SS+TF-ThM	Organic Layers on Surfaces *Michael Ramsey, University of Graz*
SS+AS+NS-ThA	Semiconductor Surfaces and Interfaces 1
SS+EM-FrM	Semiconductor Surfaces and Interfaces 2

THIN FILM

The TF Program offers 13 core oral sessions, several co-sponsored sessions, and a poster session. A broad range of outstanding invited speakers will touch on topics across the gamut of thin film science and technology. There are several sessions dedicated to ALD, featuring a session on Atmospheric, Roll-to-Roll and other Manufacturing Advances in ALD. Also, sessions on ALD for Emerging Applications, ALD Surface Reactions and Precursors, and ALD for Energy continue to highlight new basic science and the pursuit of applications for ALD. We are excited about our core sessions on Thin Film: Growth and Characterization and Self Assembled and Layer by Layer growth. We have a session on Energetic Thin Films which covers thin film structures with stored chemical energy. We continue providing a venue for a broad range of thin film related topics such as a full session on thin film characterization, films for permeation barrier and nanostructured thin films for optical applications. A Thin Films Poster Session will cover a diverse range of topics drawn from all the TFD sessions. For the second year, we will host a student-only session to highlight Harper Award candidates in which student finalists will present their work in an interactive "Shark Tank" type of forum. This is an excellent opportunity for all 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. TF is proud to host many distinguished invited speakers from the cutting edge research. The ALD sessions features Charles Dezelah of Picosun, Lorenzo Fedrizzi (emerging applications), Sean Berry (ALD/MLD surface reactions, precursors, and properties), and Xueliang (Andy) Sun (Energy). The Thin Film Growth and characterization promises to be another diverse and exciting topic, lead off by Tiffany Kaspar of PNNL. Finally, one of the new emerging areas of research is that of ALD for hybrid films, including ALD on non-traditional substrates, such as fibrous materials. This new topic will be led off by an invited talk from Jolien Dendooven of University of Ghent who will present "Nanostructure synthesis through ALD onto sacrificial carbonaceous templates."

CODE	SESSION
TF+PS+SE-MoM	Advanced PVD Methods *Ken Nauman, VON ARDENNE North America Inc.*
TF+PS-MoM	Atmospheric, Roll-to-Roll and other Manufacturing Advances in ALD *Charles Dezelah, Picosun USA, LLC* *Andrea Illiberi, TNO, Netherlands*
TF+PS-MoA	ALD Surface Reactions and Precursors *Seán Barry, Carleton University, Canada*
TF-MoA	Self-Assembled Monolayers, Layer-by-Layer Assemblies, and Hydrophobic/Amphiphobic Thin Films *Nicholas Spencer, ETH Zürich, Switzerland* *Milko Van der Boom, The Weizmann Institute of Science, Israel*
TF+PS-TuM	ALD for Emerging Applications *Lorenzo Fedrizzi, University of Udine, Italy*
TF+SE-TuM	Energetic Thin Films/Optical Characterization *Timothy Weihs, Johns Hopkins University*
TF+AS+EM-TuA	Thin Film: Growth and Characterization II *Antoine Goullet, IMN, France*
TF+EN+PS-TuA	ALD for Energy *Xueliang (Andy) Sun, Univ. of Western Ontario*
TF+MS+PS-WeM	Applied ALD: Nanoelectronics and Emerging Applications *Jolien Dendooven, Univ. of Ghent, Belgium* *Robert Wallace, Univ. of Texas at Dallas*
TF+EM+EN-WeA	Thin Film and Nanostructured Coatings for Light Trapping, Extraction, and Plasmonic Applications *Koray Aydin, Northwestern University*
TF+PS-ThM	Advanced CVD and Chemical Vapor Infiltration Methods *Don Futaba, AIST, Japan*
TF-ThA	Thin Film for Permeation Barriers and Membranes *Karen Gleason, Massachusetts Institute of Technology*
TF-ThP	Thin Films Poster Session
TF+AS-FrM	Thin Film Characterization *Tiffany Kaspar, Pacific Northwest National Laboratory*

*Medard W. Welch Award Winner

VACUUM TECHNOLOGY

The Vacuum Technology (VT) division welcomes presentations for the many diverse areas of vacuum science and technology and anticipates an exciting program this year. In addition to our traditional core sessions in Vacuum Measurement, Gas Dynamics and Modelling, Pumping Systems, Vacuum Quality Analysis, and Accelerator and Large Vacuum Systems, we are offering a special topic in Applications of UHV and Ultraclean Processes. Invited talks include the winner of our inaugural VT Division Early Career Award speaking in the Applications of UHV and Ultraclean Processes session, as well as speakers on Surface Science for Accelerator Applications, Motion and Movement in Vacuum, and Instrumentation for Ambient Ionization Mass Spectrometry. Throughout all of our sessions, new technologies and solutions to practical problems in vacuum science are featured, such as the invited talk on new fiber-optic pressure sensors. The VT poster session covers the spectrum of vacuum research topics and features a Student Poster Competition, where students in any discipline are invited to share their innovative solutions to vacuum equipment challenges. VT also hosts the "Ask the Experts" booth, located in the exhibit area, where experienced vacuum scientists, engineers and technicians strive to answer perplexing vacuum technology issues.

CODE	SESSION
VT-MoM	Vacuum Measurement, Calibration, and Primary Standards *Miao Yu, University of Maryland, College Park*
VT-MoA	Vacuum Measurement, Applications of UHV and Ultraclean Processes *Norbert Koster, TNO Tech. Sciences, Netherlands* *Jason D. Myers, U.S. Naval Research Laboratory*
VT-TuM	Gas Dynamics, Modeling, and Pumping Systems *Kevin Flynn, Brooks Automation, Inc., Polycold* *Roberto Kersevan, CERN, Switzerland* *Fabrizio Siviero, SAES Getters, Italy*
VT-TuA	Vacuum Quality Analysis, Outgassing, and Control *Manfred Leisch, Graz University of Tech., Austria* *Vincenc Nemanič, Jozef Stefan Institute, Slovenia*
VT-TuP	Vacuum Technology Division Poster Session and Student Poster Contest
VT-WeM	Accelerator and Large Vacuum Systems I *Keith Middleman, STFC Daresbury Lab., UK* *Anne-Marie Valente-Feliciano, Thomas Jefferson National Accelerator Facility*
VT-WeA	Accelerator and Large Vacuum Systems II *Robert Pearce, ITER Organisation, France* *Karl Smolenski, Cornell University*

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 10 AVS Divisions and other focus topics. The comprehensive review of state of the art will be presented in 17 invited talks and 57 contributed papers, discussing the world-wide efforts in exploring the fundamental properties of emerging 2-D materials, their synthesis, characterization, processing and applications. Highlights include synthesis of large scale MoS2/graphene heterostructures by Kathleen McCreary (NRL); XPS and EELS investigation of electronic structure of h-BN, MoS2 materials and their interfaces by B French (Intel); engineering of structural defects in graphene by Jeremy Robinson (NRL); growth, structure and properties of 2D SiO2 by Eric Altman (Yale U.); mechanochemistry of chemically modified graphene by Jonathan Felts (NRL); structural phase transitions in 2D Mo- and W- dichalcogenides by Evan Reed (Stanford U.); solution-synthesized graphene nanoribbons By Alex Sinitskii (U. Nebraska Lincoln); graphene transport barriers by Daniel Gunlycke (NRL) and lithography-free fabrication of graphene devices by Nick Thissen (Eindhoven).

CODE	SESSION
2D+EM+NS+PS+SS +TF-MoM	2D Materials Growth and Processing *Jun Lou, Rice University* *Juerg Osterwalder, University of Zurich, Switzerland*
2D+AS+EM+NS +SS-MoA	Dopants, Defects, and Interfaces in 2D Materials *Thomas Greber, University of Zurich, Switzerland* *Hua Zhang, Nanyang Technological University*
2D+AS+BI+PS +SS-TuM	2D Materials: Surface Chemistry, Functionalization, Bio and Sensor Applications *Manish Chhowalla, Rutgers University*
2D+AS+HI+MC +NS+PS+SP+SS-TuA	2D Materials Characterization including Microscopy and Spectroscopy *Richard Osgood, Columbia University*
2D+EM+NS+SS +TF-WeM	Novel 2D Materials *Christin Büchner, Fritz-Haber-Institut der Max-Planck-Gesellschaft, Germany* *Guy Le Lay, Aix-Marseille University, France*
2D+AS+EM+MI +MN+NS+TF-WeA	Properties of 2D Materials *Kirill Bolotin, Vanderbilt University* *Jon Schuller, UC Santa Barbara*
2D+AS+HI+NS +SS-ThM	Nanostructures including 2D Heterostructures, Patterning of 2D Materials *Walt de Heer, Georgia Inst. of Technology* *Jiwoong Park, Cornell University*
2D+EM+MI+MN +NS+SS+TF-ThA	Novel Quantum Phenomena in 2D Materials *Hugo Dil, Ecole Polytechnique Fédérale de Lausanne (EPFL), Switzerland* *Zhi-Xun Shen, Stanford University* *Xiaodong Xu, University of Washington*
2D-ThP	2D Materials Poster Session
2D+EM+MS+NS-FrM	2D Materials: Device Physics and Applications *Joerg Appenzeller, Purdue University* *ChunNing(Jeanie) Lau, University of California, Riverside*

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, Christian Elsässer (Fraunhofer Institute for Mechanics of Materials IWM, Germany), James Rondinelli (Drexel University, USA), and Joachim Sauer (Humboldt University Berlin, Germany) will describe materials modeling methods applied to crystal design, while Maria Emelianenko (George Mason University, USA) and Veena Tikare (Sandia National Laboratory, USA) will discuss dynamics and properties important for materials design associated with grain boundaries and microstructure. Additionally, Mike Finnis (Imperial College, London, UK) and Alberto Roldan (University College, London, UK) will present on efforts to use materials modeling to examine mechanisms associated with high-temperature ceramic behavior and catalysis. Similarly, exchange bias optimization and magnetic material properties at interfaces or within nanostructures are the focus of talks by Christian Binek (University of Nebraska at Lincoln, USA), Mark Stiles (NIST, USA), and Angela Hight Walker (NIST, USA), respectively. The application of combinatorial approaches and data-mining to materials design is the focus of presentations by Ichiro Takeuchi (University of Maryland, USA) and Richard Hennig (University of Florida, USA). Lastly, design and high-throughput processing of biomaterials is the focus of presentations by Markus Buehler (MIT, USA) and Clemens Van Blitterswijk (Maastricht University, The Netherlands), respectively.

CODE	SESSION
MG-TuA	Multi-scale Modeling in the Discovery of Advanced Materials *Christian Elsässer, Fraunhofer Institute for Mechanics of Materials IWM, Germany* *Maria Emelianenko, George Mason University* *Joachim Sauer, Humboldt Univ. Berlin, Germany*
MG-WeM	Design of New Materials *Michael Finnis, Imperial College London, UK* *Alberto Roldan, University College London, UK* *Veena Tikare, Sandia National Laboratories*

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 5th AC Focus Topic at the AVS Symposia. The previous ones were at Albuquerque (1), Nashville (2), Tampa (3) and Long Beach (4).

CODE	SESSION
AC+AS+MI+SA +SS-MoM	Spectroscopy, Microscopy and Dichroism of Actinides and Rare Earths *Stefan Minasian, Lawrence Berkeley National Laboratory* *Andrei Rogalev, European Synchrotron Radiation Facility (ESRF), France* *Jan Rusz, Uppsala University, Sweden*
AC+AS+MI+SA +SS-MoA	Theoretical Modeling of f Electron Systems *Jindrich Kolorenc, Academy of Sciences of the Czech Republic* *Durga Paudyal, Ames Laboratory* *Jian-Xin Zhu, Los Alamos National Lab.*
AC+AS+MI+SA +SS-TuM	Synchrotron Radiation and Laboratory Based Investigations of Actinides and Rare Earths *Corwin Booth, Lawrence Berkeley Natl. Lab.* *Roberto Caciuffo, European Commission, JRC-ITU, Germany* *Tom Scott, University of Bristol, UK* *David Simons, National Institute of Standards and Technology (NIST)*
AC-TuP	AC Posters for Fun and Profit

ATOM PROBE TOMOGRAPHY

Atom Probe Tomography (APT) is an evolving technique based on atomic-resolution field ion microscopy that can provide quantitative three-dimensional compositional imaging and analysis of a volume of approximately 100x100x500 nm3 with part-per-million sensitivity and sub-nanometer spatial resolution. Atom probe tomography excels with (chemical/elemental) sensitivity comparable to other surface analysis techniques such as SIMS and Auger analysis, while at the same time achieves spatial (structural/atomic) resolution close to high resolution transmission electron microscopy, although 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, nucleation and growth of materials with buried interfaces and related aspects through 3D chemical imaging. The organizers of this Focus Topic symposium seek to bring together a broad coalition of scientists who apply 3D atom probe tomography to understand interfacial and nanoscale science phenomena in metals, 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+NS +SS-ThM	APT Analysis of Semiconductors, Magnetic and Oxide Materials *Oana Cojocaru-Mirédin, Max Planck Institut fur Eisenforschung GmbH, Germany* *Thomas F. Kelly, CAMECA Instruments Inc.* *Hans Kreuzer, Dalhousie Univ., Canada*
AP+AS+EN+NS +SS-ThA	APT and FIM Analysis of Catalysts and Nanomaterials *Michael Moody, University of Oxford, UK* *Krishna Rajan, Iowa State University*
AP-ThP	Atom Probe Tomography Poster Session
AP+AS+NS+SS-FrM	Correlative Surface and Interface Analysis with APT *David Diercks, Colorado School of Mines* *William Lefebvre, Univ. of Rouen, France* *Daniel Perea, Pacific Northwest Natl. Lab.*

CONSERVATION STUDIES OF HERITAGE MATERIALS

The conservation of paintings, sculpture, glass, paper, photographs, materials and even machinery, is important to preserve our cultural heritage. It involves the study of materials, the significance (meaning) of artifacts and the changes that affect artifacts. In this focus topic we shall explore the use of analytical methods including Raman spectroscopy, SIMS, IR spectroscopy, electron microscopy, XPS, XRF, PIXE and synchrotron studies, to investigate these important objects.

CODE	SESSION
CS-ThM	Conservation Studies of Heritage Materials *Fenella France, Library of Congress* *Jennifer Herrmann, National Archives and Records Administration* *Barbara Shollock, Imperial College, London*
CS-ThA	Conservation Studies of Heritage Materials 2 *Francesca Casadio, The Art Institute of Chicago* *Patricia Favero, The Phillips Collection* *Jennifer Mass, Winterthur Museum*
CS-FrM	Conservation Studies of Modern Heritage Materials 3 *Timothy Rose, Smithsonian Institution* *Edward Vicenzi, Smithsonian Institution* *James Ziegler, United States Naval Academy*

ENERGY FRONTIERS

The Energy Frontiers Focus Topic (EN) focuses on cutting-edge research that addresses the importance of surfaces and interfaces for the manipulation, conversion, and storage of energy. This year 5 core sessions highlight energy in a variety of forms, including chemical, electrical, electrochemical, solar, and thermal. As this focus topic is inherently cross-disciplinary, EN is also co-sponsoring additional sessions with 7 divisions (Advanced Surface Engineering, Applied Surface Science, Electronic Materials and Processing, Nanometer-scale Science and Technology, Plasma Science and Technology, Surface Science, and Thin Films) as well as 2 focus topics (Atom Probe Tomography and Spectroscopic Ellipsometry). A session on Energy Harvesting with Nanostructures opens this year's program. Susanna Thon will highlight "Optical Engineering for Colloidal Quantum Dot Photovoltaics" and ZhongLin Wang will describe "Triboelectric Nanogenerators – A New Energy Technology." Sossina Haile begins a session on Fuel Formation and Thermal Transport with her work on "Unraveling Thermodynamic and Kinetic Factors in Solar-Thermochemical Fuel Production." Phillip Christopher will provide his perspective on "Controlling Catalysis on Metal Nanoparticles by Direct Photoexcitation of Adsorbate-Metal Bonds" and Rachel Segalman will discuss "Molecular and Mesoscale Design for Organic and Hybrid Thermoelectrics." Di-Jai Liu headlines a session on Charge Storage Materials and Devices by describing the "Spatiotemporal Investigation of Li-Air Batteries Under Operation Condition – Understanding the Cathodic and Anodic Electrochemical Processes and their Interdependence." This year's session on Thin Film Photovoltaics includes talks discussing a wide range of chalcogenide materials and devices fabricated from them. A potpourri of device types is represented in this year's final session on Organic-Inorganic Interfaces for Energy. In particular, Elsa Reichmanis and Russell Holmes will examine opposing directions of energy conversion with their talks "Towards Efficient Solution Processed Organic Photovoltaic Devices" and "Engineering Exciton Recombination in Organic Light-Emitting Devices."

CODE	SESSION
EN+EM+MN+NS +TR-MoA	Energy Harvesting with Nanostructures *Susanna Thon, Johns Hopkins University* *ZhongLin Wang, Georgia Institute of Technology*
EN+AS+EM+SE-TuM	Fuel Formation and Thermal Transport *Phillip Christopher, Univ. of California, Riverside* *Sossina Haile, California Institute of Technology* *Rachel Segalman, Univ. of California, Santa Barbara*
EN+EM+NS-TuA	Charge Storage Materials and Devices *Di-Jia Liu, Argonne National Laboratory*
EN-TuP	Energy Frontiers Poster Session
EN+AS+EM+SE-WeM	Thin Film Photovoltaics
EN+AS+EM-WeA	Organic-Inorganic Interfaces for Energy *Russell Holmes, University of Minnesota* *Elsa Reichmanis, Georgia Institute of Technology*

FUNDAMENTALS & BIOLOGICAL, ENERGY AND ENVIRONMENTAL APPLICATIONS OF QUARTZ CRYSTAL MICROBALANCE

Quartz crystal microbalance has become a measurement technique with a manifold of applications in liquid or gas phase. This focus topic will cover fundamental and applied aspects of QCM. Papers will be presented about new instrument developments, including combinations of QCM or QCM-D with other techniques, novel or improved methods for qualitative and quantitative data interpretation, and about the technique's applications in life sciences, and research and development related to energy and environment. In particular, the invited speaker Diethelm Johannsmann will present novel sensing dimensions of QCM, for the characterization of high-frequency contact mechanics. Daeyeon Lee will present applications of QCM to study the regulation of skin hydration using models of the stratum corneum, and Adam Olsson will present methods to characterize the size and orientation of particles and viruses.

CODE	SESSION
QC+AS+BI+MN-ThM	Fundamentals and Method Development of QCM *Diethelm Johannsmann, Clausthal University of Technology, Germany* *Adam Olsson, McGill Univ., Canada*
QC+AS+BI+MN-ThA	Applications of QCM *Daeyeon Lee, Univ. of Pennsylvania*
QC+AS+BI+MN-ThP	Fundamentals & Biological, Energy and Environmental Applications of Quartz Crystal Microbalance Poster Session

HELIUM ION MICROSCOPY

The Focus Topic on Helium Ion Microscopy (HIM) provides a forum for scientists working with Helium Ion Microscopes and those interested in its prospects and capabilities. Researchers from different fields such as materials science and nanotechnology, as well as life science and biotechnology will present their results. Two oral session are scheduled. Both session will be introduced with an overview talk presenting the many facets of the technique. While the morning session is focused on fundamental aspects and imaging applications the afternoon is devoted to nano-machining with helium and neon. Consequently, new results on single atom tips for gas field ionization and imaging of biological samples will be covered before lunch. After lunch a variety of nano-patterning and machining as well as lithography topics will be discussed. In both cases a good mixture of theory and experiment could be achieved. The Focus Topic is closed by a poster session presenting high quality bleeding edge results in a relaxed atmosphere with plenty of time to talk to other HIM users.

CODE	SESSION
HI+2D+AS+BI +MC-ThM	Fundamental Aspects and Imaging with the Ion Microscope *James Fitzpatrick, Salk Institute for Biological Studies* *David C. Joy, Univ. of Tennessee, Oak Ridge National Laboratory* *Jason Pitters, National Institute for Nanotechnology, Canada*
HI+2D+AS +MC-ThA	Nanoengineering with Helium Ion Beams *Richard Livengood, Intel Corporation* *Shinichi Ogawa, NeRI, AIST, Japan*
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 structure and chemistry of materials to functions they perform toward development of new materials. This focused symposium presents current capabilities of in-situ characterization techniques, new structure and chemistry revealed with these in-situ techniques, and the evolving new microscopic and spectroscopic techniques.

Topics of particular interest include:

- Ambient pressure x-ray photoelectron spectroscopy and the revealed surface chemistry
- Environmental TEM and the visualized evolution of structure of materials in gas and liquid phases
- X-ray absorption spectroscopy and chemical and structural information of materials under reaction condition
- In-situ vibrational spectroscopy and identity of absorbates and surfaces
- Ambient pressure STM and surface structure at atomic scale under reaction conditions
- Evolving new analytical techniques of materials and surfaces, and chemical and structure of material and devices under working conditions.

CODE	SESSION
IS+AS+MC+SS-TuM	Ambient Pressure X-ray Photoelectron Spectroscopy (AP-XPS) *Jorge Boscoboinik, Brookhaven Natl. Lab.* *Michael Hävecker, Helmholtz-Zentrum Berlin für Materialien und Energie/ Elektronenspeicherring BESSY II, Germany* *Hirohito Ogasawara, SLAC National Accelerator Laboratory*
IS+AS+MC+SS-TuA	Environmental Electron Microscopies *Jakob Wagner, Tech. Univ. of Denmark* *Judith Yang, University of Pittsburgh* *Haimei Zheng, Lawrence Berkeley Lab., University of California, Berkeley*
IS+AS+MC+SS-WeM	In-Situ X-ray Absorption and Raman Spectroscopy *Markus Ammann, Paul Scherrer Institut, Switzerland* *Jose Rodriguez, Brookhaven Natl. Lab.* *Israel Wachs, Lehigh University*
IS+2D+MC+NS +SP+SS-WeA	In-Situ Scanning Microscopy *Irene Groot, Huygens-Kamerlingh Onnes Laboratory, Leiden University, Netherlands* *Zhi Liu, Lawrence Berkeley Natl. Lab.*
IS-ThP	In-Situ Spectroscopy and Microscopy Poster Session

MATERIALS CHARACTERIZATION IN THE SEMICONDUCTOR INDUSTRY

The rapidly changing landscape in CMOS based semiconductor device fabrication (logic and memory) is continually pushing the frontiers of materials characterization. Some examples of these changes include: incorporation of strained Si technology (this allowed transistor nodes to progress to and beyond 90 nm), introduction of new materials such as III-V materials, HK materials, etc. (this provides improved electrical characteristics) to the movement from planar to 3D structures. These changes, resulting in continual miniaturization to and beyond the 20 nm node, have not only introduced new materials of interest but also new characterization needs. The same can be said for the photovoltaic industry. Some examples of the needs not only include deriving chemical composition/dimensions, but also film growth mechanisms/kinetics, film work-functions, modifications of relevant surface properties, interface diffusion, dopant/impurity distributions, lattice strain, crystallinity, grain size, defect distributions, etc. This Focus Topic examines the application of techniques inclusive but not limited to (in alphabetical order): AES (in-situ and ex-situ), APT, ECCI, IBC, LEIS, NRA, PL, SIMS (MS, Quad and TOF), SPM, SSRM, TEM, XPS, and XRD for providing this information. Novel approaches using the more conventional techniques applied within the semiconductor industry will also be covered.

CODE	SESSION
MC+AP+AS-MoM	Characterization of 3D Structures, 2D Films and Interconnects *Hidde Brongersma, ION-TOF / Tascon / Calipso, Netherlands* *Wilfried Vandervorst, IMEC, KU Leuven Belgium*
MC+2D+AP+AS-MoA	Characterization of III-Vs (2:00–3:20 pm)/ Photovoltaics, EUV masks, etc. (3:40–4:40 pm)
MC-TuP	Poster Session for all areas of Materials Characterization in the Semiconductor Industry

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 four sub-sessions deal with the challenges of characterizing smart novel materials with applications spanning over energy, sensor and electronic devices. The role of interfacial processes and charge transfer phenomena is an important part of this topical session. The selected presentations will illustrate the potential of the different spectroscopic and imaging techniques offered at the large scale facilities, highlighting future expectations.

CODE	SESSION
SA-MoM	Synchrotron Studies of Processes in Energy Conversion, Electronic Devices and Other Materials I *Russell Egdell, University of Oxford, UK* *Charles Fadley, University of California, Davis* *Greg Hughes, Dublin City University, Ireland* *Conan Weiland, Synchrotron Research, Inc.*
SA-MoA	Synchrotron Studies of Processes in Energy Conversion, Electronic Devices and Other Materials II *Benedetto Bozzini, Universita' del Salento – Italy* *Franz Himpsel, University of Wisconsin–Madison* *Wanli Yang, Lawrence Berkeley National Lab.*
SA-TuM	Characterization of Nanostructured and LD Materials Using Synchrotron-Based Methods *Burkhard Beckhoff, Physikalisch-Technische Bundesanstalt (PTB), Germany* *Andrea Goldoni, Elettra-Sincrotrone Trieste, Italy* *Petra Rudolf, Univ. of Groningen, The Netherlands* *Andrés F. Santander-Syro, Univ. Paris-Sud, France* *Claus Schneider, Forschungszentrum Juelich GmbH, Germany*
SA-TuA	Free Electron Laser and Synchrotron Studies at the Molecule-Surface Interfaces *Oliver Gessner, Lawrence Berkeley National Lab.* *Sujoy Roy, Lawrence Berkeley National Lab.* *Philippe Wernet, Helmholtz-Zentrum Berlin (HZB), Germany* *Wilfried Wurth, Universität Hamburg, Germany*
SA-TuP	Synchrotron Analysis Poster Session

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 4 key areas, namely: (1) Advances in Scanning Probe Microscopy, (2) Probe-Sample Interactions and Emerging Instrument Formats, (3) Electron Transport and Transport Properties, and (4) Chemical Reactions at the Nanoscale.

CODE	SESSION
SP+AS+BI+NS +SS-WeA	Advances in Scanning Probe Microscopy *Jinfeng Jia, Shanghai Jiao Tong Univ., China* *Han Woong Yeom, Institute for Basic Science, Republic of Korea*
SP+2D+AS+EM +MC+NS+SS-ThM	Probing Electronic and Transport Properties *Phillip First, Georgia Institute of Tech.* *Herbert Pfnür, Leibniz Universität, Germany*
SP+AS+BI+NS +SS-ThA	Probing Chemical Reactions at the Nanoscale *Franklin (Feng) Tao, Univ. of Notre Dame*
SP+AS+EM+NS +SS-ThP	Scanning Probe Microscopy Poster Session
SP+AS+BI+EM +NS+SE+SS-FrM	Probe-Sample Interactions and Emerging Instrument Formats *Xuedong Bai, Chinese Academy of Sciences, China* *Aleksandr Noy, Lawrence Livermore National Laboratory*

SELECTIVE DEPOSITION AS AN ENABLER OF SELF-ALIGNMENT

With the realization that pattern overlay will limit scaling long before devices and interconnects fail to perform intrinsically, the AVS is sponsoring a new focus topic aimed at providing a state-of-the-art perspective of selective deposition as an enabler of self-alignment.

Researchers from industry and academia are encouraged to present their work on the selective deposition of inorganic and organic thin films. Themes include selective atomic layer/chemical vapor/molecular layer deposition (with a special emphasis on precursor development and low-temperature processes), 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 metrology techniques aimed at evaluating the structural, electronic and chemical properties of selective surfaces.

CODE	SESSION
SD-WeM	Fundamentals of Selective Deposition *John R. Abelson, Univ. of Ill. at Urbana-Champaign* *Yves Chabal, University of Texas at Dallas*
SD-WeA	Process Development for Selective Deposition and Self-Aligned Patterning *Gregory Parsons, North Carolina State University* *Charles Wallace, Intel Corporation*

SPECTROSCOPIC ELLIPSOMETRY

For the 6th year in a row, the AVS International Symposium will host the Spectroscopic Ellipsometry Focus Topic. 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. The Focus Topic will host three oral and one poster session. The first session will feature contributions dedicated to photovoltaics, optical coatings, and inorganic thin films as well as novel applications, development of new instrumentation, and theoretical approaches of Spectroscopic Ellipsometry. The second session will focus on new developments and applications of Spectroscopic Ellipsometry for the characterization of nanostructures and metamaterials. New results on the application of Spectroscopic Ellipsometry for the investigation of organic and biological materials will be presented in the third session.

An award for outstanding contributions to the SE FT is sponsored by the J.A. Woollam Co., Inc. and will be presented to a graduate student or young postdoc.

CODE	SESSION
EL+AS+EM+EN +SS-ThM	Spectroscopic Ellipsometry for Photovoltaics and Instrument Development *Nikolas Podraza, University of Toledo*
EL+AS+EM+MC +SS-ThA	Optical Characterization of Nanostructures and Metamaterials *Bruno Gompf, Univ. Stuttgart, Germany*
EL-ThP	Spectroscopic Ellipsometry Poster Session
EL+AS+BI+EM +SS-FrM	Application of SE for the Characterization of Organic and Biological Materials *DaeWon Moon, DGIST, Republic of Korea*

SURFACE MODIFICATION OF MATERIALS BY PLASMAS FOR MEDICAL PURPOSES

Plasma surface modification represents an ideal way to either create new or modify existing materials for use in biomedical applications. Focus Topic sessions focus on the chemistry, biointerfaces, and device efficacy of materials made or modified via plasma processes. For such materials, fundamental science, biological response profiles and solving of device fabrication issues will be emphasized, particularly with regard to therapeutic properties, antimicrobial activity and biocompatibility of resulting materials and devices. The sessions, cosponsored with Biointerfaces (BID), Plasma Science and Technology (PSTD), and Applied Surface Science (ASSD), focus on creation of antimicrobial surfaces, plasma polymerization and surface modification to produce increased biocompatibility for 3D substrates and biomimetic materials.

CODE	SESSION
SM+AS+BI+PS-ThM	Plasma Processing of Antimicrobial Materials and Devices *Renate Foerch, FhG-ICT-IMM, Germany* *Sally McArthur, Swinburne University of Technology, Australia* *Melissa Reynolds, Colorado State Univer.*
SM+AS+BI+PS-ThA	Plasma Processing of Biomemetic Materials *Marcela Bilek, University of Sydney, Australia* *Heather Canavan, University of New Mexico* *Eloisa Sardella, CNR-IMIP, Italy*

TRIBOLOGY

The 2014 Tribology Focus Topic features topics including novel tribological materials and biomaterials, advanced tribological measurements, characterization of tribological interfaces, atomistic and multi-scale modeling of friction and wear events, advances in automotive tribology, and evaluation of environmental influences, with individual sessions jointly sponsored by Nanometer-scale Science and Technology (NS). Presentations 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. The first session is focused on bridging spatial and temporal scales in tribological measurements with a strong emphasis on the most recent developments and modeling efforts. The second session focuses on tribology in unique environments which includes invited talks related to biotribology. The third session focuses on the use of novel materials in tribology in industrial and automotive applications. Contributed talks in each session will report on 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. In addition to the three oral sessions, a poster session is being offered to provide an opportunity for personal exchange and discussion of results with colleagues.

CODE	SESSION
TR+NS-ThM	Bridging Scales in Tribology *Woo-Kyun Kim, University of Cincinnati* *Lars Pastewka, Karlsruhe Institute of Technology, Institute for Applied Materials IAM, Germany* *Mark Robbins, Johns Hopkins University*
TR-ThA	Tribology in Unique Environs *Bharat Bhushan, Ohio State University* *Ali Erdemir, Argonne National Laboratory* *Stefan Zauscher, Duke University*
TR-ThP	Tribology Poster Session
TR-FrM	Applications of novel materials in tribology *Peter Lee, Southwest Research Institute* *Kevin Turner, University of Pennsylvania*

SESSION OVERVIEW

Symposium Plenary Lecture

Mon. 12 Noon Ballroom I (CC)
"New Materials Strategies for Hybrid Electronic Circuitry"
Tobin J. Marks, Northwestern University

Advanced Surface Engineering

Mon.	AM	Room 302	New Developments in Atmospheric Pressure Plasma Deposition and Thin Films for Energy Applications
Mon.	PM	Room 302	Pulsed Plasmas in Surface Engineering
Tue.	AM	Room 302	Nanostructured Thin Films and Coatings
Tue.	PM	Room Hall D	Advanced Surface Engineering Poster Session

Applied Surface Science

Mon.	AM	Room 316	Quantitative Surface Analysis
Mon.	PM	Room 316	The Liquid Interface & Depth Profiling and Sputtering with Cluster Ion Beams
Tue.	AM	Room 316	Ambient Ionization Mass Spectrometry
Tue.	PM	Room 316	Analysis of Modified Surfaces
Wed.	AM	Room 316	Chemical Imaging in 2D and 3D
Wed.	PM	Room 316	Practical Surface Analysis I
Thu.	PM	Room Hall D	Applied Surface Science Poster Session
Fri.	AM	Room 316	Practical Surface Analysis II

Biomaterial Interfaces

Sun.	PM	Room 317	Biomaterials Plenary Session
Mon.	AM	Room 317	Biomolecules & Biomaterials Interfaces
Mon.	PM	Room 317	Bio/Nano Interfaces
Tue.	AM	Room 317	Biosensors
Tue.	PM	Room 317	Characterization of Biointerfaces
Wed.	AM	Room 317	Nonlinear Optical & Vibrational Spectroscopy
Wed.	PM	Room 317	Design and Discovery: Biointerfaces
Thu.	PM	Room Hall D	Biomaterial Interfaces Poster Session

Electronic Materials and Processing

Mon.	AM	Room 314	Complex Oxides and Their Interfaces
Mon.	PM	Room 314	Nanoparticles for Electronic Materials
Tue.	AM	Room 314	Advanced Interconnects and Materials
Tue.	PM	Room 314	High-k Dielectrics for Advance Semiconductor
Tue.	PM	Room Hall D	Electronic Materials and Processing Poster Session
Wed.	AM	Room 311	Materials and Devices for High Power Electronics (8:20–11:00 am)/Two Dimensional Electronic Materials & Devices (11:00 am–12:20 pm)
Wed.	AM	Room 314	High-K Dielectrics from Non-Classical Channels
Wed.	PM	Room 311	Thin Films and Materials for Energy Storage
Wed.	PM	Room 314	High-K Dielectrics for 2D Semiconductor
Thu.	AM	Room 311	Materials for Light Management
Thu.	AM	Room 314	High-K Dielectrics for ReRAM and RAM
Thu.	PM	Room 311	Materials for Quantum Computation
Thu.	PM	Room 314	Hybrid and Organic Electronics
Fri.	AM	Room 311	Nitrides for LED and PV Device Applications
Fri.	AM	Room 314	Transparent Electronics

Magnetic Interfaces and Nanostructures

Mon.	AM	Room 311	Interfacial Effects in Oxide Heterostructures
Mon.	PM	Room 311	Topological Insulators/Rashba Effect
Tue.	AM	Room 311	Advanced Materials Discovery
Tue.	PM	Room 311	Development of Multiferroic Materials (2:20–5:00 pm) MIND Panel Discussion (5:00–6:30 pm)
Tue.	PM	Room Hall D	Magnetic Interfaces Poster Session

Manufacturing Science and Technology

Wed.	PM	Room 302	Overview: Applications and Manufacturing of Devices on Paper and Textiles
Thu.	AM	Room 302	Processes for Mesoscale Structure on Paper and Textiles
Thu.	PM	Room 302	Functionalization of Paper and Textiles & Their Applications
Thu.	PM	Room Hall D	Manufacturing Science and Technology Poster Session

MEMS and NEMS

Tue.	PM	Room 301	Multi-Scale Phenomena and Bio-Inspired MEMS/NEMS
Wed.	AM	Room 301	Optomechanics, Photonics, and Quantum Nanosystems
Wed.	PM	Room 301	Emerging Materials and Fabrication Technologies for MEMS/NEMS
Thu.	PM	Room Hall D	MEMS and NEMS Posters

Nanometer-Scale Science and Technology

Mon.	AM	Room 304	Delivering Energy and Mass at the Nanoscale
Mon.	PM	Room 304	Nanophotonics and Plasmonics
Tue.	AM	Room 304	Nanopatterning and Nanolithography
Tue.	PM	Room 304	Nanowires and Nanotubes: Advances in Growth and Characterization
Wed.	AM	Room 304	Nanoscale Catalysis and Surface Chemistry
Wed.	PM	Room 304	Nanoscale Imaging and Materials Characterization
Thu.	PM	Room Hall D	Nanoscience Division Poster Session

Plasma Science and Technology

Mon.	AM	Room 308	Current Challenges of Plasma Etching Technologies
Mon.	PM	Room 308	Advanced FEOL/Gate Etching
Tue.	AM	Room 308	Plasma Surface Interactions I
Tue.	PM	Room 308	Advanced BEOL/Interconnect Etching
Tue.	PM	Room Hall D	Plasma Science and Technology Poster Session
Wed.	AM	Room 305	Plasma Based Ion Implantation and Ion-Surface Interactions
Wed.	AM	Room 308	Plasma Modeling
Wed.	PM	Room 305	Plasma Processing for 2D Materials, Coating, and Surface Modification
Wed.	PM	Room 308	Plasma Diagnostics, Sensors, and Control
Thu.	AM	Room 305	Plasma Deposition and Plasma Assisted ALD
Thu.	AM	Room 308	Atomic Layer Etching (ALE) and Low-Damage Processing

SESSION OVERVIEW

Thu.	PM	Room 308	Atmospheric Pressure Plasma Processing; Fundamental and Applications
Thu.	PM	Room 305	Plasma Processing of Nanoparticles and Nanomaterials
Fri.	AM	Room 305	Plasma Sources
Fri.	AM	Room 308	Plasma Surface Interactions II

Surface Science

Mon.	AM	Room 309	Mechanistic Insights into Surface Reactions: Catalysis, ALD, etc.
Mon.	AM	Room 315	Photocatalysis and Photochemistry at Surfaces
Mon.	PM	Room 309	Metals, Alloys and Oxides: Structure, Reactivity & Catalysis
Tue.	AM	Room 309	Synthesis, Structure and Characterization of Oxides
Tue.	PM	Room 309	Nanostructures: Growth, Reactivity and Catalysis
Tue.	PM	Room Hall D	Surface Science Poster Session
Wed.	AM	Room 309	Dynamic Processes of Single Atoms and Molecules at Surfaces
Wed.	AM	Room 312	Atomistic Modeling of Surface Phenomena
Wed.	PM	Room 309	Chirality and Enantioselectivity on Surfaces
Thu.	AM	Room 309	Organic Layers on Surfaces
Thu.	PM	Room 309	Semiconductor Surfaces and Interfaces 1
Fri.	AM	Room 309	Semiconductor Surfaces and Interfaces 2

Thin Film

Mon.	AM	Room 305	Advanced PVD Methods
Mon.	AM	Room 307	Atmospheric, Roll-to-Roll and other Manufacturing Advances in ALD
Mon.	PM	Room 307	ALD Surface Reactions and Precursors
Mon.	PM	Room 305	Self-Assembled Monolayers, Layer-by-Layer Assemblies, and Hydrophobic/ Amphiphobic Thin Films
Tue.	AM	Room 307	ALD for Emerging Applications
Tue.	AM	Room 305	Energetic Thin Films/Optical Characterization
Tue.	PM	Room 305	Thin Film: Growth and Characterization II
Tue.	PM	Room 307	ALD for Energy
Wed.	AM	Room 307	Applied ALD: Nanoelectronics and Emerging Applications
Wed.	PM	Room 307	Thin Film and Nanostructured Coatings for Light Trapping, Extraction, and Plasmonic Applications
Thu.	AM	Room 307	Advanced CVD and Chemical Vapor Infiltration Methods
Thu.	PM	Room 307	Thin Film for Permeation Barriers and Membranes
Thu.	PM	Room Hall D	Thin Films Poster Session
Fri.	AM	Room 307	Thin Film Characterization

Vacuum Technology

Mon.	AM	Room 303	Vacuum Measurement, Calibration, and Primary Standards
Mon.	PM	Room 303	Vacuum Measurement, Applications of UHV and Ultraclean Processes
Tue.	AM	Room 303	Gas Dynamics, Modeling, and Pumping Systems
Tue.	PM	Room 303	Vacuum Quality Analysis, Outgassing, and Control
Tue.	PM	Room Hall D	Vacuum Technology Division Poster Session and Student Poster Contest
Wed.	AM	Room 303	Accelerator and Large Vacuum Systems I
Wed.	PM	Room 303	Accelerator and Large Vacuum Systems II

Exhibitors and Manufacturers Technology Spotlight

Tue.	AM	Exhibit Hall	10:20–11:00 AM
Tue.	Lunch	Exhibit Hall	12:40–2:00 PM
Tue.	PM	Exhibit Hall	4:00 PM
Wed.	AM	Exhibit Hall	10:20–11:00 AM
Wed.	Lunch	Exhibit Hall	12:40–1:40 PM
Wed.	PM	Exhibit Hall	4:00 PM
Thurs.	AM	Exhibit Hall	10:20–11:00 AM

2D Materials Focus Topic

Mon.	AM	Room 310	2D Materials Growth and Processing
Mon.	PM	Room 310	Dopants, Defects, and Interfaces in 2D Materials
Tue.	AM	Room 310	2D Materials: Surface Chemistry, Functionalization, Bio and Sensor Applications
Tue.	PM	Room 310	2D Materials Characterization including Microscopy and Spectroscopy
Wed.	AM	Room 310	Novel 2D Materials
Wed.	PM	Room 310	Properties of 2D Materials
Thu.	AM	Room 310	Nanostructures including 2D Heterostructures, Patterning of 2D Materials
Thu.	PM	Room 310	Novel Quantum Phenomena in 2D Materials
Thu.	PM	Room Hall D	2D Materials Poster Session
Fri.	AM	Room 310	2D Materials: Device Physics and Applications

Accelerating Materials Discovery for Global Competitiveness Focus Topic

Tue.	PM	Room 302	Multi-scale Modeling in the Discovery of Advanced Materials
Wed.	AM	Room 302	Design of New Materials

Actinides and Rare Earths Focus Topic

Mon.	AM	Room 301	Spectroscopy, Microscopy and Dichroism of Actinides and Rare Earths
Mon.	PM	Room 301	Theoretical Modeling of f Electron Systems
Tue.	AM	Room 301	Synchrotron Radiation and Laboratory Based Investigations of Actinides and Rare Earths
Tue.	PM	Room Hall D	AC Posters for Fun and Profit

Atom Probe Tomography Focus Topic

Thu.	AM	Room 301	APT Analysis of Semiconductors, Magnetic and Oxide Materials
Thu.	PM	Room 301	APT and FIM Analysis of Catalysts and Nanomaterials
Thu.	PM	Room Hall D	Atom Probe Tomography Poster Session
Fri.	AM	Room 301	Correlative Surface and Interface Analysis with APT

Conservation Studies of Heritage Materials Focus Topic

Thu.	AM	Room 313	Conservation Studies of Heritage Materials
Thu.	PM	Room 313	Conservation Studies of Heritage Materials 2

Fri.	AM	Room 313	Conservation Studies of Modern Heritage Materials 3

Energy Frontiers Focus Topic

Mon.	PM	Room 315	Energy Harvesting with Nanostructures
Tue.	AM	Room 315	Fuel Formation and Thermal Transport
Tue.	PM	Room 315	Charge Storage Materials and Devices
Tue.	PM	Room Hall D	Energy Frontiers Poster Session
Wed.	AM	Room 315	Thin Film Photovoltaics
Wed.	PM	Room 315	Organic-Inorganic Interfaces for Energy

Fundamentals & Biological, Energy and Environmental Applications of Quartz Crystal Microbalance Focus Topic

Thu.	AM	Room 317	Fundamentals and Method Development of QCM
Thu.	PM	Room 317	Applications of QCM
Thu.	PM	Room Hall D	Fundamentals & Biological, Energy and Environmental Applications of Quartz Crystal Microbalance Poster Session

Helium Ion Microscopy Focus Topic

Thu.	AM	Room 316	Fundamental Aspects and Imaging with the Ion Microscope
Thu.	PM	Room 316	Nanoengineering with Helium Ion Beams
Thu.	PM	Room Hall D	Aspects of Helium Ion Microscopy Poster Session

In-Situ Spectroscopy and Microscopy Focus Topic

Tue.	AM	Room 313	Ambient Pressure X-ray Photoelectron Spectroscopy (AP-XPS)
Tue.	PM	Room 313	Environmental Electron Microscopies
Wed.	AM	Room 313	In-Situ X-ray Absorption and Raman Spectroscopy
Wed.	PM	Room 313	In-Situ Scanning Microscopy
Thu.	PM	Room Hall D	In-Situ Spectroscopy and Microscopy Poster Session

Materials Characterization in the Semiconductor Industry Focus Topic

Mon.	AM	Room 313	Characterization of 3D Structures, 2D films and Interconnects
Mon.	PM	Room 313	Characterization of III-Vs (2:00–3:20 pm)/ Photovoltaics, EUV masks, etc. (3:40–4:40 pm)
Tue.	PM	Room Hall D	Poster Session for all areas of Materials Characterization in the Semiconductor Industry

Novel Trends in Synchrotron and FEL-Based Analysis Focus Topic

Mon.	AM	Room 312	Synchrotron Studies of Processes in Energy Conversion, Electronic Devices and Other Materials I
Mon.	PM	Room 312	Synchrotron Studies of Processes in Energy Conversion, Electronic Devices and Other Materials II
Tue.	AM	Room 312	Characterization of Nanostructured and LD Materials Using Synchrotron-Based Methods
Tue.	PM	Room 312	Free Electron Laser and Synchrotron Studies at the Molecule-Surface Interfaces
Tue.	PM	Room Hall D	Synchrotron Analysis Poster Session

Scanning Probe Microscopy Focus Topic

Wed.	PM	Room 312	Advances in Scanning Probe Microscopy
Thu.	AM	Room 312	Probing Electronic and Transport Properties
Thu.	PM	Room 312	Probing Chemical Reactions at the Nanoscale
Thu.	PM	Room Hall D	Scanning Probe Microscopy Poster Session
Fri.	AM	Room 312	Probe-Sample Interactions and Emerging Instrument Formats

Selective Deposition as an Enabler of Self-Alignment Focus Topic

Wed.	AM	Room 318	Fundamentals of Selective Deposition
Wed.	PM	Room 318	Process Development for Selective Deposition and Self-Aligned Patterning

Spectroscopic Ellipsometry Focus Topic

Thu.	AM	Room 304	Spectroscopic Ellipsometry for Photovoltaics and Instrument Development
Thu.	PM	Room 304	Optical Characterization of Nanostructures and Metamaterials
Thu.	PM	Room Hall D	Spectroscopic Ellipsometry Poster Session
Fri.	AM	Room 304	Application of SE for the Characterization of Organic and Biological Materials

Surface Modification of Materials by Plasmas for Medical Purposes Focus Topic

Thu.	AM	Room 315	Plasma Processing of Antimicrobial Materials and Devices
Thu.	PM	Room 315	Plasma Processing of Biomemetic Materials

Tribology Focus Topic

Thu.	AM	Room 303	Bridging Scales in Tribology
Thu.	PM	Room 303	Tribology in Unique Environs
Thu.	PM	Room Hall D	Tribology Poster Session
Fri.	AM	Room 303	Applications of Novel Materials in Tribology

MEETINGS AND SPECIAL EVENTS

SATURDAY, NOVEMBER 8, 2014

2:00 p.m.	Educational Materials and Outreach Committee Meeting	Potomac (H)
6:30 p.m.	Educational Materials and Outreach Committee Dinner	Orioles Grille Restaurant (H)

SUNDAY, NOVEMBER 9, 2014

7:30 a.m.	AVS Board of Directors' Executive Session (Closed Session)	Harborview I (H)
8:00 a.m.	Quantitative Surface Analysis 2015	316 (CC)
8:45 a.m.	AVS Board of Directors' Meeting	Harborview I (H)
12:30 p.m.	AVS Board of Directors' Lunch	Harborview II (H)
1:00 p.m.	Tutorial: Design & Analysis of UHV Systems Using the Test Particle Montecarlo Code MOLFLOW+	315 (CC)
1:00 p.m.	Tutorial: Tip Reliability in Atomic Force Microscopy: The Science of Nanoscale Wear, with Applications to Nanometrology and Nanofabrication	313 (CC)
2:00 p.m.	Companion Tour Registration	Charles Street Lobby (CC)
2:00 p.m.	AVS Editor's Meeting	Board Room (H)
3:00 p.m.	Biomaterials Plenary Session and Reception	317 (CC)
5:15 p.m.	Professional Development Tutorial on Entrepreneurship	314 (CC)
6:00 p.m.	Science Educators' Workshop Teachers' Reception	Harbor View II (H)
6:00 p.m.	Vacuum Technology Division Executive Committee Meeting and Dinner	Potomac (H)
6:00 p.m.	ASTM E-42 Business Meeting	Chesapeake I (H)
7:00 p.m.	ASTM E-42 Workshop: "And the Survey Says ... Extracting Information from the XPS Survey Scan"	Chesapeake I (H)
7:00 p.m.	Short Course Committee Meeting	Camden I (H)
7:00 p.m.	International Dignitaries & Chapter Chairs Reception (Invitation Only)	Presidential Suite (H)

MONDAY, NOVEMBER 10, 2014

7:00 a.m.	Companion Tour Registration	Main Lobby (H)
7:00 a.m.	History Committee Meeting and Breakfast	Camden I (H)
8:00 a.m.	Science Educators' Workshop	Loch Raven (H)
12:00 p.m.	Plenary Lecture: Tobin J. Marks, Northwestern Univ., "New Materials Strategies for Hybrid Electronic Circuitry"	Ballroom II (CC)
12:00 p.m.	Science Educators' Workshop Lunch	Potomac (H)
1:15 p.m.	2015 AVS Program Committee Meeting and Lunch	Harbor View I (H)
1:15 p.m.	Publications Committee Meeting and Lunch	Camden I (H)
1:15 p.m.	Professional Development Workshop: "Welcome to AVS"	314 (CC)
1:30 p.m.	Recommended Practices Committee Meeting and Lunch	Board Room (H)
3:00 p.m.	Vacuum Technology Division Business Meeting	303 (CC)
3:40 p.m.	Peter Mark Award Lecture: J. Zide, Univ. of Delaware, "Novel Semiconductor and Epitaxial Nanocomposite Materials for Electronic and Photonic Applications"	314 (CC)
5:00 p.m.	New Member Meet-n-Greet	Ballroom III (CC)
5:30 p.m.	Welcome Mixer	Ballroom III (CC)
5:45 p.m.	Biomaterial Interfaces Division Business Meeting	317 (CC)
6:00 p.m.	Electronic Materials and Processing Division Forum & Reception: Careers at LAM Research	314 (CC)
6:30 p.m.	Biointer*phases* Reception	TBD (Offsite)
7:00 p.m.	Applied Surface Science Division Executive Committee Meeting and Dinner	Camden II (H)
7:15 p.m.	Publications Committee Meeting and Dinner	TBD (Offsite)
7:30 p.m.	Thin Film Division/Harper Award TED-Talk Competition (Invite Only)	305 (CC)
8:30 a.m.-5:00 p.m.	*Short Course Program*	*Various Rooms (H)*

TUESDAY, NOVEMBER 11, 2014

7:00 a.m.	Awards Committee Meeting and Lunch	Camden I (H)
7:00 a.m.	Companion Tour Registration	Main Lobby (H)
7:00 a.m.	Professional Leadership Committee Meeting and Breakfast	Orioles Grille Restaurant (H)
8:00 a.m.	Science Educators' Workshop	Loch Raven (H)
10:00 a.m.	Session Coffee Break	Hall ABC (CC)
12:00 p.m.	Science Educators' Workshop Lunch	Potomac (H)
12:20 p.m.	Exhibit Hall Lunch	Hall ABC (CC)
12:30 p.m.	Chapters, Divisions, and Groups Meeting and Lunch	Harborview II (H)
12:30 p.m.	Governance Committees Meeting and Lunch	Orioles Grille Restaurant (H)
12:30 p.m.	Professional Development Job Information Forum and Lunch	314 (CC)
3:40 p.m.	Session Refreshment Break	Hall ABC (CC)
4:20 p.m.	Medard W. Welch Award Lecture: P. Thiel, Iowa State Univ., "Quasicrystals to Nanoclusters: It's All on the Surface"	309 (CC)

CC = Baltimore Convention Center
H = Sheraton Inner Harbor

= New Attendee Networking Events

MEETINGS AND SPECIAL EVENTS

5:20 p.m.	Magnetic Interfaces and Nanostructures Division Panel Discussion	311 (CC)
5:30 p.m.	Mid-Atlantic Chapter Reception	Chesapeake Gallery I (H)
6:05 p.m.	Plasma Science and Technology Division Business Meeting	308 (CC)
6:25 p.m.	Electronic Materials and Processing Division Business Meeting	314 (CC)
6:25 p.m.	Nanometer-scale Science and Technology Business Meeting	304 (CC)
6:25 p.m	Surface Science Division Business Meeting	309 (CC)
6:25 p.m.	Thin Film Division Business Meeting	305 (CC)
6:30 p.m.	Magnetic Interfaces and Nanostructures Division Business Meeting	311 (CC)
6:30 p.m.	MEMS and NEMS Technical Group Executive Committee Meeting and Dinner	Board Room (H)
6:30 p.m.	Poster Session and Refreshments	Hall D (CC)
6:45 p.m.	Electronic Materials and Processing Division Forum: Moore's Law & Careers at Intel	314 (CC)
7:00 p.m.	Biomaterial Interfaces Division Executive Committee Meeting and Dinner	Harborview II
7:00 p.m.	Nanometer-scale Science and Technology Division Meeting and Dinner	Camden II (H)
7:00 p.m.	Plasma Science and Technology Executive Committee Meeting and Dinner	Severn II-III (H)
7:00 p.m.	Surface Science Division Executive Committee Meeting and Dinner	Potomac (H)
7:00 p.m.	Thin Film Division Executive Committee Meeting and Dinner	Harborview I (H)
7:15 p.m.	Magnetic Interfaces and Nanostructures Division Executive Committee Meeting and Dinner	Camden I (H)
7:30 p.m.	Applied Surface Science Division Business Meeting	Chesapeake I (H)
7:30 p.m.	Electronic Materials and Processing Division Executive Committee Meeting and Dinner	Sassafras (H)
8:00 p.m.	ASTM E-42 and Applied Surface Science Division Joint Workshop: "Gas Cluster Ion Sources: Shiny New Toy or Tool for Opening Up New Frontiers in Surface Analysis?"	Chesapeake I (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 ABC (CC)*

WEDNESDAY, NOVEMBER 12, 2014

6:15 a.m.	34th Annual AVS Run (Register at Run Booth before Wednesday (CC)	TBD
7:00 a.m.	Companion Tour Registration	Main Lobby (H)
7:30 a.m.	Diversity Committee Meeting and Breakfast	Orioles Grille Restaurant (H)
8:00 a.m.	Advanced Surface Engineering Division Business Meeting	Camden (H)
8:15 a.m.	Advanced Surface Engineering Division Executive Committee Meeting (Lunch Offsite)	Camden (H)
10:00 a.m.	Session Coffee Break	Hall ABC (CC)
12:20 p.m.	Exhibit Hall Lunch	Hall ABC (CC)
12:20 p.m.	Nanometer-Scale Science Division Graduate Student Award Competition	304 (CC)
12:30 p.m.	PacSurf Committee Meeting and Lunch	Potomac (H)
12:30 p.m.	Professional Development Lunch with the Feds/Federal Funding Town Hall	314 (CC)
2:20 p.m.	Albert Nerken Award Lecture: O. Shenderova, Adámas Nanotechnologies Inc., "Brilliant Nanodiamond Particles"	304 (CC)
3:40 p.m.	Session Refreshment Break	Hall ABC (CC)
4:30 p.m.	E&M Reception (Invitation Only)	Hall ABC (CC)
6:30 p.m.	AVS Awards Ceremony & Reception	Ballroom I-II (CC)
7:00 p.m.	Manufacturing Science and Technology Group Committee Meeting and Dinner	Potomac (H)
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 ABC (CC)*

THURSDAY, NOVEMBER 13, 2014

7:00 a.m.	Companion Tour Registration	Main Lobby (H)
7:30 a.m.	Membership Committee Meeting and Breakfast	Orioles Grille Restaurant (H)
10:00 a.m.	Session Coffee Break	Hall ABC (CC)
12:20 p.m.	Exhibit Finale and Refreshments	Hall ABC (CC)
12:30 p.m.	2015 AVS Program Committee Chairs' Meeting and Lunch	Harborview I (H)
12:30 p.m.	AVS Business Meeting	304 (CC)
12:30 p.m.	Professional Development Workshop and Lunch: "Work-Life Satisfaction"	314 (CC)
12:30 p.m.	Surface Science Division Mort Traum Awards Ceremony	309 (CC)
3:40 p.m.	Plasma Science and Technology Division Coburn and Winters Award Ceremony	308 (CC)
6:00 p.m.	Poster Session and Refreshments	Hall D (CC)
6:30 p.m.	2014/2015 Program Committee Reception and Dinner	Harborview II (H)
7:00 p.m.	*Surface Science Spectra* Editorial Board Dinner	Camden (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 ABC (CC)*

FRIDAY, NOVEMBER 14, 2014

8:00 a.m.	Tutorial: Atomic Modeling and the Computational Design of New Materials, Surfaces and Interface	315 (CC)
8:30 a.m.-5:00 p.m.	*Short Course Program*	*Various Rooms (H)*

CC = Baltimore Convention Center
H = Sheraton Inner Harbor

= 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

Editor-in-Chief: Eray S. Aydil, University of Minnesota

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JVSTB

Journal of Vacuum Science & Technology B

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

www.jvstb.org

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

Editor-in-Chief: Eray S. Aydil, University of Minnesota

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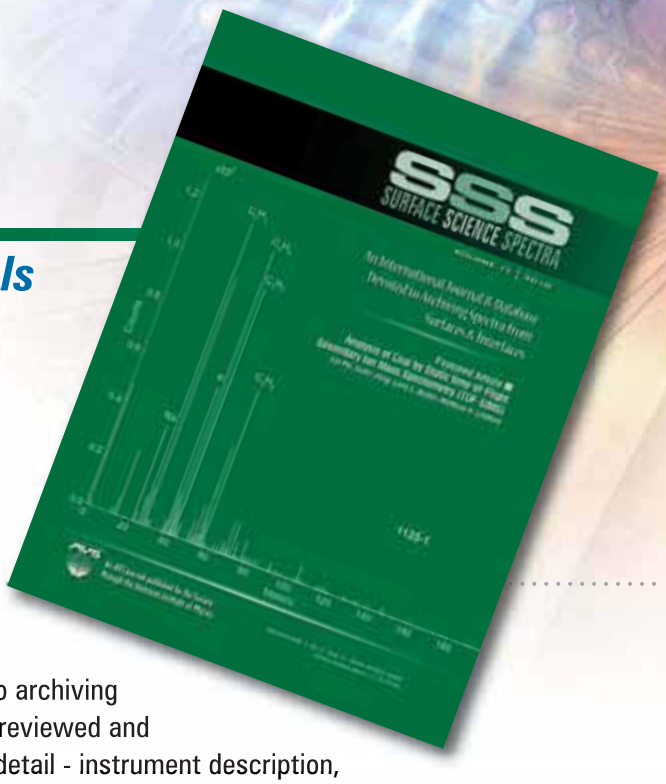
SURFACE SCIENCE SPECTRA



Journal and Database for Individuals or Analytical Laboratories

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

http://avspublications.org/sss

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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Editors: James E. Castle, University of Surrey and Richard T. Haasch, University of Illinois

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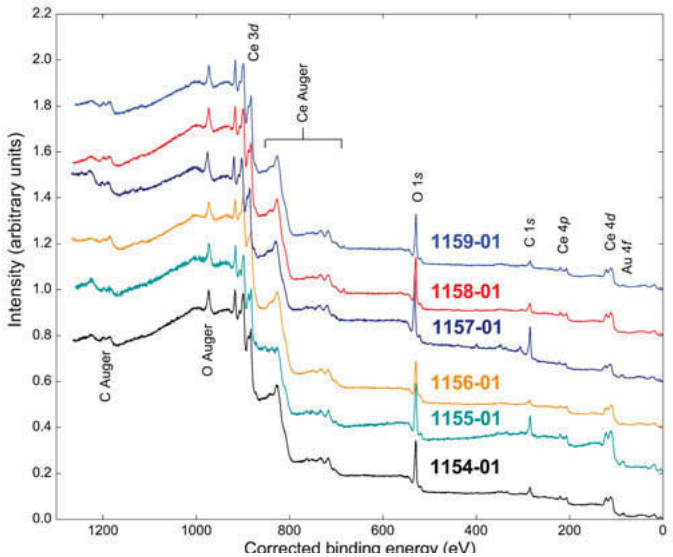
— Dr. Davide Barreca, U. Padova



Download digital data by clicking on the blue accession number located in the caption of each figure.

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Biointerphases

Journal for Quantitative Biological Interface Data

- Quantitative Data on Biological and Soft Matter Interfaces
- Experiments, Modeling, Theory and Applications
- Only journal in this subject area
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Biointer*phases* is a peer-reviewed journal. It is an interdisciplinary journal which explores all aspects of quantitative soft matter interfaces: chemistry, physics, engineering, theory and modeling. Topics covered include interface spectroscopy, *in vivo* and *in vitro* mechanisms, interface modeling, adhesion phenomena, protein-surface interactions, biomembranes on a chip, cell-surface interactions, biosensors/biodiagnostics, bio-surface modification, the nano-bio interface, biotribology/biorheology, molecular recognition, cell patterning for function, polyelectrolyte surfaces, and ambient diagnostic methods. In addition to regular submissions, the journal features In Focus sections examining specific topics and edited by experts in the field.

Editor: Dr. Anna Belu, Medtronic

"Biointerphases is an excellent information source for research in the field of cell adhesion and mechanics with growing importance."
— Dr. Joachim Spatz, MPI Intelligent Systems & University of Heidelberg

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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 13 symposia, along with focused topic sessions, short courses, equipment exhibition, awards convocation, and social events.

A	Coatings for Use at High Temperature
B	Hard Coatings and Vapor Deposition Technology
C	Fundamentals and Technology of Multifunction Thin Films
D	Coatings and Biomedical and Healthcare Applications
E	Tribology & Mechanical Behavior of Coatings and Engineered Surfaces
F	New Horizons in Coatings and Thin Films

G	Applications, Manufacturing, and Equipment
TS1	Mechanical Aspects of Biointerfaces
TS2	Advanced Characterization of Coatings and Thin Films
TS3	Energetic Materials and Micro-Structures for Nanomanufacturing
TS4	Graphene and 2D Nanostructures
TS5	Plasma Diagnostics and Modeling
TS6	Atmospheric Plasma Applications

Plenary Lecture
"Connecting Residual Stress and Thin Film Growth Processes: Real-time Experiments and a Kinetic Model"
Professor Eric Chason
Professor of Engineering,
Brown University, USA

Exhibition Keynote Lecture
"Synthesis of Oxides by Reactive Cathodic Arc Evaporation: Target Surface, Condensation and Coating Properties"
Dr. Jürgen Ramm
Manager, R&D New Technologies
Oerlikon Balzers, Liechtenstein

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MARK YOUR CALENDARS

Abstract Submission Deadline	**October 1, 2014**
Awards Nomination Deadline	**October 1, 2014**
Conference Pre-registration Deadline	**March 15, 2015**
Manuscript Submission Deadline	**April 1, 2015**

SAVE THESE DATES APRIL 25-30, 2015

SANTA CLARA SVC™ TECHCON 2015

SOCIETY OF VACUUM COATERS

58th Annual Technical Conference
Santa Clara Convention Center, CA, USA

APRIL 27-30 TECHNICAL PROGRAM featuring a Symposium on

Coating Technologies for the Interconnected Age

ADVANCING MOBILITY, DURABILITY AND PERFORMANCE OF MOBILE ELECTRONICS

The SVC Technical Advisory Committees will explore the Symposium topic in depth together with other topics as part of the traditional Technical Sessions:

- WEBTECH ROLL-TO-ROLL COATINGS FOR HIGH-END APPLICATIONS
- COATINGS FOR ENERGY CONVERSION AND RELATED PROCESSES
- PROTECTIVE, TRIBOLOGICAL AND DECORATIVE COATINGS
- EMERGING TECHNOLOGIES
- HIGH POWER IMPULSE MAGNETRON SPUTTERING (HIPIMS)
- OPTICAL COATINGS
- PLASMA PROCESSING
- LARGE AREA COATINGS
- COATINGS AND PROCESSES FOR BIOMEDICAL AND ENVIRONMENTAL APPLICATIONS

APRIL 25-30 EDUCATION PROGRAM Problem-Solving Tutorial Courses

APRIL 28-29 EQUIPMENT EXHIBIT Dedicated to Vacuum Coating Technologies

APRIL 26-30 INTERACTIVE NETWORKING Forums and Discussion Groups

SPOTLIGHT SESSIONS

Technical Poster Presentations: with 3-Minute Oral Presentations
Heuréka! Post-Deadline Recent Developments: Featuring Late-Breaking Technology
Business Topics: Beyond Vacuum Coating... New Ideas Making Your Business Better

Abstracts Accepted for Poster Presentations, Heuréka! Post-Deadline Recent Developments Session and Vendor Innovators Showcase Until March 1, 2015

FOR MORE INFORMATION:
SVCINFO@SVC.ORG . 505-856-7188 . WWW.SVC.ORG

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Charles VIP 2,100 Sq. Ft.
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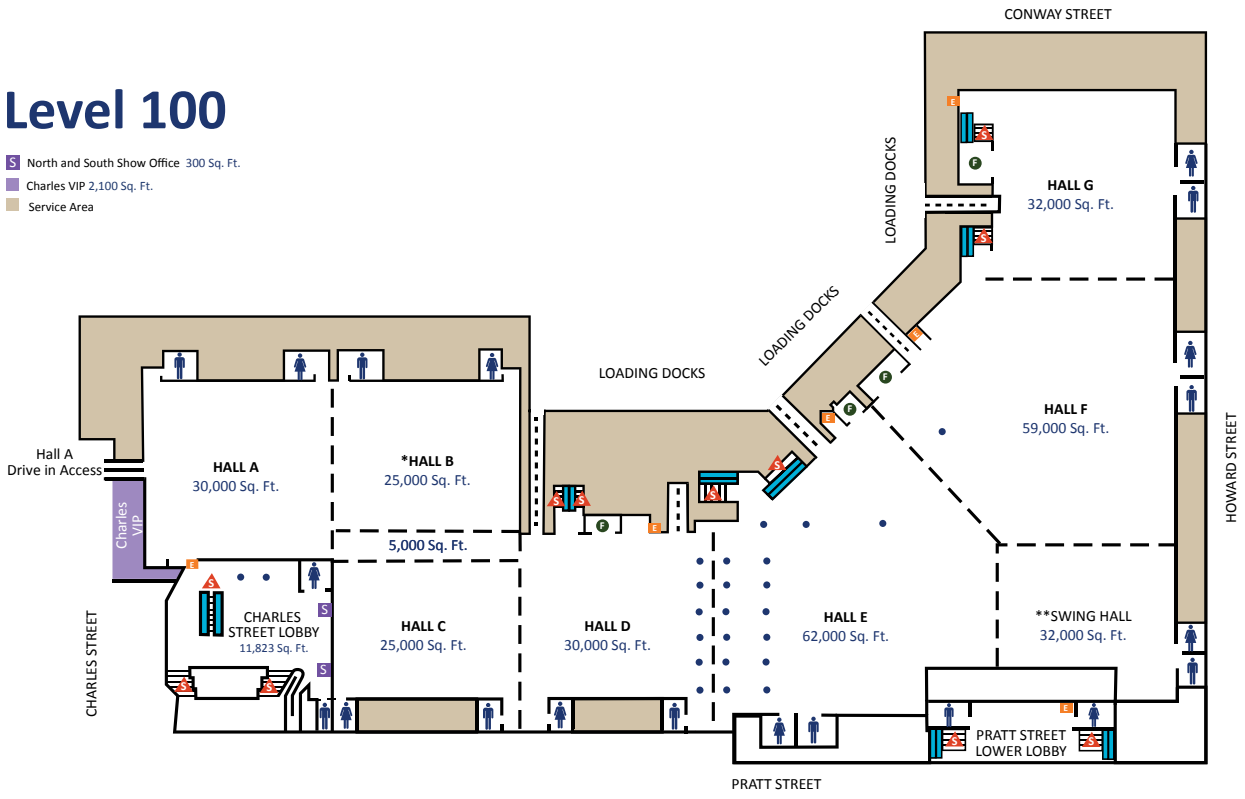
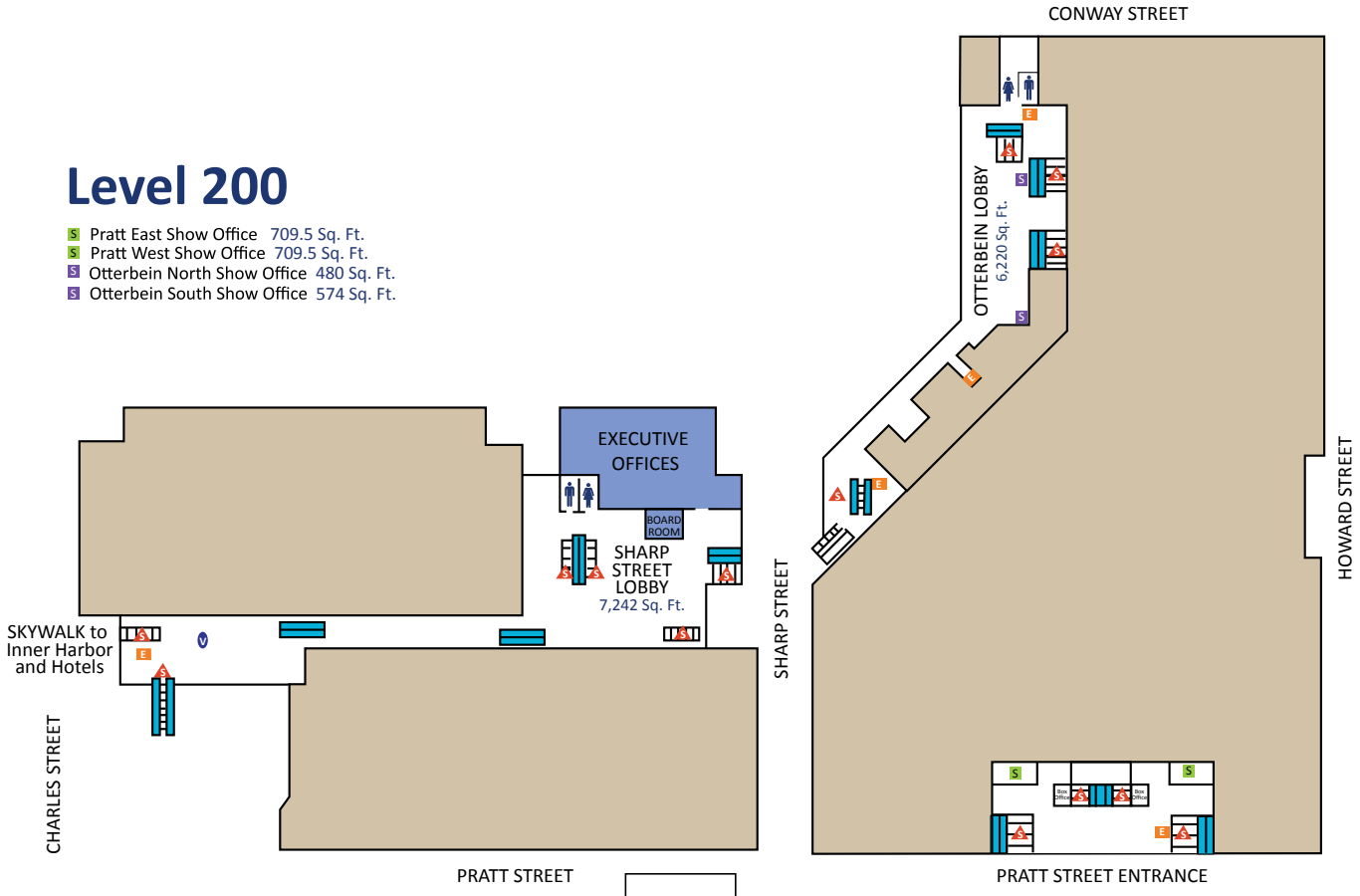
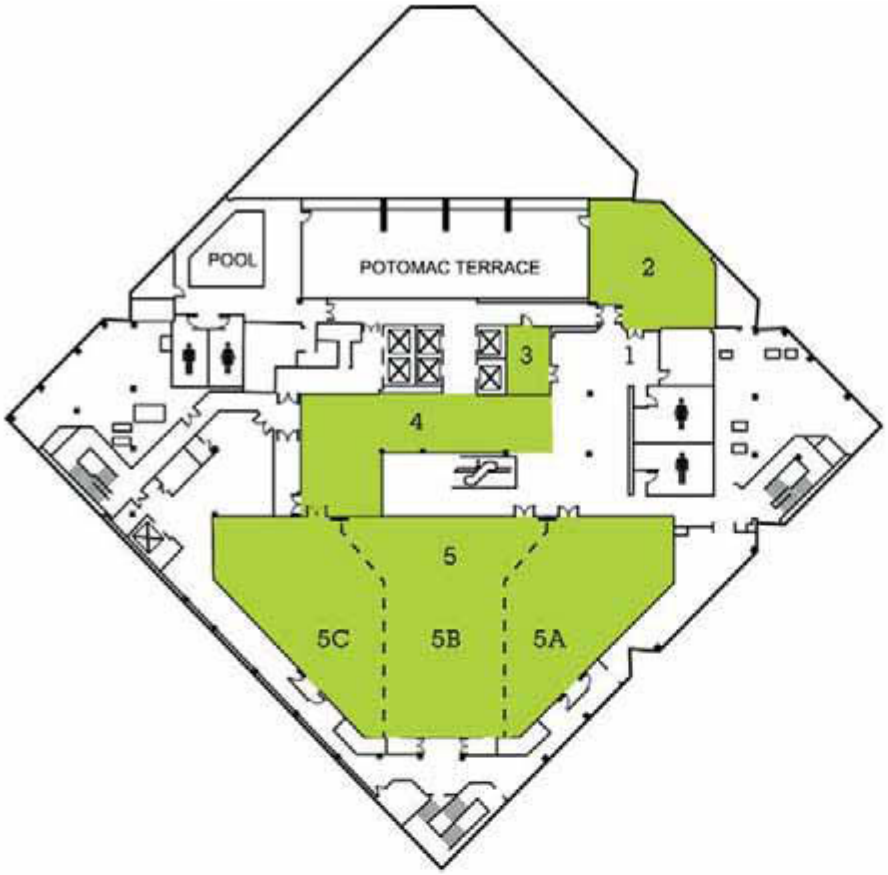


Level 200

S Pratt East Show Office 709.5 Sq. Ft.
S Pratt West Show Office 709.5 Sq. Ft.
S Otterbein North Show Office 480 Sq. Ft.
S Otterbein South Show Office 574 Sq. Ft.



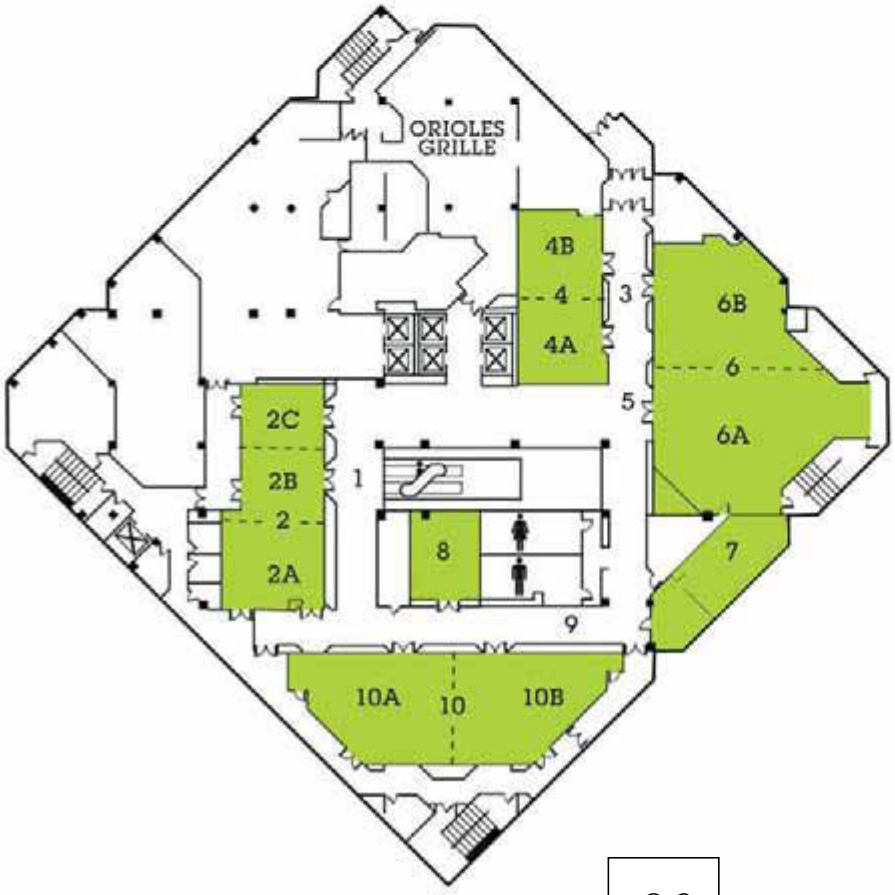
SHERATON INNER HARBOR



THIRD FLOOR

KEY

Room 1 - Potomac Gallery
Room 2 - Potomac Room
Room 3 - Patapsco
Room4 - Chesapeake Gallery
Room 5 - Chesapeake Ballroom
Room 5A - Chesapeake Ballroom I
Room 5B - Chesapeake Ballroom II
Room 5C - Chesapeake Ballroom III



SECOND FLOOR

KEY

Room 1 - Severn Gallery
Room 2 - Severn Room
Room 2A - Severn Room I
Room 2B - Severn Room II
Room 2C - Severn Room III
Room 3 - Camden Gallery
Room 4 - Camden Room
Room 4A - Camden Room I
Room 4B - Camden Room II
Room 5 - Harborview Gallery
Room 6 - Harborview Ballroom
Room 6A - Harborview Ballroom I
Room 6B - Harborview Ballroom II
Room 7 - Board Room
Room 8 - Sassafras
Room 9 - Loch Raven Gallery
Room 10 - Loch Raven Room
Room 10A - Loch Raven Room I
Room 10B - Loch Raven Room II

Technical Sessions
Key to Session/Paper Numbers

2D 2D Materials Focus Topic
AC Actinides and Rare Earths Focus Topic
AP Atom Probe Tomography Focus Topic
AS Applied Surface Science
BI Biomaterial Interfaces
BP Biomaterials Plenary Session
CS Conservation Studies of Heritage Materials Focus Topic
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
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
QC Fundamentals & Biological, Energy and Environmental Applications of Quartz Crystal Microbalance Focus Topic
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 sponsored by two divisions are labeled with both acronyms (e.g. **EM+SS**),

then: a number to indicate parallel sessions sponsored by the same division (e.g. **SS1, SS2**),
then: a dash followed by the first two characters of the day of the week:
Monday, **Tu**esday, **We**dnesday, **Th**ursday, **Fr**iday,
then: **M**orning, **A**fternoon, **L**unch, **P**oster,
then: a number to indicate the time slot scheduled for each paper.

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

Room/ Day	301	302	303	304	305	307	308	309	310
SuA									
MoM	**AC+AS+MI+SA +SS** Spectroscopy, Microscopy and Dichroism of Actinides and Rare Earths	**SE+EM+EN+PS +TF** New Developments in Atmospheric Pressure Plasma Deposition & Thin Films for Energy Applications	**VT** Vacuum Measurement, Calibration, and Primary Standards	**NS+SE** Delivering Energy and Mass at the Nanoscale	**TF+PS+SE** Advanced PVD Methods	**TF+PS** Atmospheric, Roll-to-Roll and other Manufacturing Advances in ALD	**PS** Current Challenges of Plasma Etching Technologies	**SS+AS+EN** Mechanistic Insights into Surface Reactions: Catalysis, ALD, etc.	**2D+EM+NS+PS +SS+TF** 2D Materials Growth and Processing
MoA	**AC+AS+MI+SA +SS** Theoretical Modeling of f Electron Systems	**SE+PS+TF** Pulsed Plasmas in Surface Engineering	**VT** Vacuum Measurement, Applications of UHV and Ultraclean Processes	**NS+EN** Nanophotonics and Plasmonics	**TF** Self-Assembled Monolayers, Layer-by-Layer Assemblies, & Hydrophobic/ Amphiphobic Thin Films	**TF+PS** ALD Surface Reactions and Precursors	**PS** Advanced FEOL/Gate Etching	**SS+EN** Metals, Alloys and Oxides: Structure, Reactivity & Catalysis	**2D+AS+EM+NS +SS** Dopants, Defects, and Interfaces in 2D Materials
TuM	**AC+AS+MI+SA +SS** Synchrotron Radiation & Laboratory Based Investigations of Actinides and Rare Earths	**SE+NS+TR** Nanostructured Thin Films and Coatings	**VT** Gas Dynamics, Modeling, and Pumping Systems	**NS+HI** Nanopatterning and Nanolithography	**TF+SE** Energetic Thin Films/Optical Characterization	**TF+PS** ALD for Emerging Applications	**PS** Plasma Surface Interactions I	**SS+AS+EN** Synthesis, Structure and Characterization of Oxides	**2D+AS+BI+PS+ SS** 2D Materials: Surface Chemistry, Functionalization, Bio and Sensor Applications
TuL									
TuA	**MN+NS** Multi-Scale Phenomena and Bio-Inspired MEMS/NEMS	**MG** Multi-scale Modeling in the Discovery of Advanced Materials	**VT** Vacuum Quality Analysis, Outgassing, and Control	**NS+AS+SS** Nanowires and Nanotubes: Advances in Growth & Characterization	**TF+AS+EM** Thin Film: Growth and Characterization II	**TF+EN+PS** ALD for Energy	**PS** Advanced BEOL/Interconnect Etching	**SS+NS** Nanostructures: Growth, Reactivity and Catalysis	**2D+AS+HI+MC +NS+PS+SP+SS** 2D Materials Characterization including Microscopy & Spectroscopy
TuP									
WeM	**MN** Optomechanics, Photonics, and Quantum Nanosystems	**MG** Design of New Materials	**VT** Accelerator and Large Vacuum Systems I	**NS** Nanoscale Catalysis and Surface Chemistry	**PS1** Plasma Based Ion Implantation and Ion-Surface Interactions	**TF+MS+PS** Applied ALD: Nanoelectronics and Emerging Applications	**PS2** Plasma Modeling	**SS+AS+EN** Dynamic Processes of Single Atoms and Molecules at Surfaces	**2D+EM+NS+SS +TF** Novel 2D Materials
WeL									
WeA	**MN+PS** Emerging Materials and Fabrication Technologies for MEMS/NEMS	**MS+TF** Overview: Applications and Manufacturing of Devices on Paper and Textiles	**VT** Accelerator and Large Vacuum Systems II	**NS+AS** Nanoscale Imaging and Materials Characterization	**PS+2D** Plasma Processing for 2D Materials, Coating, & Surface Modification	**TF+EM+EN** Thin Film & Nanostructured Coatings for Light Trapping, Extraction, & Plasmonic Applications	**PS** Plasma Diagnostics, Sensors, and Control	**SS** Chirality and Enantioselectivity on Surfaces	**2D+AS+EM+MI +MN+NS+TF** Properties of 2D Materials
ThM	**AP+AS+MC+ NS+SS** APT Analysis of Semiconductors, Magnetic and Oxide Materials	**MS+PS+TF** Processes for Mesoscale Structure on Paper and Textiles	**TR+NS** Bridging Scales in Tribology	**EL+AS+EM+ EN+SS** Spectroscopic Ellipsometry for Photovoltaics & Instrument Development	**PS1+TF** Plasma Deposition and Plasma Assisted ALD	**TF+PS** Advanced CVD and Chemical Vapor Infiltration Methods	**PS2+TF** Atomic Layer Etching (ALE) & Low-Damage Processing	**SS+TF** Organic Layers on Surfaces	**2D+AS+HI+NS +SS** Nanostructures including 2D Heterostructures, Patterning of 2D Materials
ThL									
ThA	**AP+AS+EN+NS +SS** APT and FIM Analysis of Catalysts and Nanomaterials	**MS+PS+TF** Functionalization of Paper and Textiles & Their Applications	**TR** Tribology in Unique Environs	**EL+AS+EM+ MC+SS** Optical Characterization of Nanostructures and Metamaterials	**PS** Plasma Processing of Nanoparticles and Nanomaterials	**TF** Thin Film for Permeation Barriers and Membranes	**PS+SE** Atmospheric Pressure Plasma Processing; Fundamental and Applications	**SS+AS+NS** Semiconductor Surfaces and Interfaces 1	**2D+EM+MI+ MN+NS+SS+TF** Novel Quantum Phenomena in 2D Materials
ThP									
FrM	**AP+AS+NS+SS** Correlative Surface and Interface Analysis with APT		**TR** Applications of Novel Materials In Tribology	**EL+AS+BI+EM +SS** Application of SE for the Characterization of Organic and Biological Materials	**PS1** Plasma Sources	**TF+AS** Thin Film Characterization	**PS2** Plasma Surface Interactions II	**SS+EM** Semiconductor Surfaces and Interfaces 2	**2D+EM+MS+ NS** 2D Materials: Device Physics and Applications

at a Glance

311	312	313	314	315	316	317	318	Hall ABC	Hall D
						BP+BI+AS Biomaterials Plenary Session			
MI+EM Interfacial Effects in Oxide Heterostructures	**SA** Synchrotron Studies of Processes in Energy Conversion, Electronic Devices & Other Materials I	**MC+AP+AS** Characterization of 3D Structures, 2D Films and Interconnects	**EM+MI+NS** Complex Oxides and Their Interfaces	**SS+EN** Photocatalysis and Photochemistry at Surfaces	**AS+MC** Quantitative Surface Analysis	**BI+AS** Biomolecules & Biomaterials Interfaces			
MI Topological Insulators/ Rashba Effect	**SA** Synchrotron Studies of Processes in Energy Conversion, Electronic Devices & Other Materials II	**MC+2D+AP+AS** Characterization of III-Vs (2:00-3:20 pm)/ Photovoltaics, EUV Masks, etc. (3:40-4:40 pm)	**EM** Nanoparticles for Electronic Materials	**EN+EM+MN+ NS+TR** Energy Harvesting with Nanostructures	**AS+BI+MC+SS** The Liquid Interface & Depth Profiling and Sputtering with Cluster Ion Beams	**BI+AS+NS** Bio/Nano Interfaces			
MI+MG Advanced Materials Discovery	**SA** Characterization of Nanostructured and LD Materials Using Synchrotron-Based Methods	**IS+AS+MC+SS** Ambient Pressure X-ray Photoelectron Spectroscopy (AP-XPS)	**EM** Advanced Interconnects and Materials	**EN+AS+EM +SE** Fuel Formation and Thermal Transport	**AS+BI+VT** Ambient Ionization Mass Spectrometry	**BI+AS+MN +NS** Biosensors		**EW** Exhibitor Technology Spotlight Session	
								EW Exhibitor Technology Spotlight Sessin	
MI+MG Development of Multiferroic Materials (2:20-5:00 pm) / MIND Panel Discussion (5:00-6:30 pm)	**SA** Free Electron Laser and Synchrotron Studies at the Molecule-Surface Interfaces	**IS+AS+MC+SS** Environmental Electron Microscopies	**EM+2D** High-k Dielectrics for Advance Semiconductor	**EN+EM+NS** Charge Storage Materials and Devices	**AS+MC+SS** Analysis of Modified Surfaces	**BI+AS** Characterization of Biointerfaces		**EW** Exhibitor Technology Spotlight Session	
									POSTER SESSIONS AC, EM, EN, MC, MI, PS, SA, SE, SS, VT
EM1 Mtls & Dev. for High Power Electr. (8:20-11:00am) / 2D Electr. Mtls & Devices (11:00 am-12:20 pm)	**SS+AS** Atomistic Modeling of Surface Phenomena	**IS+AS+MC+SS** In-Situ X-ray Absorption and Raman Spectroscopy	**EM2** High-K Dielectrics from Non-Classical Channels	**EN+AS+EM +SE** Thin Film Photovoltaics	**AS+BI+MC** Chemical Imaging in 2D and 3D	**BI+AS** Nonlinear Optical & Vibrational Spectroscopy	**SD** Fundamentals of Selective Deposition	**EW** Exhibitor Technology Spotlight Session	
								EW Exhibitor Technology Spotlight Session	
EM+EN+TF Thin Films and Materials for Energy Storage	**SP+AS+BI+NS +SS** Advances in Scanning Probe Microscopy	**IS+2D+MC+NS +SP+SS** In-Situ Scanning Microscopy	**EM** High-K Dielectrics for 2D Semiconductor	**EN+AS+EM** Organic-Inorganic Interfaces for Energy	**AS+BI+MC** Practical Surface Analysis I	**BI+MG** Design and Discovery: Biointerfaces	**SD** Process Development for Selective Deposition & Self-Aligned Patterning	**EW** Exhibitor Technology Spotlight Session	
EM1 Materials for Light Management	**SP+2D+AS+EM +MC+NS+SS** Probing Electronic and Transport Properties	**CS** Conservation Studies of Heritage Materials	**EM2** High-K Dielectrics for ReRAM and RAM	**SM+AS+BI+PS** Plasma Processing of Antimicrobial Materials and Devices	**HI+2D+AS+BI +MC** Fundamental Aspects and Imaging with the Ion Microscope	**QC+AS+BI +MN** Fundamentals and Method Development of QCM		**EW** Exhibitor Technology Spotlight Session	
								EW Exhibitor Technology Spotlight Session	
EM1 Materials for Quantum Computation	**SP+AS+BI+NS +SS** Probing Chemical Reactions at the Nanoscale	**CS** Conservation Studies of Heritage Materials 2	**EM2** Hybrid and Organic Electronics	**SM+AS+BI+PS** Plasma Processing of Biomemetic Materials	**HI+2D+AS +MC** Nanoengineering with Helium Ion Beams	**QC+AS+BI +MN** Applications of QCM			
									POSTER SESSIONS 2D, AP, AS, BI, EL, HI, IS, MN, MS, NS, QC, SP, TF, TR
EM+EN Nitrides for LED and PV Device Applications	**SP+AS+BI+EM +NS+SE+SS** Probe-Sample Interactions and Emerging Instrument Formats	**CS** Conservation Studies of Modern Heritage Materials 3	**EM+NS+TF** Transparent Electronics		**AS+MC+SS** Practical Surface Analysis II				

SUNDAY SPECIAL EVENTS

7:30 a.m.	AVS Board of Directors' Executive Session (Closed Session) — Harborview I (H)
8:00 a.m.	Quantitative Surface Analysis 2015 — 316 (CC)
8:45 a.m.	AVS Board of Directors' Meeting — Harborview I (H)
12:30 p.m.	AVS Board of Directors' Lunch — Harborview II (H)
1:00 p.m.	Tutorial: Design & Analysis of UHV Systems Using the Test Particle Montecarlo Code MOLFLOW+ — 315 (CC)
1:00 p.m.	Tutorial: Tip Reliability in Atomic Force Microscopy: The Science of Nanoscale Wear, with Applications to Nanometrology and Nanofabrication — 313 (CC)
2:00 p.m.	Companion Tour Registration — Charles Street Lobby (CC)
2:00 p.m.	AVS Editor's Meeting — Board Room (H)
3:00 p.m.	Biomaterials Plenary Session and Reception — 317 (CC)
5:15 p.m.	Professional Development Tutorial on Entrepreneurship — 314 (CC)
6:00 p.m.	Science Educators' Workshop Teachers' Reception — Harbor View II (H)
6:00 p.m.	Vacuum Technology Division Executive Committee Meeting and Dinner — Potomac (H)
6:00 p.m.	ASTM E-42 Business Meeting — Chesapeake I (H)
7:00 p.m.	ASTM E-42 Workshop: "And the Survey Says ... Extracting Information from the XPS Survey Scan" — Chesapeake I (H)
7:00 p.m.	Short Course Committee Meeting — Camden I (H)
7:00 p.m.	International Dignitaries & Chapter Chairs Reception (Invitation Only) — Presidential Suite (H)

CC = Baltimore Convention Center
H = Sheraton Inner Harbor

= New Attendee Networking Events

NOTES

Biomaterials Plenary Session
Room: 317 - Session BP+BI+AS-SuA

Biomaterials Plenary Session
Moderators: M.R. Alexander, The University of Nottingham, UK, I.S. Gilmore, National Physical Laboratory

3:00 pm	**BP+BI+AS-SuA1 Invited** Imaging Mass Spectrometry: Molecular Mapping Beyond the Microscope, **R.M. CAPRIOLI**, Vanderbilt University School of Medicine	
3:20 pm	Invited talk continued.	
3:40 pm	**BP+BI+AS-SuA3 Invited** Nanotechnology Platforms for Triple Negative Breast Cancer, **M. FERRARI**, Houston Methodist Research Institute	
4:00 pm	Invited talk continued.	
4:20 pm	**BP+BI+AS-SuA5 Invited** Nanotechnology in the Pharmaceutical Sciences: From Lab to Industry, **M.C. DAVIES**, The University of Nottingham and Molecular Profiles Ltd., UK	
4:40 pm	Invited talk continued.	
5:00 pm	**BP+BI+AS-SuA7 Invited** Shape Control in DNA–Polymer Nanoparticle Assembly and Gene Delivery, **H.-Q. MAO**, Whiting School of Engineering	
5:20 pm	Invited talk continued.	
5:40 pm		

Anticipated Schedule
Sunday Morning, November 9, 2014

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, November 9, 2014

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		

MONDAY SPECIAL EVENTS

7:00 a.m.	Companion Tour Registration — Main Lobby (H)
7:00 a.m.	History Committee Meeting and Breakfast — Camden I (H)
8:00 a.m.	Science Educators' Workshop — Loch Raven (H)
12:00 p.m.	Plenary Lecture: Tobin J. Marks, Northwestern Univ., "New Materials Strategies for Hybrid Electronic Circuitry" — Ballroom II (CC)
12:00 p.m.	Science Educators' Workshop Lunch — Potomac (H)
1:15 p.m.	2015 AVS Program Committee Meeting and Lunch — Harbor View I (H)
1:15 p.m.	Publications Committee Meeting and Lunch — Camden I (H)
1:15 p.m.	Professional Development Workshop: "Welcome to AVS" — 314 (CC)
1:30 p.m.	Recommended Practices Committee Meeting and Lunch — Board Room (H)
3:00 p.m.	Vacuum Technology Division Business Meeting — 303 (CC)
3:40 p.m.	Peter Mark Award Lecture: J. Zide, Univ. of Delaware, "Novel Semiconductor and Epitaxial Nanocomposite Materials for Electronic and Photonic Applications" — 314 (CC)
5:00 p.m.	New Member Meet-n-Greet — Ballroom III (CC)
5:30 p.m.	Welcome Mixer — Ballroom III (CC)
5:45 p.m.	Biomaterial Interfaces Division Business Meeting — 317 (CC)
6:00 p.m.	Electronic Materials and Processing Division Forum & Reception: Careers at LAM Research — 314 (CC)
6:30 p.m.	Biointerphases Reception — TBD (Offsite)
7:00 p.m.	Applied Surface Science Division Executive Committee Meeting and Dinner — Camden II (H)
7:15 p.m.	Publications Committee Meeting and Dinner — TBD (Offsite)
7:30 p.m.	Thin Film Division/Harper Award TED-Talk Competition (Invite Only) — 305 (CC)

CC = Baltimore Convention Center
H = Sheraton Inner Harbor

= New Attendee Networking Events

MONDAY SHORT COURSES

8:30 a.m.	Comprehensive Course on Surface Analysis and Depth Profiling by XPS or ESCA, AES, FIB & SIMS (2-days)
8:30 a.m.	Fundamentals of Vacuum Technology (4-days)
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 Sheraton Inner Harbor Hotel (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: 310 - Session 2D+EM+NS+PS+SS+TF-MoM** **2D Materials Growth and Processing** **Moderator:** T. Greber, University of Zurich, Switzerland	**Actinides and Rare Earths Focus Topic** **Room: 301 - Session AC+AS+MI+SA+SS-MoM** **Spectroscopy, Microscopy and Dichroism of Actinides and Rare Earths** **Moderator:** D. Shuh, Lawrence Berkeley National Laboratory
8:20 am	**2D+EM+NS+PS+SS+TF-MoM1 Invited** Exploring the Flatlands: Synthesis, Characterization and Engineering of Two-Dimensional Materials, **J. LOU**, Rice University	**AC+AS+MI+SA+SS-MoM1 Invited** Novel Synthetic and Spectroscopic Techniques in Actinide Materials Chemistry, **S. MINASIAN**, Lawrence Berkeley National Laboratory, E. BATISTA, Los Alamos National Laboratory, C.H. BOOTH, Lawrence Berkeley National Laboratory, D. CLARK, Los Alamos National Laboratory, J. KEITH, Colgate University, W. LUKENS, Lawrence Berkeley National Laboratory, S. KOZIMOR, R.L. MARTIN, Los Alamos National Laboratory, D. NORDLUND, SLAC National Accelerator Laboratory, D. SHUH, T. TYLISZCZAK, Lawrence Berkeley National Laboratory, D. SOKARAS, SLAC National Accelerator Laboratory, X.-D. WENG, Los Alamos National Laboratory, T.-C. WENG, SLAC National Accelerator Laboratory
8:40 am	Invited talk continued.	Invited talk continued.
9:00 am	**2D+EM+NS+PS+SS+TF-MoM3** Influence of Substrate Orientation on the Growth of Graphene on Cu Single Crystals, **T.R. MOWLL**, University at Albany-SUNY, Z.R. ROBINSON, U.S. Naval Research Laboratory, P. TYAGI, E.W. ONG, C.A. VENTRICE, JR., University at Albany-SUNY	**AC+AS+MI+SA+SS-MoM3 Invited** X-ray Magnetic Circular Dichroism of Actinides, **A. ROGALEV**, F. WILHELM, European Synchrotron Radiation Facility (ESRF), France
9:20 am	**2D+EM+NS+PS+SS+TF-MoM4** Synthesis of Large Scale MoS_2-Graphene Heterostructures, **K.M. MCCREARY**, A.T. HANBICKI, J. ROBINSON, B.T. JONKER, Naval Research Laboratory	Invited talk continued.
9:40 am	**2D+EM+NS+PS+SS+TF-MoM5** Growth of 2D MoS_2 Films by Magnetron Sputtering, **A.A. VOEVODIN**, Air Force Research Laboratory, C. MURATORE, University of Dayton, J.J. HU, Air Force Research Laboratory/UDRI, B. WANG, M.A. HAQUE, Pennsylvania State University, J.E. BULTMAN, M.L. JESPERSON, Air Force Research Laboratory/UDRI, P.J. SHAMBERGER, Texas A&M University, R. STEVENSON, Air Force Research Laboratory, A. WAITE, Air Force Research Laboratory/UTC, M.E. MCCONNEY, R. SMITH, Air Force Research Laboratory	**AC+AS+MI+SA+SS-MoM5 Invited** Magnetic Circular Dichroism Measured with Transmission Electron Microscope, **J. RUSZ**, Uppsala University, Sweden
10:00 am	**2D+EM+NS+PS+SS+TF-MoM6** Formation of Graphene on the C-face of SiC{0001}: Experiment and Theory, **J. LI**, G. HE, M. WIDOM, R.M. FEENSTRA, Carnegie Mellon University	Invited talk continued.
10:20 am	**BREAK**	**BREAK**
10:40 am	**2D+EM+NS+PS+SS+TF-MoM8 Invited** Graphene on Hexagonal Boron Nitride Heterostacks Grown by UHV-CVD on Metal Surfaces, **J. OSTERWALDER**, S. ROTH, A. HEMMI, University of Zurich, Switzerland, F. MATSUI, Nara Institute of Science and Technology, Japan, T. GREBER, University of Zurich, Switzerland	**AC+AS+MI+SA+SS-MoM8** The Microstructure of Plutonium Hydride Growth Sites, **M. BRIERLEY**, J.P. KNOWLES, AWE, UK, M. PREUSS, A.H. SHERRY, University of Manchester, UK
11:00 am	Invited talk continued.	**AC+AS+MI+SA+SS-MoM9** Hydrides of U-Mo and U-Zr Alloys: Structure and Electronic Properties, **L. HAVELA**, M. PAUKOV, I. TKACH, D. DROZDENKO, M. CIESLAR, Z. MATEJ, Charles University, Czech Republic
11:20 am	**2D+EM+NS+PS+SS+TF-MoM10** Kinetics of Monolayer Graphene Growth by Carbon Segregation on Pd(111), **A. EBNONNASIR**, H.S. MOK, Y. MURATA, University of California at Los Angeles, S. NIE, K.F. MCCARTY, Sandia National Laboratories, C.V. CIOBANU, Colorado School of Mines, S. KODAMBAKA, University of California at Los Angeles	**AC+AS+MI+SA+SS-MoM10** Unraveling the Mystery of Reactively-Sputtered UO(4+x), **D.D. ALLRED**, R.S. TURLEY, B.S. MCKEON, A. DIWAN, E.A. SCOTT, R.R. VANFLEET, Brigham Young University
11:40 am		**AC+AS+MI+SA+SS-MoM11** Cathodoluminescence and Band Gap Studies of Single Crystal $U_xTh_{1-x}O_2$ (x = 0.00, 0.01, 0.22), **D. TURNER**, Oak Ridge Institute for Science and Education, J. REDING, R. HENGEHOLD, T. KELLY, Air Force Institute of Technology, J.M. MANN, Air Force Research Laboratory, J. KOLIS, Clemson University, J. PETROSKY, Air Force Institute of Technology

	Applied Surface Science **Room: 316 - Session AS+MC-MoM** **Quantitative Surface Analysis** **Moderators:** J.A. Ohlhausen, Sandia National Laboratories, W.F. Stickle, Hewlett Packard	**Biomaterial Interfaces** **Room: 317 - Session BI+AS-MoM** **Biomolecules & Biomaterials Interfaces** **Moderator:** I. Reviakine, CIC biomaGUNE, Spain
8:20 am	**AS+MC-MoM1** Automating Multi-Technique Surface Analyses for Materials Characterisation, **A.E. WRIGHT**, P. MACK, T.S. NUNNEY, A. BUSHELL, A. YEADON, Thermo Fisher Scientific, UK	
8:40 am	**AS+MC-MoM2** The *S'* component in the Si 2*p* X-ray Photoemission Spectrum of Si [001], **A. HERRERA-GOMEZ**, CINVESTAV-Queretaro, Mexico, M.O. VAZQUEZ-LEPE, Universidad de Guadalajara, Mexico, P.G. MANI-GONZALEZ, Universidad Autónoma de Ciudad Juárez, Mexico, O. CEBALLOS-SANCHEZ, CINVESTAV-Queretaro, Mexico	**BI+AS-MoM2** Deposition of Porous Polyparylene Layers with Even Thickness in Narrow Tubes, **G.F. FRANZ**, H. HEIDARI, Munich University of Applied Sciences, Germany
9:00 am	**AS+MC-MoM3 Invited** Quantitative Analysis of Nanostructured Surfaces by means of X-ray Photoelectron Spectroscopy: Theory and Applications, **W.S.M. WERNER**, Vienna University of Technology, Austria	**BI+AS-MoM3** Deciphering the Scaling of Single Molecule Acid-Amine Interactions using Jarzynski's Equality, **S. RAMAN**, T. UTZIG, T. BAIMPOS, B.R. SHRESTHA, M. VALTINER, Max Planck Institut fur Eisenforschung GmbH, Germany
9:20 am	Invited talk continued.	**BI+AS-MoM4** Fabrication of ssDNA Monolayers, Custom Designed ssDNA Arrays and Brush Patterns in Biorepulsive Templates by Promoted Exchange Reaction, M.N. KHAN, University of Heidelberg, Germany, V. TJONG, A. CHILKOTI, Duke University, **M. ZHARNIKOV**, University of Heidelberg, Germany
9:40 am	**AS+MC-MoM5** Effective Attenuation Lengths for Hard X-ray Photoelectron Spectroscopy (HAXPES), A. JABLONSKI, Polish Academy of Sciences, Poland, **C.J. POWELL**, National Institute of Standards and Technology (NIST), S. TANUMA, National Institute for Materials Science (NIMS), Japan	**BI+AS-MoM5 Invited** High Throughput BioMaterials Screening using Microarrays and High Information Content Imaging Methods, S. BOUDJABI, D. COVELLI, M. KERAMANE, E. LUCKHAM, **J.D. BRENNAN**, McMaster University, Canada
10:00 am	**AS+MC-MoM6** Angle-Resolved XPS Test Structures Fabricated *In Situ* by Argon Ion and Argon Cluster Ion Treatment, **P.J. CUMPSON**, A.J. BARLOW, J.F. PORTOLES, N. SANO, Newcastle University, UK	Invited talk continued.
10:20 am	**BREAK**	**BREAK**
10:40 am	**AS+MC-MoM8** Metrology for Surface Chemical Analysis: Active Parties, Status and Challenges, **W. UNGER**, BAM Federal Institute for Materials Research and Testing, Germany	**BI+AS-MoM8** Osteocalcin Adsorption onto Calcium Phosphate and Silica Surfaces, L.A. SCUDELLER, **D.G. CASTNER**, University of Washington
11:00 am	**AS+MC-MoM9** Local Crystallography: Phases, Symmetries, and Defects from Bottom Up, A. BELIANINOV, Q. HE, A,. BORISEVICH, S. JESSE, **S.V. KALININ**, Oak Ridge National Laboratory	**BI+AS-MoM9** Reversible Activation of a pH-sensitive Cell Penetrating Peptides Attached to Gold Surfaces, **J.E. BAIO**, Oregon State University, D. SCHACH, University of Chicago, M. BONN, T. WEIDNER, Max Planck Institute for Polymer Research, Germany
11:20 am	**AS+MC-MoM10** Chemical Warfare Agent Surface Adsorption: Hydrogen Bonding of Sarin and Soman to Amorphous Silica, **E.M. DURKE**, W.O. GORDON, Edgewood Chemical Biological Center, A.R. WILMSMEYER, Augustana College, D. TROYA, J.R. MORRIS, Virginia Tech	**BI+AS-MoM10** Polydopamine Modification Using Small Molecule Thiols and Dithiols: Problems and Solutions for Creating Protein Resistant Coatings, **M. WALKER**, A. VAISH, D. VANDERAH, National Institute of Standards and Technology (NIST)
11:40 am	**AS+MC-MoM11** The Shake-up Satellites in the Fe 2*p* Core Level X-ray Photoelectron Spectra Analyzed with the Double Lorentzian Line Shape, **M. BRAVO-SANCHEZ**, CINVESTAV-Queretaro, Mexico, J.A. HUERTA-RUELAS, Centro de Investigación en Ciencia Aplicada y Tecnología Avanzada, Mexico, A. HERRERA-GOMEZ, CINVESTAV-Queretaro, Mexico, M.O. VAZQUEZ-LEPE, Universidad de Guadalajara, Mexico, F. ESPINOSA-MAGAÑA, CIMAV-Unidad Chihuahua, Mexico	**BI+AS-MoM11** A Process to Functionalize Polyaniline for Biotin-Avidin Biosensing, **T. SHAW**, M.D. WILLIAMS, Clark Atlanta University

	Electronic Materials and Processing **Room: 314 - Session EM+MI+NS-MoM** **Complex Oxides and Their Interfaces** **Moderator:** J. Hilton, Mantis Deposition, L.M. Porter, Carnegie Mellon University	**Materials Characterization in the Semiconductor Industry Focus Topic** **Room: 313 - Session MC+AP+AS-MoM** **Characterization of 3D Structures, 2D Films and Interconnects** **Moderators:** P. Ronsheim, CTO, PAR Technical Consulting
8:20 am	**EM+MI+NS-MoM1 Invited** Emergent Phenomena at Complex Oxide Interfaces, **S. STEMMER**, University of California at Santa Barbara	**MC+AP+AS-MoM1 Invited** Dopant/Carrier and Compositional Profiling for 3D-Structures and Confined Volumes., **W. VANDERVORST**, A. KUMAR, J. DEMEULEMEESTER, A. FRANQUET, P. EYBEN, J. BOGDANOWICZ, M. MANNARINO, A. KAMBHAM, U. CELANO, IMEC, KU Leuven Belgium
8:40 am	Invited talk continued.	Invited talk continued.
9:00 am	**EM+MI+NS-MoM3** Atomic and Electronic Structure of the Ferroelectric $BaTiO_3$-Ge (001) Interface, **K.D. FREDRICKSON**, The University of Texas at Austin, P. PONATH, A.B. POSADAS, University of Texas at Austin, M.R. MCCARTNEY, T. AOKI, D.J. SMITH, Arizona State University, A.A. DEMKOV, University of Texas at Austin	**MC+AP+AS-MoM3** Characterization of the Periodicity (Pitch) and Stress of Transistor Fin Structures using X-Ray Diffraction Reciprocal Space Mapping, **A.C. DIEBOLD**, M. MEDIKONDA, SUNY College of Nanoscale Science and Engineering, M. WORMINGTON, Jordan Valley Semiconductors Inc
9:20 am	**EM+MI+NS-MoM4** Strain-Controlled Stochiometry Variations in $CaMnO_3$ Epitaxial Thin Films, **R. KOLAGANI**, G. YONG, Z. WARECKI, C. STUMPF, D. SCHAEFER, P. SHARMA, C. HART, A. BURGER, Towson University	**MC+AP+AS-MoM4** MBE Grading Techniques for the Growth of InAsSb Films with Inherent Properties Unaffected by Strain, **W.L. SARNEY**, S.P. SVENSSON, US Army Research Laboratory, Y. LIN, D. WANG, L. SHTERENGAS, D. DONETSKY, G. BELENKY, Stony Brook University
9:40 am	**EM+MI+NS-MoM5 Invited** Controlling Complex Oxide Chemistry to Enable Advanced Dielectric, Ferroelectric, and Electronic Applications, **L.W. MARTIN**, University of California, Berkeley	**MC+AP+AS-MoM5** Quantitative 3-D Imaging of Filaments in Hybrid Resistive Memory Devices by Combined XPS and ToF-SIMS Spectroscopies, Y. BUSBY, **J.-J. PIREAUX**, University of Namur, Belgium
10:00 am	Invited talk continued.	**MC+AP+AS-MoM6** High Throughput Electron Diffraction-Based Metrology of Nanocrystalline Materials, X. LIU, Carnegie Mellon University, D. CHOI, Korea Railroad Research Institute, Republic of Korea, N.T. NUHFER, Carnegie Mellon University, D.L. YATES, T. SUN, University of Central Florida, G.S. ROHRER, Carnegie Mellon University, K.R. COFFEY, University of Central Florida, **K. BARMAK**, Columbia University
10:20 am	**BREAK**	**BREAK**
10:40 am	**EM+MI+NS-MoM8 Invited** Monolithic Integration of Epitaxial $BaTiO_3$ on Si and SiGe for Ferroelectric Devices, L. MAZET, R. BACHELET, G. SAINT-GIRONS, Institut des Nanotechnologies de Lyon (INL) - CNRS - ECL, France, D. ALBERTINI, B. GAUTIER, Institut des Nanotechnologies de Lyon (INL) - CNRS - INSA de Lyon, France, M.M. FRANK, J. JORDAN-SWEET, I. LAUER, V. NARAYANAN, IBM T.J. Watson Research Center, M. HYTCH, S. SCHAMM-CHARDON, CEMES - CNRS - Université de Toulouse, France, **C. DUBOURDIEU**, Institut des Nanotechnologies de Lyon (INL) - CNRS - ECL, France	**MC+AP+AS-MoM8 Invited** LEIS Characterization of the Outer Surface, Ultra-Thin Layers and Contacts, **H.H. BRONGERSMA**, ION-TOF / Tascon / Calipso, Netherlands, P. BRUENER, T. GREHL, ION-TOF GmbH, Germany, H.R.J. TER VEEN, Tascon GmbH, Germany
11:00 am	Invited talk continued.	Invited talk continued.
11:20 am	**EM+MI+NS-MoM10** The Surface Study of Hexagonal $LuFeO_3$ Multiferroic Thin Films, **S. CAO**, X.S. XU, T. PAUDEL, E.Y. TSYMBAL, P.A. DOWBEN, University of Nebraska-Lincoln	**MC+AP+AS-MoM10** Backside versus Frontside Characterization of High-k/Metal Gate Stacks for CMOS sub-14 nm Technological Nodes, **E. MARTINEZ**, CEA, LETI, MINATEC Campus, France, B. SAIDI, P. CAUBET, F. PIALLAT, STMicroelectronics, France, H. KIM, CEA, LETI, MINATEC Campus, France, S. SCHAMM-CHARDON, CEMES-CNRS, France, R. GASSILLOUD, CEA, LETI, MINATEC Campus, France
11:40 am	**EM+MI+NS-MoM11** Integration of Ferroelectric Perovskites on Ge(001) by ALD: A Case Study of $BaTiO_3$, **T.Q. NGO**, M.D. MCDANIEL, S.N. CHOPRA, J.G. EKERDT, A.B. POSADAS, A.A. DEMKOV, The University of Texas at Austin	**MC+AP+AS-MoM11** Charge Storage Properties of $Al/(1-x)BaTiO_3$-$_x Ba(Cu_{1/3}Nb_{2/3})O_3$ (x = 0.025) (BTBCN)/HfO_2/p-Si Metal/Ferroelectric/Insulator/Semiconductor Devices, **S. KUNDU**, M. CLAVEL, D. MAURYA, M. HUDAIT, S. PRIYA, Virginia Tech

	Magnetic Interfaces and Nanostructures **Room: 311 - Session MI+EM-MoM**	**Nanometer-scale Science and Technology** **Room: 304 - Session NS+SE-MoM**
	Interfacial Effects in Oxide Heterostructures **Moderator:** G.J. Szulczewski, The University of Alabama	**Delivering Energy and Mass at the Nanoscale** **Moderator:** P.E. Sheehan, Naval Research Laboratory
8:20 am	**MI+EM-MoM1** Theory of the Intrinsic Spin Orbit Torque : 2D Spin Orbit Coupling Magnetism at 3d/5d Thin Film Interface, A. KALITSOV, University of Alabama, M. CHSHIEV, SPINTEC, France, W. BUTLER, **O.N. MRYASOV**, University of Alabama	**NS+SE-MoM1 Invited** Mechanical Properties of Polymer Systems Using Atomic Force Microscopy, **G.F. MEYERS**, The Dow Chemical Company
8:40 am	**MI+EM-MoM2** Linear Dichroism of $La_{0.7}Sr_{0.3}MnO_3$ Magnetic Dead Layers, **R. TRAPPEN**, M.B. HOLCOMB, J. ZHOU, C.-Y. HUANG, West Virginia University, Y.-H. CHU, V. TRA, National Chiao Tung University, Taiwan, Republic of China	Invited talk continued.
9:00 am	**MI+EM-MoM3 Invited** Magnetotransport at the Superconducting $LaAlO_3/SrTiO_3$ Interface, **S. GARIGLIO**, D. LI, A. FÊTE, W. LIU, J.-M. TRISCONE, University of Geneva, Switzerland	**NS+SE-MoM3** Extension of Loss-Tangent Mode to Characterization of Materials' Stiffness and Damping, X. YU, M. TAO, **N.A. BURNHAM**, Worcester Polytechnic Institute
9:20 am	Invited talk continued.	**NS+SE-MoM4** Nanomechanical Spectroscopy with Lorentz Contact Resonance AFM, **E. DILLON**, K. KJOLLER, R. SHETTY, Anasys Instruments, D.G. YABLON, SurfaceChar LLC, C.B. PRATER, Anasys Instruments
9:40 am	**MI+EM-MoM5 Invited** Symmetry Breaking in Strained Vanadium Dioxide Films, **M. LIU**, UC San Diego	**NS+SE-MoM5** Direct Mechanical Measurements of Viscoelasticity in Simple Liquids Using Vibrating Nanostructures, **M. PELTON**, University of Maryland, Baltimore County, D. CHAKRABORTY, University of Melbourne, Australia, E. MALACHOSKY, P. GUYOT-SIONNEST, University of Chicago, J.E. SADER, University of Melbourne, Australia
10:00 am	Invited talk continued.	**NS+SE-MoM6** Electronic and Optical Properties of Nanometer Sized Structures formed via Local Intercalated of Carbon in Layered Materials, **A.J. STOLLENWERK**, University of Northern Iowa
10:20 am	**BREAK**	**BREAK**
10:40 am	**MI+EM-MoM8 Invited** Interface Assisted Molecular Spintronics, **K.V. RAMAN**, Indian Institute of Science, India	**NS+SE-MoM8 Invited** Effects of Chemical Bonding on Heat Transfer Across Interfaces, **P. BRAUN**, M. LOSEGO, M. GRADY, N. SOTTOS, D.G. CAHILL, University of Illinois at Urbana-Champaign
11:00 am	Invited talk continued.	Invited talk continued.
11:20 am	**MI+EM-MoM10** Coverage-Dependent Surface Magnetism of Iron Phthalocyanine on an O-Fe(110) Surface, **J.E. ROWE**, D.B. DOUGHERTY, North Carolina State University, E. VESCOVO, National Synchrotron Light Source	**NS+SE-MoM10** Enhanced Thermal Transport at Covalently Functionalized Carbon Nanotube Array Interfaces to Oxide-forming and Noble Metals, S. KAUR, Lawrence Berkeley National Laboratory, N. RARAVIKAR, Intel Corporation, B.A. HELMS, Lawrence Berkeley National Laboratory, R. PRASHER, Sheetak, Inc., **D.F. OGLETREE**, Lawrence Berkeley National Laboratory
11:40 am	**MI+EM-MoM11** Time Resolved Imaging At 10Ghz And Beyond Using The Ssrl Scanning Transmission X-Ray Microscope, **H. OHLDAG**, SLAC National Accelerator Laboratory, S. BONETTI, R. KUKREJA, Stanford University, J. FRISCH, H. DUERR, J. STOEHR, SLAC National Accelerator Laboratory	**NS+SE-MoM11** Desktop Nanofabrication with Cantilever-Free Scanning Probes, **K.A. BROWN**, D.J. EICHELSDOERFER, X. LIAO, C.A. MIRKIN, Northwestern University

	Plasma Science and Technology Room: 308 - Session PS-MoM Current Challenges of Plasma Etching Technologies **Moderator:** S. Sriraman, Lam Research Corp	Novel Trends in Synchrotron and FEL-Based Analysis Focus Topic Room: 312 - Session SA-MoM Synchrotron Studies of Processes in Energy Conversion, Electronic Devices and Other Materials I **Moderator:** F.J. Himpsel, University of Wisconsin-Madison
8:20 am	**PS-MoM1 Invited** Dielectric Etch Challenges and Evolutions, **M. HONDA**, Tokyo Electron Miyagi Limited, Japan	**SA-MoM1 Invited** Looking Into Buried Interfaces with Soft/hard X-Ray Photoemission and Standing-Wave Excitation, **C.S. FADLEY**, University of California, Davis
8:40 am	Invited talk continued.	Invited talk continued.
9:00 am	**PS-MoM3** Improving Selectivity for 10nm BEOL Etch Using C5HF7 Gas, **R.L. BRUCE**, IBM T.J. Watson Research Center, T. SUZUKI, M. NAKAMURA, ZEON Chemicals L.P., A. ITOU, G. MATSUURA, Zeon Corporation, S.U. ENGELMANN, N.P. MARCHACK, E.M. SIKORSKI, IBM T.J. Watson Research Center, J. LEE, IBM Albany Nanotech Center, E.A. JOSEPH, IBM T.J. Watson Research Center	**SA-MoM3** Hard X-ray Photoelectron Spectra (HXPES) of Bulk Non-Conducting Silicate Glasses, **Y.F. HU**, Q.F. XIAO, X.Y. CUI, D. WANG, Canadian Light Source, Canada, G.M. BANCROFT, H.W. NESBITT, M. BIESINGER, University of Western Ontario, Canada
9:20 am	**PS-MoM4** Effect of 147nm Photons on Porous Organo-Silicon Glass Materials and Damage Improvement by Optimized Cu/Low-k Integration Approaches, **L. ZHANG**, IMEC, KU Leuven, Belgium, J.-F. DE MARNEFFE, IMEC, Belgium, M. LUKASZEWICZ, Wroclaw University of Technology, Poland, S. BARRY-PORTER, F. VAJDA, Trinity College Dublin, Ireland, Y. SUN, IMEC, Belgium, M.H. HEYNE, IMEC, KU Leuven, Belgium, M. BAKLANOV, IMEC, Belgium	**SA-MoM4** *In Situ* Study of Plasma Assisted Atomic Layer Epitaxy of III-N Semiconductors Using Synchrotron X-ray Methods, N. NEPAL, Naval Research Laboratory, M.G. ERDEM, Boston University, S.D. JOHNSON, V.R. ANDERSON, Naval Research Laboratory, A. DEMASI, K.F. LUDWIG, Boston University, **C.R. EDDY, JR.**, Naval Research Laboratory
9:40 am	**PS-MoM5** Non-PFC Plasma Chemistries for Patterning Low-k Dielectric Materials, **J.K. CHEN**, N. ALTIERI, M. PAINE, T. KIM, J.P. CHANG, UCLA	**SA-MoM5 Invited** Application of Synchrotron Radiation Based Hard X-ray Photoelectron Spectroscopy (HAXPES) to Characterise Semiconductor Device Structures, **G. HUGHES**, L. WALSH, Dublin City University, Ireland, J.C. WOICIK, National Institute of Standards and Technology (NIST), P.K. HURLEY, Tyndall National Institute, Ireland
10:00 am	**PS-MoM6** Optimization of the Optical Transmission of Submicron Silicon-on-Insulator Rib Waveguides, **M. FOUCHIER**, E. PARGON, CNRS/UJF/CEA-LTM, France, B. BEN BAKIR, P. BRIANCEAU, J. HARDUIN, S. BARNOLA, P. GROSSE, CEA-LETI, France	Invited talk continued.
10:20 am	**BREAK**	**BREAK**
10:40 am	**PS-MoM8** Using Hydrogen Post Etch Treatment (H2 PET) to Resolve Poly Residue Defect Issue of Dummy Poly Removal (DPR) in hi-K Metal Gate Processing, **C.-C.. WANG**, F.Y. CHANG, S.-Y. LU, United Microelectronics Co., Taiwan, Republic of China, P.-W. HUANG, Y.-C. KAO, S.-Y. CHENG, T.-T. SU, Lam Research Corporation	**SA-MoM8 Invited** Correlative Probing of the Surface Chemistry and Electron Transport of Nanodevices in Operando Mode using Scanning Photoelectron Emission Microscopy, **ANDREI KOLMAKOV**, National Institute of Standards and Technology (NIST) Invited talk continued.
11:00 am	**PS-MoM9** Sidewall Roughness Characterization of an Advanced Spacer Patterning Process, **E. DUPUY**, M. FOUCHIER, E. PARGON, CNRS-LTM, France, J. PRADELLES, CEA-Léti, France, H. GRAMPEIX, CEA-LETI, France, P. PIMENTA-BARROS, S. BARNOLA, CEA, LETI, France, O. JOUBERT, LTM - CEA/LETI, France	
11:20 am	**PS-MoM10** Improving Pattern Fidelity for Selective Etch Processes, **N.P. 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, ZEON Chemicals L.P., A. ITOU, H. MATSUMOTO, Zeon Corporation	**SA-MoM10 Invited** A NEXAFS Spectromicroscope for Structural and Chemical Imaging Analysis, **C. WEILAND**, Synchrotron Research, Inc., Z. FU, C. JAYE, D.A. FISCHER, National Institute of Standards and Technology, K. SCAMMON, University of Central Florida, P.E. SOBOL, E.L. PRINCIPE, Synchrotron Research, Inc.
11:40 am		Invited talk continued.

	Advanced Surface Engineering Room: 302 - Session SE+EM+EN+PS+TF-MoM New Developments in Atmospheric Pressure Plasma Deposition and Thin Films for Energy Applications **Moderators:** H. Barankova, Uppsala University, Sweden, M. Stueber, Karlsruhe Institute of Technology, Germany	Surface Science Room: 309 - Session SS+AS+EN-MoM Mechanistic Insights into Surface Reactions: Catalysis, ALD, etc. **Moderators:** F. Netzer, University of Graz, Austria J. Lee, National Energy Technology Laboratory
8:20 am		**SS+AS+EN-MoM1 Invited** Electron Trap or Atomic Hydrogen Recombination Catalyst? The Role of Metals in Photocatalysis Revisited, J.-B. JOO, R.J. DILLON, I. LEE, C.J. BARDEEN, **F. ZAERA**, University of California - Riverside
8:40 am	**SE+EM+EN+PS+TF-MoM2** Real Time Characterization of Polymer Surface Modification by an Atmospheric Pressure Plasma Jet, **A.J. KNOLL**, P. LUAN, E.A.J. BARTIS, C. HART, University of Maryland, College Park, Y. RAITSES, Princeton Plasma Physics Laboratory, G.S. OEHRLEIN, University of Maryland, College Park	Invited talk continued.
9:00 am	**SE+EM+EN+PS+TF-MoM3 Invited** Gas-Liquid Mixed Phase Plasma at Atmospheric Pressure, **A. ANDO**, G. TANG, R. OHNO, A. KOMURO, K. TAKAHASHI, Tohoku University, Japan	**SS+AS+EN-MoM3** Atomically Resolved Observation of Defects Catalysing Phase Transitions in an Adsorbate System, M. CORDIN, B.A.J. LECHNER, S. DUERRBECK, A. MENZEL, **E. BERTEL**, University of Innsbruck, Austria, J. REDINGER, Vienna University of Technology, Austria, C. FRANCHINI, University of Vienna, Austria
9:20 am	Invited talk continued.	**SS+AS+EN-MoM4** The Co-adsorption of Water and ammonia on Pt(111), B.A.J. LECHNER, Lawrence Berkeley National Laboratory, Y. KIM, H. KANG, Seoul National University, Korea, **M.B. SALMERON**, Lawrence Berkeley National Laboratory
9:40 am	**SE+EM+EN+PS+TF-MoM5** Atmospheric Pressure High Power Impulse Plasma Source (AP-HiPIPS) for Plasma Enhanced Chemical Vapor Deposition of Thin Films, **V.Z. POENITZSCH**, R. WEI, M.A. MILLER, K. COULTER, Southwest Research Institute	**SS+AS+EN-MoM5** Thermal Decomposition of Ethylene on Ru(001), **Y. REN**, I. WALUYO, M. TRENARY, University of Illinois at Chicago
10:00 am	**SE+EM+EN+PS+TF-MoM6** Importance of Argon's Spectral Emission for Plasma Diagnostics at an Atmospherics Open Air Plasma Discharge, **V. MILOSAVLJEVIC**, J. LALOR, P. BOURKE, P.J. CULLEN, Dublin Institute of Technology, Ireland	**SS+AS+EN-MoM6** Kinetics of Alkyl Species on Pt(111), **Y. SONG**, I.A. HARRISON, University of Virginia
10:20 am	**BREAK**	**BREAK**
10:40 am	**SE+EM+EN+PS+TF-MoM8 Invited** Hot 'n Flaky: Thermal Properties of Layered Atomic Structures, **C. MURATORE**, University of Dayton, V. VARSHNEY, Air Force Research Laboratory/UTC, J.J. HU, Air Force Research Laboratory/UDRI, A.A. VOEVODIN, Air Force Research Laboratory	**SS+AS+EN-MoM8** C_2 Hydrogenation at Ambient Pressure on Pt(111), **J. KROOSWYK**, M. TRENARY, University of Illinois at Chicago
11:00 am	Invited talk continued.	**SS+AS+EN-MoM9** Reaction Kinetics and Mechanism between Nitrate Radicals and Functionalized Organic Surfaces, **YF. ZHANG**, J.R. MORRIS, Virginia Tech
11:20 am	**SE+EM+EN+PS+TF-MoM10** Resonance Enhancement of Tunneling Thermovoltage on Silver Surfaces, **P. MAKSYMOVYCH**, S.J. KELLY, Oak Ridge National Laboratory, J.I. CERDA, Instituto de Ciencia de Materiales de Madrid, Spain	**SS+AS+EN-MoM10** Oxide Growth Kinetics at Sio2/si(001) Interfaces Induced by Rapid Temperature Raising, **S. OGAWA**, J. TANG, Tohoku University, Japan, A. YOSHIGOE, JAEA, Japan, K. NISHIMOTO, Tohoku University, Japan, S. ISHIDZUKA, Akita Nat. Col. Technol., Japan, Y. TERAOKA, JAEA, Japan, Y. TAKAKUWA, Tohoku University, Japan
11:40 am		**SS+AS+EN-MoM11** Electron Beam Induced Surface Reactions of Adsorbed π-allyl Ruthenium Tricarbonyl Bromide: Towards the Design of Precursors Specifically for Electron Beam Induced Deposition, **J.A. SPENCER**, Johns Hopkins University, R.G. THORMAN, University of Iceland, M.S. BARCLAY, Johns Hopkins University, J.A. BRANNAKA, University of Florida, O. INGÓLFSSON, University of Iceland, L. MCELWEE-WHITE, University of Florida, D.H. FAIRBROTHER, Johns Hopkins University

	Surface Science Room: 315 - Session SS+EN-MoM **Photocatalysis and Photochemistry at Surfaces** **Moderators:** A.J. Gellman, Carnegie Mellon University, B. Koel, Princeton University	Thin Film Room: 305 - Session TF+PS+SE-MoM **Advanced PVD Methods** **Moderator:** S. Gupta, University of Alabama
8:20 am	**SS+EN-MoM1** Reaction Chemistry at Surfaces of Hematite-Based Photoelectrocatalysts, P. ZHAO, C. KRONAWITTER, **B. KOEL**, Princeton University	**TF+PS+SE-MoM1 Invited** Thin Film Deposition Development, Applications, and Future Direction, J. NEIDHARDT, Von Ardenne, DE, **K. NAUMAN**, VON ARDENNE North America Inc.
8:40 am	**SS+EN-MoM2** Infrared Reflection-Absorption Spectroscopy Study of Adsorption and Photo-Decomposition of Formic Acid on Reduced and Defective Rutile TiO_2 (110) Surfaces, **A. MATTSSON**, L. ÖSTERLUND, Uppsala University, Sweden	Invited talk continued.
9:00 am	**SS+EN-MoM3 Invited** Molecular Beam Epitaxy of Highly Mismatched GaN Alloys with GaAs, GaSb and GaBi for Potential Water Splitting and Other Solar Energy Conversion Applications, **S.V. NOVIKOV**, University of Nottingham, UK, K.M. YU, Lawrence Berkeley National Laboratory, W.L. SARNEY, US Army Research Laboratory, Z. LILIENTAL-WEBER, Lawrence Berkeley National Laboratory, R.W. MARTIN, University of Strathclyde, UK, S.P. SVENSSON, US Army Research Laboratory, W. WALUKIEWICZ, Lawrence Berkeley National Laboratory, C.T. FOXON, University of Nottingham, UK	**TF+PS+SE-MoM3** Ternary and Quaternary Thin Layers Deposited by Magnetron Sputtering, **M.-P. BESLAND**, J. TRANCHANT, E. JANOD, C. BENOIT, L. CARIO, P.Y. JOUAN, M. CARETTE, A. LAFOND, Institut des Matériaux Jean Rouxel – Université de Nantes, France, R. MEUNIER, S. FABERT, Institut des Matériaux Jean Rouxel – Université de Nantes and Crosslux, France, P.Y. THOULON, M. RICCI, Crosslux Company, France
9:20 am	Invited talk continued.	**TF+PS+SE-MoM4** Molecular Dynamics Simulations of TiN/TiN(001) Growth, **D. EDSTRÖM**, D.G. SANGIOVANNI, V. CHIRITA, L. HULTMAN, Linköping University, Sweden, I.G. PETROV, J.E. GREENE, University of Illinois at Urbana Champaign
9:40 am	**SS+EN-MoM5** Photochemistry of Acetone on Reduced Rutile TiO_2(110), **N.G. PETRIK**, M.A. HENDERSON, G.A. KIMMEL, Pacific Northwest National Laboratory	**TF+PS+SE-MoM5** Surface Chemistry of Pd and Ag Interaction with 3C-SiC Thin Films Deposited on Si(111) by Pulsed Laser Depositon, **R. SEIBERT**, D. VELAZQUEZ, J. TERRY, Illinois Institute of Technology, K.A. TERRANI, C. BALDWIN, F. MONTGOMERY, K. LEONARD, J. HUNN, P. SCHUCK, R. STOLLER, Oak Ridge National Laboratory, S. SADDOW, University of South Florida
10:00 am	**SS+EN-MoM6** STM Spectroscopic Studies of TMAA Photocatalysis on TiO_2, **D.V. POTAPENKO**, Z. LI, R.M. OSGOOD, Columbia University	**TF+PS+SE-MoM6** High Thermal Stability Nanocrystalline Gold, Part I, **R.S. GOEKE**, N. ARGIBAY, J.E. MOGONYE, K.M. HATTAR, S.V. PRASAD, Sandia National Laboratories
10:20 am	**BREAK**	**BREAK**
10:40 am		**TF+PS+SE-MoM8** High Thermal Stability Nanocrystalline Gold Thin Films, Part II, **N. ARGIBAY**, J.E. MOGONYE, R.S. GOEKE, K.M. HATTAR, M.T. DUGGER, S.V. PRASAD, Sandia National Laboratories
11:00 am	**SS+EN-MoM9** Photoluminescence Response of p-$GaInP_2$ Photocathodes to Vapor and Solution Ambients, **J.L. YOUNG**, University of Colorado, Boulder, H. DOSCHER, T.G. DEUTSCH, J.A. TURNER, National Renewable Energy Laboratory, S.M. GEORGE, University of Colorado, Boulder	**TF+PS+SE-MoM9** Growth and Phase Stability of Zirconium Diboride Thin Films, **D.M. STEWART**, D.J. FRANKEL, R.J. LAD, University of Maine
11:20 am	**SS+EN-MoM10** Photoelectrochemical Application of Graphene Oxide/Iron Oxide (GO/Fe_2O_3) Thin Films for Solar Energy Conversion, **P. SHARMA**, University of Maryland, College Park, V.R. SATSANGI, R. SHRIVASTAV, S. DASS, Dayalbagh University, India, M.R. ZACHARIAH, S.H. EHRMAN, University of Maryland, College Park	**TF+PS+SE-MoM10** Thickness Dependence of High Frequency Magnetic Properties for Thin Films of Iron-Gallium-Boron, **C. REMENTER**, Y. KIM, J.P. CHANG, University of California at Los Angeles
11:40 am	**SS+EN-MoM11** Enhancement of Surface Properties of TiO_2 Film Coated Glass for Self-Cleaning Application, **R.R. PANDEY**, C. KANT, CSIR- National Physical Laboratory, India, A. PALIWAL, Amity University, Noida – (UP) INDIA, V.K. SHARMA, CSIR- National Physical Laboratory, India, A. MEHRA, Amity University, Noida – (UP) INDIAoida, India, K.K. SAINI, CSIR- National Physical Laboratory, India	**TF+PS+SE-MoM11** Optimizing Magnetic Confinement for High Productivity PVD System Linear Scanning Magnetron, V. KUDRIAVTSEV, **R. NORRIS**, T. BLUCK, I. LATCHFORD, Intevac, Inc.

	Thin Film Room: 307 - Session TF+PS-MoM Atmospheric, Roll-to-Roll and other Manufacturing Advances in ALD **Moderator:** P. Poodt, Holst Centre / TNO, Netherlands	Vacuum Technology Room: 303 - Session VT-MoM Vacuum Measurement, Calibration, and Primary Standards **Moderators:** S. Borichevsky, Varian Semiconductor Equipment, Y. Li, Cornell University
8:20 am	**TF+PS-MoM1 Invited** Barrier Properties of Plastic Films Coated with Al_2O_3 by Roll-to-Roll ALD, **C. DEZELAH**, Picosun USA, LLC, T. HIRVIKORPI, R. LAINE, W.-M. LI, Picosun Oy, Finland, M. VÄHÄ-NISSI, E. SALO, VTT Technical Research Centre of Finland, V. KILPI, S. LINDFORS, Picosun Oy, Finland, J. VARTIAINEN, E. KENTTÄ, J. NIKKOLA, A. HARLIN, VTT Technical Research Centre of Finland, J. KOSTAMO, Picosun Oy, Finland	**VT-MoM1 Invited** Miniature Fiber Optic Pressure Sensors: Technologies and Applications, **M. YU**, University of Maryland, College Park
8:40 am	Invited talk continued.	Invited talk continued.
9:00 am	**TF+PS-MoM3** An Industrial Approach to Roll-to-Roll Atomic Layer Deposition, **V. MALININ**, M.J. SÖDERLUND, P.T. SOININEN, Beneq, Finland	**VT-MoM3** Quantum Based Vacuum Standard, **J.H. HENDRICKS**, J.A. STONE, J.E. RICKER, P.F. EGAN, G.E. SCACE, D.A. OLSON, National Institute of Standards and Technology, D.R. GERTY, Sandia National Laboratories, G.F. STROUSE, National Institute of Standards and Technology
9:20 am	**TF+PS-MoM4** Modular Rotating Cylinder Design for Spatial ALD on Porous Flexible Substrates, **K. SHARMA**, R.B. HALL, S.M. GEORGE, University of Colorado at Boulder	**VT-MoM4** New PTB Standard to Provide Traceability for Partial Pressure Measurement, **K. JOUSTEN**, Physikalisch-Technische Bundesanstalt (PTB), Germany
9:40 am	**TF+PS-MoM5 Invited** Spatial Atmospheric Atomic Layer Deposition of Oxide and Oxysulfide Semiconductors, **A. ILLIBERI***, TNO, Netherlands	**VT-MoM5** Study of Long Term Stability of Quadrupole Mass Spectrometers, **J. SETINA**, Institute of Metals and Technology (IMT), Slovenia, R. KANGI, Ulusal Metroloji Enstitüsü (TUBITAK UME), Turkey, K. JOUSTEN, Physikalisch-Technische Bundesanstalt (PTB), Germany, M. BERGOGLIO, Istituto Nazionale di Ricerca Metrologica (INRIM), Italy, F. BOINEAU, Laboratoire National de métrologie et d'Essais (LNE), France, S. RUIZ, Centro Español de Metrología (CEM), Spain, M. VICAR, Czech Metrology Institute (CMI), Czech Republic
10:00 am	Invited talk continued.	**VT-MoM6** The Stability of Spinning Rotor Gauges as Transfer Standards, **J.A. FEDCHAK**, National Institute of Standards and Technology (NIST)
10:20 am	**BREAK**	**BREAK**
10:40 am	**TF+PS-MoM8** Large Area Atmospheric Spatial Atomic Layer Deposition of Zn(O,S) Buffer Layers for CIGS Solar Cells on Glass Substrates, M.D. BIJKER, R.S.R. ARCHER, Smit Ovens B.V., Netherlands, P. POODT, Holst Centre / TNO, Netherlands, A. ILLIBERI, Solliance / TNO, Netherlands, **K. SPEE**, Smit Ovens B.V., Netherlands	**VT-MoM8** Pilot Study for International Comparison of Absolute Pressure Measurement from 3×10^{-9} Pa to 9×10^{-4} Pa, **H. YOSHIDA**, K. ARAI, E. KOMATSU, K. FUJII, National Institute of Advanced Industrial Science and Technology (AIST), Japan, K. JOUSTEN, T. BOCK, Physikalisch-Technische Bundesanstalt (PTB), Germany
11:00 am	**TF+PS-MoM9** Growth Rates and Mechanisms for Al_2O_3 ALD using TMA/O_3 at Atmospheric Pressure, **M. MOUSA**, C.J. OLDHAM, G.N. PARSONS, North Carolina State University	**VT-MoM9** Stability of the Cold Cathode Ionization Gauge, **P.C. ARNOLD**, G.A. BRUCKER, Granville-Phillips Vacuum Products
11:20 am	**TF+PS-MoM10** Integration of Feature and Reactor Scales during the Simulation of ALD Scale Up, **A. YANGUAS-GIL**, J.A. LIBERA, J.W. ELAM, Argonne National Laboratory	**VT-MoM10** Cold Cathode Ionization Gauge Design Mitigates Well-known Performance Issues, **B.J. KELLY**, G.A. BRUCKER, Granville-Phillips Vacuum Products
11:40 am	**TF+PS-MoM11** Structural and Optical Characterization of AlN Deposited by N_2/H_2 Plasma-Enhanced Atomic Layer Deposition, **P.J. MOTAMEDI**, K. CADIEN, University of Alberta, Canada	**VT-MoM11** A Systematic Study of Long-Term Vacuum Gauge Performance, **G.A. BRUCKER**, S. HEINBUCH, T.C. SWINNEY, Granville-Phillips Vacuum Products

* Paul Holloway Award Winner

	2D Materials Focus Topic Room: 310 - Session 2D+AS+EM+NS+SS-MoA Dopants, Defects, and Interfaces in 2D Materials **Moderator:** J. Lou, Rice University	Actinides and Rare Earths Focus Topic Room: 301 - Session AC+AS+MI+SA+SS-MoA Theoretical Modeling of f Electron Systems **Moderator:** L. Havela, Charles University, Czech Republic
2:00 pm	**2D+AS+EM+NS+SS-MoA1 Invited** Cutting and Assembling 2 Nanometer Voids in Single Layer Hexagonal Boron Nitride, **T. GREBER**, H.Y. CUN, M. IANNUZZI, A. HEMMI, J. OSTERWALDER, University of Zurich, Switzerland	**AC+AS+MI+SA+SS-MoA1 Invited** Nonmagnetic Ground State of PuO_2, **J. KOLORENC**, Academy of Sciences of the Czech Republic
2:20 pm	Invited talk continued.	Invited talk continued.
2:40 pm	**2D+AS+EM+NS+SS-MoA3** Engineering Structural Defects in Graphene Materials, **J. ROBINSON**, M. ZALALUTDINOV, J. CULBERTSON, C. JUNKERMIER, P.E. SHEEHAN, T. REINECKE, A. FRIEDMAN, Naval Research Laboratory	**AC+AS+MI+SA+SS-MoA3 Invited** DMFT Modeling of Electronic Spectral Properties in Pu-based Actinides, **J.-X. ZHU**, Los Alamos National Laboratory
3:00 pm	**2D+AS+EM+NS+SS-MoA4** Graphene Cleaning using a Low Energy Ar Ion Beam, **K.S. KIM**, G. YEOM, Sungkyunkwan University, Republic of Korea	Invited talk continued.
3:20 pm	**BREAK**	**BREAK**
3:40 pm	**2D+AS+EM+NS+SS-MoA6** Electronic Structure Modification in van der Waals Heterostructures: Interlayer Hybridization in the Case of Graphene/MoS2, **M. BATZILL**, H. COY-DIAZ, University of South Florida, M.C. ASENSIO, Synchrotron Soleil, France, J. AVILA, Synchrotron Soleil	**AC+AS+MI+SA+SS-MoA6** The Evolution in Pu Nanocluster Electronic Structure: From Atomicity to Three-Dimensionality, **J.G. TOBIN**, S.W. YU, B.W. CHUNG, Lawrence Livermore National Laboratory, M.V. RYZHKOV, Russian Academy of Science-Urals, A. MIRMELSTEIN, Russian Federation Nuclear Lab (VNIITF)
4:00 pm	**2D+AS+EM+NS+SS-MoA7** Edge States and Exposure to Hydrogen of Silicon at the 2D Limit on Ag(111), A.J. MANNIX, B.T. KIRALY, Argonne National Laboratory, M.C. HERSAM, Northwestern University, **N.P. GUISINGER**, Argonne National Laboratory	**AC+AS+MI+SA+SS-MoA7** First-Principles Density Functional Theory Simulation on Rare-Earth-Based Oxides as Fast Oxygen Ion Conductors, **M. SAKAUE**, M. ALAYDRUS, H. KASAI, Osaka University, Japan, T. ISHIHARA, Kyushu University, Japan
4:20 pm	**2D+AS+EM+NS+SS-MoA8** Chlorine Trap-Doping for Transparent, Conductive, Thermally Stable and Damage-Free Graphene, **P.V. PHUONG**, K.N. KIM, M.H. JEON, K.S. KIM, G. YEOM, Sungkyunkwan University, Republic of Korea	**AC+AS+MI+SA+SS-MoA8 Invited** Electronic Structure, Magnetic Properties, and Magneto-Structural Transformations of Rare Earth Magneto-Caloric Materials, **D. PAUDYAL**, Ames Laboratory, V.K. PECHARSKY, K.A. GSCHNEIDNER, JR., Ames Laboratory and Iowa State University
4:40 pm	**2D+AS+EM+NS+SS-MoA9** Modification of Graphene by Neutral Beam Irradiation and Edge Structure Analysis, **T. OKADA**, S. SAMUKAWA, Tohoku University, Japan	Invited talk continued.
5:00 pm	**2D+AS+EM+NS+SS-MoA10** Growth Mechanism of Metal Clusters on a Graphene/Ru(0001) Template, **S.X. DU**, L.Z. ZHANG, Chinese Academy of Sciences, W. HOFER, University of Liverpool, UK, H.-J. GAO, Chinese Academy of Sciences	
5:20 pm		

	Applied Surface Science **Room: 316 - Session AS+BI+MC+SS-MoA** **The Liquid Interface & Depth Profiling and Sputtering with Cluster Ion Beams** **Moderators:** I.S. Gilmore, National Physical Laboratory, UK M.L. Pacholski, The Dow Chemical Company	**Biomaterial Interfaces** **Room: 317 - Session BI+AS+NS-MoA** **Bio/Nano Interfaces** **Moderator:** P. Koelsch, University of Washington
2:00 pm	**AS+BI+MC+SS-MoA1 Invited** Quantifying the Impact of Curvature, Convection and Complexity on Dynamic Interfacial Tension of Fluid-fluid Interfaces, **L.M. WALKER**, Carnegie Mellon University	**BI+AS+NS-MoA1** Controlling Bio/Nano Interface Response using Metal Oxide Atomic Layer Deposition: Zinc Oxide ALD Modifies how Human Lung Fibroblasts respond *In Vitro* to Multiwall Carbon Nanotubes, **E.C. DANDLEY**, A. TAYLOR, G.N. PARSONS, J. BONNER, North Carolina State University
2:20 pm	Invited talk continued.	**BI+AS+NS-MoA2** Mechanically Optimized Fe (III) Doped Silica Nanoshells as a Contrast Agent for Ultrasound Imaging and HIFU Therapy, **J. WANG**, A. LIBERMAN, R. VIVEROS, C. BARBACK, S.L. BLAIR, Z. WU, R. MATTREY, W. TROGLER, A.C. KUMMEL, University of California at San Diego
2:40 pm	**AS+BI+MC+SS-MoA3** *In Situ* Probing of Liquid Surfaces and Interfaces by Time-of-Flight Secondary Ion Mass Spectrometry, **X.Y. YU**, Pacific Northwest National Laboratory	**BI+AS+NS-MoA3 Invited** Synthesis, Functionalization, and Biological Imaging with Quantum Dots, **P. SNEE**, University of Illinois at Chicago
3:00 pm	**AS+BI+MC+SS-MoA4** Mass Spectrometric Characterization of Droplet Surfaces at Ambient Pressure, **K. JORABCHI**, Georgetown University	Invited talk continued.
3:20 pm	**BREAK**	**BREAK**
3:40 pm	**AS+BI+MC+SS-MoA6 Invited** Organic Depth Profiling Alchemy: Can We Transmute Data into Meaning?, **A.G. SHARD**, National Physical Laboratory, UK	**BI+AS+NS-MoA6** Easynanofab: Fast, Simple, Combinatorial Routes to Reusable Plasmonically Active Gold Nanostructures Over Macroscopic Areas, A. TSARGORODSKA, O. EL ZUBIR, **G.J. LEGGETT**, University of Sheffield, UK
4:00 pm	Invited talk continued.	**BI+AS+NS-MoA7** Impacts of Nanoparticle Synthesis Route, Structure and Serum Proteins on the Dispersion and Dissolution of Ag Nanoparticles in Biological Media, P. MUNUSAMY, J.N. SMITH, C. LIU, C.-M. WANG, Pacific Northwest National Laboratory, S. CHEN, Imperial College London, UK, M.H. ENGELHARD, Pacific Northwest National Laboratory, A.E. PORTER, M.P. RYAN, Imperial College London, UK, **D.R. BAER**, Pacific Northwest National Laboratory
4:20 pm	**AS+BI+MC+SS-MoA8** Argon Clusters - A Novel Solution for the Depth Profiling of Metal Alloys and Inorganic Materials, **J.D.P. COUNSELL**, H.L. BRANNON, S.J. COULTAS, S.J. HUTTON, A.J. ROBERTS, C.J. BLOMFIELD, Kratos Analytical Limited, UK	**BI+AS+NS-MoA8** Analysis of Protein Coated Nanoparticles by X-ray Photoelectron Spectroscopy and Solution-Based Particle Size Techniques, C. MINELLI, **N.A. BELSEY**, A.G. SHARD, National Physical Laboratory, UK
4:40 pm	**AS+BI+MC+SS-MoA9** Low Temperature Plasma for Crater Edge Depth Profiling of Crosslinking Organic Multilayers: Comparison with C_{60} and Argon Cluster Sputter Sources, **S. MURAMOTO**, National Institute of Standards and Technology (NIST), D. RADING, ION-TOF GmbH, Germany, B. BUSH, G. GILLEN, National Institute of Standards and Technology (NIST), D.G. CASTNER, University of Washington	**BI+AS+NS-MoA9** Development of Nanofibrous Meshes as Smart Dressings for Chronic Wound Care, **M. ABRIGO**, P. KINGSHOTT, S.L. MCARTHUR, Swinburne University of Technology, Australia
5:00 pm	**AS+BI+MC+SS-MoA10** Desorption/Ionization induced by Neutral Cluster Impact as a Versatile Tool for the Investigation of Sensitive and Complex Biosamples, A. PORTZ, Justus Liebig University, Germany, M. BAUR, University of Applied Sciences, Germany, C.R. GEBHARDT, Bruker Daltonik GmbH, Germany, **M. DURR**, Justus Liebig University, Germany	**BI+AS+NS-MoA10** Electrophoretic Stretching of Tethered DNA in Nanoslits, **J.W. YEH**, K. SZETO, H.G. CRAIGHEAD, Cornell University
5:20 pm	**AS+BI+MC+SS-MoA11** C_{60} and Argon Gas Cluster Ion Sputter Depth Profiling for Quantitative Inorganic Thin Film Analysis, **S.S. ALNABULSI**, G.L. FISHER, S.R. BRYAN, J.S. HAMMOND, J.F. MOULDER, Physical Electronics Inc.	**BI+AS+NS-MoA11** Measuring DNA Looping Pathways using Nanofluidic Manipulation, M. ROUSHAN, Z. AZAD, H. WANG, **R. RIEHN**, NC State University

	Electronic Materials and Processing Room: 314 - Session EM-MoA Nanoparticles for Electronic Materials **Moderators:** J. Hilton, Mantis Deposition, J.G. Tischler, Naval Research Laboratory	Energy Frontiers Focus Topic Room: 315 - Session EN+EM+MN+NS+TR-MoA Energy Harvesting with Nanostructures **Moderator:** P. Christopher, University of California - Riverside
2:00 pm	**EM-MoA1 Invited** Synthesis of Nanoparticles Via Gas-Aggregated Sputtering, **C. CASSIDY**, Okinawa Institute of Science and Technology, Japan	**EN+EM+MN+NS+TR-MoA1 Invited** Optical Engineering for Colloidal Quantum Dot Photovoltaics, **S.M. THON**, Johns Hopkins University
2:20 pm	Invited talk continued.	Invited talk continued.
2:40 pm	**EM-MoA3** Soft Landing of Size-Selected Nanoparticles: Novel Materials for Electrocatalysis, **G. JOHNSON**, R.J. COLBY, M.H. ENGELHARD, D. DU, Y. LIN, J. LASKIN, Pacific Northwest National Laboratory	**EN+EM+MN+NS+TR-MoA3** Energy Transfer from Nanocrystal Quantum Dots to Si Nanomembranes Monitored via Wavelength Dependent Photocurrent Response, **W. PENG**, S. SAMPAT, S. RUPICH, B. ANAND, H. NGUYEN, D. TAYLOR, Y. GARTSTEIN, Y.J. CHABAL, A. MALKO, University of Texas at Dallas
3:00 pm	**EM-MoA4** Aerosol Spray Pyrolysis Synthesis and Characterization of CZTS Nanoparticles, **S. EXARHOS**, L. MANGOLINI, University of California - Riverside	**EN+EM+MN+NS+TR-MoA4** Cadmium Sulphide Quantum Dots as Photosensitizer for DSSC Electrode, M. PAL, R.R. PANDEY, CSIR- National Physical Laboratory, India, A. SINGH, Jamia Millia Islamia, India, V. MAURYA, Amity University, India, **C. KANT**, K.K. SAINI, CSIR- National Physical Laboratory, India
3:20 pm	**BREAK**	**BREAK**
3:40 pm	**EM-MoA6 Invited** Peter Mark Memorial Award Lecture - Novel Semiconductor and Epitaxial Nanocomposite Materials for Electronic and Photonic Applications, **J.M.O. ZIDE***, University of Delaware	**EN+EM+MN+NS+TR-MoA6 Invited** Triboelectric Nanogenerator - A New Energy Technology, **Z.L. WANG**, Georgia Institute of Technology
4:00 pm	Invited talk continued.	Invited talk continued.
4:20 pm	**EM-MoA8** Assembly of Functional Nanocrystal Films at Fluid Interfaces, **K. WHITHAM**, T. HANRATH, Cornell University	**EN+EM+MN+NS+TR-MoA8** Conflicting Roles of Charge Traps in ETA Solar Cells: The CREM Point of View, **H. COHEN**, Weizmann Institute of Science, Israel
4:40 pm	**EM-MoA9** Characterization of $Cu_{2-X}S$ Nanoparticles in Organic Matrices, **M. MAJESKI**, I. BOLOTIN, L. HANLEY, University of Illinois at Chicago	**EN+EM+MN+NS+TR-MoA9** Understanding Morphological and Structural Effect on Organic Photovoltaic Devices from Plasmonic Particles using Advanced Characterization Techniques, **N. HERATH**, V. LAUTER, J. BROWNING, Oak Ridge National Laboratory
5:00 pm	**EM-MoA10** Optical Properties of PbSe Nanorods with Controlled Diameter and Length, **D. PLACENCIA**, J.E. BOERCKER, E.E. FOOS, J.G. TISCHLER, Naval Research Laboratory	**EN+EM+MN+NS+TR-MoA10** Doped TiO_2 Based Core-Shell Structures for High Efficiency Hybrid Solar Cells, **J. WEICKERT**, J. DORMAN, M. NOEBELS, M. PUTNIK, T. PFADLER, University of Konstanz, Germany, A. WISNET, C. SCHEU, LMU Munich, Germany, L. SCHMIDT-MENDE, University of Konstanz, Germany
5:20 pm	**EM-MoA11** Plasmonic Behavior of Copper Iron Sulfide Nanoparticles, **K.E. PLASS**, N.J. FREYMEYER, C. KIM, C.J. WISDO, Franklin & Marshall College	**EN+EM+MN+NS+TR-MoA11** Stack Numbers Dependence of the Activation Energies for Carrier Escape from and Recombination in Strain-Balanced InGaAs/GaAsP MQW, **A. FUKUYAMA**, T. IKARI, K. NISHIOKA, T. AIHARA, H. SUZUKI, University of Miyazaki, Japan, H. FUJII, M. SUGIYAMA, Y. NAKANO, The University of Tokyo, Japan

* Peter Mark Memorial Award Winner

	Materials Characterization in the Semiconductor Industry Focus Topic **Room: 313 - Session MC+2D+AP+AS-MoA** **Characterization of III-Vs (2:00-3:20 pm) / Photovoltaics, EUV Masks, etc. (3:40-4:40 pm)** **Moderators:** A.C. Diebold, SUNY College of Nanoscale Science and Engineering & GLOBALFOUNDRIES	**Magnetic Interfaces and Nanostructures** **Room: 311 - Session MI-MoA** **Topological Insulators/Rashba Effect** **Moderator:** R.A. Lukaszew, The College of William and Mary
2:00 pm	**MC+2D+AP+AS-MoA1** High Resolution SIMS Depth Profiling in III-V Compound Semiconductors, **M.J.P. HOPSTAKEN**, M.S. SCHAMIS, Y. SUN, A. MAJUMDAR, C.-W. CHENG, B.A. WACASER, G. COHEN, K.K. CHAN, D.K. SADANA, D.-G. PARK, E. LEOBANDUNG, IBM T.J. Watson Research Center	**MI-MoA1 Invited** Spin-Polarized Electronic Structure at Strongly Spin-Orbit Coupled Surface, **K. MIYAMOTO**, Hiroshima Synchrotron Radiation Center, Japan
2:20 pm	**MC+2D+AP+AS-MoA2** Nitrogen Incorporation in Dilute Nitride III-V Semiconductors Measured by Resonant Nuclear Reaction Analysis and Ion Beam Channeling, **J. DEMAREE**, S.P. SVENSSON, W.L. SARNEY, US Army Research Laboratory	Invited talk continued.
2:40 pm	**MC+2D+AP+AS-MoA3** Determination of Growth Conditions for Highly Mismatched Alloys, Using *In Situ* Auger Electron Spectroscopy and Flux grading, **S.P. SVENSSON**, W.L. SARNEY, US Army Research Laboratory, M. TING, K.M. YU, Lawrence Berkeley National Laboratory, L.W. CALLEY, Staib Instruments, Inc.	**MI-MoA3** Spin Chirality in Momentum Space for Surface States on Tl/Si(111) and Tl/Ge(111), **M. DONATH**, S.D. STOLWIJK, P. EICKHOLT, A.B. SCHMIDT, Muenster University, Germany, K. SAKAMOTO, Chiba University, Japan, P. KRUEGER, Muenster University, Germany
3:00 pm	**MC+2D+AP+AS-MoA4** Electron Channeling Contrast Imaging: Examining Dislocation Effects in III-Ns, J.K. HITE, U.S. Naval Research Laboratory, P. GADDIPATI, American Society for Engineering Education, **M.A. MASTRO**, C.R. EDDY, D.J. MEYER, U.S. Naval Research Laboratory	**MI-MoA4** Spin-Orbit-Induced Spin Polarization in the Unoccupied Electronic Structure of W(110), **H. WORTELEN***, Westfälische Wilhelms-Universität Münster, Germany, H. MIRHOSSEINI, Johannes Gutenberg-Universität, Germany, J. HENK, Martin-Luther-Universität Halle-Wittenberg, Germany, A.B. SCHMIDT, M. DONATH, Westfälische Wilhelms-Universität Münster, Germany
3:20 pm	**BREAK**	**BREAK**
3:40 pm	**MC+2D+AP+AS-MoA6** EUV Lithography Mask Cleaning Applications of TOF SIMS Analysis, **T. LAURSEN**, S.W. NOVAK, SUNY College of Nanoscale Science and Engineering, A. RASTEGAR, SEMATECH, T. NAKAYAMA, SUNY College of Nanoscale Science and Engineering	**MI-MoA6 Invited** Reorganization and Annihilation of Topologically Nontrivial Surface and Interface States, **J. HENK**, Martin Luther University Halle-Wittenberg, Germany
4:00 pm	**MC+2D+AP+AS-MoA7** Characterization of Ag/$CuInSe_2$ Thin-Film Photovoltaics by Photoelectron Spectroscopy, **P. AYDOGAN**, Bilkent University, Turkey, N. JOHNSON, A. ROCKETT, University of Illinois at Urbana-Champaign, S. SUZER, Bilkent University, Turkey	Invited talk continued.
4:20 pm	**MC+2D+AP+AS-MoA8** Enhanced Quantum Efficiency from Hybrid Cesium Halide/Copper Photocathode, **L. KONG**, A.G. JOLY, T.C. DROUBAY, Y. GONG, W.P. HESS, Pacific Northwest National Laboratory	**MI-MoA8** Unconventional Relativistic Electron Structure on Polar Bi Chalcogenide Sufaces, **A.P. WEBER***, University of Missouri-Kansas City, I. PLETIKOSIC, Q.D. GIBSON, H. JI, Princeton University, T. YILMAZ, University of Connecticut, J.T. SADOWSKI, E. VESCOVO, Brookhaven National Laboratory, A.V. FEDOROV, Lawrence Berkeley National Laboratory, A.N. CARUSO, University of Missouri-Kansas City, G. GU, Brookhaven National Laboratory, B. SINKOVIC, University of Connecticut, R.J. CAVA, Princeton University, T. VALLA, Brookhaven National Laboratory
4:40 pm	**MC+2D+AP+AS-MoA9** Facile Synthesis of Composition Tuned $Cu_{1-x}Zn_xO$ Nanoarchitecture on Alpha-Brass, Y. MYUNG, **S. BANERJEE**, Washington University, St. Louis, H. IM, J. PARK, Korea University, S. RAMAN, Physical Electronics Inc., P. BANERJEE, Washington University, St. Louis	**MI-MoA9** Identifying the Intrinsic Atomic Defects in Bi_2Se_3 with Scanning Tunneling Microscopy, **J.-X. DAI**, Rutgers University, D. WEST, Rensselaer Polytechnic Institute, X.-Y. WANG, Y.-Z. WANG, D. KWOK, Rutgers University, S.B. ZHANG, Rensselaer Polytechnic Institute, S.-W. CHEONG, W. WU, Rutgers University
5:00 pm	**MC+2D+AP+AS-MoA10** In-line Dimensional Measurement via Simultaneous Small Spot XPS and XRF for Cu CMP Process Control, B. LHERRON, ST Microelectronics, **W.T. LEE**, Revera, MOTOYAMA, CHAO, DEPROSPO, KIM, IBM	**MI-MoA10** Probing Topological Crystalline Insulator SnTe (001) Surface States via Energy Resolved Quasiparticle Interference, **D. ZHANG**, NIST and University of Maryland, H. BAEK, NIST and Seoul National University, Korea, J. HA, T. ZHANG, NIST and University of Maryland, J.E. WYRICK, A.V. DAVYDOV, National Institute of Standards and Technology, Y. KUK, Seoul National University, Korea, J.A. STROSCIO, National Institute of Standards and Technology
5:20 pm	**MC+2D+AP+AS-MoA11** Imaging of the Native Inversion Layer on Silicon-on-Insulator via Scanning Surface Photovoltage; Implications for RF harmonic generation, **D. DAHANAYAKA**, IBM, A. WONG, Dartmouth College, P. KASZUBA, L. MOSZKOWICZ, R. WELLS, F. ALWINE, IBM, L.A. BUMM, University of Oklahoma, R. PHELPS, J. SLINKMAN, IBM	**MI-MoA11** Control of Graphene Nucleation on Magnetic Oxides: Spintronics without Spin Injection, **Y. CAO**, University of North Texas, P. KUMAR, Indian Institute of Technology-Mandi, India, I. TANABE, University of Nebraska-Lincoln, J. BEATTY, M. DRIVER, University of North Texas, A. KASHYAP, Indian Institute of Technology-Mandi, India, P.A. DOWBEN, University of Nebraska-Lincoln, J.A. KELBER, University of North Texas

* Falicov Student Award Finalist

	Nanometer-scale Science and Technology Room: 304 - Session NS+EN-MoA Nanophotonics and Plasmonics **Moderator:** W.D. Wei, University of Florida	Plasma Science and Technology Room: 308 - Session PS-MoA Advanced FEOL/Gate Etching **Moderator:** E.A. Joseph, IBM Research Division, T.J. Watson Research Center
2:00 pm	**NS+EN-MoA1 Invited** Sculpting the Flow of Light at the Nanoscale, **H. ATWATER**, California Institute of Technology	**PS-MoA1 Invited** Breaking Through Limits in Semiconductor Technology, **C.-J. KANG**, Samsung Electronics, Republic of Korea
2:20 pm	Invited talk continued.	Invited talk continued.
2:40 pm	**NS+EN-MoA3** Patterning of Plasmonic Structures for Chiroptical Spectroscopy, **O. RABIN**, A.P. LAWSON, P.C. MCAVOY, I.D. MAYERGOYZ, University of Maryland, College Park	**PS-MoA3** Mechanism of Silicon Damage during N_2/H_2 Block Etching for FinFET CMOS, **T. MORIMOTO**, Tokyo Electron Limited, Japan, H. OHTAKE, Tokyo Electron America, Inc., T. WANIFUCHI, Tokyo Electron Miyagi Limited, Japan
3:00 pm	**NS+EN-MoA4** Hot Electron Generation Enhanced by Carrier Multiplication Probed with a Graphene/TiO_2 Nanodiode, **Y.K. LEE**, KAIST, Republic of Korea, H.K. CHOI, ETRI, Republic of Korea, H. LEE, KAIST, Republic of Korea, J.S. CHOI, ETRI, Republic of Korea, E. HWANG, Sungkyunkwan University, Republic of Korea, J.Y. PARK, KAIST, Republic of Korea	**PS-MoA4** Development of Improved FIN Recess Profile with Less Pattern Loading, **K. PILLAI**, S.C. HAN, S.W. HONG, H.C. KOO, S. PATIL, GLOBALFOUNDRIES
3:20 pm	**BREAK**	**BREAK**
3:40 pm	**NS+EN-MoA6** Doping Induced 1D Plasmons in Ag Monolayer Stripes on Si(557), **T. LICHTENSTEIN**, U. KRIEG, C. TEGENKAMP, H. PFNÜR, Leibniz Universität Hannover, Germany	**PS-MoA6 Invited** Plasma Etch in the Era of Atomic Scale Fidelity, **V. VAHEDI**, J. MARKS, Lam Research Corp
4:00 pm	**NS+EN-MoA7** Surface Plasmon-Mediated Gold Nanoparticle Deposition *via* Two Different Mechanisms, **J. QIU***, W.D. WEI, University of Florida	Invited talk continued.
4:20 pm	**NS+EN-MoA8 Invited** Enhanced Light-Matter Interactions in Nanoparticle Arrays, **T.W. ODOM**, Northwestern University	**PS-MoA8** Challenges of 3D NAND Staircase Patterning Process, **H. ZHOU**, S. SRINIVASAN, J. CHOI, A. KHAN, L. YU, Z. YAO, A. AGARWAL, S. RAUF, Applied Materials Inc.
4:40 pm	Invited talk continued.	**PS-MoA9** Impact of the Addition of $SiCl_4$ in a CH_3F/O_2/He Chemistry for the Nitride Spacer Etching of FDSOI 14 nm Technology, C. ARVET, S. LAGRASTA, **M. GARCIA BARROS**, STMicroelectronics, France, S. BARNOLA, N. POSSEME, CEA, LETI, MINATEC Campus, France, F. LEVERD, STMicroelectronics, France
5:00 pm	**NS+EN-MoA10** Plasmon-induced Current Enhancement at Nano-sized Metal-Oxide Interfaces, **J. HOU***, D.A. BONNELL, University of Pennsylvania	**PS-MoA10** Hydrofluorocarbon Gases for Selective, Low-Damage, Silicon Nitride Etching, **J. ROYER**, R. GUPTA, V. PALLEM, American Air Liquide
5:20 pm	**NS+EN-MoA11** Extreme Tunability of Metal-Dielectric Multilayered Structures using Al-doped ZnO Grown by Atomic Layer Deposition, **J.R. SKUZA**, R.M. MUNDLE, K.C. SANTIAGO, Norfolk State University, D.L. LEPKOWSKI, Louisiana State University, A.K. PRADHAN, Norfolk State University	**PS-MoA11** Alternative Process for Thin Layer Etching: Application to Nitride Spacer Stopping on Silicon Germanium, **N. POSSEME**, G. SANTINI, O. POLLET, C. ARVET, S. BARNOLA, CEA-LETI, France

* NSTD Student Award Finalist

	Novel Trends in Synchrotron and FEL-Based Analysis Focus Topic **Room: 312 - Session SA-MoA**	**Advanced Surface Engineering** **Room: 302 - Session SE+PS+TF-MoA**
	Synchrotron Studies of Processes in Energy Conversion, Electronic Devices and Other Materials II **Moderator:** C.S. Fadley, University of California, Davis	**Pulsed Plasmas in Surface Engineering** **Moderators:** J. Klemberg-Sapieha, Ecole Polytechnique de Montreal, Canada, M. Stueber, Karlsruhe Institute of Technology, Germany
2:00 pm	**SA-MoA1 Invited** Synchrotron-based *In Situ* Study of PEMFC, SOFC, Battery and Supercapacitor Components, **B. BOZZINI**, Universita' del Salento - Italy	**SE+PS+TF-MoA1** Complex Magnetic Systems for High Power Pulsed Magnetron Sputtering, **P. RAMAN***, I.A. SHCHELKANOV, J. MCLAIN, University of Illinois at Urbana Champaign, S. ARMSTRONG, Kurt J. Lesker Company, B. ZHANG, M. SCHILLING, DEXTER Magnetic Technologies, D.N. RUZIC, University of Illinois at Urbana Champaign
2:20 pm	Invited talk continued.	**SE+PS+TF-MoA2** Triple Langmuir Probe and Ion Fraction Measurements in an Industrial PVD Deposition System, **Y.L. WU**, S.S. MA, I.A. SHCHELKANOV, D.N. RUZIC, University of Illinois at Urbana-Champaign
2:40 pm	**SA-MoA3** Structure/Selectivity Studies of Promoted Rh/TiO_2 Catalysts under CO Hydrogenation Reaction Conditions, **R. PALOMINO**, J. MAGEE, P. CARRILLO SANCHEZ, Stony Brook University, M. WHITE, Brookhaven National Laboratory and SUNY Stony Brook	**SE+PS+TF-MoA3 Invited** Understanding the Physics of Magnetron Discharges: Ionization Zones and Their Role in Transport of Charged Particles, **M. PANJAN**, R. FRANZ, A. ANDERS, Lawrence Berkeley National Laboratory
3:00 pm	**SA-MoA4** Synchrotron Infrared Nano-spectroscopy, **A. BECHTEL**, Lawrence Berkeley National Laboratory, E.A. MULLER, R.L. OLMON, University of Colorado at Boulder, M.C. MARTIN, Lawrence Berkeley National Laboratory, M.B. RASCHKE, University of Colorado at Boulder	Invited talk continued.
3:20 pm	**BREAK**	**BREAK**
3:40 pm	**SA-MoA6 Invited** Synchrotron-Based Spectroscopy Shedding Light on Solar Cells, **F.J. HIMPSEL**, University of Wisconsin-Madison	**SE+PS+TF-MoA6** Properties of Ionization Zones in Magnetron Sputtering Observed in the Transition Region between dc and HiPIMS, **A. ANDERS**, Y. YANG, J. LIU, Y. QIU, Lawrence Berkeley National Laboratory
4:00 pm	Invited talk continued.	**SE+PS+TF-MoA7** Observation of Multiple Charge States and High Ion Energies in High-Power Impulse Magnetron Sputtering (HiPIMS) and Burst HiPIMS using a LaB_6 Target, **R. FRANZ**, Montanuniversität Leoben, Austria, C. CLAVERO, Lawrence Berkeley National Laboratory, R. BOLAT, Nazarbayev University, Kazakhstan, R. MENDELSBERG, A. ANDERS, Lawrence Berkeley National Laboratory
4:20 pm	**SA-MoA8** *In Situ* Soft X-Ray Absorption Spectroscopy for Investigation of Charge Storage and Actuation in Nanostructured Carbon Aerogels, J.R.I. LEE, M. BAGGE-HANSEN, B. WOOD, T. OGITSU, A. WITTSTOCK, M. WORSLEY, **T.M. WILLEY**, M. MERRILL, Lawrence Livermore National Laboratory, D. PRENDERGAST, Lawrence Berkeley National Laboratory, I.C. TRAN, M. BIENER, T. BAUMANN, J. BIENER, Lawrence Livermore National Laboratory, J.-H. GUO, Lawrence Berkeley National Laboratory, T.W. VAN BUUREN, Lawrence Livermore National Laboratory	**SE+PS+TF-MoA8** Pulsed Magnetron Sputtering of Novel Multifunctional Films, **J. VLCEK**, J. REZEK, J. KOHOUT, University of West Bohemia, Czech Republic
4:40 pm	**SA-MoA9** First-Principles Modeling of Near-Edge X-ray Spectroscopy for Lithium Compounds, **J. VINSON**, National Institute of Standards and Technology (NIST)	**SE+PS+TF-MoA9** Surface Engineering of Magnesium and Magnesium Alloys for Improved Corrosion Resistance, **M.A. MELIA**, J.R. SCULLY, J.M. FITZ-GERALD, University of Virginia
5:00 pm	**SA-MoA10 Invited** Soft X-ray Spectroscopy for Fundamental Understanding and Practical Optimization of Battery Materials, **W.L. YANG**, Lawrence Berkeley National Laboratory	**SE+PS+TF-MoA10** Designing a Precious Metal-Free Catalyst for Purification of Automotive Exhausts: NO Reduction and CO Oxidation on CuO(110) Surface, **H. KASAI**, J. MORENO, A.A. PADAMA, Osaka University, Japan, C. MATSUDA, K. NAITO, M. UENISHI, H. TANAKA, Daihatsu Motor Co., Ltd, Japan, Y. NISHIHATA, Japan Atomic Energy Agency, Japan
5:20 pm	Invited talk continued.	

* Coburn & Winters Student Award Finalist

	Surface Science Room: 309 - Session SS+EN-MoA **Metals, Alloys and Oxides: Structure, Reactivity & Catalysis** **Moderators:** J.F. Weaver, University of Florida	Thin Film Room: 307 - Session TF+PS-MoA **ALD Surface Reactions and Precursors** **Moderator:** A.S. Cavanagh, University of Colorado, Boulder
2:00 pm	**SS+EN-MoA1 Invited** High Throughput Discovery and Optimisation of Metal Alloy Electrocatalysts, **B.E. HAYDEN**, University of Southampton	**TF+PS-MoA1** Broadband Sum-frequency Generation: Studying the Initial Growth of ALD Al_2O_3 by Nonlinear Surface Vibrational Spectroscopy, **V. VANDALON**, R.H.E.C. BOSCH, W.M.M. KESSELS, Eindhoven University of Technology, Netherlands
2:20 pm	Invited talk continued.	**TF+PS-MoA2** *In Situ* FTIR Analysis of Reaction Mechanisms between Trimethylaluminum and Carbonyl-Containing Polymers During ALD, **P. WILLIAMS**, E.C. DANDLEY, A. BROZENA, C. NEEDHAM, C.J. OLDHAM, G.N. PARSONS, North Carolina State University
2:40 pm	**SS+EN-MoA3** Methanol Oxidation on Pt-Re Surfaces: Ambient Pressure XPS and Reactor Studies, A.S. DUKE, R.P. GALHENAGE, K. XIE, University of South Carolina, S.A. TENNEY, P. SUTTER, Brookhaven National Laboratory, **D.A. CHEN**, University of South Carolina	**TF+PS-MoA3** Time-resolved FT-IR Spectroscopy during ALD using $La(^iPrCp)_3$ and H_2O, **B.A. SPERLING**, J.E. MASLAR, W.A. KIMES, NIST
3:00 pm	**SS+EN-MoA4** Angstrom-resolved Real-Time Dissection of Electrochemically Active Noble-Metal Interfaces during Oxidation and Reduction, B.R. SHRESTHA, T. BAIMPOS, S. RAMAN, **M. VALTINER**, Max Planck Institut fur Eisenforschung GmbH, Germany	**TF+PS-MoA4** Surface Reactions and Interface Evolution during the ALD of HfO_2 on GaAs Surfaces Studied by *In Situ* ATR-FTIR, **L. YE**, T. GOUGOUSI, University of Maryland, Baltimore County
3:20 pm	**BREAK**	**BREAK**
3:40 pm	**SS+EN-MoA6** Catalytic Dehydration of 2-propanol on Size Selected $(WO_3)_n$ and $(MoO_3)_n$ Metal Oxide Clusters, **X. TANG**, Johns Hopkins University, D. BUMUELLER, G. GANTEFOER, Universität Konstanz, Germany, D.H. FAIRBROTHER, K.H. BOWEN, Johns Hopkins University	**TF+PS-MoA6 Invited** Precursor Design: Controlling Melting Point, Volatility, Reactivity and Other Important Characteristics of CVD and ALD Precursors, **S.T. BARRY**, Carleton University, Canada
4:00 pm	**SS+EN-MoA7** Growth and Characterization of Ultrathin ZnO Layers on Au(111) – STM Study of Growth Mode and Adsorption of Water, **J. LEE**, X. DENG, D.C. SORESCU, National Energy Technology Laboratory	Invited talk continued.
4:20 pm	**SS+EN-MoA8** *In Situ* Imaging of the Dynamic Interaction of the Oxide with the Atomic Steps During the Oxide Growth on NiAl(100), **H. QIN**, SUNY Binghamton, X. CHEN, Biola University, P. SUTTER, Brookhaven National Laboratory, G.W. ZHOU, SUNY Binghamton	**TF+PS-MoA8** Characterizing Vapor Delivery of μ^2-η^2-(^{t}Bu-Acetylene)Dicobalthexacarbonyl (CCTBA) for Deposition Processes, **J.E. MASLAR**, W.A. KIMES, B.A. SPERLING, National Institute of Standards and Technology (NIST), R. KANJOLIA, SAFC Hitech
4:40 pm	**SS+EN-MoA9** Subsurface Oxygen on Ni(111) and Ag(111), **D.R. KILLELEA**, J. DEROUIN, R. FARBER, Loyola University Chicago	**TF+PS-MoA9** Effect of Precursor on Coating Uniformity in Mesoporous Metal Oxide Films during Steady and Hold-Step ALD Processes, **B. KALANYAN**, M.D. LOSEGO, G.N. PARSONS, North Carolina State University
5:00 pm	**SS+EN-MoA10** Direct Imaging of the Amphiprotic Nature of Rutile (110) Surfaces in Solution, **D. JING**, A. SONG, M.A. HINES, Cornell University	**TF+PS-MoA10** Study of the Growth of Zinc Tin Oxide As Model System for Ternary Metal Oxide Atomic Layer Deposition, **A.J.M. MACKUS**, R.W. JOHNSON, W.-H. KIM, S.F. BENT, Stanford University
5:20 pm	**SS+EN-MoA11** Water Splitting Kinetics at MgO(100) Terrace Sites, **J.T. NEWBERG**, University of Delaware	

	Thin Film Room: 305 - Session TF-MoA **Self-Assembled Monolayers, Layer-by-Layer Assemblies, and Hydrophobic/Amphiphobic Thin Films** **Moderator:** S. Gupta, University of Alabama	Vacuum Technology Room: 303 - Session VT-MoA **Vacuum Measurement, Applications of UHV and Ultraclean Processes** **Moderators:** J. Becker, Kurt J. Lesker Company, B. Garcia, SAES Getters
2:00 pm		**VT-MoA1** A Capacitance Diaphragm Gauge with 10 mTorr Full Scale, **M.P. WÜEST**, INFICON Ltd., Liechtenstein, P. BJÖRKMAN, J. BÄCKMAN, INFICON Ab, Finland
2:20 pm		**VT-MoA2** What if Saving Energy become Important on Bayard Alpert Hot Ionization Gauges?, **S.P. NAEF**, INFICON Ltd., Liechtenstein
2:40 pm	**TF-MoA3** Embedded Dipole in Alkanethiolate Self-Assembled Monolayers: Electronic Structure and Work Function Effects, **S. SCHUSTER**, Heidelberg University, Germany, N. SULLIVAN, O. CABARCOS, Pennsylvania State University, I. HEHN, Graz University of Technology, Austria, J.-F. MORIN, Université Laval, Canada, E. ZOJER, Graz University of Technology, Austria, M. ZHARNIKOV, Heidelberg University, Germany, D.L. ALLARA, Pennsylvania State University	**VT-MoA3** Emission Characteristics of a W(310) Cold Field Emitter Reflecting the Vacuum States of an Extreme High Vacuum Electron Gun, **B. CHO**, K. SHIGERU, Hitachi High-Technologies, Japan, C. OSHIMA, Waseda University, Japan
3:00 pm	**TF-MoA4** Formation of Highly Ordered Self-Assembled Monolayers of Alkynes on Au (111) Substrates, T. ZABA, A. NOWOROLSKA, Jagiellonian University, Poland, C.M. BOWERS, B. BREITEN, G.M. WHITESIDES, Harvard University, **P. CYGANIK**, Jagiellonian University, Poland	**VTD BUSINESS MEETING**
3:20 pm	**BREAK**	**BREAK**
3:40 pm	**TF-MoA6** Dynamic and Angle-Resolved XPS Analysis of Ultra Thin Polyelectrolyte Films Containing Metal Nanoparticles, **M. TANER-CAMCI***, S. SUZER, Bilkent University, Turkey	**VT-MoA6 Invited** How to Create as Less as Possible to Make the Best as Possible, **N.B. KOSTER**, TNO Technical Sciences, Netherlands
4:00 pm	**TF-MoA7** Growth Ambient Dependent and Photoinduced Reversible Wetting Property of Indium Oxide Nanowires, **K. YADAV**, B.R. MEHTA, J.P. SINGH, Indian Institute of Technology Delhi, India	Invited talk continued.
4:20 pm	**TF-MoA8** Ultralow Friction and Adhesion on Fluorinated Covalently Surface-Bound Polymer Brushes, S. PUJARI, N. BHAIRAMADGI, **H. ZUILHOF**, Wageningen University, Netherlands	**VT-MoA8** Study of Potential Particle Generation by Ion Sources During EUV Mask Blank Deposition, **I.A. SHCHELKANOV**, A.M. LIETZ, J. PACHICANO, University of Illinois at Urbana-Champaign, A. ANTOHE, P. KEARNEY, SEMATECH, D.N. RUZIC, University of Illinois at Urbana-Champaign
4:40 pm	**TF-MoA9** Proton Conductive Crystalline Coatings by Initiated Chemical Vapor Deposition, **A.M. COCLITE**, C. RANACHER, Graz University of Technology, Austria	**VT-MoA9** Particle Defect Reduction in EUV Mask Blank Production Devices, **A.M. LIETZ**, I.A. SHCHELKANOV, University of Illinois at Urbana-Champaign, A. HAYES, Veeco Instruments, Inc., J. PACHICANO, S. KENILEY, D.N. RUZIC, University of Illinois at Urbana-Champaign
5:00 pm	**TF-MoA10 Invited** Tailoring Polymeric Structures on Surfaces for Lubrication, **N.D. SPENCER**, ETH Zürich, Switzerland	**VT-MoA10 Invited** VTD Early Career Award: Novel Vacuum Processing of Thin-Film Photovoltaic Materials, **J.D. MYERS†**, J.A. FRANTZ, R.Y. BEKELE, V.Q. NGUYEN, C.C. BAKER, S.C. ERWIN, N.D. BASSIM, U.S. Naval Research Laboratory, A. BRUCE, S.V. FROLOV, Sunlight Photonics, J.S. SANGHERA, U.S. Naval Research Laboratory
5:20 pm	Invited talk continued.	Invited talk continued.

* TFD James Harper Award Finalist
† VTD Early Career Award

Anticipated Schedule
Monday Morning, November 10, 2014

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, November 10, 2014

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. Awards Committee Meeting and Lunch — Camden I (H)
7:00 a.m. Companion Tour Registration — Main Lobby (H)
7:00 a.m. Professional Leadership Committee Meeting and Breakfast — Orioles Grille Restaurant (H)
8:00 a.m. Science Educators' Workshop — Loch Raven (H)
10:00 a.m. Session Coffee Break — Hall ABC (CC)
12:00 p.m. Science Educators' Workshop Lunch — Potomac (H)
12:20 p.m. Exhibit Hall Lunch — Hall ABC (CC)
12:30 p.m. Chapters, Divisions, and Groups Meeting and Lunch — Harborview II (H)
12:30 p.m. Governance Committees Meeting and Lunch — Orioles Grille Restaurant (H)
12:30 p.m. Professional Development Job Information Forum and Lunch — 314 (CC)
3:40 p.m. Session Refreshment Break — Hall ABC (CC)
4:20 p.m. Medard W. Welch Award Lecture: P. Thiel, Iowa State Univ., "Quasicrystals to Nanoclusters: It's All on the Surface" — 309 (CC)
5:20 p.m. Magnetic Interfaces and Nanostructures Division Panel Discussion — 311 (CC)
5:30 p.m. Mid-Atlantic Chapter Reception — Chesapeake Gallery I (H)
6:05 p.m. Plasma Science and Technology Division Business Meeting — 308 (CC)
6:25 p.m. Electronic Materials and Processing Division Business Meeting — 314 (CC)
6:25 p.m. Nanometer-scale Science and Technology Business Meeting — 304 (CC)
6:25 p.m Surface Science Division Business Meeting — 309 (CC)
6:25 p.m. Thin Film Division Business Meeting — 305 (CC)
6:30 p.m. Magnetic Interfaces and Nanostructures Division Business Meeting — 311 (CC)
6:30 p.m. MEMS and NEMS Technical Group Executive Committee Meeting and Dinner — Board Room (H)
6:30 p.m. Poster Session and Refreshments — Hall D (CC)
6:45 p.m. Electronic Materials and Processing Division Forum: Moore's Law & Careers at Intel — 314 (CC)
7:00 p.m. Biomaterial Interfaces Division Executive Committee Meeting and Dinner — Harborview II
7:00 p.m. Nanometer-scale Science and Technology Division Meeting and Dinner — Camden II (H)
7:00 p.m. Plasma Science and Technology Executive Committee Meeting and Dinner — Severn II-III (H)
7:00 p.m. Surface Science Division Executive Committee Meeting and Dinner — Potomac (H)
7:00 p.m. Thin Film Division Executive Committee Meeting and Dinner — Harborview I (H)
7:15 p.m. Magnetic Interfaces and Nanostructures Division Executive Committee Meeting and Dinner — Camden I (H)
7:30 p.m. Applied Surface Science Division Business Meeting — Chesapeake I (H)
7:30 p.m. Electronic Materials and Processing Division Executive Committee Meeting and Dinner — Sassafras (H)
8:00 p.m. ASTM E-42 and Applied Surface Science Division Joint Workshop: "Gas Cluster Ion Sources: Shiny New Toy or Tool for Opening Up New Frontiers in Surface Analysis?" — Chesapeake I (H)

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

CC = Baltimore Convention Center
H = Sheraton Inner Harbor
= New Attendee Networking Events

TUESDAY SHORT COURSES

8:30 a.m. Comprehensive Course on Surface Analysis and Depth Profiling by XPS or ESCA, AES, FIB & SIMS (2-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. Surface Preparation for Thin Film Deposition

LOCATION: All AVS Short Courses will be held at the Sheraton Inner Harbor Hotel (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)

	2D Materials Focus Topic Room: 310 - Session 2D+AS+BI+PS+SS-TuM 2D Materials: Surface Chemistry, Functionalization, Bio and Sensor Applications **Moderator:** R.M. Osgood, Columbia University	Actinides and Rare Earths Focus Topic Room: 301 - Session AC+AS+MI+SA+SS-TuM Synchrotron Radiation and Laboratory Based Investigations of Actinides and Rare Earths **Moderator:** D.A. Geeson, AWE, UK
8:00 am	**2D+AS+BI+PS+SS-TuM1 Invited** Phase Engineering in 2D Transition Metal Dichalcogenides, **M. CHHOWALLA**, Rutgers University	**AC+AS+MI+SA+SS-TuM1 Invited** The Role of the 5f Band and Partial Occupancy in Actinide L3-edge XANES and RXES Measurements, **C.H. BOOTH**, S.A. MEDLING, Y. JIANG, Lawrence Berkeley National Laboratory, J.G. TOBIN, Lawrence Livermore National Laboratory, P.H. TOBASH, J.N. MITCHELL, D.K. VEIRS, Los Alamos National Laboratory, M.A. WALL, P.G. ALLEN, Lawrence Livermore National Laboratory, J.J. KAS, University of Washington, D. SOKARAS, D. NORDLUND, T.-C. WENG, SLAC National Accelerator Laboratory, E.D. BAUER, Los Alamos National Laboratory
8:20 am	Invited talk continued.	Invited talk continued.
8:40 am	**2D+AS+BI+PS+SS-TuM3** Transition Metal Nanoparticles on Single-Layer MoS_2: Structural, Electronic and Catalytic Properties, **T.B. RAWAL**, D.T. LE, T.S. RAHMAN, University of Central Florida	**AC+AS+MI+SA+SS-TuM3 Invited** Actinide Research with Hard Synchrotron Radiation, **R. CACIUFFO**, European Commission, JRC-ITU, Germany
9:00 am	**2D+AS+BI+PS+SS-TuM4** How Fluorination Enhances Friction Forces for Graphene, **X.-Z. LIU**, Q. LI, University of Pennsylvania, S.P. KIM, Brown University, V.B. SHENOY, University of Pennsylvania, P.E. SHEEHAN, J. ROBINSON, Naval Research Laboratory, R.W. CARPICK, University of Pennsylvania	Invited talk continued.
9:20 am	**2D+AS+BI+PS+SS-TuM5** Chemical, Structural and Electrical Modification of Graphene, **S. HERNÁNDEZ**, E.H. LOCK, M. OSOFSKY, S. TSOI, Naval Research Laboratory, C. JUNKERMEIER, Penn State University, R. STINE, Nova Research, J. ROBINSON, Naval Research Laboratory, A. NATH, George Mason University, V.D. WHEELER, R.L. MYERS-WARD, J. CALDWELL, C.R. TAMANAHA, T. REINECKE, P.E. SHEEHAN, D.K. GASKILL, S.G. WALTON, Naval Research Laboratory	**AC+AS+MI+SA+SS-TuM5 Invited** Lumps, Bumps and Pyrophoric Powders - Nuclear Waste Viewed in a New Light, **T. SCOTT**, University of Bristol, UK, C.A. STITT, M. HART, Diamond Light Source Ltd., UK, J. MACFARLANE, A. BANOS, H. PARASKEVOULAKOS, K. HALLAM, University of Bristol, UK
9:40 am	**2D+AS+BI+PS+SS-TuM6** The Mechanochemistry of Chemically Modified Graphene, **J.R. FELTS**, S.C. HERNANDEZ, A.J. OYER, J. ROBINSON, S.G. WALTON, P.E. SHEEHAN, Naval Research Laboratory	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+AS+BI+PS+SS-TuM10** Fe-catalyzed Etching of Graphene, Few-Layer Graphene, and Graphite, **G. CHENG**, A.R. HIGHT WALKER, National Institute of Standards and Technology	**AC+AS+MI+SA+SS-TuM10 Invited** Isotopic Measurements of Uranium in Particles by SIMS, **D. SIMONS**, National Institute of Standards and Technology (NIST)
11:20 am	**2D+AS+BI+PS+SS-TuM11** Tunable Graphene/Si Schottky Diode Sensor: Before and After Functionalization for Wide Range of Molecular Sensing, **M.A. UDDIN**, A. SINGH, T. SUDARSHAN, M.V.S. CHANDRASHEKHAR, G. KOLEY, University of South Carolina	Invited talk continued.
11:40 am	**2D+AS+BI+PS+SS-TuM12** Identification of Functional Groups in Brodie Graphite Oxide at Different Degrees of Oxidation: XPS, FTIR and DFT Study, O. BONDARCHUK, CIC energuGUNE, Spain, E. PAPAIANINA, M. SAVOSKIN, NAS of Ukraine, Y. ZHANG, J. CARRASCO, **R. MYSYK**, T. ROJO, CIC energiGUNE, Spain	**AC+AS+MI+SA+SS-TuM12** X-ray Excited Auger Transitions of Pu Compounds, **A.J. NELSON**, W.K. GRANT, J.A. STANFORD, W.J. SIEKHAUS, W. MCLEAN, Lawrence Livermore National Laboratory
12:00 pm	**2D+AS+BI+PS+SS-TuM13** Dielectrics Layer Deposition on Graphene Surface by Functionalization with Polar Titanyl Phthalocyanine, **J.H. PARK**, I.J. KWAK, K. SARDASHTI, A.C. KUMMEL, University of California at San Diego	

	Applied Surface Science **Room: 316 - Session AS+BI+VT-TuM** **Ambient Ionization Mass Spectrometry** **Moderators:** G.A. Brucker, Granville-Phillips Vacuum Products, S.J. Pachuta, 3M Company	**Biomaterial Interfaces** **Room: 317 - Session BI+AS+MN+NS-TuM** **Biosensors** **Moderator:** G.J. Leggett, University of Sheffield, UK
8:00 am	**AS+BI+VT-TuM1 Invited** Laser Ablation Electrospray Ionization Mass Spectrometry with Ion Mobility Separation for Cell and Tissue Analysis, **A. VERTES**, B. SHRESTHA, H. LI, S.A. STOPKA, L. ZHANG, George Washington University	
8:20 am	Invited talk continued.	**BI+AS+MN+NS-TuM2** An Inductive-Capacitive Sensor for Real-time Biofilm Growth Monitoring, **E.I. TOLSTAYA**, Y.W. KIM, S. CHU, K.D. GERASOPOULOS, W.E. BENTLEY, R. GHODSSI, University of Maryland, College Park
8:40 am	**AS+BI+VT-TuM3 Invited** Miniature Mass Spectrometry Systems with Ambient Ionization and MS/MS Capabilities, **Z. OUYANG**, L. LI, Y. REN, X. WANG, X. MA, R. ZOU, R.G. COOKS, Y. XIA, Purdue University	**BI+AS+MN+NS-TuM3** The Interplay of Electrode Materials and Biomaterials in a Catechol-Modified Chitosan-Based Sensor for Clozapine Detection, **R. DIETRICH**, T.E. WINKLER, H. BEN-YOAV, S.E. CHOCRON, E. KIM, University of Maryland, College Park, D.L. KELLY, University of Maryland School of Medicine, G.F. PAYNE, R. GHODSSI, University of Maryland, College Park
9:00 am	Invited talk continued.	**BI+AS+MN+NS-TuM4** Characterization of an Amperometric Glucose Sensor on a Flexible Polyimide Substrate for Continuous Glucose Monitoring and Insulin Delivery through Single Device, X. DU, J.R. MOTLEY, A.K. HERMAN, **L. ARNADOTTIR**, G.S. HERMAN, X. TAN, J.F. CONLEY, JR., Oregon State University, W.K. WARD, R.S. CARGILL, J.R. CASTLE, P.G. JACOBS, Pacific Diabetes
9:20 am	**AS+BI+VT-TuM5** The Importance of Sample Form and Surface Temperature for Analysis by Ambient Plasma Mass Spectrometry (PADI), **I.S. GILMORE**, T.L. SALTER, J. BUNCH, National Physical Laboratory, UK	**BI+AS+MN+NS-TuM5 Invited** Chemically Modifying Graphene for Biosensing and Interfacing with Biology, **P.E. SHEEHAN**, Naval Research Laboratory, S.C. HERNANDEZ, National Research Council, N. LONG, Nova Research, S.P. MULVANEY, J. ROBINSON, Naval Research Laboratory, R. STINE, Nova Research, C.R. TAMANAHA, S.G. WALTON, Naval Research Laboratory
9:40 am	**AS+BI+VT-TuM6** A VAMAS Interlaboratory Study for Desorption Electrospray Ionisation Mass Spectrometry (DESI MS) - Survey of the Measurement Issues, **P.D. RAKOWSKA**, E. GURDAK, F.M. GREEN, M.P. SEAH, T.L. SALTER, I.S. GILMORE, National Physical Laboratory, UK	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+BI+VT-TuM10 Invited** Mass spectrometry surface analysis outside the vacuum, **J.W. WISEMAN**, M.E. ELNAGGAR, J.K. KENNEDY, B.L. LAUGHLIN, Prosolia Inc.	**BI+AS+MN+NS-TuM10 Invited** Bioresorbable Sensors and Electronics, **J.A. ROGERS**, University of Illinois at Urbana Champaign
11:20 am	Invited talk continued.	Invited talk continued.
11:40 am	**AS+BI+VT-TuM12 Invited** Transporting Ions from Ambient Pressure into Vacuum for Lab-based and Mobile Mass Spectrometers, **M. WELLS**, FLIR Mass Spectrometry	**BI+AS+MN+NS-TuM12** Surface Chemistry Enhanced Microbial Bioelectrocatalysis, **K. ARTYUSHKOVA**, C. SANTORO, S. BABANOVA, J. CORNEJO, L. ISTA, A. SCHULER, P. ATANASSOV, University of New Mexico
12:00 pm	Invited talk continued.	

	Electronic Materials and Processing **Room: 314 - Session EM-TuM** **Advanced Interconnects and Materials** **Moderators:** S.W. King, Intel Corporation, A. Antonelli, Lam Research	**Energy Frontiers Focus Topic** **Room: 315 - Session EN+AS+EM+SE-TuM** **Fuel Formation and Thermal Transport** **Moderator:** M.A. Filler, Georgia Institute of Technology
8:00 am	**EM-TuM1 Invited** Cu/ULK ULSI On-Chip Wiring Technologies, and Related Devices, **D.C. EDELSTEIN**, IBM	**EN+AS+EM+SE-TuM1 Invited** Unraveling Thermodynamic and Kinetic Factors in Solar-Thermochemical Fuel Production, **S.M. HAILE**, California Institute of Technology
8:20 am	Invited talk continued.	Invited talk continued.
8:40 am	**EM-TuM3** Selectivity Characterization and Enhancement of Metal-Organic Chemical Vapor Deposited (MOCVD) Selective Cobalt Cap for Advanced Back End of Line, **J. SHU**, Z. SUN, Y.B. LEE, J. PALAZZO, Z. BAYINDIR, M. HOSSAIN, S. CHOI, J. RULLAN, H. LIU, GLOBALFOUNDRIES U.S. Inc.	**EN+AS+EM+SE-TuM3 Invited** Controlling Catalysis on Metal Nanoparticles by Direct Photoexcitation of Adsorbate-Metal Bonds, M.J. KALE, T. AVANESIAN, University of California, Riverside, H. XIN, J. YAN, SLAC National Accelerator Laboratory, **P. CHRISTOPHER**, University of California, Riverside
9:00 am	**EM-TuM4** Precise Control of the Residual Stress Levels in Polycrystalline Thin Films for Advanced Interconnects and N/MEMS Applications, **H.Z. YU**, C.V. THOMPSON, Massachusetts Institute of Technology	Invited talk continued.
9:20 am	**EM-TuM5** CVD Mn-based Barrier for Advanced Copper Interconnect Technology: Integration Study, **N.J. JOURDAN**, IMEC, Belgium	**EN+AS+EM+SE-TuM5** Atomistic Insights as the the pH Dependence of Onset Potential of the Oxygen Evolution Reaction on Hematite, **A. HELLMAN**, Chalmers University, Sweden
9:40 am	**EM-TuM6** Cryogenic Etching vs P4 Approaches: Paths towards Ultra-low Damage Integration of Mesoporous Oxide Dielectric Materials, **J.-F. DE MARNEFFE**, IMEC, Belgium, L. ZHANG, M.H. HEYNE, M. KRISHTAB, IMEC, KU Leuven, Belgium, A. GOODYEAR, M. COOKE, Oxford Instruments Plasma Technologies, N. HEYLEN, I. CIOFI, L.G. WEN, C.J. WILSON, IMEC, Belgium, V. RUTIGLIANI, University Bari, Italy, S. DECOSTER, IMEC, Belgium, T. SAVAGE, SBA Materials, Inc., K. MATSUNAGA, K. NAFUS, Tokyo Electron Kyushu Limited, Japan, J. BOEMMELS, Z. TOKEI, M. BAKLANOV, IMEC, Belgium	**EN+AS+EM+SE-TuM6** Rational Design of Pt_3Ni Alloy Surface Structures for Oxygen Reduction, **L. CAO**, T. MUELLER, Johns Hopkins 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	**EM-TuM10 Invited** Reliability of Advanced Interconnects, **C.V. THOMPSON**, Massachusetts Institute of Technology	**EN+AS+EM+SE-TuM10 Invited** Molecular and Mesoscale Design for Organic and Hybrid Thermoelectrics, **R. SEGALMAN**, University of California, Santa Barbara
11:20 am	Invited talk continued.	Invited talk continued.
11:40 am	**EM-TuM12** Metal Resistivity Below 10 nm, **D. GALL**, P. ZHENG, D. GUAN, Rensselaer Polytechnic Institute, J.S. CHAWLA, Intel Corporation, T. ZHOU, Rensselaer Polytechnic Institute	**EN+AS+EM+SE-TuM12** Advances in Solid-State Energy Harvesting from Asymmetric Thermoelectric Devices, B. COOK, **J.S. LEWIS**, RTI International
12:00 pm		**EN+AS+EM+SE-TuM13** The Effect of Particle Size and Surface Termination of n-Si on Thermal and Electrical Conductivity, **T. LOPEZ**, L. MANGOLINI, University of California - Riverside, S. BUX, J.P. FLEURIAL, California Institute of Technology

	Exhibitor Technology Spotlight Room: Hall ABC - Session EW-TuM Exhibitor Technology Spotlight Session **Moderator:** C. Moffitt, Kratos Analytical Limited, UK	In-Situ Spectroscopy and Microscopy Focus Topic Room: 313 - Session IS+AS+MC+SS-TuM Ambient Pressure X-ray Photoelectron Spectroscopy (AP-XPS) **Moderator:** F. Tao, University of Notre Dame
8:00 am		**IS+AS+MC+SS-TuM1 Invited** The ISISS Facility at BESSY II and Beyond: The Application of Near Ambient Pressure X-ray Electron Spectroscopy in the Surface Characterization of Technical Catalysts, **M. HÄVECKER**, Helmholtz-Zentrum Berlin für Materialien und Energie/Elektronenspeicherring BESSY II, Germany, CH. HEINE, M. EICHELBAUM, Fritz-Haber-Institut der Max-Planck-Gesellschaft, Germany, F. ROSOWSKI, BasCat, UniCat-BASF JointLab, Germany, A. TRUNSCHKE, R. SCHLÖGL, Fritz-Haber-Institut der Max-Planck-Gesellschaft, Germany
8:20 am		Invited talk continued.
8:40 am		**IS+AS+MC+SS-TuM3** Recent Trends and Instrument Development in Ambient Pressure Photoelectron Spectroscopy, **H. BERGERSEN**, J. ÅHLUND, VG Scienta AB, Sweden
9:00 am		**IS+AS+MC+SS-TuM4** *In Situ* Studies of Exceptionally Active Catalyst of Earth Abundant Elements for Complete Combustion of Methane at a Relatively Low Temperature, F. TAO, J. SHAN, L.T. NGUYEN, S. ZHANG, **W. HUANG**, University of Notre Dame
9:20 am		**IS+AS+MC+SS-TuM5 Invited** Ambient Pressure XPS Studies of Fuel Cell and Electrolysis Catalysis, **H. OGASAWARA**, SLAC National Accelerator Laboratory
9:40 am		Invited talk continued.
10:00 am	**BREAK - Complimentary Coffee in Exhibit Hall**	**BREAK - Complimentary Coffee in Exhibit Hall**
10:20 am	**EW-TuM8** High Speed Water Vapor Cryopumps: Increasing Tool Throughput and Process Yield with Polycold PFC and MaxCool Products, **C. REBECCHI**, Brooks Automation, Inc., Polycold	**BREAK - Complimentary Coffee in Exhibit Hall**
10:40 am	**EW-TuM9** Stylus Profilometry – Bruker's DektakXTL Delivers Innovation in Flexibility and Ease of Use, **E. RUFE**, Bruker, Corp.	**BREAK - Complimentary Coffee in Exhibit Hall**
11:00 am		**IS+AS+MC+SS-TuM10** Environmental Cells with 2D Electron Transparent Windows for Ambient Pressure Photoelectron Imaging and Spectroscopy, **A. KOLMAKOV**, National Institute of Standards and Technology (NIST)
11:20 am		**IS+AS+MC+SS-TuM11** The Effect of Interfacial Ethanol on Ionic Distributions in Aqueous Solution, **M.H.C. VAN SPYK**, K.A. PERRINE, M.J. MAKOWSKI, University of California Irvine, H. BLUHM, Lawrence Berkeley National Laboratory, J.C. HEMMINGER, University of California Irvine
11:40 am		**IS+AS+MC+SS-TuM12 Invited** Studying Zeolites and Clays with the Tools of Surface Science from UHV to Near-Ambient Pressures, **J.A. BOSCOBOINIK**, Brookhaven National Laboratory
12:00 pm		Invited talk continued.

	Magnetic Interfaces and Nanostructures Room: 311 - Session MI+MG-TuM Advanced Materials Discovery **Moderator:** M. Donath, Muenster University, Germany	Nanometer-scale Science and Technology Room: 304 - Session NS+HI-TuM Nanopatterning and Nanolithography **Moderators:** N.A. Burnham, Worcester Polytechnic Institute L.E. Ocola, Argonne National Laboratory
8:00 am	**MI+MG-TuM1 Invited** Combinatorial Approach to Novel Functional Materials, **I. TAKEUCHI**, University of Maryland	**NS+HI-TuM1 Invited** Nanoetching and Characterization Towards sub-5 nm Patterning, **D.L. OLYNICK**, D. STAAKS, D. TIERNO, S. DALLARTO, S. SASSOLINI, B. MUDDIMAN, Z. LUI, G. CALAFIORE, Lawrence Berkeley National Laboratory, X. GU, T.P. RUSSELL, University of Massachusetts, Amherst, M. KOCSIS, Inpria Corporation
8:20 am	Invited talk continued.	Invited talk continued.
8:40 am	**MI+MG-TuM3 Invited** Discovery and Design of Two-Dimensional Materials by Data-Mining and Genetic Algorithm Approaches, **R. HENNIG**, University of Florida, Gainesville	**NS+HI-TuM3** Cut Patterning Challenges for the 14nm-Node and Beyond, **R. JUNG**, J.R. SPORRE, F.L. LIE, S. KANAKASABAPATHY, S. SIEG, IBM Albany Nanotech Center, A. RANJAN, S. VORONIN, A. RALEY, V. RASTOGI, A. KO, TEL Technology Center, America, LLC, D. LEE, Samsung Electronics
9:00 am	Invited talk continued.	**NS+HI-TuM4** Nanopore Memristors: Sub-10nm Devices Built on Membranes Milled with a Helium Ion Microscope, **D.A.A. OHLBERG**, J.P. STRACHAN, W. THOMPSON, Z.Y. LI, R.S. WILLIAMS, Hewlett Packard
9:20 am	**MI+MG-TuM5** Complexities in the Molecular Spin Crossover Transition, **X. ZHANG***, S. MU, University of Nebraska-Lincoln, J. CHEN, Columbia University, T. PALAMARCIUC, P. ROSA, J.-F. LÉTARD, Université de Bordeaux, France, J. LIU, D. ARENA, Brookhaven National Laboratory, B. DOUDIN, Université de Strasbourg, France, P.A. DOWBEN, University of Nebraska-Lincoln	**NS+HI-TuM5** Characterization of Cluster-Based High-Resolution Inorganic Resists, **R.P. OLEKSAK**, B.T. FLYNN, G.S. HERMAN, Oregon State University
9:40 am	**MI+MG-TuM6** Controlling and Imprinting Topological Spin Textures, R. STREUBEL, L. HAN, IFW Dresden, Germany, M.-Y. IM, Lawrence Berkeley National Laboratory, F. KRONAST, Helmholtz-Zentrum Berlin für Materialien und Energie/Elektronenspeicherring BESSY II, Germany, U.K. ROESSLER, Institute for Theoretical Solid State Physics, IFW Dresden, Germany, F. RADU, R. ABRUDAN, Ruhr-Universitaet Bochum, Germany, G. LIN, O.G. SCHMIDT, IFW Dresden, Germany, **P. FISCHER**, Lawrence Berkeley National Laboratory, D. MAKAROV, IFW Dresden, Germany	**NS+HI-TuM6** Development Characteristics of PMMA in Alternative Alcohol:Water Mixtures, **L.E. OCOLA**, Argonne 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	**MI+MG-TuM10** Growth and Properties of Skyrmionic MnSi Nanowires and Thin Film on Silicon, **J. YI**, S.W. TANG, University of Tennessee, I.I. KRAVCHENKO, G.X. CAO, Oak Ridge National Laboratory, D.G. MANDRUS, University of Tennessee, Z. GAI, Oak Ridge National Laboratory	**NS+HI-TuM10** Room Temperature Electron Beam Assisted Oxygen Purification of Electron Beam Induced Pt Deposits: Towards Pure and High-Fidelity Nanostructures, **B.B. LEWIS**, M.G. STANFORD, University of Tennessee, H. PLANK, Graz University of Technology, Austria, J.H. NOH, University of Tennessee, J. FOWLKES, Oak Ridge National Laboratory, P.D. RACK, University of Tennessee
11:20 am	**MI+MG-TuM11** Depth Dependent Mapping of Valence and Other Factors in $LaSrMnO_3/PrZrTiO_3$ Magnetoelectric Heterostructures, **M.B. HOLCOMB**, C.-Y. HUANG, R. TRAPPEN, J. ZHOU, West Virginia University, Y.-H. CHU, National Chiao Tung University, Taiwan, Republic of China	**NS+HI-TuM11** Prospects for Nanofabrication using the Combination of STM-based Depassivation Lithography, Selective ALD, and Material Etch Processes, **J. BALLARD**, Zyvex Labs, S. ANZ, S. SANDO, Systine, Inc., M. BISCHOF, University of North Texas, D. DICK, University of Texas at Dallas, J. FU, National Institute of Standards and Technology (NIST), D. JAEGER, University of North Texas, R. LONGO, University of Texas at Dallas, J. OWEN, E. FUCHS, Zyvex Labs, S. MCDONNELL, University of Texas at Dallas, R. REIDY, University of North Texas, Y.J. CHABAL, R.M. WALLACE, University of Texas at Dallas, J. RANDALL, Zyvex Labs, A. CHERALA, S. SINGHAL, S. SREENIVASAN, University of Texas at Austin
11:40 am	**MI+MG-TuM12** Strain Measurements in $LaSrMnO_3/PbZrTiO_3$ Magnetoelectric Heterostructures, **C.-Y. HUANG**, J. ZHOU, West Virginia University, Y.-H. CHU, National Chiao Tung University, Taiwan, Republic of China, M.B. HOLCOMB, West Virginia University	**NS+HI-TuM12** Deep UV Microsphere Photolithography, **A. BONAKDAR†**, H. MOHSENI, Northwestern University
12:00 pm	**MI+MG-TuM13** Bit-Patterned Media Using Block Copolymer Templating on FePt, S. GUPTA, H. SU, **A. OWEN**, R. DOUGLAS, University of Alabama	**NS+HI-TuM13** Nanolithography using DNA Nanostructure Templates, H. LIU, **F. ZHOU**, University of Pittsburgh

* Falicov Student Award Finalist
† NSTD Student Award Finalist

	Plasma Science and Technology **Room: 308 - Session PS-TuM** **Plasma Surface Interactions I** **Moderator:** J.P. Chang, University of California at Los Angeles	**Novel Trends in Synchrotron and FEL-Based Analysis Focus Topic** **Room: 312 - Session SA-TuM** **Characterization of Nanostructured and LD Materials Using Synchrotron-Based Methods** **Moderator:** M. Kiskinova, Elettra-Sincrotrone Trieste, Italy
8:00 am	**PS-TuM1 Invited** Directed Irradiation Synthesis: Manipulating Matter in Nanoscale Self-Organized Systems, **J.P. ALLAIN**, Z. KOYN, B. HOLYBEE, S. ARIAS, University of Illinois at Urbana-Champaign	**SA-TuM1 Invited** Analysis and Speciation of Nanoscaled Materials by Means of Grazing-Incidence and High-Resolution X-ray Spectrometry, **B. BECKHOFF**, M. GERLACH, I. HOLFELDER, P. HOENICKE, J. LUBECK, M. MUELLER, A. NUTSCH, B. POLLAKOWSKI, C. STREECK, R. UNTERUMSBERGER, J. WESER, Physikalisch-Technische Bundesanstalt (PTB), Germany
8:20 am	Invited talk continued.	Invited talk continued.
8:40 am	**PS-TuM3** Contact Resistance Degradation Caused By Plasma Charging of Silicon on Insulator During Contact Etch, **T.M. BAUER**, J.F. DIGREGORIO, R.L. JARECKI JR., Sandia National Laboratories	**SA-TuM3 Invited** X-Ray Photoemission Spectromicroscopy: Recent Achievements and Future Applications, **C.M. SCHNEIDER**, Forschungszentrum Juelich GmbH, Germany
9:00 am	**PS-TuM4** 3D Modeling of SiN Etching by Hydrofluorocarbon Plasma, **N. KUBOI**, T. TATSUMI, T. KINOSHITA, T. SHIGETOSHI, M. FUKASAWA, J. KOMACHI, H. ANSAI, Sony Corporation, Japan	Invited talk continued.
9:20 am	**PS-TuM5** Study of Plasma-Surface Interaction in $HBr/Cl_2/O_2$ ICP, **A.K. SRIVASTAVA**, University of Houston, T. OHASHI, Hitachi High-Technologies, V.M. DONNELLY, University of Houston	**SA-TuM5 Invited** Growth and Characterization of Low Dimensional Materials for Applications in Energy and Sensor Devices, **A. GOLDONI**, Elettra-Sincrotrone Trieste, Italy
9:40 am	**PS-TuM6** Experimental Evaluation of Ta Film Etching Characteristics by CO^+ Ion Irradiation, **M. SATAKE**, Hitachi, Japan, H. LI, K. KARAHASHI, S. HAMAGUCHI, Osaka University, Japan	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-TuM10** Study of Hydrofluorocarbon Precursor Parameters for Plasma Etching of ULK Dielectric, **C. LI**, G.S. OEHRLEIN, University of Maryland, College Park, R. GUPTA, V. PALLEM, Air Liquide	**SA-TuM10 Invited** Novel 2D Electron Gases at the Surface of Transition-Metal Oxides: Role of Topology and Spin-Orbit Coupling, **A.F. SANTANDER-SYRO**, Université Paris-Sud, France
11:20 am	**PS-TuM11** Characteristics of Reactive Ion Etching Processes for ITO and ZnO, **H. LI**, K. KARAHASHI, Osaka University, Japan, M. FUKASAWA, K. NAGAHATA, T. TATSUMI, Sony Corporation, Japan, S. HAMAGUCHI, Osaka University, Japan	Invited talk continued.
11:40 am	**PS-TuM12** Selective Etch and Functionalization of Coblock Polymers, **E.H. LOCK**, S.G. WALTON, Naval Research Laboratory	**SA-TuM12 Invited** Effects of Interfacial Interaction: Electronic Structure of Graphene on Metallic and Insulating Surfaces, **P. RUDOLF**, University of Groningen, The Netherlands
12:00 pm	**PS-TuM13** Dry Etch Process Development for PMMA Removal Selectively to PS for sub-10nm Patterning, **A. SARRAZIN**, P. PIMENTA-BARROS, N. POSSEME, S. BARNOLA, A. GHARBI, R. TIRON, CEA, LETI, MINATEC Campus, France, C. CARDINAUD, CNRS-IMN, France	Invited talk continued.

	Advanced Surface Engineering Room: 302 - Session SE+NS+TR-TuM Nanostructured Thin Films and Coatings **Moderators:** R. Franz, Montanuniversität Leoben, Austria, A.A. Voevodin, Air Force Research Laboratory	Surface Science Room: 309 - Session SS+AS+EN-TuM Synthesis, Structure and Characterization of Oxides **Moderators:** A.J. Gellman, Carnegie Mellon University
8:00 am	**SE+NS+TR-TuM1** Electrostatic Coating with Ligandless Copper Nanoparticles, **L.R. HUBBARD**, A.J. MUSCAT, University of Arizona	**SS+AS+EN-TuM1** Coexisting Accessible Surface Phases on $BaTiO_3$ (001), **E.H. MORALES**, J.M. MARTIREZ, University of Pennsylvania, W.A. SAIDI, University of Pittsburgh, A.M. RAPPE, D.A. BONNELL, University of Pennsylvania
8:20 am	**SE+NS+TR-TuM2** Electrically Stable Pt-ZrB_2 Nanocomposite Thin Films for High Temperature Applications, **J.C. SELL**, D.M. STEWART, G.P. BERNHARDT, D.J. FRANKEL, R.J. LAD, University of Maine	**SS+AS+EN-TuM2** Oxidation and Chemical Reactivity of TbO_x Thin Films on Pt(111), W. CARTAS, R. RAI, A. SATHE, University of Florida, A. SCHAEFER, University of Bremen, Germany, **J.F. WEAVER**, University of Florida
8:40 am	**SE+NS+TR-TuM3** A Novel Reactive Plasma-Assisted Coating Technique (RePAC) for Thin BN/Crystalline-Si Structures and their Mechanical and Electrical Properties, **K. ERIGUCHI**, Kyoto University, Japan, M. NOMA, SHINKO SEIKI CO., LTD., Japan, S. HASEGAWA, Osaka University, Japan, M. YAMASHITA, Hyogo Prefectural Institute of Tech., Japan, K. ONO, Kyoto University, Japan	**SS+AS+EN-TuM3 Invited** Structure/Function Relationships on Cerium Oxide: Reactions on Single Crystal Films and Shape-Selected Nanocrystals, **D.R. MULLINS**, Oak Ridge National Laboratory
9:00 am	**SE+NS+TR-TuM4** The Effect of Adsorbed Alkanethiolate Chain Length on Jumping Water Droplet Behavior from Superhydrophobic Surfaces, **J. LABUKAS**, K. STRAWHECKER, J. MITCHELL, T. PARKER, Army Research Laboratory	Invited talk continued.
9:20 am	**SE+NS+TR-TuM5 Invited** Multifunctional Protective Coatings for Aerospace Applications, **E. BOUSSER**, L. MARTINU, J. KLEMBERG-SAPIEHA, Ecole Polytechnique de Montreal, Canada	**SS+AS+EN-TuM5** Ceria on Cu(110): Formation of Nanostripe Strain Defects, L. MA, N. DOUDIN, S. SURNEV, **F.P. NETZER**, Karl-Franzens University, Austria
9:40 am	Invited talk continued.	**SS+AS+EN-TuM6** Design Rules for Stabilizing Polar Metal Oxide Surfaces: Adsorption of O_2 on Zn-rich Polar ZnO(0001), **M. LI**, P. GORAI, E. ERTEKIN, E.G. SEEBAUER, University of Illinois at Urbana-Champaign
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+NS+TR-TuM10** Hard Coatings with Designed Thermal Conductivity, P.H.M. BOETTGER, Empa, ETH Zurich, Switzerland, V. SHKLOVER, ETH Zurich, Switzerland, M. SOBIECH, Oerlikon Balzers Coating AG, Liechtenstein, **J. PATSCHEIDER**, Empa, Switzerland	**SS+AS+EN-TuM10** The Growth of Catalytic Thin Films on a Polar Substrate: Cr_2O_3 on ZnO (0001) and ZnO (000-1), **X. ZHU**, Yale University
11:20 am	**SE+NS+TR-TuM11** Microstructure and Hardness Gradients in Sputtered CrN Films, A. RIEDL, Materials Center Leoben, Austria, R. DANIEL, Montanuniversität Leoben, Austria, T. SCHOEBERL, M. STEFENELLI, Austrian Academy of Sciences, B. SARTORY, Materials Center Leoben, Austria, J. KECKES, **C. MITTERER**, Montanuniversität Leoben, Austria	**SS+AS+EN-TuM11** Growth and Structures of FeO_x, CoO_x and NiO on Rh(111): An XPS and LEIS Study, **M.S. CHEN**, H. ZHANG, W.Y. WANG, Xiamen University, China
11:40 am	**SE+NS+TR-TuM12** Development of Low Friction Nanocomposite Coatings for Diesel Engine Piston Rings, **J. LIN**, R. WEI, K. COULTER, C. BITSIS, P.M. LEE, Southwest Research Institute	**SS+AS+EN-TuM12** Chemical Characterization of Elements in Oxides using X-ray Satellite Lines, **T. JACH**, National Institute of Standards and Technology (NIST)
12:00 pm		**SS+AS+EN-TuM13** *In Situ* XPS and NRA Studies of Hydrogen Diffusion in TiO_2 Single Crystals, **V. SHUTTHANANDAN**, M.I. NANDASIRI, S.A. THEVUTHASAN, M.A. HENDERSON, S. MANANDHAR, Pacific Northwest National Laboratory

	Thin Film Room: 307 - Session TF+PS-TuM ALD for Emerging Applications **Moderator:** J.M. Fitz-Gerald, University of Virginia	Thin Film Room: 305 - Session TF+SE-TuM Energetic Thin Films/Optical Characterization **Moderators:** D.P. Adams, Sandia National Laboratories, C. Vallee, LTM - CEA/LETI, France
8:00 am	**TF+PS-TuM1 Invited** Atomic Layer Deposition: A New Strategy to Improve Metal Corrosion Resistance?, **L. FEDRIZZI**, E. MARIN, A. LANZUTTI, University of Udine, Italy	**TF+SE-TuM1** Investigations on $LiMn_xNi_yO$ Thin Films Deposited by RF Sputtering using Powder Target for Thin Film Battery Applications, **K.Y. RAO**, Indian Institute of Science, India
8:20 am	Invited talk continued.	**TF+SE-TuM2** The Dynamics of Reactive Foil Ignition after Pulsed Laser Irradiation, **R.D. MURPHY**, R.V. REEVES, Sandia National Laboratories, J.P. MCDONALD, Dow Corning Corporation, D.P. ADAMS, Sandia National Laboratories
8:40 am	**TF+PS-TuM3** Atomic Layer Deposition of Thin VO_2 Films for Thermal Management Applications, **V.D. WHEELER**, M. TADJER, N. NEPAL, M. CURRIE, Z.R. ROBINSON, M.A. MASTRO, K. CHEUNG, F. KUB, C.R. EDDY, Naval Research Laboratory	**TF+SE-TuM3 Invited** Probing Rapid Formation and Oxidation Reactions with Multilayer Films and Foils, **T.P. WEIHS**, Johns Hopkins University
9:00 am	**TF+PS-TuM4** Atomic Layer Deposition of $Pb(Zr_XTi_{1-X})O_3$ Thin Films to Engineer Nanoscale Multiferroic Composites, **D. CHIEN**, T. KIM, J.P. CHANG, UCLA	Invited talk continued.
9:20 am	**TF+PS-TuM5** Atomic Layer Deposition Enabled Synthesis of Nanoscale Multiferroics, **C. PHAM**, Y. KIM, J.P. CHANG, University of California at Los Angeles	**TF+SE-TuM5** Detonation in Vapor-deposited Explosive Films at the Micro-scale, **R. KNEPPER**, M.P. MARQUEZ, A.S. TAPPAN, Sandia National Laboratories
9:40 am	**TF+PS-TuM6** Laser Assisted Electron Beam Induced Deposition: Towards a Nanoscale Atomic Layer Deposition Process, **M.G. STANFORD**, B.B. LEWIS, J.H. NOH, University of Tennessee, H. PLANK, Graz University of Technology, Austria, J. FOWLKES, Oak Ridge National Laboratory, N.A. ROBERTS, Utah State University, P.D. RACK, University of Tennessee	**TF+SE-TuM6** Investigating the Effect of Heating Rate on the Al/Ni Formation Reaction using *In Situ* Nanocalorimetry, **M.D. GRAPES**, Johns Hopkins University, M.K. SANTALA, T. LAGRANGE, G.H. CAMPBELL, Lawrence Livermore National Laboratory, D.A. LAVAN, National Institute of Standards and Technology (NIST), T.P. WEIHS, Johns Hopkins 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+PS-TuM10** Effect of Film Stress on the Shape of Nanostructures Grown Using Atomic Layer Deposition, **J.C. GERTSCH**, N.T. EIGENFELD, J.M. GRAY, V.M. BRIGHT, S.M. GEORGE, University of Colorado, Boulder	**TF+SE-TuM10** The Role of Magnesium in Heat Generation from Al-Mg/Zr Laminate Foils, **K.R. OVERDEEP**, Johns Hopkins University, D.J. ALLEN, N.G. GLUMAC, University of Illinois at Urbana-Champaign, K.J.T. LIVI, T.P. WEIHS, Johns Hopkins University
11:20 am	**TF+PS-TuM11** Atomic Layer Deposition and Nucleation on Metallic Nanostructures for Plasmonic Devices, **J. QI**, X. JIANG, B.G. WILLIS, University of Connecticut	**TF+SE-TuM11** Dynamics of the Inverse MAPLE Process for Deposition of Nanoparticles and Nanoporous Thin Films, **M.A. STEINER**, P.J. STEINER, J.M. FITZ-GERALD, University of Virginia
11:40 am	**TF+PS-TuM12** Infrared and Thermoelectric Power Generation in Thin Atomic Layer Deposited Films, **H.S. MANN**, B.N. LANG, Y. SCHWAB, James Madison University, J. PETTERI-NIEMELÄ, M. KARPPINEN, Aalto University, Finland, G.S. SCAREL, James Madison University	**TF+SE-TuM12** Structural, Optical and Electrical Properties of Fe-doped BiOCl, **Y. MYUNG**, S. BANERJEE, F. WU, P. BANERJEE, Washington University, St. Louis
12:00 pm	**TF+PS-TuM13** Atomic Layer Deposition of Tin Doped Titanium Oxide on Type-V Titanium Implant Surface for Enhanced Photoactivated Antibacterial Property, S.K. SELVARAJ, A. BUTT, **C.G. TAKOUDIS**, University of Illinois at Chicago	**TF+SE-TuM13** Cathodoluminescent and Photoluminescent Properties of $Sr_2SiO_4:Dy^{3+}$ Thin Films Prepared by the Sol-gel Spin Coating Technique, M.A. TSHABALALA, H.C. SWART, O.M. NTWAEABORWA, University of the Free State, South Africa, **B. MOTHUDI**, University of South Africa, South Africa

Vacuum Technology
Room: 303 - Session VT-TuM

Gas Dynamics, Modeling, and Pumping Systems
Moderators: L. Wang, Los Alamos National Laboratory, M.P. Wüest, INFICON Ltd., Liechtenstein

8:00 am	**VT-TuM1** A Fast Numerical Method for Determining the Pressure Distribution in Electrostatic Chucks, **E.J. MCINERNEY**, Lam Research Corp	
8:20 am	**VT-TuM2** Numerical Simulation of a Jet Disrupter in an Electrospray RF Ion Funnel, **E. TRIDAS**, R. SCHLAF, University of South Florida, M. ANTHONY, Elion Systems	
8:40 am	**VT-TuM3 Invited** Gas Dynamics Modelling Efforts at CERN, **R. KERSEVAN**, CERN, Switzerland	
9:00 am	Invited talk continued.	
9:20 am	**VT-TuM5** Mixture Flow of Rarefied Gases through a Thin Orifice Over the Whole Range of Gas Rarefaction, **F. SHARIPOV**, Federal University of Parana, Brazil	
9:40 am	**VT-TuM6** Numerical Modeling of Particle Transport in Rarefied Flow, **MACK**, VAN DER DONCK, O. KIEVIT, TNO Delft, the Netherlands	
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** Improving the Performances of Getter Pumps: Recent Developments in NEG Technology, **F. SIVIERO**, G. BONGIORNO, L. CARUSO, A. GALLITOGNOTTA, L. VIALE, E. MACCALLINI, P. MANINI, SAES Getters, Italy	
11:20 am	Invited talk continued.	
11:40 am	**VT-TuM12 Invited** Advanced High Speed Water Vapor Cryopumps: Enabling Today's Vacuum Processes, **K. FLYNN**, C. REBECCHI, Brooks Automation, Inc., Polycold	
12:00 pm	Invited talk continued.	

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

Exhibitor Technology Spotlight Sessin
Moderator: C. Moffitt, Kratos Analytical Limited, UK

12:20 pm		
12:40 pm	**EW-TuL2** New Developments in Surface Analysis from Thermo Fisher Scientific, **T.S. NUNNEY**, P. MACK, A.E. WRIGHT, R.G. WHITE, A. BUSHELL, Thermo Fisher Scientific, UK	
1:00 pm	**EW-TuL3** What's New from Physical Electronics, **S.R. BRYAN**, J.F. MOULDER, Physical Electronics Inc.	
1:20 pm	**EW-TuL4** Latest Developments and Applications of X-ray Photoelectron Spectroscopy, **C.J. BLOMFIELD**, Kratos Analytical Limited, UK	
1:40 pm	**EW-TuL5** EW Bruker 2 Abstract, **BRUKER**, Bruker Corporation	
2:00 pm		

NOTES

	2D Materials Focus Topic Room: 310 - Session 2D+AS+HI+MC+NS+PS+SP+SS-TuA 2D Materials Characterization including Microscopy and Spectroscopy **Moderator:** M. Chhowalla, Rutgers University	Applied Surface Science Room: 316 - Session AS+MC+SS-TuA Analysis of Modified Surfaces **Moderators:** X. Dong, Eli Lilly and Company, C.A. Ventrice, Jr., University at Albany-SUNY
2:20 pm	**2D+AS+HI+MC+NS+PS+SP+SS-TuA1 Invited** Layer-Dependent Electronic and Physical Structure of 2D van der Waals Crystals, **R.M. OSGOOD**, Columbia University	**AS+MC+SS-TuA1 Invited** Analysis of Surface-oxidized Polypropylene Films, **M. STROBEL**, S.J. PACHUTA, D. POIRIER, H. LECHUGA, 3M Company
2:40 pm	Invited talk continued.	Invited talk continued.
3:00 pm	**2D+AS+HI+MC+NS+PS+SP+SS-TuA3** X-ray Photoemission and Electron Energy Loss Spectroscopy Investigation of the Band Gap and Band Alignment for h-BN and MoS_2 Materials and Interfaces, **B. FRENCH**, J. BROCKMAN, M. FRENCH, M. KUHN, J.D. BIELEFELD, S.W. KING, Intel Corporation, E. BERSCH, G. BERSUKER, SEMATECH, J. DISTEFANO, Y.C. LIN, J.A. ROBINSON, Penn State University	**AS+MC+SS-TuA3** XPS Analysis for Modified Fabrics, **C. DEEKS**, Thermo Fisher Scientific, UK, M. MILOŠEVIĆ, M. RADOIČIĆ, Z. ŠAPONJIĆ, University of Belgrade, Serbia, T.S. NUNNEY, Thermo Fisher Scientific, UK, M. RADETIĆ, University of Belgrade, Serbia
3:20 pm	**2D+AS+HI+MC+NS+PS+SP+SS-TuA4** STM/STS Characterization of MoS_2 Monolayers and Nanostructures, A. MILLS, C. CHEN, Virginia Tech, Y. YU, L. CAO, North Carolina State University, **C. TAO**, Virginia Tech	**AS+MC+SS-TuA4** Characterization of Corona Treated Polymers, **M.L. PACHOLSKI**, The Dow Chemical Company
3:40 pm	**BREAK**	**BREAK**
4:00 pm	**BREAK**	**BREAK**
4:20 pm	**2D+AS+HI+MC+NS+PS+SP+SS-TuA7** ARPES and Low-Energy Electron Microscopy Study on Supported, Suspended, and Twisted Bilayer MoS_2, **P.-C. YEH**, W. JIN, R.M. OSGOOD JR., Columbia University	**AS+MC+SS-TuA7** Investigation of Atmospheric Pressure Plasma Jet as a Pre-Treatment for Adhesive Bonding of Structures Made of Carbon Fiber Reinforced Plastics (CFRP), **T. HOFMANN**, J. HOLTMANNSPÖTTER, Bundeswehr Research Institute for Material, Fuels and Lubricants, Germany, T. MEER, Airbus Group Innovations, Germany, J. REHBEIN, G. HÄRTL, Bundeswehr Research Institute for Material, Fuels and Lubricants, Germany
4:40 pm	**2D+AS+HI+MC+NS+PS+SP+SS-TuA8** Surface Characterization of Metal Oxide Layers Grown on CVD Graphene and Spin Precession Measurements, **A. MATSUBAYASHI**, University at Albany-SUNY, W. NOLTING, University of Albany-SUNY, D. SINHA, University at Albany-SUNY, A. JAYANTHINARASIMHAM, J.U. LEE, University of Albany-SUNY, V.P. LABELLA, University at Albany-SUNY	**AS+MC+SS-TuA8** Thickness and Composition Determination of Thin Film Sn-Oxides Growth at Room Temperature using XPS Spectra, M. BRAVO-SANCHEZ, CINVESTAV-Queretaro, Mexico, **J.A. HUERTA-RUELAS**, Instituto Politecnico Nacional, Mexico, A. HERRERA-GOMEZ, CINVESTAV-Queretaro, Mexico
5:00 pm	**2D+AS+HI+MC+NS+PS+SP+SS-TuA9** Morphology of CVD-grown Hexagonal Boron Nitride on Cu Foils, **K. SRIDHARA**, W.G. CULLEN, University of Maryland, College Park, J.K. HITE, Naval Research Laboratory, M.S. FUHRER, Monash University, Australia, D.K. GASKILL, B.N. FEIGELSON, Naval Research Laboratory	**AS+MC+SS-TuA9** Understanding the Physiochemical and Ice-Nucleation Properties of Bare and Sulfuric Acid Coated Atmospheric Mineral Dust Aerosols, **M.I. NANDASIRI**, N. MADAAN, A. DEVARAJ, G.R. KULKARNI, T. VARGA, V. SHUTTHANANDAN, S.A. THEVUTHASAN, Pacific Northwest National Laboratory
5:20 pm	**2D+AS+HI+MC+NS+PS+SP+SS-TuA10** Influence of Chemisorbed Oxygen on the Growth of Graphene on Cu(100) and Cu(111) by Chemical Vapor Deposition, **E.W. ONG**, University at Albany-SUNY, Z.R. ROBINSON, U.S. Naval Research Laboratory, T.R. MOWLL, P. TYAGI, University at Albany-SUNY, H. GEISLER, SUNY College at Oneonta, C.A. VENTRICE, JR., University at Albany-SUNY	**AS+MC+SS-TuA10** A Study of the Effect of Deep UV (172nm) Irradiation on Polyimide Surfaces, **L. DAS**, M.J. KELLEY, The College of William and Mary
5:40 pm	**2D+AS+HI+MC+NS+PS+SP+SS-TuA11 Invited** Novel Materials Properties at Atomically Thin Limit, **Z.-X. SHEN**, Stanford University	**AS+MC+SS-TuA11** Small-Angle/Wide-Angle X-ray Scattering Investigation of Functional Materials at Inorganic-Macromolecular Interfaces, **I.C. TRAN**, T.W. VAN BUUREN, T.M. WILLEY, J.R.I. LEE, M. BAGGE-HANSEN, A. NOY, R. TUNUGUNTLA, K. KIM, Lawrence Livermore National Laboratory
6:00 pm	Invited talk continued.	

	Biomaterial Interfaces **Room: 317 - Session BI+AS-TuA**	**Electronic Materials and Processing** **Room: 314 - Session EM+2D-TuA**
	Characterization of Biointerfaces **Moderator:** J.E. Baio, Oregon State University	**High-k Dielectrics for Advance Semiconductor** **Moderator:** A.C. Kummel, University of California at San Diego
2:20 pm	**BI+AS-TuA1** Comparative Study of the Bonding and X-ray Induced Reactions of Thiolated and Unthiolated DNA Adsorbed on Gold, **R.A. ROSENBERG**, Argonne National Laboratory, J.M. SYMONDS, Georgia Institute of Technology, K. VIJAYALAKSHMI, Argonne National Laboratory, D. MISHRA, Weizmann Institute of Science, Israel, T.M. ORLANDO, Georgia Institute of Technology, R. NAAMAN, Weizmann Institute of Science, Israel	**EM+2D-TuA1 Invited** Time-resolved XPS of ALD, **R. TIMM**, Lund University, Sweden
2:40 pm	**BI+AS-TuA2** XPS Binding Energy Shifts for DNA Brushes on Gold, C.C.A. NG, **D.Y. PETROVYKH**, International Iberian Nanotechnology Laboratory, Portugal	Invited talk continued.
3:00 pm	**BI+AS-TuA3 Invited** Simultaneous 3D Detection of Organics for Intact Samples with Infrared Spectromicrotomography, **C.J. HIRSCHMUGL**, University of Wisconsin Milwaukee	**EM+2D-TuA3** GaSb Oxide Thermal Stability Studied by Dynamic-XPS, **S. MCDONNELL**, B. BRENNAN, E. BURSA, University of Texas at Dallas, K. WINKLER, P. BAUMANN, Omicron NanoTechnology, Germany, R.M. WALLACE, University of Texas at Dallas
3:20 pm	Invited talk continued.	**EM+2D-TuA4** Combined Wet HF and Dry Atomic H Cleaning of SiGe followed by Passivation of the Clean Surface via H_2O_2(g) Dosing, **S.W. PARK**, T. KAUFMAN-OSBORN, E.A. CHAGAROV, A.C. KUMMEL, University of California at San Diego
3:40 pm	**BREAK**	**BREAK**
4:00 pm	**BREAK**	**BREAK**
4:20 pm	**BI+AS-TuA7** Deep Thoughts: ToF-SIMS Profiling to New Depths, **D.J. GRAHAM**, L.J. GAMBLE, University of Washington	**EM+2D-TuA7** Interfacial and Electrical Study of Crystalline Oxidation Passivation for AlGaN/GaN HEMTs, **X. QIN**, H. DONG, J.Y. KIM, R.M. WALLACE, University of Texas at Dallas
4:40 pm	**BI+AS-TuA8** Development of Novel Pharmaceutical Systems Through Characterisation, **D.J. SCURR**, University of Nottingham, UK	**EM+2D-TuA8 Invited** Investigating Electrically Active Defects in High-*k*/InGaAs MOS System using MOS Capacitors and MOSFETs, **P.K. HURLEY**, Tyndall National Institute, Ireland, V. DJARA, IBM Research - Zurich, Switzerland, E. O'CONNOR, S. MONAGHAN, I.M. POVEY, J. LIN, Tyndall National Institute, Ireland, M.A. NEGARA, Stanford University, B. SHEEHAN, K. CHERKAOUI, Tyndall National Institute, Ireland
5:00 pm	**BI+AS-TuA9** Analysis of Peptide Microarrays on Si Using ToF-SIMS, **J.A. OHLHAUSEN**, C. JAMES, Sandia National Laboratories, D. SMITH, HealthTell, S.A. JOHNSTON, N. WOODBURY, Arizona State University	Invited talk continued.
5:20 pm	**BI+AS-TuA10** Investigating Tumor Microenvironments with ToF-SIMS, **L.J. GAMBLE**, B. BLUESTEIN, D.J. GRAHAM, University of Washington	**EM+2D-TuA10 Invited** XPS Study of High-k Gate Stack and Interaction with Different Channel Materials and Metal Gate, **BEVAN**, Applied Materials Inc.
5:40 pm	**BI+AS-TuA11** Correlative Imaging of Mammalian Cells in Their Native Environments using a Microfluidic Reactor by ToF-SIMS and SIM, **X. HUA**, C. SZYMANSKI, Z.Y. WANG, B.W. LIU, Z. ZHU, J.E. EVANS, G. ORR, Pacific Northwest National Laboratory, S.Q. LIU, Southeast University, China, X.Y. YU, Pacific Northwest National Laboratory	Invited talk continued.
6:00 pm	**BI+AS-TuA12** Mass Spectrometry using Femtosecond Lasers and Postionization to Characterize Biomaterials Interfaces, Y. CUI, Y.P. YUNG, **L. HANLEY**, University of Illinois at Chicago	**EM+2D-TuA12** Reliability of nc-CdSe Embedded ZrHfO High-*k* Dielectric Nonvolatile Memory – Temperature Effects, **S. ZHANG**, Y. KUO, Texas A&M University

	Energy Frontiers Focus Topic **Room: 315 - Session EN+EM+NS-TuA** **Charge Storage Materials and Devices** **Moderator:** S.M. Thon, Johns Hopkins University	**Exhibitor Technology Spotlight** **Room: Hall ABC - Session EW-TuA** **Exhibitor Technology Spotlight Session** **Moderator:** C. Moffitt, Kratos Analytical Limited, UK
2:20 pm	**EN+EM+NS-TuA1 Invited** Spatiotemporal Investigation of Li-Air Battery under Operating Condition: Understanding the Cathodic and Anodic Electrochemical Processes and their Interdependence, **D.-J. LIU**, Argonne National Laboratory	
2:40 pm	Invited talk continued.	
3:00 pm	**EN+EM+NS-TuA3** Insights into Ionic vs. Electronic Transport in Nanostructured Battery Electrodes Enabled by Microfabrication and Spatially Resolved XPS, **A.J. PEARSE**, E. GILLETTE, S.B. LEE, G.W. RUBLOFF, University of Maryland, College Park	
3:20 pm	**EN+EM+NS-TuA4** The Lithium-Induced Conversion Reaction of CoO Thin Film Battery Materials in Ultra-High Vacuum as Studied by ARXPS and STM, **R. THORPE**, S. RANGAN, A. HOWANSKY, R.A. BARTYNSKI, Rutgers, the State University of New Jersey	
3:40 pm	**BREAK**	**BREAK**
4:00 pm	**BREAK**	**EW-TuA6** What's New in AFM for Nanoelectrical and Nanomechanical Characterization, **K. JONES**, Oxford Instruments Asylum Research
4:20 pm	**EN+EM+NS-TuA7** Controlled Cathode/Catalyst Architectures for Li-O_2 Batteries, **M. NOKED**, M.A. SCHROEDER, A.J. PEARSE, C. LIU, A.C. KOZEN, S.B. LEE, G.W. RUBLOFF, University of Maryland, College Park	
4:40 pm	**EN+EM+NS-TuA8** Vertically Aligned Carbon Nanotubes on Ni Foam as a 3D Li-O_2 Battery Cathode, **M.A. SCHROEDER**, M. NOKED, A.J. PEARSE, A.C. KOZEN, S.B. LEE, G.W. RUBLOFF, University of Maryland, College Park	
5:00 pm	**EN+EM+NS-TuA9** Solid Micro-supercapacitor using Directed Self-Assembly of Tobacco Mosaic Virus and RuO_2, **M. GNERLICH**, E.I. TOLSTAYA, J. CULVER, D. KETCHUM, R. GHODSSI, University of Maryland, College Park	
5:20 pm	**EN+EM+NS-TuA10** Characterization of *Tobacco Mosaic Virus*-templated Ni/NiO Eletrodes for Solid Flexible Supercapacitors, **S. CHU**, K.D. GERASOPOULOS, M. GNERLICH, J. CULVER, R. GHODSSI, University of Maryland, College Park	
5:40 pm	**EN+EM+NS-TuA11** Charged Particles Micro-Penning-Malmberg Trap: An Approach to Store High Densities with Substantially Lower End Barrier Potentials, **A. NARIMANNEZHAD**, J. JENNINGS, C. MINNAL, M.H. WEBER, K.G. LYNN, Washington State University	
6:00 pm	**EN+EM+NS-TuA12** The Road to Next-Generation Energy Storage is Paved with Zinc, **J.F. PARKER**, C.N. CHERVIN, Naval Research Laboratory, I.R. PALA, National Research Council postdoc working at Naval Research Laboratory, E.S. NELSON, Pathways Student working at Naval Research Laboratory, J.W. LONG, D.R. ROLISON, Naval Research Laboratory	

	In-Situ Spectroscopy and Microscopy Focus Topic Room: 313 - Session IS+AS+MC+SS-TuA Environmental Electron Microscopies **Moderator:** J.A. Boscoboinik, Brookhaven National Laboratory	Accelerating Materials Discovery for Global Competitiveness Focus Topic Room: 302 - Session MG-TuA Multi-scale Modeling in the Discovery of Advanced Materials **Moderators:** A. Roldan, University College London, UK, V. Tikare, Sandia National Laboratories
2:20 pm	**IS+AS+MC+SS-TuA1 Invited** Nanocrystal Shape Evolution during Growth, **H. ZHENG**, Lawrence Berkeley Lab, University of California, Berkeley	**MG-TuA1 Invited** Search for Substitutes of Critical Materials with Targeted Properties by Scale-Bridging and High-Throughput Modelling and Simulation, **C.K.V. ELSÄSSER**, Fraunhofer Institute for Mechanics of Materials IWM, Germany
2:40 pm	Invited talk continued.	Invited talk continued.
3:00 pm	**IS+AS+MC+SS-TuA3** Microfluidic Cell for *In Situ* Scanning Electron Microscopy of Hydrated Dynamic Systems, **C.M. BROWN**, A. YULAEV, A. KOLMAKOV, National Institute of Standards and Technology (NIST)	**MG-TuA3** Monte Carlo Simulations of Nanoscale Focused Electron Beam Induced Etching, R. TIMILSINA, **P.D. RACK**, The University of Tennessee Knoxville, K. WOLFF, M. BUDACH, K. EDINGER, Carl Zeiss SMS, Germany
3:20 pm	**IS+AS+MC+SS-TuA4** Liquid Jet –X-ray Photoelectron Spectroscopy and MD Simulations indicate that Li Cations in Aqueous Solutions Exhibit High Surface Propensity, **K.A. PERRINE**, M.H.C. VAN SPYK, M.J. MAKOWSKI, A.C. STERN, K. PARRY, D.J. TOBIAS, University of California Irvine, A. SHAVORSKIY, H. BLUHM, Lawrence Berkeley National Laboratory, B. WINTER, Helmholtz-Zentrum Berlin für Materialien und Energie/Elektronenspeicherring BESSY II, Germany, J.C. HEMMINGER, University of California Irvine	
3:40 pm	**BREAK**	**BREAK**
4:00 pm	**BREAK**	**BREAK**
4:20 pm	**IS+AS+MC+SS-TuA7 Invited** Complementary Microscopy and Spectroscopy Investigations of the Initial Oxidation Stages of Binary Alloy Thin Films, **J.C. YANG**, University of Pittsburgh	**MG-TuA7 Invited** Advances in Multiscale Mathematical Modeling of Materials: From Phase Diagrams to Interface Dynamics, **M. EMELIANENKO**, George Mason University
4:40 pm	Invited talk continued.	Invited talk continued.
5:00 pm	**IS+AS+MC+SS-TuA9 Invited** Direct Observation of Structure Controlled Carbon Growth by Environmental TEM, J. KLING, T.W. HANSEN, **J.B. WAGNER**, Technical University of Denmark	**MG-TuA9** Discrete All-Atom Simulations: Predicting Fit-for-Purpose Properties of Fuels, M.T. KNIPPENBERG, High Point University, **B.L. MOONEY**, J.A. HARRISON, United States Naval Academy
5:20 pm	Invited talk continued.	**MG-TuA10** Luminescent Lanthanide Labeled Graphene Oxide Materials, **A.L. JENKINS**, ASK Inc., M.M. HURLEY, US Army Research Laboratory, A. BALBOA, US Army Edgewood Chemical and Biological Center
5:40 pm	**IS+AS+MC+SS-TuA11** *In Situ* Energy Loss Spectroscopy, A Novel Approach to the Characterization of Surfaces during MBE Growth, **P.G. STAIB**, Staib Instruments, Inc.	
6:00 pm	**IS+AS+MC+SS-TuA12** Selective Staining for Enhanced Spectroscopic Identification of Domains in Immiscible Polymer Blends by Micro-Raman Spectroscopy, **N.W.M. HELLER**, C.R. CLAYTON, SUNY Stony Brook, S.L. GILES, J.H. WYNNE, Naval Research Laboratory, M.J. WYTIAZ, M.E. WALKER, Sherwin-Williams Company	

	Magnetic Interfaces and Nanostructures Room: 311 - Session MI+MG-TuA Development of Multiferroic Materials (2:20- 5:00PM) / MIND Panel Discussion (5:00-6:30 pm) **Moderator:** P. Fischer, Lawrence Berkeley National Laboratory	MEMS and NEMS Room: 301 - Session MN+NS-TuA Multi-Scale Phenomena and Bio-Inspired MEMS/NEMS **Moderators:** M. Dhayal, CSIR Centre for Cellular and Molecular Biology (CCMB), India, P.X.-L. Feng, Case Western Reserve University
2:20 pm	**MI+MG-TuA1 Invited** Versatile Abilities of Lattice Instabilities: New Design Strategies for Emergent Ferroics, **J.M. RONDINELLI**, Drexel University	**MN+NS-TuA1 Invited** MEMS-Enabled Multiscale Nanolaminated Magnetics, **M.G. ALLEN**, University of Pennsylvania
2:40 pm	Invited talk continued.	Invited talk continued.
3:00 pm	**MI+MG-TuA3 Invited** Voltage-controlled Exchange Bias and Exchange Bias Training, **CH. BINEK**, W. ECHTENKAMP, University of Nebraska-Lincoln	**MN+NS-TuA3** Fabrication and Electrical Performance of Through Silicon Via Interconnects Filled with a Copper/Carbon Nanotube Composite, Y. FENG, **S.L. BURKETT**, The University of Alabama
3:20 pm	Invited talk continued.	**MN+NS-TuA4** Meso Scale MEMS Motion Transformer and Amplifier Electrostatically Actuated by Parallel Plate Electrodes, Y. GERSON, S. KRYLOV, Tel Aviv University, Israel, **NAHMIAS**, R. MAIMON, Microsystems Design Center, RAFAEL LTD, Israel
3:40 pm	**BREAK**	**BREAK**
4:00 pm	**BREAK**	**BREAK**
4:20 pm	**MI+MG-TuA7** Multiferroic Z_6 Vortices in Hexagonal $ErMnO_3$, Y. GENG, X.-Y. WANG, S.-W. CHEONG, **W. WU**, Rutgers University	**MN+NS-TuA7 Invited** Bio-Inspired Microlenses and Their Biomedical Applications, **H. JIANG**, University of Wisconsin - Madison
4:40 pm	**MI+MG-TuA8** Two-Dimensional Manganese Gallium Quantum Height Islands on Wurtzite GaN (000-1), **J. PAK**, A. MANDRU, A.R. SMITH, Ohio University	Invited talk continued.
5:00 pm	**PANEL DISCUSSION**	**MN+NS-TuA9** The Development of a Valve Based Microfluidic Biofilm Reactor for Biofilm Studies with Reliable Controls, **S. SUBRAMANIAN**, M.T. MEYER, Y.W. KIM, W.E. BENTLEY, R. GHODSSI, University of Maryland, College Park
5:20 pm	**MI+MG-TuA10** Current Topics in Magnetism: The Importance of Interfaces, **M.D. STILES**, National Institute of Standards and Technology	**MN+NS-TuA10** Multimode Silicon Carbide (SiC) Microdisk Resonator in Liquid, **H. JIA**, P.X.-L. FENG, J. LEE, Case Western Reserve University
5:40 pm	**MI+MG-TuA11** Optical Spectroscopy of Nanomaterials within Magnetic Fields, **A.R. HIGHT WALKER**, NIST	**MN+NS-TuA11** Development of CMOS-based Capacitive Micromachined Ultrasonic Transducers Operated in Collapsed Mode, **W.-C. CHUNG**, M.-C. TSAO, P.-C. LI, W.-C. TIAN, National Taiwan University, Taiwan, Republic of China
6:00 pm	**OPEN DISCUSSION**	**MN+NS-TuA12** Development of Micro Gas Preconcentrator Using Electroless Gold Deposition for Human Breath Analysis, **C.-Y. KUO**, C.-L. HSU, National Taiwan University, Taiwan, Republic of China, H.-Y. KUO, C.-J. LU, National Taiwan Normal University, Taiwan, Republic of China, W.-C. TIAN, National Taiwan University, Taiwan, Republic of China

	Nanometer-scale Science and Technology Room: 304 - Session NS+AS+SS-TuA **Nanowires and Nanotubes: Advances in Growth and Characterization** **Moderator:** L.J. Lauhon, Northwestern University	Plasma Science and Technology Room: 308 - Session PS-TuA **Advanced BEOL/Interconnect Etching** **Moderator:** T. Nozawa, Tokyo Electron Ltd., Japan
2:20 pm	**NS+AS+SS-TuA1 Invited** Surface Chemical Choreography of Nanowire Synthesis, **M.A. FILLER**, S.V. SIVARAM, N. SHIN, I.R. MUSIN, Georgia Institute of Technology	**PS-TuA1 Invited** Highly-Selective Etch Gas Chemistry Design for Precise DSAL Dry Development Process, **H. HAYASHI**, T. IMAMURA, H. YAMAMOTO, I. SAKAI, M. OMURA, Toshiba Corporation Center for Semiconductor Research & Development, Japan
2:40 pm	Invited talk continued.	Invited talk continued.
3:00 pm	**NS+AS+SS-TuA3** Atom Probe Tomography Analysis of GaAs-AlGaAs Core-Shell Nanowire Heterostructures, **N. JEON**, Northwestern University, S. MORKOTTER, G. KOBLMULLER, Technische Universität München, Germany, L.J. LAUHON, Northwestern University	**PS-TuA3** Plasma Etch Considerations for Roughness Improvements during EUV and DSA Pattern Transfer using Mid Gap CCP, **V. RASTOGI**, H. MATSUMOTO, A. METZ, A. RANJAN, N. MOHANTY, A. KO, Y. CHIBA, TEL Technology Center, America, LLC, X. HU, L. WANG, E. HOSLER, R. FARRELL, M. PREIL, GLOBALFOUNDRIES U.S. Inc.
3:20 pm	**NS+AS+SS-TuA4** Scanning Tunneling Microscopy of Semiconductor Nanowire Surfaces and Devices, R. TIMM, J. KNUTSSON, M. HJORT, S. MCKIBBIN, O. PERSSON, J.L. WEBB, **A. MIKKELSEN**, Lund University, Sweden	**PS-TuA4** TiN Selectivity Improvement in Sub 20nm Node SAV Process with TFMHM Scheme, **L. WANG**, Y. CHIBA, T. YAMAMURA, J. STILLAHN, Y.P. FEURPRIER, K. KUMAR, A. RANJAN, P. BIOLSI, TEL Technology Center, America, LLC, Y. REN, X. HU, M. OH, H. JOHANSSON, GLOBALFOUNDRIES, NY, USA
3:40 pm	**BREAK**	**BREAK**
4:00 pm	**BREAK**	**BREAK**
4:20 pm	**NS+AS+SS-TuA7** Poly-Aromatic Hydrocarbon Nanostructure Growth on Single and Multi-Layer Graphene, **A. YULAEV**, CNST/UMD Graduate Student Researcher, A. KOLMAKOV, NIST	**PS-TuA7** Interactions between the Plasma and the Mask Material during Contact Etching, **M. MEBARKI**, STMicroelectronics, France, M. DARNON, LTM - MINATEC - CEA/LETI, France, C.J. JENNY, D. RISTOIU, STMicroelectronics, France, N. POSSEME, Cea-Leti, Minatec, O. JOUBERT, LTM - MINATEC - CEA/LETI, France
4:40 pm	**NS+AS+SS-TuA8** Using Surface Chemistry to Direct the *In Situ* Synthesis and Placement of Nanowires, A.A. ELLSWORTH, J. YANG, Z. SHI, **A.V. WALKER**, University of Texas at Dallas	**PS-TuA8** Contact Level Patterning Challenges for Sub 22-nm Architecture, **J.C. SHEARER**, J. DECHENE, S. KANAKASABAPATHY, IBM Corporation, N. MOHANTY, B. MESSER, H. COTTLE, A. METZ, TEL Technology Center, America, LLC, J. LEE, Samsung Electronics
5:00 pm	**NS+AS+SS-TuA9** Ceramic Nanotubes Manufacture Using Reactive Magnetron Sputtering Deposition and Polymer Nanofibers Templates, **D.M. MIHUT**, K. LOZANO, H. FOLTZ, H. CORTEZ, The University of Texas Pan American	**PS-TuA9** Method for Preferential Shrink Ratio Control in Elliptical Contact Etch, **HONGYUN COTTLE**, A. LISI, A. METZ, K. KUMAR, D. KOTY, A. MOSDEN, P. BIOLSI, TEL Technology Center, America, LLC
5:20 pm	**NS+AS+SS-TuA10** Development of New Nanocatalysts through Restructuring of Co_3O_4 Nanorods Anchored with Pt Atoms, **S. ZHANG**, University of Notre Dame, A. FRENKEL, Brookhaven National Laboratory, F. TAO, University of Notre Dame	**PS-TuA10** Novel Fluorocarbons Chemistries to Enable 3D NAND High Aspect Ratio Etching, R. GUPTA, B. LEFEVRE, **V. PALLEM**, N. STAFFORD, American Air Liquide, J.M. KIM, K. DOAN, S. NEMANI, Applied Materials Inc.
5:40 pm	**NS+AS+SS-TuA11** A Study of Single-Walled Carbon Nanotubes Coated with Iron Oxide (Fe_2O_3) Nanoparticles for Enhanced Magnetic Properties, **S. NEUPANE**, D. SEIFU, Morgan State University	**PS-TuA11** LER/LWR Improvements in Dual Frequency CCPs for Advanced Node Patterning, **M. WANG**, N. MOHANTY, S. NAKAMURA, A. KO, A. RANJAN, TEL Technology Center, America, LLC
6:00 pm	**NS+AS+SS-TuA12** Strong Phase Dependent Optical and Magnetic Properties of Mn Doped Zn_2SiO_4 Nanowires, **A.S. BHATTI**, M. HAFEEZ, A. ALI, S. MANZOOR, COMSATS Institute of Information Technology, Pakistan	**6:05 pm PSTD Business Meeting**

	Novel Trends in Synchrotron and FEL-Based Analysis Focus Topic **Room: 312 - Session SA-TuA** **Free Electron Laser and Synchrotron Studies at the Molecule-Surface Interfaces** **Moderator:** Z. Hussain, Lawrence Berkeley National Laboratory	**Surface Science** **Room: 309 - Session SS+NS-TuA** **Nanostructures: Growth, Reactivity and Catalysis** **Moderators:** J.A. Harrison, United States Naval Academy, G.A. Kimmel, Pacific Northwest National Laboratory
2:20 pm	**SA-TuA1 Invited** FEL-Based Techniques to Explore Photochemistry and Transient States of Molecules on Surfaces, **W. WURTH**, Universität Hamburg, Germany	**SS+NS-TuA1 Invited** Building Nanostructured Nanowires via Sequential Catalyst Reactions, **F.M. ROSS**, IBM T.J. Watson Research Center
2:40 pm	Invited talk continued.	Invited talk continued.
3:00 pm	**SA-TuA3 Invited** Real-time X-ray Photoelectron Spectroscopy Studies of Electronic Dynamics at Molecule-Semiconductor Interfaces, **O. GESSNER**, Lawrence Berkeley National Laboratory	**SS+NS-TuA3** Ar/O_2 and H_2O Plasma Modified SnO_2 Nanomaterials for Gas Sensing Applications, **E.P. STUCKERT**, E.R. FISHER, Colorado State University
3:20 pm	Invited talk continued.	**SS+NS-TuA4** Interaction of D_2O on the Surface Grown ZnO(0001) Nanostructures, **X. DENG**, D.C. SORESCU, J. LEE, C. MATRANGA, National Energy Technology Laboratory
3:40 pm	**BREAK**	**BREAK**
4:00 pm	**BREAK**	**BREAK**
4:20 pm	**SA-TuA7 Invited** Unraveling Topological Properties of Spintronic Materials Using Coherent X-rays, **R. ROY**, Lawrence Berkeley National Laboratory	**SS+NS-TuA7 Invited** 2014 AVS Medard Welch Award Lecture: Quasicrystals to Nanoclusters: It's All on the Surface, **P.A. THIEL***, Iowa State University
4:40 pm	Invited talk continued.	Invited talk continued.
5:00 pm	**SA-TuA9 Invited** Where are the Electrons? Charge Transfer and Dissociation from a Femtosecond Electronic-Structure Perspective, **PH. WERNET**, Helmholtz-Zentrum Berlin (HZB), Germany	**SS+NS-TuA9** Photodeposited Pt Nanoparticles on Iron Oxide Nanoparticles Supported on Highly Oriented Pyrolytic Graphite, **J.Y. KWON**, J.C. HEMMINGER, University of California Irvine
5:20 pm	Invited talk continued.	**SS+NS-TuA10** Unraveling Micro-Mechanisms of Grain Boundary Migration using Molecular Dynamics Simulation and Reaction Path Techniques, **S. LU**, D. BRENNER, North Carolina State University
5:40 pm	**SA-TuA11** Layer Speciation and Electronic Structure Investigation of Hexagonal Boron Nitride Thin Film by Scanning Transmission X-ray Microscopy, **J. WANG**, Canadian Light Source Inc., Canada, Z. WANG, University of Western Ontario, Canada, H. CHO, M.J. KIM, Korea Institute of Science and Technology, Republic of Korea, T.-K. SHAM, University of Western Ontario, Canada, X. SUN, Soochow University, China	**SS+NS-TuA11** Formation and Stability of and Surface Chemistry on Dense Arrays of Au Nanoclusters on Hexagonal Boron Nitride/Rh(111), M.C. PATTERSON, **P.T. SPRUNGER**, J.R. FRICK, Y. XU, Louisiana State University, B.F. HABENICHT, University of California Merced, R.L. KURTZ, Louisiana State University, L. LIU, Texas A&M University
6:00 pm	**SA-TuA12** Reference-free, In-depth Characterization of Nanoscaled Materials by Combined X-ray Reflectivity and Grazing incidence X-ray Fluorescence Analysis, **P. HÖNICKE**, M. MÜLLER, Physikalisch-Technische Bundesanstalt, Germany, B. DETLEFS, CEA-LETI, France, C. FLEISCHMANN, IMEC, Belgium, B. BECKHOFF, Physikalisch-Technische Bundesanstalt, Germany	**SS+NS-TuA12** Collective Multi-Atom Diffusion in Ag/Ge(110) 1D Nanoisland Growth, **S. CHIANG**, C.H. MULLET, University of California, Davis, M.C. TRINGIDES, Iowa State University and Ames Lab-USDOE, M.S. VAN ZIJLL, B.H. STENGER, E.S. HUFFMAN, D.J. LOVINGER, E.C. POPPENHEIMER, University of California, Davis

* Medard W. Welch Award Winner

	Thin Film Room: 305 - Session TF+AS+EM-TuA Thin Film: Growth and Characterization II **Moderator:** M.R. Davidson, University of Florida	Thin Film Room: 307 - Session TF+EN+PS-TuA ALD for Energy **Moderator:** W.M.M. Kessels, Eindhoven University of Technology, Netherlands
2:20 pm	**TF+AS+EM-TuA1** A Statistical Optimization of Perpendicular Anisotropy and Damping for Ta-Inserted Double CoFeB/MgO Interface MTJ's, S. GUPTA, **S. SCHWARM**, B. CLARK, University of Alabama	**TF+EN+PS-TuA1** Li-Based ALD Solid Electrolytes for Beyond-Li-Ion Batteries, **A.C. KOZEN***, A.J. PEARSE, M.A. SCHROEDER, C. LIU, M. NOKED, C.F. LIN, G.W. RUBLOFF, University of Maryland, College Park
2:40 pm	**TF+AS+EM-TuA2** 1D Matlab Modeling of the Reaction-Diffusion System during the Selenization Process in the Two-Step CIGS Solar Cells Production Process, **J. EMMELKAMP**, A. MANNHEIM, TNO Technical Sciences, Netherlands	**TF+EN+PS-TuA2** Engineering Lithium-Containing Ionic Conductive Thin Films by Atomic Layer Deposition for Lithium-ion Battery Applications, **J. CHO**, T. SEEGMILLER, J. LAU, L. SMITH, J. HUR, B. DUNN, J.P. CHANG, University of California at Los Angeles
3:00 pm	**TF+AS+EM-TuA3 Invited** TiSiO Thin Films Deposited by Plasma Enhanced Chemical Vapor Deposition for Optical and Electrical Applications, **A. GOULLET**, S. ELISABETH, D. LI, M. CARETTE, A. GRANIER, IMN, France	**TF+EN+PS-TuA3 Invited** Applications of ALD for Li ion Batteries and Low Temperature Fuel Cells, **X. SUN**, University of Western Ontario
3:20 pm	Invited talk continued.	Invited talk continued.
3:40 pm	**BREAK**	**BREAK**
4:00 pm	**BREAK**	**BREAK**
4:20 pm	**TF+AS+EM-TuA7** Kinetically-Limited Lattice Relaxation in Linearly- and Non-Linearly- Compositionally-Graded InxGa1-xAs/GaAs (001) Metamorphic Heterostructures, **T. KUJOFSA**, J.E. AYERS, University of Connecticut	**TF+EN+PS-TuA7** ALD for a High Performance "All-in-One" Nanopore Battery, **C. LIU**, X. CHEN, E. GILLETTE, A.J. PEARSE, A.C. KOZEN, M.A. SCHROEDER, K. GREGORCZYK, S.B. LEE, G.W. RUBLOFF, University of Maryland, College Park
4:40 pm	**TF+AS+EM-TuA8** Vanadium Nitride Thin Films And Nanoclusters Grown *In Situ* Via Direct Nitridation, **O. BONDARCHUK**, Y. ZHANG, J. CARRASCO, R. MYSYK, T. ROJO, CIC energiGUNE, Spain	**TF+EN+PS-TuA8** Pseudocapacitive Manganese Oxide Grown by Atomic Layer Deposition, **M.J. YOUNG**, C.D. HARE, A.S. CAVANAGH, C.B. MUSGRAVE, S.M. GEORGE, University of Colorado, Boulder
5:00 pm	**TF+AS+EM-TuA9** Superconducting Properties of NbN and NbTiN Thin Films, **M. BURTON**, M.R. BEEBE, R.A. LUKASZEW, D. BERINGER, College of William and Mary	**TF+EN+PS-TuA9** Excellent Chemical Passivation of p^+ and n^+ Surfaces of Silicon Solar Cells by Atomic Layer Deposition of Al_2O_3 and SiO_2/Al_2O_3 Stacks, **B.W.H. VAN DE LOO**, H.C.M. KNOOPS, Eindhoven University of Technology, Netherlands, G. DINGEMANS, ASM, Netherlands, I.G. ROMIJN, ECN Solar Energy, Netherlands, W.M.M. KESSELS, Eindhoven University of Technology, Netherlands
5:20 pm	**TF+AS+EM-TuA10** (111) $Zr_xTi_{1-x}N$ ($0 \le x \le 1$) Thin Films Deposition and Characterization, **R. LI**, J.S. GANDHI, R. PILLAI, University of Houston, C. BONEY, Bruker Nano Surfaces, D. STARIKOV, R.L. FORREST, A. BENSAOULA, University of Houston	**TF+EN+PS-TuA10** Opportunities for Transparent Conductive Oxides Prepared by ALD for Silicon Heterojunction Solar Cells, **B. MACCO**, S. SMIT, Y. WU, D. VANHEMEL, W.M.M. KESSELS, Eindhoven University of Technology, Netherlands
5:40 pm	**TF+AS+EM-TuA11** High-Throughput Assessment of the Composition Dependence of Initial Passivating-Al_2O_3-Scale Establishment in $Al_xFe_yNi_{1-x-y}$ Alloy Thin Films, **M. PAYNE**, J. MILLER, A.J. GELLMAN, Carnegie Mellon University, DOE - National Energy Technology Laboratory	**TF+EN+PS-TuA11** Study of the Surface Passivation Mechanism of *c*-Si by Al_2O_3 using *In Situ* infrared spectroscopy, R.P. CHAUKULKAR, Colorado School of Mines, W. NEMETH, A. DAMERON, P. STRADINS, National Renewable Energy Laboratory, **S. AGARWAL**, Colorado School of Mines
6:00 pm	**TF+AS+EM-TuA12** Structural, Electrical, and Optical Characterization of Impurity-Dependent, Ultra-Low-Dislocation-Density Ge Epitaxially Grown on Si and Characterization of MOSFETs Fabricated on Ge-on-Si, **S. GHOSH**, S.M. HAN, University of New Mexico	**TF+EN+PS-TuA12** Low Temperature Plasma-assisted Atomic Layer Deposition of TiO_2 Blocking Layers for Flexible Hybrid Mesoscopic Solar Cells, V. ZARDETTO, Eindhoven University of Technology, Netherlands, F. DI GIACOMO, T.M. BROWN, A. DI CARLO, A. D'EPIFANIO, S. LICOCCIA, University of Rome "Tor Vergata", Italy, W.M.M. KESSELS, **M. CREATORE**, Eindhoven University of Technology, Netherlands

* TFD James Harper Award Finalist

Vacuum Technology
Room: 303 - Session VT-TuA

Vacuum Quality Analysis, Outgassing, and Control
Moderators: J.A. Fedchak, National Institute of Standards and Technology (NIST), M.L. Stutzman, Thomas Jefferson National Accelerator Facility

2:20 pm	**VT-TuA1 Invited** Our Present Understanding of Outgassing, **M. LEISCH**, Graz University of Tech., Austria	
2:40 pm	Invited talk continued.	
3:00 pm	**VT-TuA3** Hydrogen Traps in the Outgassing Model of a Stainless Steel Vacuum Chamber, **R.F. BERG**, National Institute of Standards and Technology (NIST)	
3:20 pm	**VT-TuA4** A Mild Steel Ultrahigh Vacuum Chamber Appropriate for Magnetic Shielding, B. CHO, S.J. AHN, Korea Research Institute of Standards and Science (KRISS), Republic of Korea, C.D. PARK, **T. HA**, POSTECH, Republic of Korea	
3:40 pm	**BREAK**	
4:00 pm	**BREAK**	
4:20 pm	**VT-TuA7 Invited** Ultimate Limits in the Gas Composition Determination Within Small Sealed Volumes by Quadrupole Mass Spectrometry, **V. NEMANIČ**, Jozef Stefan Institute, Slovenia	
4:40 pm	Invited talk continued.	
5:00 pm	**VT-TuA9** The Importance of Competitive Langmuir Adsorption Kinetics for Vacuum Cleanliness, **R. VERSLUIS**, TNO Technical Sciences, Netherlands	
5:20 pm	**VT-TuA10** Diagnostic Tool to Identify Volatile Molecules in Vacuum, **F.T. MOLKENBOER**, A. VAN DE RUNSTRAAT, J.A. VAN DER MEER, T. VAN GRONINGEN, O. KIEVIT, TNO Technical Sciences, Netherlands	
5:40 pm	**VT-TuA11** Quantitative Gas Analysis of Small Batch Samples by Quadrupole Mass Spectrometer, **L. WANG**, Los Alamos National Laboratory	
6:00 pm	**VT-TuA12** A Novel Vacuum Mini-Environment Design For Thin Film Sputter Deposition Apparatus, **X. XIE**, R.L. RUCK, C. LIU, P. LEAHEY, T. BLUCK, Intevac, Inc.	

Anticipated Schedule
Tuesday Morning, November 11, 2014

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, November 11, 2014

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		

Actinides and Rare Earths Focus Topic
Room: Hall D - Session AC-TuP

AC Posters for Fun and Profit

6:30 pm

AC-TuP1 Estimating the Fraction of Copper Incorporated in Lattice of Nano Titania, **Y.L. WEI**, S.H. CHANG, Tunghai University, Taiwan, Republic of China, H.P. WANG, National Cheng-Kung University, Taiwan, Republic of China

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

Electronic Materials and Processing Poster Session

6:30 pm

EM-TuP1 Growth of AlN Nanowires on Sapphire and Silicon using the Pulsed Electron Beam Deposition (PED) Process, N. AREFIN, P. LARSON, University of Oklahoma, **M.H. KANE**, Texas A&M University, M.B. JOHNSON, P.J. MCCANN, University of Oklahoma

EM-TuP2 Passivation of InSb(100) with 1-Eicosanethiol Self-Assembled Monolayers, Y.D. CONTRERAS, **P. MANCHENO**, A.J. MUSCAT, University of Arizona

EM-TuP3 Electric Measurements of RF SOI MOSFET using CMOS Technology, **W.C. MARIANO**, UNICAMP, Brazil

EM-TuP4 Laser-Assisted Dry Etch of poly-Si and SiO_2 for Semiconductor Processing, **J.A. PECK**, D.N. RUZIC, I.A. SHCHELKANOV, University of Illinois at Urbana-Champaign

EM-TuP5 Fabrication of Inverse Opal Structures by Langmuir-Blodgett Silica Microsphere Assembly and Germanium Back Filling by Molecular Beam Epitaxy, M. ZHOU, **S. ATIGANYANUN**, S. GHOSH, J. CHAVEZ, S.E. HAN, S.M. HAN, University of New Mexico

EM-TuP6 Band-gap Measurements of Low-k Porous Organosilicate Dielectrics using Vacuum Ultraviolet Irradiation, **H. ZHENG**, University of Wisconsin-Madison, S.W. KING, Intel Corporation, T. RYAN, GLOBALFOUNDRIES, Y. NISHI, Stanford University, J.L. SHOHET, University of Wisconsin-Madison

EM-TuP7 Formation of AlN Thin Films by Direct Nitridation of Aluminum Thin Films and Their Visible Photoluminescence Property, **S. KAJIHARA**, M. HAMASAKI, H. KATSUMATA, Meiji University, Japan

EM-TuP8 Improvement of Effective Work Function and Transmittance of ITO/Ultra-Thin $In_{1-x}Ru_xO_y$ Stack Structure, **I. YAMAMOTO**, Shibaura Institute of Technology, Japan, T. KATTAREEYA, Chulalongkorn University, Thailand, T. CHIKYO, K. TSUKAGOSHI, NIMS, Japan, T. OHISHI, Shibaura Institute of Technology, Japan, T. NABATAME, NIMS, Japan

EM-TuP9 Solid Phase Growth of Mg_2Si Thin Films on Poly-Si/Glass Substrates Prepared by Aluminum Induced Crystallization, **S. KAWAGUCHI**, A. KUSUNOKI, S. YOSHIDA, H. KATSUMATA, Meiji University, Japan

EM-TuP10 Sputter Deposited High Quality Amorphous Hydrogenated Silicon Thin Films for Device Application; Synthesis and Model, **H. SHAIK**, G.M. RAO, Indian Institute of Science, India

EM-TuP11 The Effect of Vacuum-Ultraviolet Irradiation on Copper Diffusion into Low-k Dielectrics, **X. GUO**, University of Wisconsin-Madison, Y. NISHI, Stanford University, J.L. SHOHET, University of Wisconsin-Madison

EM-TuP12 Electronic and Vibrational Structures in Photoemission Spectra for Dibenzopentacene on Au(111), **M. AOKI**, A. SUZUKI, H. SATO, The University of Tokyo, Japan, K. SHUDO, Yokohama National University, Japan, S. MASUDA, The University of Tokyo, Japan

EM-TuP13 Evolution of Gap States in Potassium-Doped Dibenzopentacene, **H. SATO**, S. MIHARA, M. AOKI, The University of Tokyo, Japan, K. SHUDO, Yokohama National University, Japan, K. AKIMOTO, University of Tsukuba, Japan, S. MASUDA, The University of Tokyo, Japan

EM-TuP14 Effects of Proton Irradiation on the dc Characteristics of AlGaN/GaN High Electron Mobility Transistors with Source Field Plate, L. LIU, **Y.H. HWANG**, Y.Y. XI, S.J. PEARTON, University of Florida, V. CRACIUN, National Institute for Laser, Plasma, and Radiation Physics, Romania, G. YANG, H.Y. KIM, J. KIM, Korea University, Korea, I.I. KRAVCHENKO, Oak Ridge National Laboratory, F. REN, University of Florida

EM-TuP15 *In Situ* Metrology during GaN and InGaN Growth by Remote Plasma-assisted MOCVD, **D. SEIDLITZ**, R.L. SAMARAWEERA, Georgia State University, I.T. FERGUSON, University of North Carolina at Charlotte, A. HOFFMAN, Technical University Berlin, Germany, N. DIETZ, Georgia State University

EM-TuP16 AFM Study on the Structural Properties of Gold Thin Films by RF Magnetron Sputtering, **M. SYED**, Lemoyne-Owen College, C. GLASER, M. SCHELL, I. SENEVIRATHNE, Lock Haven University

EM-TuP17 Influence of Plasma-Activated Nitrogen Species in MOCVD Grown GaN/GaInN Epilayers, **R.L. SAMARAWEERA**, D. SEIDLITZ, Georgia State University, B. HUSSAIN, University of North Carolina at Charlotte, M.K.I. SENEVIRATHNA, Georgia State University, I.T. FERGUSON, University of North Carolina at Charlotte, N. DIETZ, Georgia State University

EM-TuP18 The Electrical Properties of a Bimodal Nb Nanocluster Distribution Formed Through Plasma Gas Condensation, **K.R. BRAY**, C.Q. JIAO, UES, Inc., J.N. DECERBO, J.N. MERRETT, Air Force Research Laboratory

EM-TuP20 Electron-Hole Exchange Energy in PbS and PbSe Nanocrystals, **J.G. TISCHLER**, E.E. FOOS, D. PLACENCIA, W. YOON, J.E. BOERCKER, Naval Research Laboratory

EM-TuP22 Ultrasound Treatment Influence on the Si-SiO_2 interface defects structure, **D. KROPMAN**, Tallinn University of Technology, Estonia, T. LAAS, Tallinn University, Estonia

EM-TuP23 Investigation of Hydrostatic Strain Effect and Dislocation Density Before and After a-Si_3N_4 Passivation on $Al_{0.3}Ga_{0.7}N$/GaN Heterostructure, **S. MUKULIKA DINARA**, S.KR. JANA, S. GHOSH, S. DAS, D. BISWAS, Indian Institute of Technology Kharagpur, India

EM-TuP24 Low Temperature Growth of High-Quality SiO_2 Gate Dielectric by Atomic Layer Deposition, **S. PRADHAN**, E. TYANI, A.K. PRADHAN, Norfolk State University

EM-TuP25 Surface Temperature and Kinetic Energy Dependence of SiGe Growth, **S.C. CHOI**, NASA Langley Research Center, H.J.K. KIM, National Institute of Aerospace

EM-TuP26 TiN/Ag Multilayers made by dc Magnetron Sputtering for Patch Antennas Applications, **J.L. AMPUERO**, A.F. TALLEDO, V. PEÑA, C. BENNDORF, Universidad Nacional de Ingeniería, Peru, M. YARLEQUÉ, R. CERNA, Pontificia Universidad Católica del Peru

EM-TuP27 Defect Structure Relaxation Process in the Si-SiO2 System, D. KROPMAN, **T. LAAS**, Tallinn University of Technology, Estonia, P. ONUFRIEVS, Riga Technical University, Latvia

EM-TuP28 Quantum Effects Produced by Silicon Nanoparticles Embedded in Stacks of Silicon Rich Oxide Obtained by Low Pressure Chemical Vapor Deposition, **K. MONFIL-LEYVA**, Benemerita Universidad Autónoma de Puebla, Mexico, M. ACEVES-MIJARES, Instituto Nacional de Astrofísica Óptica y Electrónica, A.L. MUÑOZ-ZURITA, Universidad Autónoma de Coahuila, J.A. LUNA-LÓPEZ, Benemerita Universidad Autónoma de Puebla, R.C. AMBROSIO-LÁZARO, Universidad Autónoma de Ciudad Juárez

EM-TuP29 Study of Electrical Properties with Tunneling Effect of Amorphous Indium-Gallium-Zinc-Oxide, **T. OH**, Cheongju University, Republic of Korea

EM-TuP30 Tuning A Strong Photoluminescence Using Thin Silicon Rich Oxide And Silicon Rich Nitride Films Obtained By Low Pressure Chemical Vapor Deposition, K. MONFIL-LEYVA, Benemerita Universidad Autónoma de Puebla, Mexico, A. MORALES-SÁNCHEZ, Centro de Investigación en Materiales Avanzados, S.C., A.L. MUÑOZ-ZURITA, Universidad Autónoma de Coahuila, F.J. FLORES-GRACIA, Benemerita Universidad Autónoma de Puebla, M. MORENO-MORENO, Instituto Nacional de Astrofísica Óptica y Electrónica, **E. OJEDA-DURÁN**, Benemerita Universidad Autónoma de Puebla

EM-TuP31 High Spatial Resolution Mass Spectrometry Imaging of Electronic Devices by Femtosecond Laser Desorption, **Y. CUI**, M. MAJESKI, L. HANLEY, University of Illinois at Chicago

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

Energy Frontiers Poster Session
6:30 pm

EN-TuP2 Mini-band Formation in a Strain-balanced InGaAs/GaAsP MQW Solar Cell Structure Investigated by a Photoreflectance and a Surface Photovoltage Spectroscopy, **T. IKARI**, A. FUKUYAMA, K. NISHIOKA, T. AIHARA, H. KURADOME, University of Miyazaki, Japan, K. TOPRASERTPONG, M. SUGIYAMA, Y. NAKANO, University of Tokyo, Japan

EN-TuP3 Numerical Modeling of the Vacuum Thermal- to- Electrical Energy Converter Prototype with Thermal Field Emission Cathode, **V.E. PTITSIN**, Institute for Analytical Instrumentation RAS, Russian Federation

EN-TuP5 Cu(In,Ga)Se_2 Absorber Layer Deposited by Radiofrequency Magnetron Sputtering, **R. MEUNIER**, M.-P. BESLAND, P.Y. JOUAN, A. LAFOND, Université de Nantes, France, P.Y. THOULON, M. RICCI, Crosslux Company, France

EN-TuP6 Developments in Power Efficient Dissociation of CO_2 using Non-Equilibrium Plasma Activation, **W.A. BONGERS**, A.P.H. GOEDE, M.F. GRASWINCKEL, S. WELZEL, Dutch Institute for Fundamental Energy Research, The Netherlands, M. LEINS, J. KOPECKI, A. SCHULZ, M. WALKER, Universität Stuttgart, Germany, M.C.M. VAN DE SANDEN, Dutch Institute for Fundamental Energy Research, The Netherlands

EN-TuP7 Structural and Optical Studies on ITO Thin Films Prepared using ALD Technique using $In(acac)_3$ and SnI_4 Precursors, **B. RANGASAMY**, PSG College of Technology, India

EN-TuP8 GLAD & SAD-GLAD Nanorod Array Catalyst Electrodes for Polymer Electrolyte Membrane Fuel Cells, **F.M. YURTSEVER**, M. BEGUM, M. YURUKCU, M.F. CANSIZOGLU, A.U. SHAIKH, University of Arkansas at Little Rock, W.J. KHUDHAYER, University of Babylon, Iraq, N. KARIUKI, D.J. MYERS, Argonne National Laboratory, T. KARABACAK, University of Arkansas at Little Rock

EN-TuP9 XPS Study of Ternary Chalcogenide Semiconductors Deposited by a Solution-based Method for Solar Cells Applications, **F.S. AGUIRRE-TOSTADO**, R. GARZA-HERNANDEZ, CIMAV-Monterrey, Mexico, R. MAYEN-MONDRAGON, UNAM-Punta, Mexico, E. MARTINEZ-GUERRA, CIMAV-Monterrey, Mexico

EN-TuP10 Enhanced Photovoltaic Response of $Pb_{0.95}La_{0.05}Zr_{0.54}Ti_{0.46}O_3$ Thin Film Based Solar Cells, **V. BATRA**, G. CABOT, S. KOTRU, University of Alabama

EN-TuP11 Influence of Orientation and Size in Crystallite on Various Properties in Al-doped ZnO Films for Solar Cell Transparent Electrode Applications, T. MINAMI, **T. MIYATA**, T. YAMANAKA, Kanazawa Institute of Technology, Japan

EN-TuP12 Influence of Growth Temperature on the Structural and Optical Properties of Dip Coated Zinc Oxide Nano Rods, S. RAVIKUMAR, Sengunthar Arts and Science College, India, **M. VENKATACHALAM**, M. SAROJA, P. GOWTHAM, Erode Arts and Science College, India, P. THAMARAISELVAN, Selvam Arts and Science College, India, S. SHANKAR, Erode Arts and Science College, India

EN-TuP13 Surface Analytical Investigation on Organometal Triiodide Perovskite, **Y. GAO**, C.G. WANG, C.C. WANG, University of Rochester, X.L. LIU, Central South University, Changsha, China, J.S. HUANG, University of Nebraska Lincoln

EN-TuP14 Synthesis, Characterization and Hydrogen-Storage Performance of Nanoporous Graphene-based Adsorbents, **C.G. REBHOLZ**, N. KOSTOGLOU, University of Cyprus, V. TZITZIOS, C. TAMPAXIS, G. CHARALAMBOPOULOU, T. STERIOTIS, K. GIANNAKOPOULOS, National Center for Scientific Research Demokritos, Y. LI, K. LIAO, K. POLYCHRONOPOULOU, Khalifa University of Science, Technology & Research

EN-TuP15 Vacuum Deposition Of Photosystem 1 Films In P-Doped Silicon Surface To Improve The Efficiency Of Bio-Photovoltaic Cells, **C.F.R. FACCHINI**, L.T. MANERA, P. MAZZAFERA, R.V. RIBEIRO, E. KIYOTA, University of Campinas, Brazil

EN-TuP16 Cross Sectional Mapping of CdTe PV Devices with Scanning Capacitance Microscopy, **G. ZORN**, B.A. KOREVAAR, J.R. COURNOYER, K. DOVIDENKO, GE Global Research Center

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

Poster Session for All Areas of Materials Characterization in the Semiconductor Industry
6:30 pm

MC-TuP1 Volumetric and Surface Chemistry of SF_6/C_4F_8/Ar Gas Mixture, **R.L. BATES**, M.J. GOECKNER, P.L.S. THAMBAN, L.J. OVERZET, University of Texas at Dallas

MC-TuP2 Bulk Material and Surface Contamination Testing Using ICP-MS and OES, **F. LI**, Air Liquide

MC-TuP3 SIMS Measurements of Impurities and Alloying Elements in Cu Films used for BEOL Processes, **S.W. NOVAK**, T. LAURSEN, SUNY College of Nanoscale Science and Engineering, M. RIZZOLO, IBM Albany Nanotech Center, B. O'BRIEN, SUNY College of Nanoscale Science and Engineering

MC-TuP4 Growth and Characterization of β-Tungsten Films, **A. JAYANTHINARASIMHAM**, M. MEDIKONDA, A. MATSUBAYASHI, A.C. DIEBOLD, R. MATYI, V.P. LABELLA, SUNY Albany, P. KHARE, H. CHONG, College of Nanoscale Science and Engineering

MC-TuP6 Some Experience in Characterizing Thin Films on Next Generation 450mm Wafer with Spectroscopic Ellipsometry, **R. SUN**, N. SUN, Angstrom Sun Technologies Inc.

MC-TuP7 The Effect of Aberration Coefficients on Phase Shift in Electronic Optics, **C.N. HSIAO**, J.S. KAO, F.Z. CHEN, J.L.A. YEH, ITRC, NARL, Taiwan, Republic of China

MC-TuP8 Modification of Density of States in Iron Chloride Intercalated Epitaxial Graphene with Electric Bias, **T. GROOVER**, M.D. WILLIAMS, Clark Atlanta University

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

Magnetic Interfaces Poster Session
6:30 pm

MI-TuP1 The Ferromagnetic Domain Characteristics of FeRhPd Thin Films Probed by Polarized Neutron Scattering, **S.P. BENNETT**, H. AMBAYE, Oak Ridge National Laboratory, H. LEE, P. LECLAIRE, G.J. MANKEY, University of Alabama, V. LEUTER, Oak Ridge National Laboratory

MI-TuP2 Current-In-Plane-Tunneling via SEM-Nanoprobe workstation, **W. NOLTING**, D. SINHA, J. LEE, V.P. LABELLA, College of Nanoscale Science and Engineering

MI-TuP3 Fabrication and Magneto-Optical Properties of Co-doped ZnO Hollow Nanospheres, **D.R. LIU**, C.J. WENG, ITRC, NARL, Taiwan, Republic of China

MI-TuP4 Study of Structural, Electronic and Magnetic Properties of (Fe2O3)n Clusters Using Density Functional Theory, **S. ALAEI**, S. ERKOC, Middle East Technical University, Turkey, S. JALILI, Computational Physical Sciences Research Laboratory, School of Nano-Science, Institute for Research in Fundamental Sciences (IPM), Iran (Islamic Republic of)

Plasma Science and Technology
Room: Hall D - Session PS-TuP

Plasma Science and Technology Poster Session
6:30 pm

PS-TuP1 Study on Dry Etching of Al_2O_3 in CH_4/Cl_2/Ar Inductively Coupled Plasma, **L. LIU**, L. ZHANG, F. CHEN, V. SUN, S. WILLIAMS, D. TANG, C.H. HSU, S.C. KUNG, T. LIU, T.J. GUNG, B. SCHWARZ, Applied Materials, Inc.

PS-TuP2 O_2 Plasma Treatment Effect on Porous Low Dielectric Constant Material in Sidewall and Bottom of Trench Structure, Y.L. CHENG, B.H. LIN, **S.W. HAUNG**, National Chi-Nan University, Taiwan, Republic of China

PS-TuP3 Optical Emission Spectroscopy of CH_3F/CO_2 Plasmas and Etching of SiN_x and p-Si, **Q. LOU**, S. KALER, D.J. ECONOMOU, V.M. DONNELLY, University of Houston

PS-TuP5 Simulation and Diagnostic Study on the Large Area Magnetized Inductively Coupled $Ar/O_2/CF_4$ Plasma, **H.-J. LEE**, E.-J. SON, Y.-G. KIM, Pusan National University, Republic of Korea

PS-TuP6 Molecular Dynamics Simulation Study on Polymer Formation during Silicon Oxide (SiO_2) and Silicon Nitride (SiN) Etching by Fluoro/Hydrofluorocarbon Plasmas, **S. HAMAGUCHI**, M. ISOBE, K. MIYAKE, K. KARAHASHI, Osaka University, Japan, M. FUKASAWA, K. NAGAHATA, T. TATSUMI, Sony Corporation, Japan

PS-TuP7 Development of a Compact Microwave Plasma Density Sensor for Processing Plasma Monitoring, **J.S. CHIOU**, W.C. CHEN, C.H. HSIEH, K.C. LEOU, National Tsing Hua University, Taiwan, Republic of China

PS-TuP8 Impact of Magnetic Neutral-Loop Discharge Plasma on Low-k Dielectrics, **W. LI**, S-H. KIM, J. BLATZ, University of Wisconsin-Madison, B.H. MOON, Y.M. SUNG, Kyungsung University (Korea), S. BANNA, AMAT, Y. NISHI, Stanford University, J.L. SHOHET, University of Wisconsin-Madison

PS-TuP9 Characterization and Simulation of a VHF Remote Plasma Source, **S. POLAK**, D. CARTER, Advanced Energy Industries, A. BHOJ, A. ROY, ESI US R&D Inc.

PS-TuP10 Temporally and Spatially Resolved Optical Emission Spectroscopy of Capacitively Coupled Pulsed Plasmas, **J. POULOSE**, L.J. OVERZET, M.J. GOECKNER, University of Texas at Dallas

PS-TuP11 Laser-induced Incandescence Diagnostic for *In Situ* Monitoring of Synhtesis of Nanoparticles in Plasma, **J. MITRANI**, B. STRATTON, Y. RAITSES, Princeton Plasma Physics Laboratory

PS-TuP12 Influence of Porosity on Electrical Properties of Low-k Dielectrics Irradiated with Vacuum Ultraviolet Radiation, F.A. CHOUDHURY, University of Wisconsin-Madison, J.-F. DE MARNEFFE, M. BAKLANOV, IMEC, KU Leuven Belgium, Y. NISHI, Stanford University, **J.L. SHOHET**, University of Wisconsin-Madison

PS-TuP13 Ink Cap to Preserve Nanostructure during Sample Preparation for Electron Microscopy, **B.J. KRIST**, J.S. CHAWLA, M. CHANDHOK, S.R. COOK, H.J. YOO, Intel Corporation

PS-TuP14 Densification and Hydration of HMDSO Plasma Polymers, **N.E. BLANCHARD**, M. HEUBERGER, D. HEGEMANN, Empa, Switzerland

PS-TuP15 Surface Modification to Improve Chemical Resistance of Coatings, **G.W. PETERSON**, W.O. GORDON, Edgewood Chemical Biological Center, E.M. DURKE, Excet, Inc.

PS-TuP16 The Effect of Electron-Molecule Collision Cross Sections on Plasma Models, **S. MOHR**, Quantemol Ltd, UK, J.R. HAMILTON, A. ASOKAN, J.C. TENNYSON, University College London, UK

PS-TuP17 Development of Microwave-driven 1- and 2-Dimensional Microplasma Arrays and Tests of Atmospheric-Pressure Film Deposition, **A.R. HOSKINSON**, H.C. THEJASWINI, J. HOPWOOD, Tufts University

PS-TuP18 Mechanical Property of Polyurethane Nanocomposite Film with Carbon Nanotubes Functionalized by Atmospheric Dielectric Barrier Discharge, D. OGAWA, **K. NAKAMURA**, Chubu University, Japan

PS-TuP19 Characterization of Non-Equilibrium Atmospheric Plasma Tools, **J. LALOR**, P. BOURKE, P.J. CULLEN, V. MILOSAVLJEVIĆ, Dublin Institute of Technology, Ireland

PS-TuP20 Development of a Low Cost and Portable Needle Type DBD Jet Operated under Atmospheric Pressure, **C.W. CHEN**, Y.J. YANG, C.C. HSU, National Taiwan University, Taiwan, Republic of China

PS-TuP21 Development of Low Cost and Flexible Microplasma Generation Devices Operated under Atmospheric Pressure, **C.M. WANG**, T.H. LIN, Y.J. YANG, C.C. HSU, National Taiwan University, Taiwan, Republic of China

PS-TuP22 A Low Cost and Flexible Microplasma Generation Device to Create Hydrophobic/Hydrophilic Contrast on Nonflat Surfaces, **Y.J. YANG**, C.C. HSU, National Taiwan University, Taiwan, Republic of China

PS-TuP23 Control of Plasma in Solution Using Bipolar Pulsed Voltage, **F.H. HUANG**, C.Y. CHOU, H.W. CHANG, C.C. HSU, National Taiwan University, Taiwan, Republic of China

PS-TuP24 The Effect of the Electrode Diameter on the Behavior of Plasmas in Saline Solution, **S.C. LIN**, C.C. HSU, National Taiwan University, Taiwan, Republic of China

PS-TuP25 Surface Treatment Using Portable Dielectric Barrier Discharge Device, **Y.Y. KUO**, W.S. ZSENG, C.M. WANG, C.C. HSU, National Taiwan University, Taiwan, Republic of China

PS-TuP26 Plasma Propagation Speed And Electron Temperature Investigation Of Ar/H_2O In Non-Thermal Atmospheric Pressure Indirect Bioplasma Jet, E.H. CHOI, Kwangwoon University, Republic of Korea, **P. SUANPOOT**, Maejo University Phrae Campus, Thailand, J. SORNSAKDANUPHAP, G.H. HAN, H.S. UHM, G.S. CHO, Kwangwoon University, Republic of Korea

PS-TuP27 *RF Pulsing Technology on Commercial CCP(Capacitively Coupled Plasma) Dielectric Etcher and ICP(Inductively Coupled Plasma) Conductor Etcher.*, **T. SHIN**, SEMES, Republic of Korea

PS-TuP28 Plasma Damage Characterization in Backbone Carbon Organosilicate Glass Low-k Films - with Backbone Chains (-Si-R-R-Si-) and (-Si-R-Si-), **H. KAZI**, R. JAMES, S. GADDAM, J.A. KELBER, University of North Texas

PS-TuP29 A Continuous Plasma-Liquid Interface formed by a Laminar Flow Liquid Water Jet and Atmospheric-pressure Microplasma, **B. BISHOP**, S. GHOSH, I. MORRISON, D. SCHERSON, R. AKOLKAR, R.M. SANKARAN, Case Western Reserve University

PS-TuP30 Anomalous Electron Cross-Field Transport in a Low Pressure Magnetized Plasma For Material Processing Applications, **Y. RAITSES**, Princeton Plasma Physics Laboratory

Novel Trends in Synchrotron and FEL-Based Analysis Focus Topic
Room: Hall D - Session SA-TuP

Synchrotron Analysis Poster Session

6:30 pm

SA-TuP1 Soft X-ray Spectroscopy Reveals Chemical Information beneath the Surface of Organic Photovoltaic Devices, **C. FLEISCHMANN**, IMEC, Belgium, P. HÖNICKE, M. MÜLLER, B. BECKHOFF, Physikalisch-Technische Bundesanstalt (PTB), Germany, E. VOROSHAZI, J. TAIT, T. CONARD, IMEC, Belgium, W. VANDERVORST, IMEC, KU Leuven Belgium

SA-TuP2 Exact, Efficient Calculation of Synchrotron Radiation--Proximity and Angle Effects, **E.L. SHIRLEY**, NIST

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

Advanced Surface Engineering Poster Session

6:30 pm

SE-TuP1 Oxidation and Nanopatterning of Thin Metal Films on Flexible Substrates via Oxygen Directed Irradiation Synthesis, **Z. KOYN**, B. HOLYBEE, S.N. SRIVASTAVA, J.P. ALLAIN, University of Illinois at Urbana-Champaign

Surface Science
Room: Hall D - Session SS-TuP

Surface Science Poster Session
6:30 pm

SS-TuP1 Visible Light Photocatalytic Degradation of Methylene Blue using Ag_2O Nanostructures, Z.-H. YANG, **S. LEE**, Chung Yuan Christian University, Taiwan, Republic of China

SS-TuP2 Imaging Silver Nanoparticles (AgNPs) in Plant Tissue by Cryo-Time-of-Flight Secondary Ion Mass Spectrometry (ToF-SIMS), **A. MONTES**, M. BISSON, J. GARDELLA, SUNY-University at Buffalo

SS-TuP3 Formation of Copper Nanoparticles on a Surface of OH-terminated ZnO Powder Material, **H. KUNG**, A.V. TEPLYAKOV, University of Delaware

SS-TuP4 Radical Reactions with Organic Surfaces, **R. CHAPLESKI**, D. TROYA, Virginia Tech

SS-TuP5 Degenerate Phases of Iodine on Pt(110) at Half-Monolayer Coverage, N. OBERKALMSTEINER, M. CORDIN, **S. DUERRBECK**, E. BERTEL, University of Innsbruck, Austria, J. REDINGER, Vienna University of Technology, Austria, C. FRANCHINI, University of Vienna, Austria

SS-TuP6 Reaction of Hydrazine with Cl-terminated Si(111) Surface, **F. GAO**, A.V. TEPLYAKOV, University of Delaware

SS-TuP8 Synthesis of Formate Species on Cu Surface using CO_2 Molecular Beam, **T. OGAWA**, Q. JIAMEI, T. KONDO, J. NAKAMURA, University of Tsukuba, Japan

SS-TuP9 Chemical and Electronic Structure of $(Y_{1-x}Ca_x)CrO_3$, $(0.00 \leq x \leq 0.15)$ in Core Levels and Valence Band by XPS and DOS, **L. HUERTA**, R. ESCAMILLA, M. CRUZ, A. DURAN, Universidad Nacional Autónoma de México

SS-TuP10 Wettability of $MgO\text{-}P_2O_5$ Glasses: Relation between Bulk and Surface Properties, **N. YOSHIDA**, N. MASUDA, M. YAMADA, T. OKURA, Kogakuin University, Japan

SS-TuP11 Preparation and Characterization of Photocatalytic Thin Films of Zn-doped Calcium Phosphate, **Y. NAKAMURA**, N. YOSHIDA, T. OKURA, Kogakuin University, Japan

SS-TuP12 Critical Review and Recommended Values of Work Functions for Low Index Faces of Clean Metal Surfaces, **G. DERRY**, Loyola University Maryland

SS-TuP13 Unveiling Hidden Information in Temperature-Programmed Desorption-Reaction Data: Identification of Desorbing Compounds by Their Desorption and Fragmentation Patterns, **J.C.F. RODRÍGUEZ-REYES**, Universidad de Ingeniería y Tecnología, UTEC, Peru, J.-M. LIN, J. ZHAO, A.V. TEPLYAKOV, University of Delaware

SS-TuP14 Dependence on an O_2 Gas Flow Rate of NiO Thin Films Prepared by Reactive Magnetron Sputtering, **T. TSUCHIYA**, I. TAKANO, Kogakuin University, Japan

SS-TuP15 Properties of Cu/Ti Thin Films on the Biodegradable Resin Irradiated by an Ar^+ Ion Beam, **R. TAN**, I. TAKANO, Kogakuin University, Japan

SS-TuP16 TOF-SIMS Chemical Mapping of Protein Growth Factor Diffusion in Arginine Poly(Ester amide) Hydrogels, **A. QUINN**, J. GARDELLA, University at Buffalo-SUNY

SS-TuP17 MORTON S. TRAUM AWARD FINALIST: Understanding the Growth and Activity of Monometallic and Bimetallic Clusters on $TiO_2(110)$, **R.P. GALHENAGE***, University of South Carolina, H. YAN, Brookhaven National Laboratory, D.A. CHEN, University of South Carolina

SS-TuP18 MORTON S. TRAUM AWARD FINALIST: Conductivity of Graphene as a Function of its Lattice Orientation Relative to Substrate Layers, **H. LEE***, KAIST, Republic of Korea, Y. QI, Okinawa Institute of Science and Technology Graduate University, Japan, S. KWON, KAIST, Republic of Korea, M.B. SALMERON, Lawrence Berkeley National Laboratory, J.Y. PARK, KAIST, Republic of Korea

SS-TuP19 MORTON S. TRAUM AWARD FINALIST: Electron Percolation via In-Gap States in Semiconductor Quantum Dot Arrays, **Y. ZHANG***, University of California, Berkeley and Lawrence Berkeley National Laboratory (LBNL), D. ZHEREBETSKYY, S. BARJA, L. LICHTENSTEIN, LBNL, N.D. BRONSTEIN, University of California, Berkeley, P. ALIVISATOS, University of California, Berkeley and LBNL, L.-W. WANG, LBNL, M.B. SALMERON, University of California, Berkeley and LBNL

SS-TuP20 MORTON S. TRAUM AWARD FINALIST: Mechanisms of CO Oxidation on Well-defined Pd Oxide Films on Pd(111), **F. ZHANG***, T. LI, University of Florida, L. PAN, A. ASTHAGIRI, The Ohio State University, J.F. WEAVER, University of Florida

SS-TuP21 MORTON S. TRAUM AWARD FINALIST: Surface Structure and Chemistry of Rh(110) Model Catalyst under Reaction Condition and during CO Oxidation, **L.T. NGUYEN***, L. LIU, S. ZENG, F. TAO, University of Notre Dame

SS-TuP22 Mechansim of Formation of Zinc Oxide Nanostructures Synthesized by Photon Irradiation, **R. NAGAR**, Symbiosis Institute of Technology (SIT), Symbiosis International University (SIU), India, A. PRAVEEN, S. RAMAPRABHU, Indian Institute of Technology Madras, India

SS-TuP23 Crystallization and Phase Separation Kinetics of Organic Molecules from Solution on Si(111) Substrates, **M. CEZZA**, R.J. PHANEUF, University of Maryland, College Park

* Morton S. Traum Award Finalist

Vacuum Technology
Room: Hall D - Session VT-TuP

Vacuum Technology Division Poster Session and Student Poster Contest

6:30 pm

VT-TuP1 Engineering Techniques of Beam Position Monitors Applying for Synchrotron Light Source, **I.T. HUANG**, NSRRC, Taiwan, Republic of China

VT-TuP2 Performance Evaluation of Scroll Pump, **F.C. HSIEH**, P.H. LIN, C.S. YU, F.Z. CHEN, National Applied Research Laboratories, Taiwan

VT-TuP3 Reliability Engineering Study of TMPs and Cryopumps, **J.Y. LIM**, K.M. CHOI, K.M. BAIK, Korea Research Institute of Standards and Science, Republic of Korea, S.Y. IN, Korea Atomic Energy Research Institute, Republic of Korea, S.K. LIM, National Nano Fab Center, Republic of Korea, D.Y. KOH, Korea Institute of Machinery and Materials, Republic of Korea, W.S. CHEUNG, Korea Research Institute of Standards and Science, Republic of Korea

VT-TuP4 Improved Threshold Ionisation Mass Spectrometry, D.L. SEYMOUR, S. DAVIES, **J.A. REES**, P. HATTON, Hiden Analytical, UK

VT-TuP5 The XHV Cathode Preparation System of the "High Current High Polarization" Electron Gun for the Proposed eRHIC Project., **O. RAHMAN**, I. BEN-ZVI, E. WANG, T. RAO, J. SKARITKA, Brookhaven National Laboratory

WEDNESDAY SPECIAL EVENTS

6:15 a.m.	34th Annual AVS Run (Register at Run Booth before Wednesday (CC) — TBD
7:00 a.m.	Companion Tour Registration — Main Lobby (H)
7:30 a.m.	Diversity Committee Meeting and Breakfast — Orioles Grille Restaurant (H)
8:00 a.m.	Advanced Surface Engineering Division Business Meeting — Camden (H)
8:15 a.m.	Advanced Surface Engineering Division Executive Committee Meeting (Lunch Offsite) — Camden (H)
10:00 a.m.	Session Coffee Break — Hall ABC (CC)
12:20 p.m.	Exhibit Hall Lunch — Hall ABC (CC)
12:20 p.m.	Nanometer-Scale Science Division Graduate Student Award Competition — 304 (CC)
12:30 p.m.	PacSurf Committee Meeting and Lunch — Potomac (H)
12:30 p.m.	Professional Development Lunch with the Feds/Federal Funding Town Hall — 314 (CC)
2:20 p.m.	Albert Nerken Award Lecture: O. Shenderova, Adámas Nanotechnologies Inc., "Brilliant Nanodiamond Particles" — 304 (CC)
3:40 p.m.	Session Refreshment Break — Hall ABC (CC)
4:30 p.m.	E&M Reception (Invitation Only) — Hall ABC (CC)
6:30 p.m.	AVS Awards Ceremony & Reception — Ballroom I-II (CC)
7:00 p.m.	Manufacturing Science and Technology Group Committee Meeting and Dinner — Potomac (H)

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

CC = Baltimore Convention Center
H = Sheraton Inner Harbor

= New Attendee Networking Events

WEDNESDAY SHORT COURSES

8:30 a.m.	Comprehensive Course on Surface Analysis and Depth Profiling by XPS or ESCA, AES, FIB & 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 (*only available as part of a 3-day Comprehensive Course on Surface Analysis short course*)
8:30 a.m.	Plasma Etching and RIE: The Fundamentals

LOCATION: All AVS Short Courses will be held at the Sheraton Inner Harbor Hotel (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: 310 - Session 2D+EM+NS+SS+TF-WeM Novel 2D Materials **Moderator:** E.J. Reed, Stanford University	Applied Surface Science Room: 316 - Session AS+BI+MC-WeM Chemical Imaging in 2D and 3D **Moderators:** J. Fenton, Medtronic, Inc., K.G. Lloyd, DuPont Corporate Center for Analytical Sciences
8:00 am	**2D+EM+NS+SS+TF-WeM1 Invited** Silicene and Germanene: Novel Graphene-like Artificial Silicon and Germanium Allotropes, **G. LE LAY**, Aix-Marseille University, France	**AS+BI+MC-WeM1** Study of Orientation in Polymer Composites using TOF-SIMS, **N. KARAR**, T. GUPTA, CSIR- National Physical Laboratory, India
8:20 am	Invited talk continued.	**AS+BI+MC-WeM2** Expanded Approaches for Single Cell Analysis by SIMS, **C. SZAKAL**, National Institute of Standards and Technology (NIST)
8:40 am	**2D+EM+NS+SS+TF-WeM3** Silicon Growth at the Two-Dimensional Limit on Ag(111), **A.J. MANNIX**, B.T. KIRALY, Northwestern University, B.L. FISHER, Argonne National Laboratory, M.C. HERSAM, Northwestern University, N.P. GUISINGER, Argonne National Laboratory	**AS+BI+MC-WeM3 Invited** 3-Dimensional Chemical Imaging on the Nanoscale with Cluster-SIMS, **N. WINOGRAD**, Penn State University
9:00 am	**2D+EM+NS+SS+TF-WeM4** Growth, Structure, and Properties of 2D SiO_2 Polymorphs, **E.I. ALTMAN**, J. GÖTZEN, X. ZHU, A. SONNENFELD, U.D. SCHWARZ, Yale University	Invited talk continued.
9:20 am	**2D+EM+NS+SS+TF-WeM5** Layer-dependent Electronic and Vibrational Properties of $SnSe_2$ and SnS_2 2D Materials, **J.M. GONZALES**, R. SCHLAF, I.I. OLEYNIK, University of South Florida	**AS+BI+MC-WeM5** SIMS 2D and 3D Characterization of Organic/Inorganic Surfaces by FIB Crater Wall Imaging and Tomography, **F. KOLLMER**, R. MÖLLERS, D. RADING, S. KAYSER, ION-TOF GmbH, Germany, N. HAVERCROFT, ION-TOF USA, Inc., E. NIEHUIS, ION-TOF GmbH, Germany
9:40 am	**2D+EM+NS+SS+TF-WeM6** Synthesis and Properties of Large Scale, Atomically Thin Tungsten Diselenide (WSe_2), **S.M. EICHFELD**, Y.C. LIN, L. HOSSAIN, The Pennsylvania State University, A. PIASECKI, The Pennsylvania State University, A. AZCATI, University of Texas, Dallas, S. MCDONNELL, R.M. WALLACE, University of Texas at Dallas, J.A. ROBINSON, The Pennsylvania State University	**AS+BI+MC-WeM6** Multivariate Imaging: A New Approach towards Chemical State Identification of Novel Carbons in XPS Imaging, **A.J. BARLOW**, N. SANO, P.J. CUMPSON, NEXUS, Newcastle University, UK
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-WeM10** Growth of Transition Metal Dichalcogenides and their Alloys and on Flat and Patterned Substrates, E. PRECIADO, A. NGUYEN, D. BARROSO, V. KLEE, S. BOBEK, I. LU, S. NAGHIBI, G. VON SON PALACIO, T. EMPANTE, K. BROWN, K. YANG, A. NGUYEN, J. MANN, **L. BARTELS**, University of California - Riverside	**AS+BI+MC-WeM10 Invited** Multivariate Analysis Approaches for Image De-noising and Image Fusion, **BJ. TYLER**, National Physical Laboratory (NPL), UK
11:20 am	**2D+EM+NS+SS+TF-WeM11** Synthesis, Characterization and Radiation Response of Boro-Carbon-Oxy-Nitride: A Heterogeneous 2D Material, **G.R. BHIMANAPATI**, M. WETHERINGTON, M. KELLY, J.A. ROBINSON, The Pennsylvania State University	Invited talk continued.
11:40 am	**2D+EM+NS+SS+TF-WeM12 Invited** The Structure of 2D Glass, **C. BÜCHNER**, Fritz-Haber-Institut der Max-Planck-Gesellschaft, Germany, L. LICHTENSTEIN, Lawrence Berkeley National Laboratory, M. HEYDE, H.-J. FREUND, Fritz-Haber-Institut der Max-Planck-Gesellschaft, Germany	**AS+BI+MC-WeM12** Global Analysis Peak Fitting for Imaging NEXAFS Data, **M.H. VAN BENTHEM**, J.A. OHLHAUSEN, Sandia National Laboratory
12:00 pm	Invited talk continued.	**AS+BI+MC-WeM13** Visualizing Pharmaceutical Compounds in Single-cells with label-free 3D Mass Spectrometry Imaging, **M.K. PASSARELLI**, C. NEWMAN, National Physical Laboratory, UK, A. WEST, University of York, UK, C.T. DOLLERY, I.S. GILMORE, National Physical Laboratory, UK, J. BUNCH, National Physical Laboratory

	Biomaterial Interfaces **Room: 317 - Session BI+AS-WeM** **Nonlinear Optical & Vibrational Spectroscopy** **Moderator:** L. Hanley, University of Illinois at Chicago	**Electronic Materials and Processing** **Room: 311 - Session EM1-WeM** **Materials & Devices for High Power Electronics (8:20-11:00 am)/ Two Dimensional Electronic Materials & Devices (11:00am-12:20 pm)** **Moderators:** A. Antonelli, Lam Research, R.L. Myers-Ward, U.S. Naval Research Laboratory
8:00 am		**EM1-WeM1 Invited** Commercialization of High Voltage GaN HEMT., **P. PARIKH**, Transphorm Inc.
8:20 am		Invited talk continued.
8:40 am	**BI+AS-WeM3 Invited** Characterizing Adsorbate Structure at the Solid-Liquid Interface through Nonlinear Vibrational Spectroscopy and Modelling Approaches, S. ROY, P.A. COVERT, K.-K. HUNG, U. STEGE, **D.K. HORE**, University of Victoria, Canada	**EM1-WeM3 Invited** Progress and Future Challenges in SiC Material for High-Voltage Power Devices, **T. KIMOTO**, Kyoto University, Japan
9:00 am	Invited talk continued.	Invited talk continued.
9:20 am	**BI+AS-WeM5** Vibrational Spectroscopy Investigation of the Giant Surface Potential of Organic Semiconductors, **L.Y. KRAYA**, Princeton University, C. KREKELER, C. WEIGEL, Technical University Braunschweig, Germany, P. ZHAO, Princeton University, W. KOWALSKY, Technical University Braunschweig, Germany, C. LENNARTZ, BASF, A.L. KAHN, B. KOEL, Princeton University	**EM1-WeM5** 4H-SiC Epilayers Grown on 2° Offcut Substrates, **R.L. MYERS-WARD**, Z.R. ROBINSON, V.D. WHEELER, P.B. KLEIN, N.A. MAHADIK, R.E. STAHLBUSH, C.R. EDDY, JR., D.K. GASKILL, Naval Research Laboratory
9:40 am	**BI+AS-WeM6** Diatom Biomineralization at the Molecular Level Probed by SFG Spectroscopy, H. LUTZ, Max-Planck-Institute for Polymer Research, Germany, J.E. BAIO, Oregon State University, V. JAEGER, A. ROEHRIG, G. DROBNY, J. PFAENDTNER, University of Washington, **T. WEIDNER**, Max-Planck-Institute for Polymer Research, 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	**BI+AS-WeM10 Invited** Water, Charge and Membrane Interface Stability, **S. ROKE**, Ecole Polytechnique Fédérale de Lausanne (EPFL), Switzerland	**EM1-WeM10 Invited** Recent Progress in Graphene and Heterostructure RF Electronics, **J.-S. MOON**, H.-C. SEO, K.A. SON, B. YANG, M. ANTCLIFFE, A. SCHMITZ, D. LE, HRL Laboratories, LLC, L.O. NYAKITI, V.D. WHEELER, R.L. MYERS-WARD, C.R. EDDY, D.K. GASKILL, Naval Research Laboratory, K.-M. LEE, P. ASBECK, University of California at San Diego
11:20 am	Invited talk continued.	Invited talk continued.
11:40 am	**BI+AS-WeM12** Second Harmonic Scattering: Characterizing the Interaction between Lipid Membranes and Water, **C. LÜTGEBAUCKS**, C. MACIAS-ROMERO, S. ROKE, Ecole Polytechnique Fédérale de Lausanne (EPFL), Switzerland	**EM1-WeM12 Invited** High-Field and Thermal Transport in 2D Atomic Layer Devices, **E. POP**, C.D. ENGLISH, Stanford University, V.E. DORGAN, A. BEHNAM, University of Illinois at Urbana-Champaign, Z. LI, Stanford University, University of Illinois, Urbana-Champaign, S. ISLAM, University of Illinois at Urbana-Champaign
12:00 pm	**BI+AS-WeM13** Analyzing the Structure of Amyloid Fibrils in Bacterial Biofilms *In Vitro* and in Real Time Using Sum-Frequency-Generation Spectroscopy, P. JOHANSSON, R. FRANCISCO, J. BRYERS, **P. KOELSCH**, University of Washington	Invited talk continued.

	Electronic Materials and Processing Room: 314 - Session EM2-WeM	Energy Frontiers Focus Topic Room: 315 - Session EN+AS+EM+SE-WeM
	High-K Dielectrics from Non-Classical Channels **Moderator:** C.L. Hinkle, University of Texas at Dallas	**Thin Film Photovoltaics** **Moderator:** R.M. Morrish, Colorado School of Mines
8:00 am	**EM2-WeM1** The Influence of Surface Preparation pre-Atomic Layer Deposition of Al_2O_3 on GaN Metal Oxide Semiconductor Capacitors, **D.M. ZHERNOKLETOV**, Stanford University	**EN+AS+EM+SE-WeM1** Epitaxy and Nanochemistry of CdS on Cu(In,Ga)Se_2 for Photovoltaic Devices, X. HE, University of Illinois at Urbana Champaign, H. TELLEZ, J. DRUCE, Kyushu University, Japan, K. DEMIRKAN, Miasole, P. ERCIUS, Lawrence Berkeley National Laboratory, V. LORDI, Lawrence Livermore National Laboratory, J. KILNER, Imperial College London, UK, T. ISHIHARA, Kyushu University, Japan, **A. ROCKETT**, University of Illinois at Urbana Champaign
8:20 am	**EM2-WeM2** Low Voltage Nonlinearity Metal-Insulator-Insulator-Metal (MIIM) Capacitors using Plasma Enhanced Atomic Layer Deposition of SiO_2 and Al_2O_3, **D.Z. AUSTIN**, Oregon State University, D. ALLMAN, D. PRICE, S. HOSE, On Semiconductor, J.F. CONLEY, Oregon State University	**EN+AS+EM+SE-WeM2** The Effect of SnS(e) on Microstructure, Open Circuit Voltage (V_{oc}), Photo Conversion Efficiency (PCE), and Optoelectronic Properties of $Cu_2ZnSn(S_xSe_{4-x})$ Solar Absorbers, **B.S. TOSUN**, H.W. HILLHOUSE, University of Washington
8:40 am	**EM2-WeM3 Invited** Metal-Insulator Transitions, Resistive Switches and Oxide Electronics, **S. RAMANATHAN**, Harvard University	**EN+AS+EM+SE-WeM3** Microstructure Development in $Cu_2ZnSn(S_xSe_{1-x})4$ Thin Films During Annealing of Colloidal Nanocrystal Coatings, B.D. CHERNOMORDIK, M. KETKAR, K. HUNTER, A.E. BÉLAND, **E.S. AYDIL**, University of Minnesota
9:00 am	Invited talk continued.	**EN+AS+EM+SE-WeM4** Effect of Chemical Wet Cleaning on Surface Composition and Work Function of Thin Film CZTS,Se, **K. SARDASHTI**, University of California at San Diego, E.A. CHAGAROV, T. KAUFMAN-OSBORN, University of California, San Diego, S.W. PARK, University of California San Diego, R. HAIGHT, W. WANG, D.B. MITZI, IBM T.J. Watson Research Center, A.C. KUMMEL, University of California at San Diego
9:20 am	**EM2-WeM5 Invited** Complex Oxide Devices, **S. DATTA**, Penn State University	**EN+AS+EM+SE-WeM5** Phase Transformation, Surface States, and Electronic Structures of Pyrite Thin Films Under *In Situ* Heating and Oxygen Gas Exposure, **Y. LIU**, N. BERRY, Y.N. ZHANG, University of California Irvine, C.-C. CHEN, Argonne National Laboratory, H. BLUHM, Z. LIU, Lawrence Berkeley National Laboratory, R.Q. WU, M. LAW, J.C. HEMMINGER, University of California Irvine
9:40 am	Invited talk continued.	**EN+AS+EM+SE-WeM6** Improvement of SnS-based Photovoltaic Devices via Reverse Engineering of the V_{oc} and Study of Optimal n-Type Material, **R.E. BANAI**, N.J. TANEN, J.J. CORDELL, J.R. NASR, R.E. URENA, H. LEE, J.R.S. BROWNSON, M.W. HORN, Penn 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	**EM2-WeM10 Invited** Ferroelectric Devices, **A.A. DEMKOV**, The University of Texas at Austin	**EN+AS+EM+SE-WeM10** Advanced Contacts for High Efficiency CdTe Solar Cells, D. MEYSING, J.J. LI, J. BEACH, T.R. OHNO, Colorado School of Mines, M.O. REESE, T.M. BARNES, National Renewable Energy Laboratory, **C.A. WOLDEN**, Colorado School of Mines
11:20 am	Invited talk continued.	**EN+AS+EM+SE-WeM11** Structural Variations and their Effects on the Fundamental Bandgap of $ZnSnN_2$, **N. FELDBERG**, University at Buffalo-SUNY, Y. YANG, University of Michigan, W.M. LINHART, T.D. VEAL, University of Liverpool, UK, P.A. STAMPE, R.J. KENNEDY, Florida A&M University, D.O. SCANLON, University College London, UK, L.F.J. PIPER, Binghamton University, N. SENABULYA, R. CLARKE, University of Michigan, R.J. REEVES, University of Canterbury, New Zealand, S. DURBIN, Western Michigan University
11:40 am	**EM2-WeM12** Enhanced Performance Metal/Insulator/Insulator/Metal (MIIM) Tunnel Diodes, N. ALIMARDANI, **J.F. CONLEY, JR.**, Oregon State University	**EN+AS+EM+SE-WeM12** Inhomogeneity of *p-n* Junction and Grain Structure of Thin Film CdTe Solar Cells Studied by Electron Beams, **H. YOON**, P. HANEY, NIST, P. KOIRALA, University of Toledo, J.I. BASHAM, Y. YOON, NIST, R.W. COLLINS, University of Toledo, N.B. ZHITENEV, NIST
12:00 pm	**EM2-WeM13** Assessment of Barrier Heights between ZrCuAlNi Amorphous Metal and SiO_2, Al_2O_3, and HfO_2 using Internal Photoemission Spectroscopy, **T. KLARR**, Oregon State University, L. WEI, N.V. NGUYEN, O.A. KIRILLOV, National Institute of Standards and Technology (NIST), J. MCGLONE, J. WAGER, J.F. CONLEY, Oregon State University	**EN+AS+EM+SE-WeM13** Micro-Structural Activation Mechanisms in Thin Film CdTe Photovoltaic Devices, **J.M. WALLS**, A. ABBAS, J.W. BOWERS, P.M. KAMINSKI, Loughborough University, UK, K. BARTH, W. SAMPATH, Colorado State University

	Exhibitor Technology Spotlight **Room: Hall ABC - Session EW-WeM**	**In-Situ Spectroscopy and Microscopy Focus Topic** **Room: 313 - Session IS+AS+MC+SS-WeM**
	Exhibitor Technology Spotlight Session **Moderator:** C. Moffitt, Kratos Analytical Limited, UK	**In-Situ X-ray Absorption and Raman Spectroscopy** **Moderator:** H. Ogasawara, SLAC National Accelerator Laboratory
8:00 am		**IS+AS+MC+SS-WeM1 Invited** *In Situ* Studies on the Behavior of Metal/Oxide Catalysts during the Water-gas Shift Reaction, **J. RODRIGUEZ**, D. STACCHIOLA, S. SENANAYAKE, J. HANSON, Brookhaven National Laboratory
8:20 am		Invited talk continued.
8:40 am		**IS+AS+MC+SS-WeM3** Tuning Catalytic Performance of Bimetallic Nanoparticle Catalysts through a Single or Sequential Post-Synthesis Reaction in a Gas Phase, F. TAO, J. SHAN, S. ZHANG, L.T. NGUYEN, University of Notre Dame, A. FRENKEL, Yeshiva University, J. GREELEY, Purdue University, **S. ZENG**, University of Notre Dame
9:00 am		**IS+AS+MC+SS-WeM4** *In Situ* Characterization of Metal-Based Ionic Liquids using X-ray Spectroscopy, **R.W. MEULENBERG**, University of Maine, C. APBLETT, H. PRATT, T. ANDERSON, Sandia National Laboratories
9:20 am		**IS+AS+MC+SS-WeM5 Invited** Monitoring Catalysts during Catalytic Reactions with *In Situ* Raman Spectroscopy, **I.E. WACHS**, Lehigh 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	**EW-WeM8** Product Advancements to Reduce Semiconductor Manufacturing Contamination, J. LEGARE, **M. HELLER**, Dupont™ Kalrez® and Vespel	**BREAK - Complimentary Coffee in Exhibit Hall**
10:40 am	**EW-WeM9** Wet Cell II for Analysis at the Liquid Vacuum Interface, **LUO**, RODEK, SPI Supplies	**BREAK - Complimentary Coffee in Exhibit Hall**
11:00 am		**IS+AS+MC+SS-WeM10 Invited** Photoelectron Spectroscopy on Ice, Mineral Oxides and Aqueous Solutions of Atmospheric Relevance, **M. AMMANN**, Paul Scherrer Institut, Switzerland
11:20 am		Invited talk continued.
11:40 am		**IS+AS+MC+SS-WeM12** *In Situ* Analysis of Materials Under Mechanical Stress: A Novel Instrument for Simultaneous Nanoindentation and Raman Spectroscopy, **C.A. MICHAELS**, Y.B. GERBIG, R.F. COOK, NIST
12:00 pm		

	Accelerating Materials Discovery for Global Competitiveness **Focus Topic** **Room: 302 - Session MG-WeM** **Design of New Materials** **Moderators:** S.B. Sinnott, University of Florida, C.K.V. Elsässer, Fraunhofer Institute for Mechanics of Materials IWM, Germany	**MEMS and NEMS** **Room: 301 - Session MN-WeM** **Optomechanics, Photonics, and Quantum Nanosystems** **Moderators:** S.L. Burkett, The University of Alabama, W.K. Hiebert, University of Alberta and The National Institute for Nanotechnology
8:00 am		
8:20 am	**MG-WeM2** Hydrogen Molecules Distribution in Multi-Cathodes Funneling Gun, **E. WANG**, I. BEN-ZVI, J. SKARITKA, T. RAO, Brookhaven National Laboratory, R. BOTHELL, J. BOTHELL, A. HENRY, Atlas Technologies	
8:40 am	**MG-WeM3** Tailored Functionality of Wide Band Gap Semiconductors, B.E. GADDY, Z.A. BRYAN, I.S. BRYAN, R. KIRSTE, North Carolina State University, J. XIE, R. DALMAU, B. MOODY, Hexatech Inc., Y. KUMAGAI, Tokyo University of Agriculture and Technology, Japan, T. NAGASHIMA, Y. KUBOTA, T. KINOSHITA, Tokuyama Corporation, Japan, A. KOUKITU, Tokyo University of Agriculture and Technology, Japan, R. COLLAZO, Z. SITAR, **D.L. IRVING**, North Carolina State University	**MN-WeM3 Invited** Diamond Quantum Nanophotonics and Nanomechanics, **M. LONCAR**, Harvard University
9:00 am	**MG-WeM4** Substitution and Strain Control of Polarization in Multifunctional Materials, M. ASHTON, A. CHERNATYNSKIY, **S.B. SINNOTT**, University of Florida	Invited talk continued.
9:20 am	**MG-WeM5** Manipulation of Site Reactivity at the Au Nanoparticle – Titania Interface through Alloying: Insights from Density Functional Theory, **S. HONG**, T.S. RAHMAN, University of Central Florida	**MN-WeM5** A Compact Footprint Nano-Opto-Mechanical System with Evanescent Interaction, **M.W. PRUESSNER**, D. PARK, T.H. STIEVATER, Naval Research Laboratory, D.A. KOZAK, NRC Postdoc (Naval Research Lab), W.S. RABINOVICH, Naval Research Laboratory
9:40 am	**MG-WeM6** Structural Descriptors for Hole Traps in Hydrogenated Amorphous Silicon Revealed through Machine Learning, **T. MUELLER**, Johns Hopkins University, E. JOHLIN, J.C. GROSSMAN, Massachusetts Institute of Technology	**MN-WeM6** GaAs Disks Optomechanical Resonators in Liquid, I. FAVERO, **E. GIL-SANTOS**, Université Paris Diderot, CNRS, France
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	**MG-WeM10 Invited** Integration of Meso-scale Microstructural Modeling for Engineering Materials Development, **V. TIKARE**, Sandia National Laboratories	**MN-WeM10** Photonic Actuation and Detection of Higher Order Modes in Nanomechanical Resonators, **J. WESTWOOD**, V.T.K. SAUER, University of Alberta and The National Institute for Nanotechnology, Canada, Z. DIAO, National Institute for Nanotechnology and University of Alberta, Canada, W.K. HIEBERT, University of Alberta and The National Institute for Nanotechnology, Canada
11:20 am	Invited talk continued.	**MN-WeM11** Dynamic Range Effect on the Mass Sensitivity of Optomechanically Transduced NEMS Devices with a Poorer Q Value, **S.K. ROY**, V.T.K. SAUER, W.K. HIEBERT, University of Alberta and The National Institute for Nanotechnology, Canada
11:40 am	**MG-WeM12 Invited** Insights on the CO_2 Reduction Mechanism on Bio-inspired Iron Sulphide, **A. ROLDAN**, N.H. DE LEEUW, University College London, UK	**MN-WeM12** Micro Mirrors for MEMS Based Free Space Point to Point Indoor Wireless Optical Network, M. MEDINA, D. KIN, A. SHAR, Y. GOURMAN, A. CARMELI, RiT Technologies, Israel, **S. KRYLOV**, Tel Aviv University, Israel
12:00 pm	Invited talk continued.	**MN-WeM13** Scanning Optical Interferometric Spectromicroscopy for Mapping Multimode Resonant Motions in Planar Silicon Carbide (SiC) Micromechanical Resonators with $f \times Q$ Approaching 10^{13}Hz, **Z. WANG**, J. LEE, P.X.-L. FENG, Case Western Reserve University

	Nanometer-scale Science and Technology Room: 304 - Session NS-WeM	Plasma Science and Technology Room: 305 - Session PS1-WeM
	Nanoscale Catalysis and Surface Chemistry **Moderator:** J. Robinson, Naval Research Laboratory	**Plasma Based Ion Implantation and Ion-Surface Interactions** **Moderator:** A. Srivastava, Applied Materials, Inc.
8:00 am	**NS-WeM1 Invited** Single Atom Alloys as a Strategy for Selective Heterogeneous Hydrogenations, **E.C.H. SYKES**, Tufts University	**PS1-WeM1 Invited** Dosimetry Challenges for Plasma Doping and Ion Implantation, **B.H. VANDERBERG**, L.M. RUBIN, A.M. RAY, Axcelis Technologies, Inc.
8:20 am	Invited talk continued.	Invited talk continued.
8:40 am	**NS-WeM3** *In Situ* FTIR Spectroscopic Observation of the Formation of Gold Ketenylidene during Carboxylic Acid Oxidation on a Au/TiO_2 Nanoparticle Catalyst, **M. MCENTEE**, W. TANG, M. NEUROCK, J.T. YATES, JR., University of Virginia	**PS1-WeM3 Invited** Ion Implantation Challenges and Applications for Future Memory Devices, **A. MCTEER**, Micron Technology
9:00 am	**NS-WeM4** Fabrication and Photocatalytic Activity of Metal-loaded TiO_2 Nanometer Scale Particles, **P. REYES**, Y. LIU, J.C. HEMMINGER, University of California Irvine	Invited talk continued.
9:20 am	**NS-WeM5** Size-dependent Trends in CO and O_2 Adsorption on Pd Nanoparticle Catalysts, **H. MISTRY**, L.K. ONO, University of Central Florida, B. ROLDAN CUENYA, Ruhr-University Bochum, Germany	**PS1-WeM5 Invited** Challenges in Ion Implantation, **J. OLSON**, S. CHENNADI, G. GAMMEL, N. PRADHAN, F. SINCLAIR, S. TODOROV, M. WELSCH, R. WHITE, Applied Materials, Varian Semiconductor Equipment
9:40 am	**NS-WeM6** Mixed Structures of CO and H on Ru(0001) as Precursor States for Fischer-Tropsch Synthesis, **B.A.J. LECHNER**, X. FENG, S. CARENCO, Lawrence Berkeley National Laboratory, P.J. FEIBELMAN, Sandia National Laboratories, M.B. SALMERON, Lawrence Berkeley National Laboratory	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	**NS-WeM10** *In Situ* Investigation of Oxidation State and Reactivity of a Cu Model Catalyst by Simultaneous Mass Spectrometry and Indirect Nanoplasmonic Sensing, **H. FREDRIKSSON**, H.J.W. NIEMANTSVERDRIET, Eindhoven University of Technology, Netherlands	**PS1-WeM10** Plasma Doping Process Monitoring Diagnostics, **Y. KOBAYASHI**, Tokyo Electron Limited, Japan, P. VENTZEK, Tokyo Electron America, Inc., K. YAMASHITA, S. NISHIJIMA, M. OKA, H. UEDA, Y. SUGIMOTO, M. HORIGOME, T. NOZAWA, Tokyo Electron Limited, Japan
11:20 am	**NS-WeM11** Controlling Surface Reactivities of TiO_2 (110) by Nanoscale Strain Field, **Z. LI**, D.V. POTAPENKO, R.M. OSGOOD, Columbia University	**PS1-WeM11** Control over the Ion Flux Obtained by Sawtooth-like Waveforms in Radiofrequency Capacitively Coupled Plasmas, **B. BRUNEAU***, T. NOVIKOVA, T. LAFLEUR, J.-P. BOOTH, E.V. JOHNSON, Ecole Polytechnique, France
11:40 am	**NS-WeM12 Invited** NSTD Recognition Award Lecture: Probing Local Optoelectronic Properties of Porphyrin-Gold Molecular Interfaces with STM/STS, X. CHEN, E.H. MORALES, T.-H. PARK, University of Pennsylvania, M.J. THERIEN, Duke University, **D.A. BONNELL†**, University of Pennsylvania	**PS1-WeM12** Surface Roughening Mechanisms and Roughness Suppression during Si Etching in Inductively Coupled Cl_2 Plasmas, **N. NAKAZAKI**, H. MATSUMOTO, K. ERIGUCHI, K. ONO, Kyoto University, Japan
12:00 pm	Invited talk continued.	**PS1-WeM13** Ion Induced Electron Emission from Semiconductors: An Investigation into Fermi Level and Surface Electric Field Effects, **D. URRABAZO**, M.J. GOECKNER, L.J. OVERZET, University of Texas at Dallas

* Coburn & Winters Student Award Finalist
† NSTD Recognition Award

	Plasma Science and Technology **Room: 308 - Session PS2-WeM** **Plasma Modeling** **Moderator:** S. Shannon, North Carolina State University	**Selective Deposition as an Enabler of Self-Alignment Focus Topic** **Room: 318 - Session SD-WeM** **Fundamentals of Selective Deposition** **Moderators:** J. Engstrom, Cornell University, F. Gstrein, Intel Corporation
8:00 am	**PS2-WeM1** Self-Consistent Modeling of Capacitive Coupling in Inductively Coupled Plasmas, **A. AGARWAL**, S. RAUF, K. COLLINS, Applied Materials Inc.	**SD-WeM1 Invited** Utilizing Inhibitor Molecules in Low Temperature CVD to Control Thin Film Nucleation, Surface Morphology and Conformality in Deep Features, **J.R. ABELSON**, University of Illinois at Urbana-Champaign
8:20 am	**PS2-WeM2** Experimentally Guided Development of a Dielectric Etch Plasma Model, **A. BALAKRISHNA**, S. RAUF, K. COLLINS, Applied Materials Inc.	Invited talk continued.
8:40 am	**PS2-WeM3** Insights to Critical Dimension Control Through 3-Dimensional Profile Simulation For Plasma Etching, **Y. ZHANG***, M.J. KUSHNER, University of Michigan, S. SRIRAMAN, A. PATERSON, Lam Research Corp	**SD-WeM3 Invited** Metrology of Selective Functionalization of Semiconductor, Oxide and Nitride Surfaces, L. LIU, W.J.I. DEBENEDETTI, S. KARAKAYA, T. PEIXOTO, University of Texas at Dallas, R. HOURANI, D.J. MICHALAK, Intel Corporation, **Y.J. CHABAL**, University of Texas at Dallas
9:00 am	**PS2-WeM4** 3-Dimensional Model for Electron-Beam Generated Plasma, **S. RAUF**, A. BALAKRISHNA, A. AGARWAL, J. KENNEY, L. DORF, K. COLLINS, Applied Materials Inc.	Invited talk continued.
9:20 am	**PS2-WeM5** From Nonlocal Electron Kinetic Theory to Practical Applications, **I.D. KAGANOVICH**, Princeton Plasma Physics Laboratory, D. SYDORENKO, University of Alberta, Canada, A. KHRABROV, Y. RAITSES, Princeton Plasma Physics Laboratory, P. VENTZEK, L. CHEN, Tokyo Electron America, Inc.	**SD-WeM5** First Principles Calculations of Substrate-Specific Reactions in ALD, **S.D. ELLIOTT**, M. SHIRAZI, S. KLEJNA, Tyndall National Institute, Ireland
9:40 am	**PS2-WeM6** Electromagnetic Modeling of Inductively-Coupled Plasma Sources with Realistic Plasma Loads, **J. KENNEY**, S. RAUF, K. COLLINS, Applied Materials, Inc.	**SD-WeM6** Surface Chemistry during ALD of SiN_x from BTBAS and N_2 Plasma, C.K. ANDE, K. DE PEUTER, Eindhoven University of Technology, Netherlands, H.C.M. KNOOPS, Eindhoven University of Technology, S.D. ELLIOTT, Tyndall National Institute, Ireland, **W.M.M. KESSELS**, Eindhoven University of Technology, Netherlands
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	**PS2-WeM10** Two Dimensional Simulations of the Impact of Weak Magnetic Fields on the Plasma Properties of a Planar Slot Antenna Surface Wave Driven Plasma Source, **J. YOSHIKAWA**, Tokyo Electron Ltd., Y. SUSA, Tokyo Electron Miyagi Limited, P. VENTZEK, Tokyo Electron America, Inc.	**SD-WeM10** Enhanced Area-Selective Atomic Layer Deposition of TiN on HfO_2, **S.N. CHOPRA**, A.P. LANE, C.G. WILLSON, J.G. EKERDT, The University of Texas at Austin
11:20 am	**PS2-WeM11** Analytical Model of Plasma Sheaths at Intermediate Radio Frequencies, **M.A. SOBOLEWSKI**, NIST	**SD-WeM11** Selective Area Deposition of Short Cycle-Time ALD for Patterned-by-Printing Electronics, **C.R. ELLINGER**, S.F. NELSON, Eastman Kodak Company
11:40 am	**PS2-WeM12 Invited** Plasma Prize Invited Lecture: Simulations of Plasma Processes and Equipment for Semiconductor Device Fabrication, **P. VENTZEK**, Tokyo Electron America, Inc.	**SD-WeM12** Self-limiting CVD of a Silicon Monolayer for Preparation of Subsequent Silicon or Gate Oxide ALD on InGaAs(001)-(2x4), **M. EDMONDS**, T. KENT, University of California, San Diego, R. DROOPAD, Texas State University, E.A. CHAGAROV, A.C. KUMMEL, University of California, San Diego
12:00 pm	Invited talk continued.	

* Coburn & Winters Student Award Finalist

	Surface Science **Room: 309 - Session SS+AS+EN-WeM** **Dynamic Processes of Single Atoms and Molecules at Surfaces** **Moderators:** A.L. Utz, Tufts University, A.J. Gellman, Carnegie Mellon University	**Surface Science** **Room: 312 - Session SS+AS-WeM** **Atomistic Modeling of Surface Phenomena** **Moderators:** C.J. Hirschmugl, University of Wisconsin Milwaukee, E. Tysoe, University of Wisconsin-Milwaukee
8:00 am	**SS+AS+EN-WeM1 Invited** Construction and Manipulation of Individual Functional Molecules: from Reversible Conductance Transition to Reversible Spin Control, **H.-J. GAO**, Chinese Academy of Science, China	**SS+AS-WeM1** Oxidation of Cu Surfaces with Step-Edge Defects: Insights from Reactive Force Field Simulation, **Q. ZHU**, W.A. SAIDI, J. YANG, University of Pittsburgh
8:20 am	Invited talk continued.	**SS+AS-WeM2** The Role of Time-scale Analysis in Simulation of ALD and CVD Surface Reaction Kinetics, **R.A. ADOMAITIS**, E. REMMERS, C.D. TRAVIS, D. ARANA-CHAVEZ, University of Maryland, College Park
8:40 am	**SS+AS+EN-WeM3** Single Molecule Origins of Electronic Disorder: Random Conformations of α-NPD Molecules on Au(111), **D.B. DOUGHERTY**, J. WANG, J. WANG, North Carolina State University	**SS+AS-WeM3 Invited** Hydrogen Production from Formic Acid on Transition Metals and Alloys: A Selectivity Challenge, **M. MAVRIKAKIS**, J. SCARANTO, J.A. DUMESIC, S. SINGH, S. LI, J.A. HERRON, R. CARRASQUILLO, L. ROLING, B. O'NEILL, G. PENG, University of Wisconsin - Madison
9:00 am	**SS+AS+EN-WeM4** Pt-Cu *Single Atom Alloys* for the Selective Partial Hydrogenation of Butadiene, **F.R. LUCCI**, M. MARCINKOWSKI, E.C.H. SYKES, Tufts University	Invited talk continued.
9:20 am	**SS+AS+EN-WeM5 Invited** Toward a Dynamical Understanding of Chemistry at Metal Surfaces, **A.M. WODTKE**, Max Planck Institute for Biophysical Chemistry	**SS+AS-WeM5** Elucidating Atomic-scale Wear Processes in Hydrocarbon-based Materials via Molecular Dynamics and AFM, **J.A. HARRISON**, United States Naval Academy, T.D.B. JACOBS, University of Pennsylvania, P.L. KEATING, M. FALLET, United States Naval Academy, J.D. SCHALL, Oakland University, Y. JIANG, K.T. TURNER, R.W. CARPICK, University of Pennsylvania, K.E. RYAN, United States Naval Academy
9:40 am	Invited talk continued.	**SS+AS-WeM6** Theoretical Investigation of the Structure and Properties of Titania/Graphene Hybrid Materials, **I.O. IORDANOV**, C.J. KARWACKI, Edgewood Chemical And Biological Center, G.M. MOGILEVSKY, Booz Allen Hamilton
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-WeM10** Steric Effect in O_2 Chemisorption on Al(111), **M. KURAHASHI**, Y. YAMAUCHI, National Institute for Materials Science (NIMS), Japan	**SS+AS-WeM10** Real-Time Ab-Initio KMC Simulation of the Self-Assembly and Sintering of Bimetallic Epitaxial Nanoclusters: Au+Ag on Ag(100), **J.W. EVANS**, Y. HAN, D.-J. LIU, Iowa State University
11:20 am	**SS+AS+EN-WeM11** Surface Temperature Effects in Methane Dissociation on Ni and Ir Surfaces, **A.L. UTZ**, E. PETERSON, E. DOMBROWSKI, E. HIGH, E. NICOTERA, Tufts University	**SS+AS-WeM11** Progress in Characterizing Submonolayer Island Growth: Capture-Zone Distributions, Growth Exponents, and Hot Precursors, **T.L. EINSTEIN**, J.R. MORALES-CIFUENTES, University of Maryland, College Park, A. PIMPINELLI, Rice Quantum Institute
11:40 am	**SS+AS+EN-WeM12** Activation of C_1-C_9 Alkanes on Pt(111): Importance of Dynamics, van der Waals Interactions, and Gas-Surface Energy Transfer, **J.K. NAVIN**, S.B. DONALD, G. CUSHING, I.A. HARRISON, University of Virginia	**SS+AS-WeM12** Molecular Dynamics Simulation of Ge Deposition and Islanding on Amorphous Silica Substrates, C.Y. CHUANG, University of Pennsylvania, S.M. HAN, University of New Mexico, **T.R. SINNO**, University of Pennsylvania
12:00 pm	**SS+AS+EN-WeM13** Shining light on an Important Intermediate Step in Photocatalysis: Probing Polarons in ZnO using Infrared Reflection Absorption Spectroscopy, **F. BEBENSEE**, H. SEZEN, Karlsruhe Institute of Technology, Germany, A. NEFEDOV, C. WÖLL, Karlsruhe Institute of Technology	**SS+AS-WeM13** Dimerization Induced Deprotonation of Water on RuO_2(110), R. MU, D.C. CANTU, V.-A. GLEZAKOU, Z. WANG, I. LYUBINETSKY, R. ROUSSEAU, **Z. DOHNALEK**, Pacific Northwest National Laboratory

	Thin Film Room: 307 - Session TF+MS+PS-WeM **Applied ALD: Nanoelectronics and Emerging Applications** **Moderator:** J.S. Jur, North Carolina State University	Vacuum Technology Room: 303 - Session VT-WeM **Accelerator and Large Vacuum Systems I** **Moderators:** M.J. Ferreira, European Spallation Source, M.L. Stutzman, Thomas Jefferson National Accelerator Facility
8:00 am	**TF+MS+PS-WeM1 Invited** ALD and Beyond CMOS Materials, **R.M. WALLACE**, University of Texas at Dallas	**VT-WeM1 Invited** Vacuum Technology Developments at Daresbury Laboratory for Modern Accelerators, **K.J. MIDDLEMAN**, A.N. HANNAH, J.D. HERBERT, O.B. MALYSHEV, R. VALIZADEH, STFC Daresbury Laboratory, UK
8:20 am	Invited talk continued.	Invited talk continued.
8:40 am	**TF+MS+PS-WeM3** Control of Stoichiometry, Composition, and Defects in Oxide Semiconductors via Alteration of Plasma Processing Steps during PEALD, **T.J. LARRABEE**, S.M. PROKES, E.R. GLASER, J.A. FREITAS, Naval Research Laboratory	**VT-WeM3** First Year Operation of NSLS-II Vacuum Systems with Beam, **H.-C. HSEUH**, W. DEBOER, S. DISTEFANO, C. HETZEL, S. LENG, K. WILSON, D. ZIGROSSER, H. XU, Brookhaven National Laboratory
9:00 am	**TF+MS+PS-WeM4** Combining Gas Phase Aerosol Deposition with Atomic Layer Deposition for Fast Thin Film Deposition: A Case Study of Transparent Conducting ZnO, **E. THIMSEN**, Washington University, St. Louis, M. JOHNSON, A. WAGNER, A. MKHOYAN, U.R. KORTSHAGEN, E.S. AYDIL, University of Minnesota	**VT-WeM4** APS-Upgrade Storage Ring Vacuum System Conceptual Design, **H. CEASE**, B. STILLWELL, B. BRAJUSKOVIC, J. NUDELL, J. CARTER, Argonne National Laboratory
9:20 am	**TF+MS+PS-WeM5** Detecting Order in the Molecular Layer Deposition of Polymer Films by X-Ray Diffraction, **D.S. BERGSMAN**, R.W. JOHNSON, R. BRITTO, S.F. BENT, Stanford University	**VT-WeM5** APS-Upgrade Vacuum System Pressure Using a 3-D Simulation Tool, **J. CARTER**, H. CEASE, Argonne National Laboratory
9:40 am	**TF+MS+PS-WeM6** Native Oxide Diffusion and Removal During the Atomic Layer Deposition of Ta_2O_5 on InAs(100) Surfaces, **A. HENEGAR**, T. GOUGOUSI, University of Maryland, Baltimore County	**VT-WeM6** For Some Results Solving Key Issues of Vacuum Systems in Electron Storage Rings, **H. SAEKI**, Japan Synchrotron Radiation Research Institute, Japan, T. MOMOSE, Emeritus Professor of Miyagi National College of Technology, Japan
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+MS+PS-WeM10 Invited** ALD in High Aspect Ratio Structures and Nanoporous Materials, C. DETAVERNIER, **J. DENDOOVEN**, University of Ghent, Belgium	**VT-WeM10 Invited** Progress in Thin Film Technology for Superconducting RF Applications, **A.-M. VALENTE-FELICIANO**, Thomas Jefferson National Accelerator Facility
11:20 am	Invited talk continued.	Invited talk continued.
11:40 am	**TF+MS+PS-WeM12** Pyrolysis of Alucone MLD Films to Form Electrically Conducting and Nanodomained Al_2O_3/C Composite Films, J.J. TRAVIS, J.W. DUMONT, **S.M. GEORGE**, University of Colorado, Boulder	**VT-WeM12** Modeling and Measurement of a Tesla-like Cage Cavity, **J.R. NOONAN**, M.J. VIRGO, T.L. SMITH, Argonne National Laboratory
12:00 pm	**TF+MS+PS-WeM13** Atomic Layer Deposition of Metal Oxides on Ultra-High Aspect Ratio, Vertically Aligned Carbon Nanotube Arrays, **K. STANO**, M. CARROLL, R.P. PADBURY, J.S. JUR, P. BRADFORD, North Carolina State University	**VT-WeM13** e-Cloud Activity of DLC Coated Chamber at FNAL Main Injector, **S. KATO**, KEK-High Energy Accelerator Research Organization, Japan, J. ELDRED, Indiana University, C.Y. TAN, M. BACKFISH, B. ZWASKA, FNAL

NOTES

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

Exhibitor Technology Spotlight Session
Moderator: C. Moffitt, Kratos Analytical Limited, UK

12:20 pm		
12:40 pm	**EW-WeL2** An Auger Electron Analyzer System for *In Situ* Growth Monitoring, **W.L. CALLEY III**, P.G. STAIB, Staib Instruments, Inc.	
1:00 pm	**EW-WeL3** Safe and Efficient - Dry Bed Exhaust Gas Abatement of Toxic Gases I, **S. YEE**, CS Clean Systems Inc.	
1:20 pm	**EW-WeL4** The Workstation For Your 2D Characterization Needs - The First Low Temperature MultiProbe SPM-NSOM System Integrated with Raman, **D. LEWIS**, Nanonics Imaging Ltd.	
1:40 pm	**EW-WeL5** Trends and Solutions of Control Electronics for Surface Analysis and Science, **JACEK LATKOWSKI**, PREVAC sp. z o. o.	
2:00 pm		

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	2D Materials Focus Topic Room: 310 - Session 2D+AS+EM+MI+MN+NS+TF-WeA Properties of 2D Materials **Moderator:** G. Le Lay, Aix-Marseille University, France	Applied Surface Science Room: 316 - Session AS+BI+MC-WeA Practical Surface Analysis I **Moderators:** A.G. Shard, National Physical Laboratory, UK C. Szakal, National Institute of Standards and Technology (NIST)
2:20 pm	**2D+AS+EM+MI+MN+NS+TF-WeA1 Invited** Tuning Excitons in Two-Dimensional Semiconductors, **K.I. BOLOTIN**, Vanderbilt University	**AS+BI+MC-WeA1** The Application of XPS to Study Corroded Stainless Steel Surfaces, **H.L. BRANNON**, S.J. COULTAS, J.D.P. COUNSELL, S.J. HUTTON, A.J. ROBERTS, C.J. BLOMFIELD, Kratos Analytical Limited, UK, J. MORRISON, The University of Birmingham, UK
2:40 pm	Invited talk continued.	**AS+BI+MC-WeA2** Molecular Characterization of Lubricant Degradation Produced in a Tribological Wear Test Using TOF-SIMS and Scanned Microprobe XPS Imaging, **G.L. FISHER**, S.S. ALNABULSI, Physical Electronics Inc., T. LE MONGE, Ecole Centrale de Lyon - LTDS, France, J.S. HAMMOND, Physical Electronics Inc.
3:00 pm	**2D+AS+EM+MI+MN+NS+TF-WeA3** Electron-Phonon Coupling and Photoluminescence in Single Layer Transition Metal Dichalcogenides, **N. NAYYAR**, V. TURKOWSKI, D.T. LE, T.S. RAHMAN, University of Central Florida	**AS+BI+MC-WeA3 Invited** Surfaces and Interfaces of Real-World Products: What Do We Really Need to Know and What Are The Best Ways to Find Out?, **A.M. BELU**, L. LAGOO, W. THEILACKER, Medtronic, Inc.
3:20 pm	**2D+AS+EM+MI+MN+NS+TF-WeA4** Temperature Dependent Photoluminescent Spectroscopy of MoS_2, **M. WATSON**, J.R. SIMPSON, Towson University & NIST, R. YAN, H. XING, University of Notre Dame, S. BERTOLAZZI, J. BRIVIO, A. KIS, EPFL, Switzerland, A.R. HIGHT-WALKER, NIST	Invited talk continued.
3:40 pm	**BREAK**	**BREAK**
4:00 pm	**BREAK**	**BREAK**
4:20 pm	**2D+AS+EM+MI+MN+NS+TF-WeA7** Effects of Dimensionality on the Raman and Photoluminescence Spectra of and $TaSe_2$ and TaS_2 Dichalcogenides, **D. ROMERO**, University of Maryland, College Park, M. WATSON, J.R. SIMPSON, Towson University, H. BERGER, Ecole Polytechnique Federale de Lausanne, Switzerland, A.R. HIGHT WALKER, NIST	**AS+BI+MC-WeA7** Forensic XPS Surface Characterization of Cosmetic Trace Evidence, **B.R. STROHMEIER**, Thermo Fisher Scientific, R. BLACKLEDGE, Independent Consultant
4:40 pm	**2D+AS+EM+MI+MN+NS+TF-WeA8** Few-Layer and Symmetry-Breaking Effects on the Electrical Properties of Ordered CF_3Cl Phases on Graphene, **J.R. MORALES-CIFUENTES**, T.L. EINSTEIN, Y. WANG, J. REUTT-ROBEY, University of Maryland, College Park	**AS+BI+MC-WeA8** Industrial Applications of Surface Analysis, **W.F. STICKLE**, M.D. JOHNSON, G.A. DEHAAN, J.A. BURGESS, Hewlett Packard
5:00 pm	**2D+AS+EM+MI+MN+NS+TF-WeA9 Invited** Optical Anisotropies in Layered Nanomaterials, **J. SCHULLER**, UC Santa Barbara	**AS+BI+MC-WeA9 Invited** Peter Sherwood Mid-Career Award Talk: Chemical Analysis of Cells and Tissues with Imaging ToF-SIMS, **L.J. GAMBLE**, B. BLUESTEIN, D. GRAHAM, University of Washington
5:20 pm	Invited talk continued.	Invited talk continued.
5:40 pm	**2D+AS+EM+MI+MN+NS+TF-WeA11** Mechanical Properties of 2D-Materials, J.M. GONZALES, University of South Florida, R. PERRIOT, Los Alamos National Laboratory, **I.I. OLEYNIK**, University of South Florida	**AS+BI+MC-WeA11** Characterization Strategies for the Detection of Carbon Nanotubes within an Epoxy Matrix, **J.M. GORHAM**, J. WOODCOCK, W.A. OSBORN, J. HEDDLESTON, K. SCOTT, National Institute of Standards and Technology (NIST)
6:00 pm	**2D+AS+EM+MI+MN+NS+TF-WeA12** Mechanical Control of Structural Phase Transitions in Two-Dimensional Mo- and W- Dichalcogenide Monolayers, **E.J. REED**, K.-A.N. DUERLOO, Y. LI, Stanford University	**AS+BI+MC-WeA12** Measuring Schmutz: Accounting for Adventitious Carbon Contamination in X-ray Absorption Spectra of Carbon-Based Materials, **F. MANGOLINI**, J.B. MCCLIMON, J. HILBERT, R.W. CARPICK, University of Pennsylvania

	Biomaterial Interfaces **Room: 317 - Session BI+MG-WeA**	**Electronic Materials and Processing** **Room: 311 - Session EM+EN+TF-WeA**
	Design and Discovery: Biointerfaces **Moderator:** M.R. Alexander, The University of Nottingham, UK	**Thin Films and Materials for Energy Storage** **Moderator:** C.L. Hinkle, University of Texas at Dallas
2:20 pm	**BI+MG-WeA1 Invited** Biomateriomics: Discovery, Innovation and Manufacturing Advanced Materials, **M. BUEHLER**, MIT	**EM+EN+TF-WeA1** Investigation of Composite Dielectric Materials for Energy Storage, **K. COOK-CHENNAULT**, U. SUNDAR, W. DU, Rutgers, the State University of New Jersey
2:40 pm	Invited talk continued.	**EM+EN+TF-WeA2** Preparation and Characterization of ZnO Nano Rods, P. THAMARAISELVAN, Selvam Arts and Science College, India, **M. SAROJA**, M. VENKATACHALAM, P. GOWTHAMAN, Erode Arts and Science College, India, S. RAVIKUMAR, Sengunthar Arts and Science College, India, S. SHANKAR, Erode Arts and Science College, India
3:00 pm	**BI+MG-WeA3** Interfacial Force Field Parameterization in CHARMM for the Accurate Molecular Dynamics Simulation of Peptide Adsorption on High-Density Polyethylene, **T.A. ABRAMYAN**, J.S. SNYDER, J.Y. YANCEY, S.S. STUART, R.A. LATOUR, Clemson University	**EM+EN+TF-WeA3 Invited** Rational Design of Energy Storage Materials from Earth Abundant Elements, **K.J. CHO**, UT Dallas
3:20 pm	**BI+MG-WeA4** Degradable Silica Nanoshells for Ultrasonic Imaging and Therapy, **A. LIBERMAN**, C. BARBACK, R. VIVEROS, S.L. BLAIR, D. VERA, L. ELLIES, R. MATTREY, W. TROGLER, A.C. KUMMEL, University of California at San Diego	Invited talk continued.
3:40 pm	**BREAK**	**BREAK**
4:00 pm	**BREAK**	**BREAK**
4:20 pm	**BI+MG-WeA7** An Encapsulation Technique for Adenovirus to Enhance Viral Gene Therapy, **N. MENDEZ**, V. HERRERA, L. ZHANG, F. HEDJRAN, W. TROGLER, S.L. BLAIR, A.C. KUMMEL, University of California at San Diego	**EM+EN+TF-WeA7** Transferring Environmentally Sensitive Battery Materials between GloveBox and UHV Surface Analysis Chamber: Composition Study of Model Battery Interfaces and their Controlled Oxidation, **H.C. CELIO**, University of Texas at Austin
4:40 pm	**BI+MG-WeA8** Sequential and Competitive Adsorption of Peptides at Pendant PEO Layers, X.W. WU, M.R. RYDER, J.M. MCGUIRE, **K.S. SCHILKE**, Oregon State University	**EM+EN+TF-WeA8** Development of Thin Film Si-C Based High Temperature Microsupercapacitor Devices, J.P. ALPER, C.-H. CHANG, C. CARRARO, **R. MABOUDIAN**, University of California at Berkeley
5:00 pm	**BI+MG-WeA9 Invited** Moulding Cells and Materials in High Throughput, **C. VAN BLITTERSWIJK**, R. TRUCKENMULLER, L. MORONI, N. RIVRON, P. HABIBOVIC, J. DE BOER, Maastricht University, The Netherlands	**EM+EN+TF-WeA9** Rate Capability of Silicon Carbon Nanotube Anodes for Lithium Ion Batteries, **L. BARRETT**, R. FAN, R.C. DAVIS, K. HINTON, R.R. VANFLEET, Brigham Young University
5:20 pm	Invited talk continued.	**EM+EN+TF-WeA10** Characterization and Optimization of Interface Engineering on Li Metal Anode Using Atomic Layer Deposition and *In Situ* Electrochemical AFM, **C.F. LIN**, A.C. KOZEN, A.J. PEARSE, M. NOKED, M.A. SCHROEDER, S.B. LEE, G.W. RUBLOFF, University of Maryland, College Park
5:40 pm	**BI+MG-WeA11** Discovery of Materials for Stem Cell Control using Polymer Microarrays, **M.R. ALEXANDER**, The University of Nottingham, UK	
6:00 pm	**BI+MG-WeA12** The Influence of Structural Array of Polymorphic hIAPP fibrils to its Mechanical Properties, **H.J. CHANG**, M. LEE, Korea University, Republic of Korea, G. YOON, Boston University, S. NA, Korea University, Republic of Korea	

	Electronic Materials and Processing Room: 314 - Session EM-WeA High-K Dielectrics for 2D Semiconductor **Moderator:** A.C. Kummel, University of California at San Diego	Energy Frontiers Focus Topic Room: 315 - Session EN+AS+EM-WeA Organic-Inorganic Interfaces for Energy **Moderator:** R. Chintalapalle, University of Texas at El Paso
2:20 pm	**EM-WeA1 Invited** Adding New Functionalities to CMOS Integrated Circuits Via Directed Self-Assembly, **T.S. MAYER**, Penn State University	**EN+AS+EM-WeA1 Invited** Towards Efficient Solution Processed Organic Photovoltaic Devices, **E. REICHMANIS**, Georgia Institute of Technology
2:40 pm	Invited talk continued.	Invited talk continued.
3:00 pm	**EM-WeA3** Band Gap Engineering of 2D Semiconductor Materials *via* Atomic Layer Deposition of TiOPc on Graphene and MoS_2, **P. CHOUDHURY**, New Mexico Institute of Mining and Technology, A.C. KUMMEL, University of California at San Diego	**EN+AS+EM-WeA3** Understanding Carrier Dynamics in $Cu_2ZnSn(S,Se)_4$ Using Time-Resolved Terahertz Spectroscopy, G.W. GUGLIETTA, Drexel University, K. ROY CHOUDHURY, J.V. CASPAR, DuPont Central Research and Development, **J.B. BAXTER**, Drexel University
3:20 pm	**EM-WeA4** $HfSe_2$ Thin Films: 2D Transition Metal Dichalcogenides Grown by MBE, **R. YUE**, A. BARTON, X. PENG, N. LU, R. ADDOU, S. MCDONNELL, L. CHEN, J.Y. KIM, University of Texas at Dallas, L. COLOMBO, Texas Instruments, M. KIM, R.M. WALLACE, C.L. HINKLE, University of Texas at Dallas	**EN+AS+EM-WeA4** Comparative Study of the Doping Effects of Titanium and Nitrogen into Tungsten Oxide (WO_3) Thin Films for Photovoltaic Device Applications, **M. VARGAS**, C.V. RAMANA, The University of Texas at El Paso
3:40 pm	**BREAK**	**BREAK**
4:00 pm	**BREAK**	**BREAK**
4:20 pm	**EM-WeA7 Invited** Phonons, Scattering, and Semiclassical Transport Studies in 2D Materials and Devices, **M.V. FISCHETTI**, W.G. VANDENBERGHE, The University of Texas at Dallas	**EN+AS+EM-WeA7** Inverted Organic Solar Cell Based on Solution-processed Cs-doped TiO_2 Thin Film as Electron Transport Layer, A. RANJITHA, **M. NATARAJAN**, Coimbatore Institute of Technology, India, M. THAMBIDURAI, Seoul National University, Republic of Korea, D. VELAUTHAPILLAI, University College of Bergen, Norway
4:40 pm	Invited talk continued.	**EN+AS+EM-WeA8** Metal/Polymer Interfaces: The Case for Li Electrodes with π-conjugated Polymers, X.F. FENG, **Y.F. YE**, H.X. JU, J.F. ZHU, University of Science and Technology of China
5:00 pm	**EM-WeA9 Invited** *In Situ* Transmission Electron Microscopy of Oxides on TMDs, **M. KIM**, N. LU, J. OVIEDO, X. PENG, J. WANG, G. LIAN, A. AZCATL, S. MCDONNELL, R.M. WALLACE, The University of Texas at Dallas, S. VISHWANATH, H. XING, University of Notre Dame	**EN+AS+EM-WeA9 Invited** Engineering Exciton Recombination in Organic Light-Emitting Devices, **R.J. HOLMES**, University of Minnesota
5:20 pm	Invited talk continued.	Invited talk continued.
5:40 pm	**EM-WeA11** Effects of Neutron Irradiation of Ultra-Thin HfO_2 Films, **K.W. HSU**, University of Wisconsin-Madison, H. REN, Applied Materials, R.J. AGASIE, University of Wisconsin-Madison, L. ZHAO, Y. NISHI, Stanford University, J.L. SHOHET, University of Wisconsin-Madison	**EN+AS+EM-WeA11** Interface Engineering to Control Magnetic Field Effects of Organic-based Devices by using a Self-Assembled Monolayer, **H.-J. JANG**, NIST & WFU, S.J. POOKPANRATANA, NIST, A.N. BRIGEMAN, Wake Forest University, R.J. KLINE, NIST, J.I. BASHAM, NIST & PSU, D.J. GUNDLACH, C.A. HACKER, O.A. KIRILLOVA, NIST, O.D. JURCHESCU, Wake Forest University, C.A. RICHTER, NIST
6:00 pm	**EM-WeA12** Nucleation of Low Temperature HfO_2 Atomic Layer Deposition on InGaAs using Various Native Oxide Removal Techniques, **T. KENT**, University of California at San Diego, K. TANG, Stanford University, S. LEE, C.Y. HUANG, V. CHOBPATTANA, University of California at Santa Barbara, K. SARDASHTI, M. EDMONDS, University of California at San Diego, R. DROOPAD, Texas State University, P.C. MCINTYRE, Stanford University, A.C. KUMMEL, University of California at San Diego	**EN+AS+EM-WeA12** Study on the Correlation between Electrode-Active Layer Interfaces and Performance of Polymer Solar Cells, **H.X. JU**, J.F. ZHU, University of Science and Technology of China

	Exhibitor Technology Spotlight **Room: Hall ABC - Session EW-WeA**	**In-Situ Spectroscopy and Microscopy Focus Topic** **Room: 313 - Session IS+2D+MC+NS+SP+SS-WeA**
	Exhibitor Technology Spotlight Session **Moderator:** C. Moffitt, Kratos Analytical Limited, UK	**In-Situ Scanning Microscopy** **Moderator:** M. Ammann, Paul Scherrer Institut, Switzerland
2:20 pm		**IS+2D+MC+NS+SP+SS-WeA1 Invited** *In Situ* Studies of Model Fuel Cells, **Z. LIU**, Lawrence Berkeley National Laboratory
2:40 pm		Invited talk continued.
3:00 pm		**IS+2D+MC+NS+SP+SS-WeA3** Probing of Nanoscale Objects in Reactive Liquids through Membranes using Near-Field Microwave Microscopy, **A. TSELEV**, Oak Ridge National Laboratory, A. KOMAKOV, National Institute of Standards and Technology (NIST)
3:20 pm		**IS+2D+MC+NS+SP+SS-WeA4** Recent Applications and Results in Near Ambient Pressure XPS – *In Situ* Cell Designs for Liquid Environments, **A. THISSEN**, SPECS Surface Nano Analysis GmbH, Germany
3:40 pm	**BREAK**	**BREAK**
4:00 pm	**EW-WeA6** FOCUS beyond PEEM and NanoESCA, **D. POHLENZ**, M. ESCHER, M. WEBER, FOCUS GmbH, Germany	**BREAK**
4:20 pm		**IS+2D+MC+NS+SP+SS-WeA7 Invited** Caught in the Act! Live Observations of Catalysts Using High-Pressure Scanning Probe Microscopy, **I.M.N. GROOT**, Huygens-Kamerlingh Onnes Laboratory, Leiden University, Netherlands
4:40 pm		Invited talk continued.
5:00 pm		**IS+2D+MC+NS+SP+SS-WeA9** X-ray Photoelectron Spectroscopy Studies of H_2O Dissociation on Pre-oxidized Al (111) and Cu (111) Single Crystal Surface, **Q.Q. LIU**, SUNY, Binghamton University, X. TONG, Brookhaven National Laboratory, G.W. ZHOU, SUNY, Binghamton University
5:20 pm		**IS+2D+MC+NS+SP+SS-WeA10** Operando APXPS of the Liquid-Solid Interface: Au Oxidation, **E.J.C. CRUMLIN**, S.A. AXNANDA, P.N.R. ROSS, Z.L. LIU, Lawrence Berkeley National Laboratory
5:40 pm		**IS+2D+MC+NS+SP+SS-WeA11** Water on ZnO(10-10) Investigated by Ambient Pressure X-ray Photoelectron Spectroscopy, **C. GOODWIN**, University of Delaware, A. BOSCOBOINIK, Brookhaven National Lab, C. ARBLE, J.T. NEWBERG, University of Delaware
6:00 pm		

	MEMS and NEMS Room: 301 - Session MN+PS-WeA Emerging Materials and Fabrication Technologies for MEMS/NEMS **Moderators:** S. Kotru, The University of Alabama, M. Metzler, Cornell University	Manufacturing Science and Technology Room: 302 - Session MS+TF-WeA Overview: Applications and Manufacturing of Devices on Paper and Textiles **Moderator:** L.B. Hu, University of Maryland, College Park
2:20 pm	**MN+PS-WeA1 Invited** Organic Sensors and Actuators Patterned by Inkjet Printing, **T.N. NG**, PARC (Palo Alto Research Center), a Xerox Company, J. KIM, W.S. KIM, Simon Fraser University, Canada, K.S. KWON, Soonchunhyang University, South Korea	**MS+TF-WeA1 Invited** Challenges and Opportunities in the Production of Cellulose Nanomaterials, **J.Y. ZHU**, USDA Forest Products Lab
2:40 pm	Invited talk continued.	Invited talk continued.
3:00 pm	**MN+PS-WeA3** Microfabrication by Etching for Carbon Nanotube Composite Sheets, **N. BOYER**, J. ROWLEY, D.D. ALLRED, Brigham Young University, S. LIDDIARD, Moxtek, Inc, R.R. VANFLEET, R.C. DAVIS, Brigham Young University	**MS+TF-WeA3 Invited** Engineering Cellulose Nanomaterial Substrates for Flexible Electronics, Y. ZHOU, C. FUENTES-HERNANDEZ, T. KHAN, Georgia Institute of Technology, J.-C. LIU, J. DIAZ, Purdue University, J. HSU, J. SHIM, A. DINDAR, Georgia Institute of Technology, **R. MOON**, US Forest Service-Forest Products Laboratory, J. YOUNGBLOOD, Purdue University, B.J. KIPPELEN, Georgia Institute of Technology
3:20 pm	**MN+PS-WeA4** High Aspect Ratio Magnetic MEMS Fabricated using Carbon Nanotube Templated Microfabrication, **R.C. DAVIS**, L. BARRETT, D. BARTON, R.R. VANFLEET, D.D. ALLRED, Brigham Young University	Invited talk continued.
3:40 pm	**BREAK**	**BREAK**
4:00 pm	**BREAK**	**BREAK**
4:20 pm	**MN+PS-WeA7** Sub-100nm Thin Polycrystalline Diamond Nanomechanical Torsional Resonators, **R. YANG**, Z. WANG, J. LEE, C.A. ZORMAN, P.X.-L. FENG, Case Western Reserve University	**MS+TF-WeA7 Invited** Circuits on Cellulose: From Transistors to LEDS, from Displays to Microfluidics on Paper, **A. STECKL**, University of Cincinnati
4:40 pm	**MN+PS-WeA8** Temperature Compensated Graphene Nanomechanical Resonators, **J. LEE**, Case Western Reserve University, H.-Y. CHIU, University of Kansas, P.X.-L. FENG, Case Western Reserve University	Invited talk continued.
5:00 pm	**MN+PS-WeA9** A Porous Material for Improving Cantilever Q in Air and Liquid for Resonant Mechanical Sensing, **S. NOYCE**, R.C. DAVIS, R.R. VANFLEET, Brigham Young University, H.G. CRAIGHEAD, Cornell University	**MS+TF-WeA9 Invited** Optically Transparent Cellulose Nanopaper for Electronic Devices, **M. NOGI**, Osaka University, Japan
5:20 pm	**MN+PS-WeA10** XPS to Investigating Spatial and Temporal Modification of PDMS Platforms for Micro-Fluidic Devices, **M. DHAYAL**, CSIR- Centre for Cellular and Molecular Biology, India	Invited talk continued.
5:40 pm	**MN+PS-WeA11** A Microplasma-based Sputtering System for Direct-Write, Micropatterning of Metal Structures, **E. BURWELL**, A.C. BARNES, P.X.-L. FENG, M. SANKARAN, C.A. ZORMAN, Case Western Reserve University	**MS+TF-WeA11** Designing Functional Paper for Emerging Electronics and Energy Devices, **H.L. ZHU**, L.B. HU, University of Maryland, College Park
6:00 pm		**MS+TF-WeA12** Transparent Films of Cellulose Nanocrystals Derived from Waste Cotton T-shirts, **N. FARAHBAKHSH**, J.S. JUR, R.A. VENDITTI, North Carolina State University

	Nanometer-scale Science and Technology Room: 304 - Session NS+AS-WeA Nanoscale Imaging and Materials Characterization **Moderators:** C.B. Prater, Anasys Instruments, P.E. Sheehan, Naval Research Laboratory	Plasma Science and Technology Room: 305 - Session PS+2D-WeA Plasma Processing for 2D Materials, Coating, and Surface Modification **Moderator:** C.A. Wolden, Colorado School of Mines
2:20 pm	**NS+AS-WeA1 Invited** 2014 AVS Albert Nerken Mark Award Lecture - Brilliant Nanodiamond Particles, **O.A. SHENDEROVA***, Adámas Nanotechnologies Inc., G.E. MCGUIRE, International Technology Center	**PS+2D-WeA1 Invited** Hydrogen Plasmas Processing of Graphene, **E. DESPIAU-PUJO**, A.O. DAVYDOVA, G. CUNGE, LTM, Univ. Grenoble Alpes/CNRS/CEA-Leti Minatec, France, L. MAGAUD, Institut Neel, Univ. Grenoble Alpes/CNRS, France, D.B. GRAVES, University of California at Berkeley
2:40 pm	Invited talk continued.	Invited talk continued.
3:00 pm	**NS+AS-WeA3** Oxidation State Sensitive Imaging of Ceria Nanoparticles, **A.C. JOHNSTON-PECK**, National Institute of Standards and Technology (NIST)	**PS+2D-WeA3** Plasma Synthesis of WS_2 Films, **R.M. MORRISH**, C.D. SENTMAN, T. HAAK, C.A. WOLDEN, Colorado School of Mines
3:20 pm	**NS+AS-WeA4** Shape and support interaction of size-selected Pd and Pt NPs on TiO_2(110), **M. AHMADI**, F. BEHAFARID, University of Central Florida, B. ROLDAN CUENYA, Ruhr-University Bochum, Germany	**PS+2D-WeA4** Decoration of Graphene with Gold Alloy Nanoparticles Synthesized in Solution Plasma, **M.A. BRATESCU**, Aichi Science and Technology Foundation, Nagoya University, Japan, T. UENO, N. SAITO, Nagoya University, Japan
3:40 pm	**BREAK**	**BREAK**
4:00 pm	**BREAK**	**BREAK**
4:20 pm	**NS+AS-WeA7 Invited** Nanoscale Imaging and Spectroscopy of Plasmonic Hot Spots and Dark Modes with the PTIR Technique, **A. CENTRONE**, National Institute of Standards and Technology (NIST)	**PS+2D-WeA7** Generation and Stabilization Mechanisms of Free Radicals in Plasma Polymers, S. ERSHOV, F. KHELIFA, P. DUBOIS, **R. SNYDERS**, University of Mons, Belgium
4:40 pm	Invited talk continued.	**PS+2D-WeA8** Simulation of Direct Current Microplasma Discharge in Carbon Dioxide at High and Intermediate Pressures, N. HASAN, P.R. FERNANDEZ, **B. FAROUK**, Drexel University
5:00 pm	**NS+AS-WeA9** AFM-based Infrared Spectroscopy—Nanoscale Chemical Analysis with Sensitivity Down to Single Monolayers, **C.B. PRATER**, K. KJOLLER, M. LO, E. DILLON, R. SHETTY, Anasys Instruments, C. MARCOTT, Light Light Solutions, F. LU, M. JIN, M. BELKIN, University of Texas at Austin, A. DAZZI, Université Paris-Sud, France	**PS+2D-WeA9** The Impact of Ambient Gas Chemistry on Lipopolysaccharide Deactivation and Polymer Modification by Plasma-Generated Radicals at Atmospheric Pressure, **E.A.J. BARTIS**, A.J. KNOLL, P. LUAN, C. HART, University of Maryland, College Park, D.B. GRAVES, University of California, Berkeley, I.V. ADAMOVICH, W. LEMPERT, The Ohio State University, J. SEOG, G.S. OEHRLEIN, University of Maryland, College Park
5:20 pm	**NS+AS-WeA10** Schottky Barrier Height Mapping of Nanoengineered Metal/Semiconductor Interfaces, **R. BALSANO**, C. DURCAN, University of Albany-SUNY, A. MATSUBAYASHI, V.P. LABELLA, University at Albany-SUNY	**PS+2D-WeA10** Modification of LDPE Induced by an Ar/H_2O Plasma: Comparison between a Post-Discharge Treatment and a DBD Treatment, **S. COLLETTE**, Université Libre de Bruxelles, Belgium, V. CRISTAUDO, Université catholique de Louvain, Belgium, T.R. DUFOUR, Université Libre de Bruxelles, Belgium, P. VIVILLE, Université de Mons, Belgium, A. DELCORTE, Université catholique de Louvain, Belgium, F.A.B. RENIERS, Université Libre de Bruxelles, Belgium
5:40 pm	**NS+AS-WeA11** Scanning Electron Microscopy to Probe Electron Transport of Working Nanodevices under Realistic Operation Conditions, **A. STEVANOVIC**, A. KOLMAKOV, National Institute of Standards and Technology (NIST)	**PS+2D-WeA11** Atmospheric Plasma Polymerization of Fluorinated Precursor : Comparison of Various Liquid Precursors and Plasma Types (AC and Pulsed DC), J. HUBERT, **N. VANDENCASTEELE**, Université Libre de Bruxelles, Belgium, C. POLEUNIS, Université catholique de Louvain, Belgium, J. MERTENS, Université Libre de Bruxelles, Belgium, A. DELCORTE, P. BERTRAND, Université catholique de Louvain, Belgium, F.A.B. RENIERS, Université Libre de Bruxelles, Belgium
6:00 pm		**PS+2D-WeA12** Surface Modification of Nafion Membranes Exposed to an atmospheric He-O_2 and He-H_2 Post-Discharge, **T.R. DUFOUR**, D. MERCHE, H. JULIE, R.F. FRANÇOIS, Université Libre de Bruxelles, Belgium

* Albert Nerken Award Winner

	Plasma Science and Technology **Room: 308 - Session PS-WeA** **Plasma Diagnostics, Sensors, and Control** **Moderator:** J.-P. Booth, LPP-CNRS, Ecole Polytechnique, France	**Selective Deposition as an Enabler of Self-Alignment Focus Topic** **Room: 318 - Session SD-WeA** **Process Development for Selective Deposition and Self-Aligned Patterning** **Moderators:** P. Ma, Applied Materials, Inc., J. Smythe, Micron Technology
2:20 pm	**PS-WeA1** Diagnostics of Cl_2/O_2 Inductively-Coupled Plasmas by Ultra-High Sensitivity Broad-Band Absorption Spectroscopy, **M. FOUCHER**, LPP-CNRS, Ecole Polytechnique, France, E. CARBONE, LTM - MINATEC - CEA/LETI, France, J.-P. BOOTH, LPP-CNRS, Ecole Polytechnique, France	**SD-WeA1 Invited** Material Requirements for Self-Aligned Patterning – a Lithographer's Perspective, **C. WALLACE**, Intel Corporation
2:40 pm	**PS-WeA2** Diagnostics in Pulsed Hydrogen Plasmas, **J. DUBOIS**, G. CUNGE, LTM - CEA/LETI, France, N. POSSEME, CEA-LETI, France, M. DARNON, LTM - CEA/LETI, France, L. VALLIER, CNRS-LTM, France, O. JOUBERT, LTM - CEA/LETI, France	Invited talk continued.
3:00 pm	**PS-WeA3 Invited** The Role of Diagnostics in Plasma Etch Reactors in Enabling the Information Age, **A. PATERSON**, J. HOLLAND, S. SRIRAMAN, E. HUDSON, H. SINGH, V. VAHEDI, Lam Research Corp	**SD-WeA3 Invited** Controlling Selective Area Atomic Layer Deposition of Metals and Metal Oxides without the use of Organic Blocking Layers, **G.N. PARSONS**, B. KALANYAN, S.E. ATANASOV, North Carolina State University
3:20 pm	Invited talk continued.	Invited talk continued.
3:40 pm	**BREAK**	**BREAK**
4:00 pm	**BREAK**	**BREAK**
4:20 pm	**PS-WeA7** Ion Angular Distributions Measured with a Planar Retarding Field Analyzer, **S. SHARMA**, Impedans Ltd., Ireland	**SD-WeA7** Selective Deposition through Organic Blocking Layers, **R. HOURANI**, S.B. CLENDENNING, G.M. KLOSTER, A. BASU, F. GSTREIN, Intel Corporation
4:40 pm	**PS-WeA8** Quantitative Analysis of Neutral Species Generated in Styrene Low Pressure RF Plasma, as a Function of Plasma Power, X. GILLON, J.-J. JEAN-JACQUES, **L. HOUSSIAU**, University of Namur, Belgium	**SD-WeA8** Selective Deposition and Selective Etching of Patterned Dielectric Films, **F. MINAYE HASHEMI**, C. PRASITTICHAI, S.F. BENT, Stanford University
5:00 pm	**PS-WeA9** Comparison of Commercial Plasma Probe Systems, **V.A. GODYAK**, RF Plasma Consulting, B.M. ALEXANDROVICH, Plasma Sensors	**SD-WeA9** All-Dry Etching Strategy for Self-Assembly Block Copolymers PS-b-PMMA, **P. BÉZARD**, G. CUNGE, E. LATU-ROMAIN, A. TAVERNIER, LTM, France, R. TIRON, CEA-LETI, France, X. CHEVALIER, Arkema, France, O. JOUBERT, LTM - CEA/LETI, France
5:20 pm	**PS-WeA10** Systematic Diagnostic Approach for Fabricating High Quality SiNx:H Film using UHF Assisted Capacitively Coupled Plasma Source, J.G. HAN, B.B. SAHU, **K. SHIN**, Sungkyunkwan University, Republic of Korea, K. ISHIKAWA, M. HORI, Nagoya University, Japan	**SD-WeA10** Selective CVD Cobalt Capping Advanced- Groundrule Cu Interconnects : Electromigration Study, **A.H. SIMON**, IBM Microelectronics Division, T. BOLOM, GLOBALFOUNDRIES Inc., C. NIU, ST Microelectronics, F.H. BAUMANN, IBM Microelectronics Division, C.-K. HU, IBM Research Division, C. PARKS, J. NAG, IBM Microelectronics Division, J.-Y. LEE, GLOBALFOUNDRIES Inc., C.-C. YANG, S. NGUYEN, IBM Research Division, D. PRIYADARSHINI, D. KIOUSSIS, IBM Microelectronics Division, T. NOGAMI, IBM Research Division, S. GUGGILLA, J. REN, J. AUBUCHON, Applied Materials, Inc.
5:40 pm	**PS-WeA11** Electron Beam Generated Plasmas in Fluorine Chemistries, **D.R. BORIS**, R.F. FERNSLER, G.M. PETROV, TZ.B. PETROVA, S.G. WALTON, Naval Research Laboratory	**SD-WeA11** Growth and Characterization of Ultra-Thin Silicon Dioxide Layers for Low-k Dielectrics on HOPG and Graphene, **A. LUCERO**, L. CHENG, Y.G. LEE, HH. HWANG, X. QIN, R.M. WALLACE, J.Y. KIM, University of Texas at Dallas
6:00 pm	**PS-WeA12** Characterization of Hydrogen Recombination at the Wall and its Effect on Hydrogen Source Performance, **S. SMITH**, MKS Instruments, Inc.	

	Scanning Probe Microscopy Focus Topic Room: 312 - Session SP+AS+BI+NS+SS-WeA	Surface Science Room: 309 - Session SS-WeA
	Advances in Scanning Probe Microscopy **Moderators:** T.-H. Kim, Pohang University of Science and Technology, Republic of Korea, J. Park, Oak Ridge National Laboratory	**Chirality and Enantioselectivity on Surfaces** **Moderators:** M.A. Hines, Cornell University, A.V. Teplyakov, University of Delaware
2:20 pm	**SP+AS+BI+NS+SS-WeA1 Invited** Majorana Mode in Vortex core of Bi_2Te_3/$NbSe_2$Topological Insulator-Superconductor Heterostructure, **J.F. JIA**, Shanghai Jiao Tong University, China	**SS-WeA1 Invited** Simple Rules and the Emergence of Chirality at Surfaces, **R. RAVAL**, University of Liverpool
2:40 pm	Invited talk continued.	Invited talk continued.
3:00 pm	**SP+AS+BI+NS+SS-WeA3** Robust Protection from Backscattering in the Topological Insulator $Bi_{1.5}Sb_{0.5}Te_{1.7}Se_{1.3}$, **F. KOMORI**, S. KIM, S. YOSHIZAWA, Y. ISHIDA, University of Tokyo, Japan, K. ETO, K. SEGAWA, Osaka University, Japan, S. SHIN, University of Tokyo, Japan, Y. ANDO, Osaka University, Japan	**SS-WeA3** Exploring Enantioselectivity on Chirally Modified Surfaces in Ultrahigh Vacuum, **W.T. TYSOE**, University of Wisconsin-Milwaukee
3:20 pm	**SP+AS+BI+NS+SS-WeA4** Measurements and Analysis of Sub Nanometer Stepped Surfaces Using a Traceable Atomic Force Microscope, **N.G. ORJI**, National Institute of Standards and Technology (NIST), S. GONDA, AIST, Japan, R.G. DIXSON, National Institute of Standards and Technology (NIST)	**SS-WeA4** The Structure Sensitivity of L and D Tartaric Acid Explosive Decomposition on Copper Surface Structure Spread Single Crystals, **A. REINICKER**, B.S. MHATRE, B.S. HOLSCLAW, Carnegie Mellon University, E.C.H. SYKES, Tufts University, A.J. GELLMAN, Carnegie Mellon University
3:40 pm	**BREAK**	**BREAK**
4:00 pm	**BREAK**	**BREAK**
4:20 pm	**SP+AS+BI+NS+SS-WeA7 Invited** Direct Observation of Edge States of 1D and 2D Topological insulators, **H.W. YEOM**, Institute for Basic Science, Republic of Korea	**SS-WeA7** Ordering of L-alaninate Superstructures on Cu(001), **E.Z. CIFTLIKLI**, B.J. HINCH, Rutgers University
4:40 pm	Invited talk continued.	**SS-WeA8** Quantitation of Enantiospecific Adsorption on Chiral Nanoparticles from Optical Rotation, **N. SHUKLA**, N. ONDECK, N. KHOSLA, A.J. GELLMAN, Carnegie Mellon University
5:00 pm	**SP+AS+BI+NS+SS-WeA9** Controlling Charges of the Dipole Layer at Metal-Semiconductor Interfaces, **T.-H. KIM**, Pohang University of Science and Technology, Republic of Korea, H.W. YEOM, Pohang University of Science and Technology and Institute for Basic Science, Republic of Korea	**SS-WeA9** Low-Temperature STM Observation of Asymmetrical Adsorption and Chirality of Ga Adatoms on Wurtzite GaN(000-1), **K. ALAM**, A. FOLEY, J. CORBETT, Y. MA, J. PAK, A.R. SMITH, Ohio University
5:20 pm	**SP+AS+BI+NS+SS-WeA10** Advances in Imaging and Quantification of Electrical Properties at the Nanoscale using Scanning Microwave Impedance Microscopy (sMIM), **S. FRIEDMAN**, Y. YANG, O. AMSTER, PrimeNano, Inc, S. JOHNSTON, Stanford University	**SS-WeA10** Enantioselectivity and Auto-Amplification by Adsorption, **A.J. GELLMAN**, Y. YUN, Carnegie Mellon University
5:40 pm	**SP+AS+BI+NS+SS-WeA11** Scanning Photocurrent Microscopy on MoS_2, $MoS_{2(1-x)}Se_{2x}$, and $MoSe_2$ Monolayer Islands and Films Grown by CVD, **V. KLEE**, D. BARROSO, E. PRECIADO, University of California - Riverside, K. ERICKSON, Sandia National Laboratories, M. TRIPLETT, University of California -Davis, C. LEE, A. NGUYEN, I. LU, S. BOBEK, J. MANN, University of California - Riverside, A. TALIN, F. LEONARD, Sandia National Laboratories, L. BARTELS, University of California - Riverside	**SS-WeA11 Invited** Enantioselective Adsorption on Rock-Forming Minerals: A Thought Experiment, **R.M. HAZEN**, Carnegie Institution
6:00 pm		Invited talk continued.

	Thin Film Room: 307 - Session TF+EM+EN-WeA Thin Film and Nanostructured Coatings for Light Trapping, Extraction, and Plasmonic Applications **Moderator:** T. Karabacak, University of Arkansas at Little Rock	Vacuum Technology Room: 303 - Session VT-WeA Accelerator and Large Vacuum Systems II **Moderators:** J.A. Fedchak, National Institute of Standards and Technology (NIST), M.J. Ferreira, European Spallation Source
2:20 pm	**TF+EM+EN-WeA1** Enhanced Light Trapping by Glancing Angle Deposited Semiconducting and Metallic Nanostructure Arrays, **H. CANSIZOGLU**, R. ABDULRAHMAN, M.F. CANSIZOGLU, University of Arkansas at Little Rock, M. FINCKENOR, NASA Marshall Space Flight Center, T. KARABACAK, University of Arkansas at Little Rock	**VT-WeA1 Invited** Load locks, Transfer arms, and other In-Vacuum Motions in the Cornell DC Photoelectron Gun Development Project, **K. SMOLENSKI**, X. LIU, B. DUNHAM, L. CULTRERA, J. CONWAY, Cornell University
2:40 pm	**TF+EM+EN-WeA2** Enhanced Photoresponsivity of Conformal TiO_2/Ag Nanorod Arrays Fabricated via (Successive) Glancing Angle and Atomic Layer Deposition, **A. HAIDER**, N. BIYIKLI, A.K. OKYAY, Bilkent University, Turkey, T. KARABACAK, H. CANSIZOGLU, University of Arkansas at Little Rock, B. TECKCAN, Bilkent University, Turkey, M.F. CANSIZOGLU, University of Arkansas at Little Rock	Invited talk continued.
3:00 pm	**TF+EM+EN-WeA3 Invited** Nanostructured Photonic Materials for Light-Trapping and Photon Management in Solar Energy Conversion, **K. AYDIN**, Northwestern University	**VT-WeA3** Vacuum Performance of 5-mm Undulator Chamber for Cornell High-Energy Synchrotron Source, **Y. LI**, X. LIU, A. LYNDAKER, A. TEMNYKH, Cornell University
3:20 pm	Invited talk continued.	**VT-WeA4** Near-XHV Pressure Characterization for the Jefferson Lab Polarized Electron Source, **M.L. STUTZMAN**, P. ADDERLEY, Thomas Jefferson National Accelerator Facility, M.A. MAMUN, A.A. ELMUSTAFA, Old Dominion University, M. POELKER, Thomas Jefferson National Accelerator Facility
3:40 pm	**BREAK**	**BREAK**
4:00 pm	**BREAK**	**BREAK**
4:20 pm	**TF+EM+EN-WeA7** Porous Solid Phase Microextraction (SPME) Fibers by Oblique Angle Deposition, **A. DIWAN**, B. SINGH, Brigham Young University, M. KAYKHAII, Sistan & Balouchestan University, Iran (Islamic Republic of), B. PAUL, P. NESTERENKO, University of Tasmania, Australia, M.R. LINFORD, Brigham Young University	**VT-WeA7 Invited** Design Optimization and Fabrication Progress of ITER's Large Custom Vacuum Pumps, **R. PEARCE**, M. DREMEL, L. WORTH, ITER Organisation, France, L. BAYLOR, S. MEITNER, Oak Ridge National Laboratory
4:40 pm	**TF+EM+EN-WeA8** Chiral Patchy Particle Arrays: A Simple Fabrication Method to Achieve Plasmonic Circular Dichroism in the Visible Region, **G.K. LARSEN**, Y. HE, W. INGRAM, Y.P. ZHAO, University of Georgia, Athens	Invited talk continued.
5:00 pm	**TF+EM+EN-WeA9** Tunable Three-Dimensional Helically Stacked Plasmonic Layers on Nanosphere Monolayers, **Y. HE***, G.K. LARSEN, W. INGRAM, Y.P. ZHAO, University of Georgia, Athens	**VT-WeA9** Commissioning of the KATRIN Main Spectrometer, **J. WOLF**, Karlsruhe Institute of Technology, Germany
5:20 pm	**TF+EM+EN-WeA10** Co-deposition of Mixed-Valent Oxides of Molybdenum and Germanium ($Mo_xGe_yO_z$): A Route to Tailored Optical Absorption, **N.R. 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	
5:40 pm	**TF+EM+EN-WeA11** VO_2 Thin Films: Post-Growth Oxidation of V Into VO_x Films, **M.R. BEEBE**, L. WANG, K. YANG, R.A. LUKASZEW, The College of William & Mary	
6:00 pm	**TF+EM+EN-WeA12** Permanent Optical Tape and Solid State Data Storage Devices, **H. WANG**, R. GATES, N. MADAAN, J. BAGLEY, A. DIWAN, A. PEARSON, S. JAMIESON, K. LAUGHLIN, Brigham Young University, Y. LIU, Lehigh University, B. LUNT, M. ASPLUND, Brigham Young University, V. SHUTTHANANDAN, Pacific Northwest National Laboratory, R.C. DAVIS, M.R. LINFORD, Brigham Young University	

* TFD James Harper Award Finalist

Anticipated Schedule
Wednesday Morning, November 12, 2014

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, November 12, 2014

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

7:00 a.m.	Companion Tour Registration — Main Lobby (H)
7:30 a.m.	Membership Committee Meeting and Breakfast — Orioles Grille Restaurant (H)
10:00 a.m.	Session Coffee Break — Hall ABC (CC)
12:20 p.m.	Exhibit Finale and Refreshments — Hall ABC (CC)
12:30 p.m.	2015 AVS Program Committee Chairs' Meeting and Lunch — Harborview I (H)
12:30 p.m.	AVS Business Meeting — 304 (CC)
12:30 p.m.	Professional Development Workshop and Lunch: "Work-Life Satisfaction" — 314 (CC)
12:30 p.m.	Surface Science Division Mort Traum Awards Ceremony — 309 (CC)
3:40 p.m.	Plasma Science and Technology Division Coburn and Winters Award Ceremony — 308 (CC)
6:00 p.m.	Poster Session and Refreshments — Hall D (CC)
6:30 p.m.	2014/2015 Program Committee Reception and Dinner — Harborview II (H)
7:00 p.m.	Surface Science Spectra Editorial Board Dinner — Camden (H)

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

CC = Baltimore Convention Center
H = Sheraton Inner Harbor

= New Attendee Networking Events

THURSDAY SHORT COURSES

8:30 a.m.	Atomic Layer Deposition: Basic Principles, Characterization and Applications
8:30 a.m.	Fundamentals of Vacuum Technology (4-days)
8:30 a.m.	Sputter Deposition

LOCATION: All AVS Short Courses will be held at the Sheraton Inner Harbor Hotel (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: 310 - Session 2D+AS+HI+NS+SS-ThM Nanostructures including 2D Heterostructures, Patterning of 2D Materials **Moderator:** K.I. Bolotin, Vanderbilt University	Atom Probe Tomography Focus Topic Room: 301 - Session AP+AS+MC+NS+SS-ThM APT Analysis of Semiconductors, Magnetic and Oxide Materials **Moderators:** P.A.J. Bagot, Oxford University, UK, D.E. Perea, Pacific Northwest National Laboratory
8:00 am	**2D+AS+HI+NS+SS-ThM1 Invited** Stitching and Stacking for Atomically Thin Circuitry, **J. PARK**, Cornell University	**AP+AS+MC+NS+SS-ThM1 Invited** A Vision for Atom Probe Tomography, **T.F. KELLY**, CAMECA Instruments Inc
8:20 am	Invited talk continued.	Invited talk continued.
8:40 am	**2D+AS+HI+NS+SS-ThM3** Vertical and Lateral Heterostructures of Carbon Nanomembranes (CNMs) and Graphene, **A. WINTER**, University of Bielefeld, Germany, M. WOSZCZYNA, R. STOSCH, T. WEIMANN, F. AHRELRS, Physikalisch-Technische Bundesanstalt, Germany, A. TURCHANIN, University of Bielefeld, Germany	**AP+AS+MC+NS+SS-ThM3 Invited** Interfaces in Semiconductors: Application to Photovoltaic Materials, **O. COJOCARU-MIRÉDIN**, Max Planck Institut fur Eisenforschung GmbH, Germany, R. WÜRZ, Zentrum für Sonnenenergie- und Wasserstoff-Forschung Baden-Württemberg, Germany, D. RAABE, Max Planck Institut fur Eisenforschung GmbH, Germany
9:00 am	**2D+AS+HI+NS+SS-ThM4** Gate Tunable Carbon Nanotube - Single Layer MoS_2 p-n Heterojunctions, **D. JARIWALA***, V.K. SANGWAN, C.-C. WU, P.L. PRABHUMIRASHI, M.L. GEIER, T.J. MARKS, L.J. LAUHON, M.C. HERSAM, Northwestern University	Invited talk continued.
9:20 am	**2D+AS+HI+NS+SS-ThM5** Graphene Transfer onto sub 1nm Al_2O_3/TiOPc/Graphene Gate Stacks, **I.J. KWAK**, J.H. PARK, University of California at San Diego, H.C.P. MOVVA, University of Texas at Austin, E.K. KINDER, H.L. LU, University of Notre Dame, A.C. KUMMEL, University of California at San Diego	**AP+AS+MC+NS+SS-ThM5** Analysis of Discontinuous InGaN Quantum Wells by Correlated Atom Probe Tomography, Micro-Photoluminescence, and X-ray Diffraction, J. RILEY, X. REN, Northwestern University, D. KOLESKE, Sandia National Laboratories, **L.J. LAUHON**, Northwestern University
9:40 am	**2D+AS+HI+NS+SS-ThM6** Effect of Monolayer Substrates on the Electronic Structure of Single-Layer MoS_2, **A. RAMIREZ-TORRES**, D.T. LE, T.S. RAHMAN, University of Central FLorida	**AP+AS+MC+NS+SS-ThM6** Atom Probe Tomography Characterization of Doped Epitaxial Oxide Multi-Layered Structures, **N. MADAAN**, A. DEVARAJ, Z. XU, M.I. NANDASIRI, S.A. THEVUTHASAN, Pacific Northwest 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	**2D+AS+HI+NS+SS-ThM10 Invited** Ballistic Transport in Epitaxial Graphene Nanoribbons, **W.A. DE HEER**, Georgia Institute of Technology	**AP+AS+MC+NS+SS-ThM10 Invited** Atom Probe Tomography and Field Evaporation of Insulators and Semiconductors: Theoretical Issues, **H.J. KREUZER**, Dalhousie University, Canada
11:20 am	Invited talk continued.	Invited talk continued.
11:40 am	**2D+AS+HI+NS+SS-ThM12** Solution-Synthesized Graphene Nanoribbons, **A. SINITSKII**, University of Nebraska - Lincoln	**AP+AS+MC+NS+SS-ThM12** Atom Probe Tomography Investigation of the Microstructure of Multistage Annealed Nanocrystalline $SmCo_2Fe_2B$ Alloy with Enhanced Magnetic Properties, **X. JIANG**, A. DEVARAJ, Pacific Northwest National Laboratory, B. BALAMURUGAN, University of Nebraska-Lincoln, J. CUI, Pacific Northwest National Laboratory, J. SHIELD, University of Nebraska-Lincoln
12:00 pm	**2D+AS+HI+NS+SS-ThM13** Graphene Silicon Interfaces at the Two-Dimensional Limit, **B.T. KIRALY**, A.J. MANNIX, M.C. HERSAM, Northwestern University, N.P. GUISINGER, Argonne National Laboratory	**AP+AS+MC+NS+SS-ThM13** Detector Dead-time Effects on the Accurate Measurement of Boron in Atom Probe Tomography, **F. MEISENKOTHEN**, National Institute of Standards and Technology (NIST), T.J. PROSA, CAMECA Instruments Inc., E.B. STEEL, NIST, R.P. KOLLI, University of Maryland, College Park

* NSTD Student Award Finalist

	Conservation Studies of Heritage Materials Focus Topic Room: 313 - Session CS-ThM **Conservation Studies of Heritage Materials** **Moderators:** D.S. McPhail, Imperial College London, UK, N. Sano, NEXUS, Newcastle University, UK	Spectroscopic Ellipsometry Focus Topic Room: 304 - Session EL+AS+EM+EN+SS-ThM **Spectroscopic Ellipsometry for Photovoltaics and Instrument Development** **Moderators:** M. Creatore, Eindhoven University of Technology, Netherlands, T. Hofmann, University of Nebraska-Lincoln
8:00 am	**CS-ThM1 Invited** Complementary Ion and Electron Microscopy Studies for Heritage Conservation, **B. SHOLLOCK**, Imperial College, London	**EL+AS+EM+EN+SS-ThM1 Invited** Spectroscopic Ellipsometry Characterization in the Photovoltaic Device Configuration, **N.J. PODRAZA**, University of Toledo
8:20 am	Invited talk continued.	Invited talk continued.
8:40 am	**CS-ThM3 Invited** Conservation Science at the National Archives: Science in Support of the Preservation of the Records of the Federal Government, **J.K. HERRMANN**, National Archives and Records Administration	**EL+AS+EM+EN+SS-ThM3** Application of Pseudo-Bulk Approach in Ellipsometric Studies of Polycrystalline Photovoltaic Thin Films, **S.G. CHOI**, National Renewable Energy Laboratory, J. LI, University of Toledo, I. REPINS, National Renewable Energy Laboratory
9:00 am	Invited talk continued.	**EL+AS+EM+EN+SS-ThM4** Real-Time and Through-the-Glass Mapping Spectroscopic Ellipsometry for Analysis and Optimization of CdS:O Window Layers of CdTe Superstrate Solar Cells, **X. TAN**, R.W. COLLINS, P. KOIRALA, J. LI, N.J. PODRAZA, University of Toledo
9:20 am	**CS-ThM5 Invited** Advanced Spectroscopy for Traditional and Modern Heritage Materials, **F.G. FRANCE**, Library of Congress	**EL+AS+EM+EN+SS-ThM5** Combined Optical Emission Spectroscopy and Spectroscopic Ellipsometry Collected During Thin Film Deposition, **A. BARNES**, M.M. JUNDA, N.J. PODRAZA, University of Toledo
9:40 am	Invited talk continued.	**EL+AS+EM+EN+SS-ThM6** Optical Insights into Graphene Functionalized by Atoms, Biomolecules and Metal Nanoparticles, **M. LOSURDO**, M. GIANGREGORIO, G.V. BIANCO, P. CAPEZZUTO, G. BRUNO, CNR-IMIP, Italy
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	**CS-ThM10** Building a Case for the Future: Design and Construction of an Encasement and Monitoring System to Protect the US Bill of Rights for the Next 100 Years, **J.E. RICKER**, J.H. HENDRICKS, N.J. BRANDENBERG, G.F. STROUSE, NIST	**EL+AS+EM+EN+SS-ThM10** Enhanced Sensitivity to Surface-Normal Dielectric Function of Uniaxial-Anisotropic Materials via Attenuated Total Reflection Ellipsometry, **T. TIWALD**, J.A. Woollam Co., Inc., J. VANDERSLICE, Z. XIAO, J.S. HUANG, University of Nebraska Lincoln
11:20 am	**CS-ThM11** Parylene Coating for Paper/Book Strengthening, **L. PEI**, M. POLLEI, S. JORDAN-MOWERY, J. BATY, Johns Hopkins University	**EL+AS+EM+EN+SS-ThM11** Infrared to Ultraviolet Optical Properties of Gadolinium Gallium Garnet ($Gd_3Ga_5O_{12}$) and Bismuth Germanate ($Bi_4Ge_3O_{12}$) Single Crystals, **K. GHIMIRE**, H. HANEEF, N.J. PODRAZA, University of Toledo
11:40 am	**CS-ThM12** Iron Gall Ink Chemistry and Corrosion of Historical Documents Probed by XPS and Raman, **K.J. GASKELL**, A.A. PONCE, S. GIBBONS, P. ZAVALIJ, University of Maryland, College Park, L. BROSTOFF, Library of Congress, B. EICHHORN, University of Maryland, College Park	**EL+AS+EM+EN+SS-ThM12** Intrinsic Relationship between Interband Electronic Transition and Phase Transformation in Ferroelectric/Multiferroic Oxides discovered by Spectroscopic Ellipsometry, **Z.G. HU**, J.H. CHU, East China Normal University, China
12:00 pm		**EL+AS+EM+EN+SS-ThM13** Cu surface reactions in hydrochloric solution probed on the atomic scale by polarization optical methods and STM, **C. COBET**, GH. BARATI, V. SOLOKHA, K. HINGERL, Johannes Kepler University, Austria

	Electronic Materials and Processing Room: 311 - Session EM1-ThM Materials for Light Management **Moderator:** S. Durbin, Western Michigan University	Electronic Materials and Processing Room: 314 - Session EM2-ThM High-K Dielectrics for ReRAM and RAM **Moderator:** J.F. Conley, Oregon State University
8:00 am		**EM2-ThM1 Invited** Challenges and Materials Solutions for Memristive Devices (ReRAM), **J.J. YANG**, HP Labs
8:20 am		Invited talk continued.
8:40 am	**EM1-ThM3 Invited** Thin Film c-Si Solar Cells – Detailed Understanding from Light Trapping to Carriers Collection, M.S. BRANHAM, W.-C. HSU, Massachusetts Institute of Technology, S. YERCI, Middle East Technical University, Turkey, **G. CHEN**, Massachusetts Institute of Technology	**EM2-ThM3 Invited** Physical Mechanisms and Scaling of the Resistive Memory (ReRAM), **D. IELMINI**, S. BALATTI, S. AMBROGIO, Politecnico di Milano, Italy
9:00 am	Invited talk continued.	Invited talk continued.
9:20 am	**EM1-ThM5** Symmetry-Breaking in Light Trapping Nanostructures on Silicon for Solar Photovoltaics, **S.E. HAN**, S. GHOSH, T. CAI, B.R. HOARD, S.M. HAN, University of New Mexico	**EM2-ThM5 Invited** Variability of Metal Oxide Based RRAM: Challenges and Opportunities, **A. CHEN**, GLOBALFOUNDRIES
9:40 am	**EM1-ThM6** Suppressing Optical Absorption in Nanostructured Metal Electrodes in Photovoltaics, **S.M. CLARK**, S.E. HAN, University of New Mexico	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	**EM1-ThM10 Invited** High Efficiency Si Cells and the Challenges to Integrate the Light Management, **P. STRADINS**, B.G. LEE, National Renewable Energy Laboratory	**EM2-ThM10 Invited** High-K Development for DRAM, NAND, and ReRAM Applications, **N. RAMASWAMY**, Micron Technology
11:20 am	Invited talk continued.	Invited talk continued.
11:40 am	**EM1-ThM12** Developing Periodically Oriented Gallium Nitride for Frequency Conversion, **J.K. HITE**, R. GOSWAMI, J.A. FREITAS, JR., M.A. MASTRO, I. VURGAFTMAN, J.R. MEYER, U.S. Naval Research Laboratory, C.G. BROWN, Sotera Defense Solutions, S.R. BOWMAN, C.R. EDDY, U.S. Naval Research Laboratory	**EM2-ThM12 Invited** Resistive Switching Characteristics and Mechanism in Oxide Conductive-Bridge RAM, **M. LIU**, Q. LIU, H.B. LV, S.B. LONG, Chinese Academy of Sciences, China
12:00 pm	**EM1-ThM13** White-Light Emission from Amorphous ZrHfO/ AlO_x/ZrHfO high-*k* Stack, C.-C. LIN, **Y. KUO**, Texas A&M University, X. ZHANG, Xi'an Jiaotong University, China	Invited talk continued.

	Exhibitor Technology Spotlight **Room: Hall ABC - Session EW-ThM** **Exhibitor Technology Spotlight Session** **Moderator:** C. Moffitt, Kratos Analytical Limited, UK	**Helium Ion Microscopy Focus Topic** **Room: 316 - Session HI+2D+AS+BI+MC-ThM** **Fundamental Aspects and Imaging with the Ion Microscope** **Moderators:** G. Hlawacek, Helmholtz-Zentrum Dresden - Rossendorf, Germany, S.A. Boden, University of Southampton, UK
8:00 am		**HI+2D+AS+BI+MC-ThM1 Invited** He+ and Ne+ Ion Beam Microscopy and Microanalysis, **D.C. JOY**, University of Tennessee, Oak Ridge National Laboratory
8:20 am		Invited talk continued.
8:40 am		**HI+2D+AS+BI+MC-ThM3 Invited** Gas Field Ion Sources, **J.L. PITTERS**, R. URBAN, National Institute for Nanotechnology, Canada, R. WOLKOW, University of Alberta and The National Institute for Nanotechnology, Canada
9:00 am		Invited talk continued.
9:20 am		**HI+2D+AS+BI+MC-ThM5** Ion Beam Profiles Generated by W(111) Single Atom Tips, **R. URBAN**, R. WOLKOW, University of Alberta and The National Institute for Nanotechnology, Canada, J.L. PITTERS, National Institute for Nanotechnology, Canada
9:40 am		**HI+2D+AS+BI+MC-ThM6** Defect Observation by using Scanning Helium Ion Microscopy, **H.X. GUO**, L. ZHANG, D. FUJITA, National Institute for Materials Science (NIMS), Japan
10:00 am	**BREAK - Complimentary Coffee in Exhibit Hall**	**BREAK - Complimentary Coffee in Exhibit Hall**
10:20 am	**EW-ThM8** An Entirely New Generation of Cold Cathode Gauges, **M.P. WÜEST**, INFICON Ltd., Liechtenstein	**BREAK - Complimentary Coffee in Exhibit Hall**
10:40 am	**EW-ThM9** Raman Imaging Microscopy Characterization of Carbon Nano Material, **A. RZHEVSKII**, M.H. WALL, Thermo Fisher Scientific	**BREAK - Complimentary Coffee in Exhibit Hall**
11:00 am		**HI+2D+AS+BI+MC-ThM10 Invited** Helium Ion Microscopy (HIM) for the Imaging of Biological Samples at Sub-nanometer Resolution, **J. FITZPATRICK**, Salk Institute for Biological Studies
11:20 am		Invited talk continued.
11:40 am		**HI+2D+AS+BI+MC-ThM12** Helium Ion Microscopy of Biological Cells, **N. FRESE**, A. BEYER, M. SCHÜRMANN, B. KALTSCHMIDT, C. KALTSCHMIDT, A. GÖLZHÄUSER, University of Bielefeld, Germany
12:00 pm		**HI+2D+AS+BI+MC-ThM13** Helium Ion Microscopy Analysis of Ag Nanoparticle Implanted Biological Samples for MILDI-MS (Matrix Implanted Laser Desorption/Ionization) Imaging, S. SHUBEITA, Rutgers University, L. MULLER, NIDA-IRP, H.D. LEE, C. XU, Rutgers University, D. BARBACCI, Ionwerks Inc., K. BALDWIN, NIDA-IRP, J.A. SCHULTZ, Ionwerks Inc., L. WIELUNSKI, **T. GUSTAFSSON**, L.C. FELDMAN, Rutgers University, A.S. WOODS, NIDA-IRP

	Manufacturing Science and Technology **Room: 302 - Session MS+PS+TF-ThM** **Processes for Mesoscale Structure on Paper and Textiles** **Moderator:** J.S. Jur, North Carolina State University	**Plasma Science and Technology** **Room: 305 - Session PS1+TF-ThM** **Plasma Deposition and Plasma Assisted ALD** **Moderator:** S. Agarwal, Colorado School of Mines
8:00 am	**MS+PS+TF-ThM1 Invited** High-Performance Composites Based on Wood Cellulose Nanofibrils, **Q. ZHOU**, KTH Royal Institute of Technology, Sweden	**PS1+TF-ThM1 Invited** Sputtering Growth of High-Quality ZnO-based Semiconductors for Optoelectronic Applications, **N. ITAGAKI**, Kyushu University, Japan
8:20 am	Invited talk continued.	Invited talk continued.
8:40 am	**MS+PS+TF-ThM3 Invited** Manufacturing and Applications of Carbon Nanotube Textiles, **P. BRADFORD**, North Carolina State University	**PS1+TF-ThM3** Novel Composite Materials Fabricated by Plasma-enhanced CVD of Carboranes and Pyridine or Benzene, **R. JAMES**, U. CHILUWAL, University of North Texas, E. ECHEVERRIA, University of Nebraska-Lincoln, R. GAPFIZI, J. TAE, University of North Texas, P.A. DOWBEN, University of Nebraska-Lincoln, J.A. KELBER, University of North Texas
9:00 am	Invited talk continued.	**PS1+TF-ThM4** Engineering High-k Dielectric Gate Stacks using *In Situ* Spectroscopic Ellipsometry, **YX. ZHENG**, Penn State University, G.B. RAYNER, Kurt J. Lesker Company, A. AGRAWAL, S. DATTA, R. ENGEL-HERBERT, Penn State University
9:20 am	**MS+PS+TF-ThM5** Carbonized Cellulose Fibers for Low-Cost Energy Storage, **F. SHEN**, L.B. HU, University of Maryland, College Park	**PS1+TF-ThM5** Impact of Low Frequency Addition to RF Power in PECVD Process: Case of TiN and GeTe, **C. VALLEE**, F. PIALLAT, M. AOUKAR, P.D. SZKUTNIK, LTM - CEA/LETI, France, R. GASSILLLOUD, P. NOÉ, P. MICHALLON, CEA, LETI, MINATEC Campus, France
9:40 am	**MS+PS+TF-ThM6** Traditional, 20th, and 21st Century Strengthening Techniques for Cultural Heritage Papers Weakened by Cellulose Depolymerization, L. PEI, M. MCGATH, **J. BATY**, Johns Hopkins University	**PS1+TF-ThM6** Plasma Induced Surface Oxidation of Polypropylene: A Combined *In Situ* XPS and UHV-Chemical Force Microscopy (CFM) Study, **B. OZKAYA**, University of Paderborn, Germany, S. GROSSE-KREUL, C. CORBELLA, A. VON KEUDELL, Ruhr-University Bochum, Germany, G. GRUNDMEIER, University of Paderborn, 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	**MS+PS+TF-ThM10** Visualizing the Interface in Strained Cellulosic Nanocomposites, **C.S. DAVIS**, J. WOODCOCK, A.M. FORSTER, M. ZAMMARANO, I. SACUI, N. CHEN, SJ. STRANICK, J.W. GILMAN, National Institute of Standards and Technology (NIST)	**PS1+TF-ThM10** Surface Reactions during Ammonia-Plasma-Assisted Atomic Layer Deposition of Silicon Nitride, **D. HAUSMANN**, Lam Research Corporation, R. OVANESYAN, S. AGARWAL, Colorado School of Mines
11:20 am	**MS+PS+TF-ThM11** SERS-based Chemical and Biological Analytics on Inkjet-fabricated Paper Devices, **I.M. WHITE**, University of Maryland	**PS1+TF-ThM11** Plasma Assisted Atomic Layer Epitaxy of III-N Ternaries for Next Generation Devices, **N. NEPAL**, J.K. HITE, V.R. ANDERSON, V.D. WHEELER, S. QADRI, C.R. EDDY, Naval Research Laboratory
11:40 am	**MS+PS+TF-ThM12 Invited** NSF Scalable Nanomanufacturing (SNM) Program, **K.P. COOPER**	**PS1+TF-ThM12 Invited** Plasma-enhanced Atomic Layer Deposition: Prospects and Challenges, **H. KIM**, Yonsei University, Korea
12:00 pm	Invited talk continued.	Invited talk continued.

	Plasma Science and Technology **Room: 308 - Session PS2+TF-ThM** **Atomic Layer Etching (ALE) and Low-Damage Processing** **Moderator:** G. Yeom, Sungkyunkwan University, Republic of Korea	**Fundamentals & Biological, Energy and Environmental Applications of Quartz Crystal Microbalance Focus Topic** **Room: 317 - Session QC+AS+BI+MN-ThM** **Fundamentals and Method Development of QCM** **Moderators:** R.P. Richter, CIC biomaGUNE & MPI for Intelligent Systems, Spain, W.K. Hiebert, University of Alberta and The National Institute for Nanotechnology, Canada
8:00 am	**PS2+TF-ThM1** Fluorocarbon Assisted Atomic Layer Etching of SiO_2 and Selectivity over Si Using Cyclic Ar/C_4F_8 Plasma, **D. METZLER***, University of Maryland, College Park, S.U. ENGELMANN, R.L. BRUCE, E.A. JOSEPH, IBM T.J. Watson Research Center, V.A. GODYAK, University of Michigan, G.S. OEHRLEIN, University of Maryland, College Park	
8:20 am	**PS2+TF-ThM2** Highly Selective Atomic Layer Etching of Silicon Dioxide Using Fluorocarbons, **E. HUDSON**, V. VIDYARTHI, R. BHOWMICK, R. BISE, H.J. SHIN, G. DELGADINO, B. JARIWALA, D. LAMBERT, S. DESHMUKH, Lam Research Corporation	
8:40 am	**PS2+TF-ThM3** Electron Beam Plasma Tool for Atomic Precision Etching, **L. DORF**, S. RAUF, M.-F. WU, Y. ZHANG, F. TAVASSOLI, K. RAMASWAMY, K. COLLINS, Applied Materials Inc.	**QC+AS+BI+MN-ThM3 Invited** High-Frequency Contact Mechanics Studies with a QCM, **D. JOHANNSMANN**, Clausthal University of Technology, Germany
9:00 am	**PS2+TF-ThM4** Precise Theoretical Calculation of Neutral Beam Generation Efficiency by Collision of Chlorine Against Graphite Surface, **T. KUBOTA**, Tohoku University, Japan, N. WATANABE, S. OHTSUKA, T. IWASAKI, K. ONO, Y. IRIYE, Mizuho Information & Research Institute, Japan, S. SAMUKAWA, Tohoku University, Japan	Invited talk continued.
9:20 am	**PS2+TF-ThM5 Invited** Achieving One Tenth of a Nanometer Precision in Etching of SiO_2 Over Silicon: Challenges and Opportunities, **G.S. OEHRLEIN**, University of Maryland, College Park	**QC+AS+BI+MN-ThM5** Study of Water Adsorption and Capillary Bridge Formation for SiO_2 Nanoparticle Layers by Means of a Combined *In Situ* FT-IR Reflection Spectroscopy – QCM-D Set-up, **B. TORUN**, C. KUNZE, University of Paderborn, Germany, C. ZHANG, T.D. KÜHNE, Johannes Gutenberg University Mainz, Germany, G. GRUNDMEIER, University of Paderborn, Germany
9:40 am	Invited talk continued.	**QC+AS+BI+MN-ThM6** On the Role of Acoustic Streaming in Particle Detachment Events at a QCM Surface, **R. KÖNIG**, A. LANGHOFF, D. JOHANNSMANN, Clausthal University of Technology, 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	**PS2+TF-ThM10** Numerical Simulation of Atomic Layer Etch via FPS3D, **P. MOROZ**, Tokyo Electron US Holdings	**QC+AS+BI+MN-ThM10 Invited** QCM for Particle Sizing and Beyond, **A. OLSSON**, I.R. QUEVEDO, D. HE, M. BASNET, W. LEE, N. TUFENKJI, McGill University, Canada
11:20 am	**PS2+TF-ThM11** Low Damage Etch Residue Removal of CoFeB Material using CO/NH_3 Reactive Ion Beam for STT-MRAM Device, **M.H. JEON**, K.C. YANG, D.H. YUN, J.Y. YOUN, G. YEOM, Sungkyunkwan University, Republic of Korea	Invited talk continued.
11:40 am	**PS2+TF-ThM12** Effects of Cryogenic Cooling on Gallium Nitride Film in Argon Plasma, **D. OGAWA**, Y. NAKANO, K. NAKAMURA, Chubu University, Japan	**QC+AS+BI+MN-ThM12** Full Experimental Proof of the Relationship between the Intrinsic Viscosity of DNA and the Acoustic Ratio of SAW and TSM Sensors, **A. TSORTOS**, IMBB-FORTH, Greece, G. PAPADAKIS, NCSR-Demokritos, Greece, E. GIZELI, IMBB-FORTH & Univ. of Crete, Greece
12:00 pm		**QC+AS+BI+MN-ThM13** Characterization of the Conformation of Linker-Suspended Proteins at Surfaces through Acoustic Ratio Measurements, **E. GIZELI**, IMBB-FORTH & Univ. of Crete, Greece, D. MILIONI, IMBB-FORTH, Greece, G. PAPADAKIS, NCSR-Demokritos, Greece, A. TSORTOS, IMBB-FORTH, Greece

* Coburn & Winters Student Award Finalist

	Surface Modification of Materials by Plasmas for Medical Purposes Focus Topic **Room: 315 - Session SM+AS+BI+PS-ThM** **Plasma Processing of Antimicrobial Materials and Devices** **Moderators:** H.E. Canavan, University of New Mexico, M.J. Hawker, Colorado State University	**Scanning Probe Microscopy Focus Topic** **Room: 312 - Session SP+2D+AS+EM+MC+NS+SS-ThM** **Probing Electronic and Transport Properties** **Moderators:** A.P. Li, ORNL, C.P. Durand, ORNL
8:00 am	**SM+AS+BI+PS-ThM1 Invited** Plasma Polymers: Dogma, Characteristaion and Challenges, **S.L. MCARTHUR**, Swinburne University of Technology, Australia	**SP+2D+AS+EM+MC+NS+SS-ThM1** Investigation of the Electronic and Structural Properties of Metal Free Naphthalocyanine Vapor Deposited on Au(111), **B.C. WIGGINS**, University of Chicago, K.W. HIPPS, Washington State University
8:20 am	Invited talk continued.	**SP+2D+AS+EM+MC+NS+SS-ThM2** The Fundamentals of Charge Transport at Oxide and Ferroelectric Interfaces, **R. KRAYA**, L.Y. KRAYA, University of Pennsylvania
8:40 am	**SM+AS+BI+PS-ThM3 Invited** The Role of Plasma Surface Modification in Antimicrobial Thin Films and Strategies, **R. FOERCH**, FhG-ICT-IMM, Germany	**SP+2D+AS+EM+MC+NS+SS-ThM3 Invited** Epitaxial Graphene on Nanostructured Silicon Carbide, **P.N. FIRST**, Georgia Institute of Technology
9:00 am	Invited talk continued.	Invited talk continued.
9:20 am	**SM+AS+BI+PS-ThM5 Invited** Plasma Modification of Drug-Eluting Materials for Localized Action at Medical Device Interfaces, J. JOSLIN, A. PEGALAJAR-JURADO, M.J. HAWKER, E.R. FISHER, **M. REYNOLDS**, Colorado State University	**SP+2D+AS+EM+MC+NS+SS-ThM5** Conductivity of Si(111) - 7 × 7: The Role of a Single Atomic Step, B. MARTINS, University of Alberta and The National Institute for Nanotechnology, Canada, M. SMEU, H. GUO, McGill University, Canada, **R. WOLKOW**, University of Alberta and The National Institute for Nanotechnology, Canada
9:40 am	Invited talk continued.	**SP+2D+AS+EM+MC+NS+SS-ThM6** Asymmetric Electron Transport Revealed at Monolayer-Bilayer Graphene Junctions by Atomic-Scale Scanning Tunneling Potentiometry, K. CLARK, X. ZHANG, J. PARK, Oak Ridge National Laboratory, G. GU, University of Tennessee, G. HE, R.M. FEENSTRA, Carnegie Mellon University, **A.P. LI**, Oak Ridge 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	**SM+AS+BI+PS-ThM10** Plasma Treated Substrates Reduce Protein Adsorption, **M. MECWAN**, J. STEIN, W. CIRIDON, University of Washington, X. DONG, Eli Lilly and Company, B. RATNER, University of Washington	**SP+2D+AS+EM+MC+NS+SS-ThM10** Defect-mediated Transport in CVD-grown Monolayer MoS_2, **C.P. DURAND**, J. FOWLKES, Oak Ridge National Laboratory, S. NAJMAEI, J. LOU, Rice University, A.P. LI, Oak Ridge National Laboratory
11:20 am	**SM+AS+BI+PS-ThM11** Modification of Porous Materials by Low Temperature Plasma Treatment to Achieve Low-Fouling Membranes, **A. PEGALAJAR-JURADO**, B.D. TOMPKINS, E.R. FISHER, Colorado State University	**SP+2D+AS+EM+MC+NS+SS-ThM11** Coherent One Dimensional Boundaries in Graphene and Hexagonal Boron Nitride Heterostructures, **J. PARK**, Oak Ridge National Laboratory, L. LIU, The University of Tennessee Knoxville, D.A. SIEGEL, K.F. MCCARTY, Sandia National Laboratories, L. BASILE, J.-C. IDROBO, K. CLARK, ORNL, W. DENG, The Univ. of Tennessee Knoxville, C.P. DURAND, ORNL, G. GU, The Univ. of Tennessee Knoxville, A.P. LI, ORNL
11:40 am	**SM+AS+BI+PS-ThM12** Immobilized Laminin Concentration Gradients on Electrospun Fiber Scaffolds for Controlled Neurite Outgrowth, **N. ZANDER**, US Army Research Laboratory, T. BEEBE JR., University of Delaware	**SP+2D+AS+EM+MC+NS+SS-ThM12 Invited** Charge and Spin Density Waves in Quasi One-Dimensional Atomic Wires, **H. PFNÜR**, Leibniz Universität, Germany
12:00 pm		Invited talk continued.

	Surface Science Room: 309 - Session SS+TF-ThM Organic Layers on Surfaces **Moderators:** E.G. Seebauer, University of Illinois at Urbana Champaign	Thin Film Room: 307 - Session TF+PS-ThM Advanced CVD and Chemical Vapor Infiltration Methods **Moderator:** R.C. Davis, Brigham Young University
8:00 am	**SS+TF-ThM1 Invited** Orbital Tomography: Imaging the Wavefunctions of Adsorbed Molecules with Angle Resolved Photoemission, **M.G. RAMSEY**, University of Graz	**TF+PS-ThM1 Invited** Industrializing Single Wall Carbon Nanotubes by Water-Assisted CVD, **D. FUTABA**, AIST, Japan
8:20 am	Invited talk continued.	Invited talk continued.
8:40 am	**SS+TF-ThM3** Chemical Pathways for Surface Functionalization: From Surface-"Stapled" Nanostructures to Layered Materials, **A.V. TEPLYAKOV**, University of Delaware	**TF+PS-ThM3** Organoboranes as Single Precursors for Low Temperature CVD of Boron Carbide Thin Films for Neutron Detectors, M. IMAM, Linköping University, Sweden, C. HÖGLUND, European Spallation Source (ESS AB), J. BIRCH, **H. PEDERSEN**, Linköping University, Sweden
9:00 am	**SS+TF-ThM4** Observation and Trapping of Organic Reaction Intermediates for the Reaction of O(^{3}P) with Oligo(Phenylene Ethynylene) Thiolate Self Assembled Monolayers on Au(111), **W. LI**, G. LANGLOIS, N.A. KAUTZ, S.J. SIBENER, The University of Chicago	**TF+PS-ThM4** High-Quality ZnO Thin Films Grown by a New CVD Method using Catalytically-generated High-energy Precursors, T. NAKAMURA, Y. OHASHI, N. YAMAGUCHI, E. NAGATOMI, T. KATO, **K. YASUI**, Nagaoka University of Technology, Japan
9:20 am	**SS+TF-ThM5** On-Surface Synthesis of Organic Macromolecular Structures through Ullmann Reaction, Q. FAN, C. WANG, Y. HAN, University of Science and Technology of China, J.M. GOTTFRIED, Philipps-Universität Marburg, Germany, **J.F. ZHU**, University of Science and Technology of China	**TF+PS-ThM5** Filling High Aspect Ratio Features: A Ballistic Transport Model, **W. WANG**, J.R. ABELSON, University of Illinois at Urbana-Champaign
9:40 am	**SS+TF-ThM6** Relative Stability of S-Au and Se-Au Bonding in Aromatic and Aliphatic Self-Assembled Monolayers – Exchange and Ion Desorption Experiments, **J.W. OSSOWSKI**, A. NOWOROLSKA, Jagiellonian University, Poland, S. SCHUSTER, University of Heidelberg, Germany, J. RYSZ, Jagiellonian University, Poland, A. TERFORT, University of Frankfurt, Germany, M. ZHARNIKOV, University of Heidelberg, Germany, P. CYGANIK, Jagiellonian University, Poland	**TF+PS-ThM6** Ozone Pretreatment's Effect on Infiltration of Carbon Nanotube Forests, **R.R. VANFLEET**, L. BARRETT, J. ROWLEY, K. HINTON, R.C. DAVIS, D.D. ALLRED, Brigham Young 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+TF-ThM10** CuPc:C_{60} Composite Films: From Sub–Monolayer to Multi-Layer Growth, **T.J.Z. STOCK**, J. NOGAMI, University of Toronto, Canada	**TF+PS-ThM10** A Novel Gap Fill Technology to Address the Current and Future Scaling Challenges of the Semiconductor Industry, A. MALLICK, **J. LIANG**, B. UNDERWOOD, K. THADANI, N. INGLE, T. MANDREKAR, Applied Materials Inc.
11:20 am	**SS+TF-ThM11** 2D Co-Crystallization of Organic Ferroelectrics, **A. ENDERS**, D.A. KUNKEL, A. SINITSKII, University of Nebraska-Lincoln, S. SIMPSON, University at Buffalo-SUNY, J. HOOPER, Jagiellonian University, Poland, E. ZUREK, University at Buffalo-SUNY	**TF+PS-ThM11** Comparison of Carbonaceous Thin Films Deposited on Ru-capped Multilayer Mirrors via Extreme-Ultraviolet Light and Electrons, **M.S. BARCLAY**, Johns Hopkins University, N.S. FARADZHEV, S.B. HILL, T.B. LUCATORTO, National Institute of Standards and Technology (NIST), D.H. FAIRBROTHER, Johns Hopkins University
11:40 am	**SS+TF-ThM12** Phenol Adsorption on TiO_2(110): Evidence for Temperature Dependent Radical Formation, **M.C. PATTERSON**, M.F. DITUSA, C.A. THIBODEAUX, Louisiana State University, RW. HALL, Dominican University of California, O. KIZILKAYA, R.L. KURTZ, E.D. POLIAKOFF, P.T. SPRUNGER, Louisiana State University	**TF+PS-ThM12** Production and Characterization of Thin Film Group IIIB, IVB and Rare Earth Hydrides by Reactive Evaporation, **J.L. PROVO**, J.L. Provo Consulting
12:00 pm	**SS+TF-ThM13** Adsorption behavior of Zinc Tetraphenylporphyrin Molecules on a Au(111) Surface, **C. RUGGIERI**, S. RANGAN, R.A. BARTYNSKI, E. GALOPPINI, Rutgers, the State University of New Jersey	**TF+PS-ThM13** Cathodic Cage Plasma Deposition of TiN and TiO_2 Thin Films on Silicon Substrate, R.R.M. DE SOUSA, IFPI, Brazil, P.S. SATO, UFSCar, Brazil, B.C. VIANA, UFPI, Brazil, C. ALVES JR, UFRSA, Brazil, A. NISHIMOTO, Kansai University, Japan, **P.A.P. NASCENTE**, UFSCar, Brazil

Tribology Focus Topic
Room: 303 - Session TR+NS-ThM

Bridging Scales in Tribology
Moderator: J.D. Schall, Oakland University

8:00 am	**TR+NS-ThM1 Invited** Temporal and Spatial Multiscale Simulations of Low-Velocity Frictional Sliding, **W.-K. KIM**, University of Cincinnati	
8:20 am	Invited talk continued.	
8:40 am	**TR+NS-ThM3 Invited** Crystal-Amorphous and Amorphous-Amorphous Transitions in Carbon under Tribological Load, **L. PASTEWKA**, Karlsruhe Institute of Technology, Institute for Applied Materials IAM, Germany	
9:00 am	Invited talk continued.	
9:20 am	**TR+NS-ThM5** A Molecular Dynamics Investigation of the Atomic-Scale Wear of Carbon-Based Materials Upon Repetitive Contact, **K.E. RYAN**, United States Naval Academy, V. VAHDAT, University of Pennsylvania, P.L. KEATING, United States Naval Academy, Y. JIANG, K.T. TURNER, R.W. CARPICK, University of Pennsylvania, J.A. HARRISON, United States Naval Academy	
9:40 am	**TR+NS-ThM6** The Buried Interface: *In Situ* Methods for Tribology, **B.A. KRICK**, Lehigh University, K.G. ROWE, A.I. BENNETT, D.W. HAHN, W.G. SAWYER, University of Florida	
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	**TR+NS-ThM10 Invited** Contact and Friction Between Rough Adhesive Surfaces: From Atomic to Micrometer Scales, **M.O. ROBBINS**, Johns Hopkins University, L. PASTEWKA, Fraunhofer Institute for Mechanics of Materials IWM, Germany	
11:20 am	Invited talk continued.	
11:40 am	**TR+NS-ThM12** Scaling Properties of Measured Frictional Parameters in Microscale Contacts, **B.P. BOROVSKY**, St. Olaf College	
12:00 pm	**TR+NS-ThM13** Scale Effects in Single-Asperity Friction, **T. SHARP**, Johns Hopkins University, L. PASTEWKA, Fraunhofer Institute for Mechanics of Materials IWM, Germany, M.O. ROBBINS, Johns Hopkins University	

NOTES

	2D Materials Focus Topic Room: 310 - Session 2D+EM+MI+MN+NS+SS+TF-ThA Novel Quantum Phenomena in 2D Materials **Moderator:** A. Sinitskii, University of Nebraska-Lincoln	Atom Probe Tomography Focus Topic Room: 301 - Session AP+AS+EN+NS+SS-ThA APT and FIM Analysis of Catalysts and Nanomaterials **Moderators:** D.R. Diercks, Colorado School of Mines, D.J. Larson, CAMECA Instruments Inc.
2:20 pm	**2D+EM+MI+MN+NS+SS+TF-ThA1 Invited** Optoelectronics of Two-Dimensional Semiconductors, **X.D. XU**, University of Washington	**AP+AS+EN+NS+SS-ThA1 Invited** *In Situ* Study of Gas - Solid Reactions via Environmental APT, **K. RAJAN**, Iowa State University
2:40 pm	Invited talk continued.	Invited talk continued.
3:00 pm	**2D+EM+MI+MN+NS+SS+TF-ThA3** Theory of Graphene Transport Barriers in the Specular Limit, **D. GUNLYCKE**, C.T. WHITE, Naval Research Laboratory	**AP+AS+EN+NS+SS-ThA3** Propagation of Chemical Waves: A Field Emission Microscopy Study, **C. BARROO**, Y. DE DECKER, N. KRUSE, T. VISART DE BOCARMÉ, Université Libre de Bruxelles, Belgium
3:20 pm	**2D+EM+MI+MN+NS+SS+TF-ThA4** Tip-induced Potential Confinement on Graphene in Scanning Tunneling Microscopy Measurement, **Y. ZHAO**, J. CHAE, J.E. WYRICK, NIST/CNST, F.D. NATTERER, Ecole Polytechnique Fédérale de Lausanne (EPFL), France, S. JUNG, Korea Research Institute of Standards and Science (KRISS), A.F. YOUNG, C.R. DEAN, L. WANG, Y. GAO, Columbia University, J.N. RODRIGUES, Graphene Research Centre, NUS, Singapore, K. WATANABE, T. TANIGUCHI, National Institute for Materials Science (NIMS), Japan, S. ADAM, Graphene Research Centre, NUS, Singapore, J.C. HONE, K. SHEPARD, P. KIM, Columbia University, N.B. ZHITENEV, J.A. STROSCIO, NIST/CNST	**AP+AS+EN+NS+SS-ThA4** 3D Nanoscale Chemical/Structure Analysis in Mineral Carbon Sequestration Study using Atom Probe Tomography, **J. LIU**, D.E. PEREA, R.J. COLBY, L. KOVARIK, B. AREY, O. QAFOKU, A. FELMY, Pacific Northwest National Laboratory
3:40 pm	**BREAK**	**BREAK**
4:00 pm	**2D+EM+MI+MN+NS+SS+TF-ThA6 Invited** Topological Phase Transitions and Spin-orbit Density Waves, **J.H. DIL**, Ecole Polytechnique Fédérale de Lausanne (EPFL), Switzerland	**AP+AS+EN+NS+SS-ThA6 Invited** Catalyst Nanomaterials Analysis via Atom Probe Tomography, P.A.J. BAGOT, Oxford University, UK, Q. YANG, University of Oxford, UK, K. KRUSKA, Pacific Northwest National Laboratory, D. HALEY, University of Oxford, UK, E. MARCEAU, X. CARRIER, Université Pierre et Marie Curie, France, **M.P. MOODY**, University of Oxford, UK
4:20 pm	Invited talk continued.	Invited talk continued.
4:40 pm	**2D+EM+MI+MN+NS+SS+TF-ThA8** The Symmetry Dependent Band Structure of MoS_2, **D.T. LE**, University of Central Florida, T. KOMESU, University of Nebraska-Lincoln, Q. MA, University of California, Riverside, E.F. SCHWIER, H. IWASAWA, Hiroshima University, Japan, M. SHIMADA, Higashi-Hiroshima, Japan, T.S. RAHMAN, University of Central Florida, L. BARTLES, University of California, Riverside, P.A. DOWBEN, University of Nebraska-Lincoln	
5:00 pm	**2D+EM+MI+MN+NS+SS+TF-ThA9** $CuIn_{III}P_2S_6$ - Room Temperature Layered Ferroelectric, **A. BELIANINOV**, P. MAKSYMOVYCH, Oak Ridge National Laboratory, A. DZIAUGYS, Vilnius University, Lithuania, Q. HE, Oak Ridge National Laboratory, E. ELISEEV, National Academy of Sciences of Ukraine, A,. BORISEVICH, Oak Ridge National Laboratory, A. MOROZOVSKA, NAS of Ukraine, J. BANYS, Vilnius University, Lithuania, Y. VYSOCHANSKII, Uzhgorod University, Ukraine, S.V. KALININ, Oak Ridge National	
5:20 pm	**2D+EM+MI+MN+NS+SS+TF-ThA10** Doping Efficiency and Mechanisms of Single and Randomly Stacked Bilayer Graphene by Iodine Adsorption, **H. KIM**, A. TYURNINA, Univ. Grenoble Alpes/ CEA, LETI, France, J.-F. GUILLET, J.-P. SIMONATO, J. DIJON, Univ. Grenoble Alpes/ CEA, LITEN, France, D. ROUCHON, D. MARIOLLE, N. CHEVALIER, O.J. RENAULT, Univ. Grenoble Alpes/ CEA, LETI, France	
5:40 pm	**2D+EM+MI+MN+NS+SS+TF-ThA11** Use of XPS for Device Characterization, P. AYDOGAN, E.O. POLAT, C. KOCABAS, **S. SUZER**, Bilkent University, Turkey	

	Conservation Studies of Heritage Materials Focus Topic **Room: 313 - Session CS-ThA** **Conservation Studies of Heritage Materials 2** **Moderators:** H.F. Dylla, American Institute of Physics, R.L. Opila, University of Delaware	**Spectroscopic Ellipsometry Focus Topic** **Room: 304 - Session EL+AS+EM+MC+SS-ThA** **Optical Characterization of Nanostructures and Metamaterials** **Moderators:** D.E. Aspnes, North Carolina State University, M. Schubert, University of Nebraska-Lincoln
2:20 pm	**CS-ThA1 Invited** A Conservator's Perspective of Technical Studies and Scientific Analysis, **P. FAVERO**, The Phillips Collection	**EL+AS+EM+MC+SS-ThA1 Invited** The Optical Properties of Metallic Nanostructures, **B. GOMPF**, Universität Stuttgart, Germany
2:40 pm	Invited talk continued.	Invited talk continued.
3:00 pm	**CS-ThA3 Invited** State of the Art: Probing Complexity in Paint, **F. CASADIO**, F. POZZI, L. CHANG, The Art Institute of Chicago, D. KUROUSKI, S. ZALESKI, N.C. SHAH, R.P. VAN DUYNE, Northwestern University, V. ROSE, Argonne National Laboratory	**EL+AS+EM+MC+SS-ThA3** Mueller Matrix Ellipsometry As a Powerful Tool for Nanoimprinted Grating Structure Metrology, **X.G. CHEN**, C.W. ZHANG, S.Y. LIU, Huazhong University of Science and Technology, China
3:20 pm	Invited talk continued.	**EL+AS+EM+MC+SS-ThA4** Vector Magneto-Optical Generalized Ellipsometry on Sculptured Thin Films with Forward Calculated Uniaxial Response Simulation, **C. BRILEY**, T. HOFMANN, University of Nebraska-Lincoln, D. SCHMIDT, National University of Singapore, E. SCHUBERT, M. SCHUBERT, University of Nebraska-Lincoln
3:40 pm	**BREAK**	**BREAK**
4:00 pm	**CS-ThA6 Invited** The Degradation Mechanisms of Cadmium Pigments in Works by Henri Matisse, Edward Munch, and Their Contemporaries, **J.L. MASS**, Winterthur Museum, E. POUYET, ESRF, France, F. MEIRER, Utrecht University, Netherlands, M. COTTE, ESRF, France, A. MEHTA, Stanford Synchrotron Radiation Lightsource	**EL+AS+EM+MC+SS-ThA6** *In Situ* Generalized Ellipsometry Characterization of Silicon Nanostructures during Lithium-ion Intercalation, **D. SEKORA**, R.Y. LAI, T. HOFMANN, M. SCHUBERT, E. SCHUBERT, University of Nebraska-Lincoln
4:20 pm	Invited talk continued.	**EL+AS+EM+MC+SS-ThA7** Characterization of SiO_2 Nanoparticle Layers on a Glass Substrate by Spectroscopic Imaging Ellipsometry and AFM, **P.H. THIESEN**, Accurion GmbH, Germany, G. HEARN, Accurion Inc., C. RÖLING, Accurion GmbH, Germany
4:40 pm	**CS-ThA8** Characterisation of Modern Watercolour Paints using XPS, HIM, ToF-SIMS and Principal Component Analysis Techniques, **N. SANO**, P.J. CUMPSON, NEXUS, Newcastle University, UK, E. CWIERTNIA, B.W. SINGER, Northumbria University, UK	**EL+AS+EM+MC+SS-ThA8** Optical Properties of TiO_2 Films Fabricated by Solgel Dip Process, R.R. PANDEY, D. SINGH, CSIR- National Physical Laboratory, India, V. MAURYA, Amity University, Noida – (UP) India, C. KANT, CSIR- National Physical Laboratory, India, A. MEHRA, Amity University, Noida – (UP) India, V.K. SHARMA, **K.K. SAINI**, CSIR- National Physical Laboratory, India
5:00 pm	**CS-ThA9** The Analysis of Egg-Oil Binding Media by Time-of-Flight Secondary Ion Mass Spectrometry, **Z. VORAS**, K. DEGHETALDI, D. CLARK, University of Delaware, J.L. MASS, Winterthur Museum, T.P. BEEBE, JR., University of Delaware	**EL+AS+EM+MC+SS-ThA9** Dielectric Tensor Model for Inter Landau-level Transitions in Highly Oriented Pyrolytic Graphite and Epitaxial Graphene – Symmetry Properties, Energy Conservation and Plasma Coupling, **P. KÜHNE**, Linköping University, Sweden, T. HOFMANN, M. SCHUBERT, University of Nebraska-Lincoln, C.M. HERZINGER, J.A. Woollam Co., Inc., V. DARAKCHIEVA, Linköping University, Sweden
5:20 pm	**CS-ThA10** The Right Snuff? A Technical Study of Two Snuff Boxes from the Winterthur Museum Collection, **M. YANDRISEVITS**, Winterthur/ University of Delaware Program in Art Conservation, J.L. MASS, C. O'GRADY, C. MATSEN, Winterthur Museum Scientific Research and Analysis Laboratory, E. TOROK, Winterthur/ University of Delaware Program in Art Conservation	**EL+AS+EM+MC+SS-ThA10** Characterization of Exfoliated 2D Nano Materials with Imaging Spectroscopic Ellipsometry, P.H. THIESEN, Accurion GmbH, Germany, **G. HEARN**, Accurion Inc., B. MILLER, Technische Universität München, Germany, C. RÖLING, Accurion GmbH, Germany, U. WURSTBAUER, Columbia University, E. PARZINGER, A.W. HOLLEITNER, U. WURSTBAUER, Technische Universität München, Germany
5:40 pm		**EL+AS+EM+MC+SS-ThA11** Doped Chiral Polymers with Tunable Resonance Frequency, **H.J.K. KIM**, National Institute of Aerospace, C. PARK, NASA Langley Research Center, G. SAUTI, S-H. CHU, National Institute of Aerospace, S. LOWTHER, NASA Langley Research Center, J. KANG, National Institute of Aerospace, K. GORDON, R. BRYANT, NASA Langley Research Center

	Electronic Materials and Processing Room: 311 - Session EM1-ThA **Materials for Quantum Computation** **Moderators:** S. Durbin, Western Michigan University, S.M. Han, University of New Mexico	Electronic Materials and Processing Room: 314 - Session EM2-ThA **Hybrid and Organic Electronics** **Moderators:** S.W. King, Intel Corporation, R.L. Myers-Ward, U.S. Naval Research Laboratory
2:20 pm	**EM1-ThA1 Invited** Mos Quantum Bits for Adiabatic and Non-Adiabatic Quantum Computing, **M. CARROLL**, Sandia National Laboratories	
2:40 pm	Invited talk continued.	
3:00 pm	**EM1-ThA3** ^{28}Si Enriched *In Situ* to 99.9998 % for Quantum Computing Devices, **K.J. DWYER**, University of Maryland, College Park, J. POMEROY, D. SIMONS, National Institute of Standards and Technology (NIST)	
3:20 pm	**EM1-ThA4** Computational Analysis of Interdiffusion in Silicon-Germanium Alloy Films Subject to Patterned Stress Fields, **D. KAISER**, University of Pennsylvania, S. GHOSH, S.M. HAN, University of New Mexico, T.R. SINNO, University of Pennsylvania	
3:40 pm	**BREAK**	**BREAK**
4:00 pm	**EM1-ThA6** Scanning Capacitance Microscopy of Atomically-Precise Donor Devices in Si, **S. MISRA**, E. BUSSMANN, M. RUDOLPH, S.M. CARR, G. SUBRAMANIA, G. TEN EYCK, J. DOMINGUEZ, M.P. LILLY, M. CARROLL, Sandia National Laboratories	**EM2-ThA6 Invited** Innovating Organic Electronics and Photonics, **B.J. KIPPELEN**, Georgia Institute of Technology
4:20 pm	**EM1-ThA7** SiGe on sSOI: Nanoscale Engineering of Structures and Devices on Surfaces, **E. YITAMBEN**, E. BUSSMANN, Sandia National Laboratories, R. BUTERA, Laboratory for Physical Sciences, S. MISRA, M. RUDOLPH, S.M. CARR, M. CARROLL, Sandia National Laboratories	Invited talk continued.
4:40 pm	**EM1-ThA8** Creating a Responsive SiGe Substrate to Form 2D Array of Ge Quantum Dots Using Stress-induced Near-surface Compositional Redistribution, S. GHOSH, University of New Mexico, D. KAISER, T.R. SINNO, University of Pennsylvania, **S.M. HAN**, University of New Mexico	**EM2-ThA8** Role of Light Scattering in Hybrid Solar Cells, **J. DORMAN**, M. NOEBELS, T. PFADLER, J. WEICKERT, L. SCHMIDT-MENDE, University of Konstanz, Germany
5:00 pm	**EM1-ThA9** DFTMD Modeling of Atomic Scale Structure Requirements for amorphous Sub 0.5 EOT Gate Oxides, T. KENT, T. KAUFMAN-OSBORN, M. EDMONDS, S.W. PARK, J.H. PARK, I.J. KWAK, E.A. CHAGAROV, University of California, San Diego, P. CHOUDHURY, New Mexico Institute of Mining and Technology, R. DROOPAD, Texas State University, **A.C. KUMMEL**, University of California, San Diego	**EM2-ThA9** The Structure and Energetics of the Calcium / Phenyl-C_{61}-butyric Acid Methyl Ester Interface, **J.M. LOWNSBURY**, C.T. CAMPBELL, University of Washington
5:20 pm	**EM1-ThA10** Crystalline $SrHfO_3$ Grown Directly on Ge (001) by Atomic Layer Deposition as a Gate Oxide for High-Mobility Ge-based Transistors, **M.D. MCDANIEL**, T.Q. NGO, A.B. POSADAS, C. HU, S.N. CHOPRA, E.T. YU, A.A. DEMKOV, J.G. EKERDT, The University of Texas at Austin	**EM2-ThA10 Invited** Controlling the Electronic Structure of Organic Semiconductors via Doping, **A.L. KAHN**, Princeton University
5:40 pm	**EM1-ThA11** The Influence of Carbon Incorporation into Gd_2O_3 High-k Gate Dielectric on the Electronic Behavior of the MOS Stack, **P. SHEKHTER**, Technion Israel Institute of Technology, Israel, A.R. CHAUDHURI, Leibniz University, Germany, A. LAHA, Indian Institute of Technology Bombay, India, H.J. OSTEN, Leibniz University, Germany, M. EIZENBERG, Technion Israel Institute of Technology, Israel	Invited talk continued.

	Helium Ion Microscopy Focus Topic Room: 316 - Session HI+2D+AS+MC-ThA	Manufacturing Science and Technology Room: 302 - Session MS+PS+TF-ThA
	Nanoengineering with Helium Ion Beams **Moderators:** A. Gölzhäuser, University of Bielefeld, Germany, D.C. Joy, University of Tennessee, Oak Ridge National Laboratory	**Functionalization of Paper and Textiles & Their Applications** **Moderators:** J.E. Rowe, North Carolina State University, B.R. Rogers, Vanderbilt University
2:20 pm	**HI+2D+AS+MC-ThA1 Invited** Helium Ion Microscopy (HIM) Technology for Imaging, Characterization, and nano-Fabrication for nano-Device Materials and Structures, **S. OGAWA**, NeRI, AIST, Japan	**MS+PS+TF-ThA1 Invited** Vapor-Phase Infiltration of Cellulose and Cotton, **M. KNEZ**, K. GREGORCZYK, M. GARCIA, I. AZPITARTE, CIC nanoGUNE, Spain, D. PICKUP, C. ROGERO, Centro de Física de Materiales (CSIC-UPV-EHU), Spain
2:40 pm	Invited talk continued.	Invited talk continued.
3:00 pm	**HI+2D+AS+MC-ThA3** MEMS Temperature Controlled Sample Stage for the Helium Ion Microscope, **J.F. PORTOLES**, P.J. CUMPSON, Newcastle University, UK	**MS+PS+TF-ThA3** Patterned Photoreduction of Metal Atoms on Polymeric Substrates for Flexible Electronic Applications, **H.I. AKYILDIZ**, J.C. HALBUR, North Carolina State University, A.T. ROBERTS, Redstone Arsenal, H.O. EVERITT, Duke University, J.S. JUR, North Carolina State University
3:20 pm	**HI+2D+AS+MC-ThA4** Monte Carlo Simulations of Focused Neon Ion Beam Induced Sputtering of Copper, **R. TIMILSINA**, P.D. RACK, The University of Tennessee Knoxville, S. TAN, R.H. LIVENGOOD, Intel Corporation	**MS+PS+TF-ThA4** Multifunctional Fabrics via Tungsten ALD on Kevlar, **S.E. ATANASOV**, B. KALANYAN, G.N. PARSONS, North Carolina State University
3:40 pm	**BREAK**	**BREAK**
4:00 pm	**HI+2D+AS+MC-ThA6 Invited** Circuit Edit Nanomachining Study using Ne+ & He+ Focused Ion Beam, **R.H. LIVENGOOD**, S. TAN, Intel Corporation	**MS+PS+TF-ThA6 Invited** Direct and Self-Assembly of Nanocellulose Cleaved from Fiber Cell Walls and Integration in Device Manufacture, **O. ROJAS**, North Carolina State University
4:20 pm	Invited talk continued.	Invited talk continued.
4:40 pm	**HI+2D+AS+MC-ThA8** Evaluation of EUV Resist Performance below 20-nm CD using Helium Ion Lithography, D.J. MAAS, TNO Technical Sciences, Netherlands, **N. KALHOR**, TU Delft, Netherlands, W. MULCKHUYSE, E. VAN VELDHOVEN, TNO Technical Sciences, Netherlands, A. VAN LANGEN–SUURLING, P.F.A. ALKEMADE, TU Delft, Netherlands, S. WUISTER, R. HOEFNAGELS, C. VERSPAGET, J. MEESSEN, T. FLIERVOET, ASML, Netherlands	**MS+PS+TF-ThA8 Invited** Plasmonic Paper: An Emerging Analytical Platform for Trace Chemical and Biological Detection, **S. SINGAMANENI**, Washington University, St. Louis
5:00 pm	**HI+2D+AS+MC-ThA9** Helium Ion Beam Lithography for Nanoscale Patterning, X. SHI, University of Southampton, UK, D.M. BAGNALL, University of New South Wales, UK, **S.A. BODEN**, University of Southampton, UK	Invited talk continued.
5:20 pm	**HI+2D+AS+MC-ThA10** Sub-100nm Nanofabrication using Helium and Neon Ion Beams, **J. SAGAR**, C. NASH, N. BRAZ, T. WOOTTON, M.J.L. SOURRIBES, T.-T. NGUYEN, R.B. JACKMAN, P.A. WARBURTON, London Centre for Nanotechnology, UK	**MS+PS+TF-ThA10** Van der Waals Materials on Nanostructured Paper -- Aqueous Gating and Sensing Application, **W. BAO**, Z. FANG, J. WAN, L.B. HU, University of Maryland, College Park
5:40 pm		**MS+PS+TF-ThA11** Mechanistic Understanding of Anomalous Scaling Law of Mechanical Properties of Nano-Cellulose Paper, S. ZHU, Z. JIA, Y. LI, Z. FANG, S. PARVINIAN, N.J. WEADOCK, O. VAALAND, Y.C. CHEN, L.B. HU, **T. LI**, University of Maryland, College Park

	Plasma Science and Technology Room: 308 - Session PS+SE-ThA **Atmospheric Pressure Plasma Processing; Fundamental and Applications** **Moderator:** M.C.M. van de Sanden, S. Welzel, DIFFER, Netherlands	Plasma Science and Technology Room: 305 - Session PS-ThA **Plasma Processing of Nanoparticles and Nanomaterials** **Moderator:** M. Sankaran, Case Western Reserve University
2:20 pm	**PS+SE-ThA1 Invited** Insights into the Chemistry of Atmospheric Pressure Plasma Deposition Processes, **F. FANELLI**, Institute of Inorganic Methodologies and Plasmas - National Research Council, Italy, P. BOSSO, A.M. MASTRANGELO, F. FRACASSI, University of Bari 'Aldo Moro', Italy	**PS-ThA1** Raman Spectroscopy as Diagnostics for Size Distribution and Surface Chemistry of Remote Plasma Synthesized Silicon Nanocrystals, I. DOGAN, Eindhoven University of Technology, Netherlands, R. GRESBACK, T. NOZAKI, Tokyo Institute of Technology, Japan, **M.C.M. VAN DE SANDEN**, Dutch Institute for Fundamental Energy Research (DIFFER), Netherlands
2:40 pm	Invited talk continued.	**PS-ThA2** High Rate Production of Silicon Nanoparticles Through a Microwave Torch Production Process, **D.B. OAKES**, M.A. COSTOLO, J.D. LENNHOFF, Physical Sciences Inc.
3:00 pm	**PS+SE-ThA3** Understanding Charge Transfer Reactions at a Plasma-Liquid Interface, **P. RUMBACH***, University of Notre Dame, R.M. SANKARAN, Case Western Reserve University, D.M. BARTELS, D.B. GO, University of Notre Dame	**PS-ThA3 Invited** Plasma-Produced Nanomaterials for Energy Recovery and Storage, **L. MANGOLINI**, University of California, Riverside
3:20 pm	**PS+SE-ThA4** A Novel Atmospheric Pressure Plasma Application for Fuel Tank Inerting, **M. PRICE**, A. SRIVASTAVA, Interspace, Inc.	Invited talk continued.
3:40 pm	**BREAK**	**BREAK**
4:00 pm	**PS+SE-ThA6** *In Situ* Diagnostic Studies of CO_2 containing Dielectric Barrier Discharges, **S. WELZEL**, FOM Institute DIFFER; Eindhoven University of Technology, Netherlands, F. BREHMER, Eindhoven University of Technology; AFS GmbH, Germany, B.L.M. KLARENAAR, Eindhoven University of Technology, Netherlands, M.C.M. VAN DE SANDEN, FOM Institute DIFFER; Eindhoven University of Technology, Netherlands, R. ENGELN, Eindhoven University of Technology, Netherlands	**PS-ThA6** Atmospheric-Pressure Microplasma Synthesis of Colloidal Metal Nanoparticles, **C. DE VOS**, J. BANETON, J. DILLE, S. GODET, Université libre de Bruxelles, Belgium, M. SANKARAN, Case Western Reserve University, F.A.B. RENIERS, Université libre de Bruxelles, Belgium
4:20 pm	**PS+SE-ThA7** Effect of the Nature of the Plasma Gas on the Resulting Chemistry of Atmospheric Plasma Deposited Coatings and of Plasma Treated Gases, D. MERCHE, N. VANDENCASTEELE, A. OZKAN, J. HUBERT, **F.A.B. RENIERS**, Université Libre de Bruxelles, Belgium	**PS-ThA7** Gas Chromatography and Mass Spectrometry Characterization of Nanoparticle-Producing Atmospheric-Pressure Microplasmas, **J. COLE**, R.M. SANKARAN, Case Western Reserve University
4:40 pm	**PS+SE-ThA8 Invited** Diagnostics of an Atmospheric-Pressure dc Glow Plasma in Contact with Solution: Insight into Plasma-Liquid Interaction, **SASAKI**, Hokkaido University, Japan	**PS-ThA8** Top-down InGaAs/GaAs Nanopillars Fabrication using a Bio-Nano-Process and a Neutral Beam Etching Process, **C. THOMAS**, K. YOSHIKAWA, C.Y. LEE, Y. TAMURA, A. HIGO, Tohoku University, Japan, T. KIBA, A. MURAYAMA, Hokkaido University, Japan, I. YAMASHITA, Nara Institute of Science and Technology, Japan, S. SAMUKAWA, Tohoku University, Japan
5:00 pm	Invited talk continued.	**PS-ThA9** Nanostructuring of Metal Surfaces by Low Energy He Ions, **I. TANYELI**, FOM Institute DIFFER, Netherlands, L. MAROT, University of Basel, Switzerland, M.C.M. VAN DE SANDEN, FOM institute DIFFER, Netherlands, G. DE TEMMERMAN, ITER Organization, Netherlands
5:20 pm	**PS+SE-ThA10** Absolute Measurements of Short Lived Reactive Species in Cold Atmospheric Pressure Plasmas, **D. O'CONNELL**, K. NIEMI, J. DEDRICK, S. SCHROETER, J. BREDIN, A. WEST, E. WAGENAARS, T. GANS, University of York, UK	**PS-ThA10** Nucleation of Microcrystalline Silicon Thin Films on Nano-Imprint Textured Substrates, **J. PALMANS**, T. FARAZ, W.M.M. KESSELS, M. CREATORE, Eindhoven University of Technology, Netherlands
5:40 pm	**PS+SE-ThA11** Recent Progress in the Diagnostics of Microwave Discharges for Optimization of CO_2 Dissociation, **T. SILVA**, N. BRITUN, T. GODFROID, R. SNYDERS, University of Mons, Belgium	**PS-ThA11** Synthesis of AZO Film on Polymer by Nano-Process Control with Confined Magnetic Field Sputtering, J.G. HAN, NU-SKKU Joint Institute for Plasma-Nano Materials, Republic of Korea, **S.B. JIN**, B.B. SAHU, J.B. KIM, NU-SKKU Joint institute for plasma nano materials, Republic of Korea, K. TAKEDA, M. HORI, Plasma Nanotechnology Research Center, Japan

* Coburn & Winters Student Award Finalist

	Fundamentals & Biological, Energy and Environmental Applications of Quartz Crystal Microbalance Focus Topic **Room: 317 - Session QC+AS+BI+MN-ThA** **Applications of QCM** **Moderators:** E. Gizeli, IMBB-FORTH, Greece, A. Olsson, McGill University, Canada	**Surface Modification of Materials by Plasmas for Medical Purposes Focus Topic** **Room: 315 - Session SM+AS+BI+PS-ThA** **Plasma Processing of Biomemetic Materials** **Moderators:** S.L. McArthur, Swinburne University of Technology, Australia, A. Pegalajar-Jurado, Colorado State University
2:20 pm	**QC+AS+BI+MN-ThA1 Invited** Permeability of a Model Stratum Corneum Lipid Membrane, **D. LEE**, University of Pennsylvania	**SM+AS+BI+PS-ThA1 Invited** The Chemistry of Plasma Modified 3D Biomaterials, **E. SARDELLA**, CNR-IMIP, Italy
2:40 pm	Invited talk continued.	Invited talk continued.
3:00 pm	**QC+AS+BI+MN-ThA3** Investigation of Interaction between a Monoclonal Antibody and Solid Surfaces via Multiple Surface Analytical Techniques, **X. DONG**, C.A.J. KEMP, Z. XIAO, Eli Lilly and Company	**SM+AS+BI+PS-ThA3 Invited** Advantages of Plasma Polymerized Surfaces for Cell Sheet Engineering over Other Deposition Techniques, **H.E. CANAVAN**, M.A. COOPERSTEIN, University of New Mexico, B. BLUESTEIN, University of Washington, J.A. REED, University of New Mexico
3:20 pm	**QC+AS+BI+MN-ThA4** Combining Spectroscopic Ellipsometry and Quartz Crystal Microbalance to Study Biological Hydrogels – Towards Understanding Nucleo-Cytoplasmic Transport, N.B. EISELE, S. EHRET, R. ZAHN, CIC biomaGUNE, Spain, S. FREY, D. GORLICH, MPI Biophysical Chemistry, Germany, **R.P. RICHTER**, CIC biomaGUNE & Université Grenoble Alpes & MPI Intelligent Systems, Spain	Invited talk continued.
3:40 pm	**BREAK**	**BREAK**
4:00 pm	**QC+AS+BI+MN-ThA6** Probing Nanoparticle-Biofilm Interactions using Quartz Crystal Microgravimetry and Complementary Surface-sensitive Methods, **K. IKUMA***, University of Massachusetts, Z. SHI, A.V. WALKER, University of Texas at Dallas, B.L.T. LAU, University of Massachusetts	**SM+AS+BI+PS-ThA6 Invited** Biofunctionalization of Surfaces by Energetic Ion Implantation: Fundamentals and Recent Progress on Applications, **M.M. BILEK**, A. KONDYURIN, E. KOSOBRODOVA, G. YEO, University of Sydney, Australia, S. WISE, Heart Research Institute, Australia, N.J. NOSWORTHY, C.G. DOS REMEDIOS, A.S. WEISS, D.R. MCKENZIE, University of Sydney, Australia
4:20 pm	**QC+AS+BI+MN-ThA7** Association and Entrapment of Membrane-Targeted Nanoparticles with Different Binding Avidity: A QCM-D and sIngle Particle Tracking Study, **A.O. LUNDGREN***, B. AGNARSSON, S. BLOCK, F. HÖÖK, Chalmers University of Technology, Sweden	Invited talk continued.
4:40 pm	**QC+AS+BI+MN-ThA8** Complementary Chemiresistor and QCM Studies of Biomacromolecules as Sorptive Materials for Vapor Sensing, **K. FU**, X. JIANG, B.G. WILLIS, University of Connecticut	**SM+AS+BI+PS-ThA8** Three-Dimensional Biopolymeric Scaffold Surface Modification Using Plasma Enhanced Chemical Vapor Deposition: The Effect of Functionality and Wettability on Cell and Bacterial Attachment, **M.J. HAWKER**, A. PEGALAJAR-JURADO, E.R. FISHER, Colorado State University
5:00 pm	**QC+AS+BI+MN-ThA9** The Evolution of Complex Artificial Cell Membranes: Combining Patterned Plasma Polymers and Supported Lipid Bilayers, **H.J. ASKEW**, S.L. MCARTHUR, Swinburne University of Technology, Australia	**SM+AS+BI+PS-ThA9** Plasma Polymerized Bandages for Wound Healing, **J.D. WHITTLE**, L.E. SMITH, T.L. FERNANDEZ, University of South Australia
5:20 pm	**QC+AS+BI+MN-ThA10** Applications of QCM in Industrial R&D, **A.N. SOUKHOJAK**, The Dow Chemical Company	
5:40 pm		

* QCM Focus Topic Young Investigator Award

	Scanning Probe Microscopy Focus Topic Room: 312 - Session SP+AS+BI+NS+SS-ThA Probing Chemical Reactions at the Nanoscale **Moderators:** C.A. Ventrice, Jr., University at Albany-SUNY, J. Nogami, University of Toronto, Canada	Surface Science Room: 309 - Session SS+AS+NS-ThA Semiconductor Surfaces and Interfaces 1 **Moderators:** K.W. Kolasinski, West Chester University, L. Bartels, University of California - Riverside
2:20 pm	**SP+AS+BI+NS+SS-ThA1 Invited** Surface Structures of Catalysts in Reactive Environments with Scanning Tunneling Microscopy, **F. TAO**, L.T. NGUYEN, University of Notre Dame	**SS+AS+NS-ThA1** A Study of the InAs(001) Surface Electronic Structure, **J. KOLODZIEJ**, N. TOMASZEWSKA, P. CIOCHON, Jagiellonian University, Poland
2:40 pm	Invited talk continued.	**SS+AS+NS-ThA2** Control of Point Defect Behavior in Metal Oxides via Surface Band Bending, M. LI, P. GORAI, **E.G. SEEBAUER**, University of Illinois at Urbana-Champaign
3:00 pm	**SP+AS+BI+NS+SS-ThA3** Numerical Analysis of Amplitude Modulation Atomic Force Microscopy in Aqueous Salt Solutions, P. KARAYAYLALI, **M.Z. BAYKARA**, Bilkent University, Turkey	**SS+AS+NS-ThA3** Evolution of Surface-Assisted Oxidation of GaAs by Gas-Phase N_2O, NO and O_2, **X.Q. ZHANG**, S. PTASINSKA, University of Notre Dame
3:20 pm	**SP+AS+BI+NS+SS-ThA4** Surface Potential Investigation of AlGaAs/GaAs Heterostructures by Kelvin Force Microscopy, S. POUCH, **N. CHEVALIER**, D. MARIOLLE, F. TRIOZON, Y.M. NIQUET, T. MELIN, Ł. BOROWIK, CEA, LETI, MINATEC Campus, France	**SS+AS+NS-ThA4** Morphology Dependence of Gas-Phase Molecule Interactions with GaAs Surfaces, **S. PTASINSKA**, X.Q. ZHANG, University of Notre Dame
3:40 pm	**BREAK**	**BREAK**
4:00 pm	**SP+AS+BI+NS+SS-ThA6 Invited** Probing the Quantum Nature of Hydrogen Bonds at Single Bond Limit in Interfacial Water, **Y. JIANG**, Peking University, China	**SS+AS+NS-ThA6** STM Imaging of the Buried Interface Structures at Ultra-thin Ag Films/Si(111) Substrates, Y. YOSHIIKE, I. KOKUBO, Y. AOKI, K. NAKATSUJI, **H. HIRAYAMA**, Tokyo Institute of Technology, Japan
4:20 pm	Invited talk continued.	**SS+AS+NS-ThA7** Ge on Si Epitaxy: Formation of 3D Ge Islands on Si(100)-2x1 by Annealing of Ge Wetting Layers, **G. RAMALINGAM**, P. REINKE, University of Virginia
4:40 pm	**SP+AS+BI+NS+SS-ThA8** Resonant Enhanced Spectroscopy of Molecular Rotations with the STM and Field Effect Control of Molecular Dynamics, **F.D. NATTERER**, F. PATTHEY, Ecole Polytechnique Fédérale de Lausanne (EPFL), Switzerland, Y. ZHAO, J.E. WYRICK, J.A. STROSCIO, NIST, H. BRUNE, Ecole Polytechnique Fédérale de Lausanne (EPFL), Switzerland	**SS+AS+NS-ThA8** In Search of Nanopatterns: STM Provides Mechanistic Insights into Silicon Functionalization, **E.S. SKIBINSKI**, Cornell University, W.J.I. DEBENEDETTI, Y.J. CHABAL, University of Texas at Dallas, M.A. HINES, Cornell University
5:00 pm		**SS+AS+NS-ThA9** Benzene and Chlorobenzene Dissociation Pathways Involving Singlet-Triplet Crossing on the Si(100) Surface Modeled Using Small Clusters, **N. MATERER**, E. BUTSON, Oklahoma State University, Q. ZHU, University of Pittsburgh
5:20 pm		**SS+AS+NS-ThA10** Adsorption of Organic Triols on Ge(100)-2x1 Surface, **T. SANDOVAL**, S.F. BENT, Stanford University
5:40 pm		**SS+AS+NS-ThA11** The Chemistry of Adsorbed Water on Semiconductor Surfaces for Aqueous Photoelectrochemistry, **C. KRONAWITTER**, B. KOEL, Princeton University

	Thin Film **Room: 307 - Session TF-ThA** **Thin Film for Permeation Barriers and Membranes** **Moderator:** M. Creatore, Eindhoven University of Technology, Netherlands	**Tribology Focus Topic** **Room: 303 - Session TR-ThA** **Tribology in Unique Environs** **Moderator:** K.E. Ryan, United States Naval Academy
2:20 pm	**TF-ThA1 Invited** Enhancing Water Desalination Membranes by Initiated Chemical Vapor Deposition (iCVD), **K. GLEASON**, Massachusetts Institute of Technology	
2:40 pm	Invited talk continued.	
3:00 pm	**TF-ThA3** Pulsed Plasma Enhanced Chemical Vapor Deposition for Nanoscale Control of the Size, Shape and Surface Properties of Asymmetric Membranes, **S. KELKAR**, D. CHIAVETTA, C.A. WOLDEN, Colorado School of Mines	**TR-ThA3 Invited** Molecular Mechanisms of Aqueous Boundary Lubrication by Mucinous Glycoproteins, **S. ZAUSCHER**, Duke University
3:20 pm	**TF-ThA4** A Combined Microstructure Characterization of Moisture Permeation Barrier Layers by Means of Electrochemical Impedance Spectroscopy and Ellipsometric Porosimetry, **A. PERROTTA**, Eindhoven University of Technology; Dutch Polymer Institute (DPI), Netherlands, S.J. GARCÍA, Delft University of Technology, Netherlands, J.J. MICHELS, Holst Centre / TNO, Netherlands, W.M.M. KESSELS, M. CREATORE, Eindhoven University of Technology, Netherlands	Invited talk continued.
3:40 pm	**BREAK**	**BREAK**
4:00 pm	**TF-ThA6** Influence of Surface Topography and Defects on the Performance of Nanoscale Thin Film Moisture Permeation Barriers, **S.W. KING**, D. JACOB, B. COLVIN, D. VANLEUVEN, J. KELLY, Intel Corporation	**TR-ThA6 Invited** Unusual Friction and Wear Behavior of Graphene in Different Environments, **A. ERDEMIR**, D. BERMAN, A.V. SUMANT, Argonne National Laboratory
4:20 pm	**TF-ThA7** Atomic Layer Deposition for Encapsulation and Barriers, F. VAN DEN BRUELE, F. GROB, **P. POODT**, Holst Centre / TNO, Netherlands	Invited talk continued.
4:40 pm	**TF-ThA8** Lifetime of Atomic Layer Deposited Al_2O_3 and Parylene Bilayer Encapsulation for Passive and Active Neural Interfaces, **L.W. RIETH**, R. CALDWELL, X. XIE, F. SOLZBACHER, University of Utah	**TR-ThA8** Tribological Properties and Effects of Water on Carbon-Based Materials using Molecular Dynamics Simulations, **M. FALLET**, K.E. RYAN, United States Naval Academy, M. KNIPPENBERG, High Point University, P. MIKULSKI, J.A. HARRISON, United States Naval Academy
5:00 pm	**TF-ThA9** Influence of Polymer Microstructure and Process Temperature on the Formation of Tailored ALD Coatings on Polymers, R.P. PADBURY, **J.S. JUR**, North Carolina State University	**TR-ThA9** An Atomistic Investigation of Tribological Performance of Solvated Nanodiamonds, **F. SABERI-MOVAHED**, D. BRENNER, North Carolina State University, O.A. SHENDEROVA, International Technology Center
5:20 pm	**TF-ThA10** Mechanisms of Moisture and Oxygen Transport through Thin Silica-like Barrier Films Deposited in Atmospheric Pressure Dielectric Barrier Discharge, **S.A. STAROSTIN**, FOM Institute DIFFER, Netherlands, B.C.A.M. VAN DER VELDEN-SCHUERMANS, S. QUAN, FUJFILM Manufacturing Europe b.v., Netherlands, A. MESHKOVA, M.C.M. VAN DE SANDEN, H.W. DE VRIES, FOM Institute DIFFER, Netherlands	**TR-ThA10** Quantitative Analysis by AES and XRD and Tribologycal Properties of Multilayers and Nanocomposites Based on Titanium Nitride, **A.F. TALLEDO**, Universidad Nacional de Ingeniería, Peru, J.A. HUARANGA, J.L. AMPUERO, J.J. ASMAT, K. PAUCAR, C. BENNDORF, Universidad Nacional de Ingeniería, Perú
5:40 pm	**TF-ThA11** Scale Dependent Surface Energies Influence Wetting Behaviour on Ultimately Small Topographies, **J. KNAUF**, Advanced Molecular Films GmbH and RWTH Aachen University, Germany, L. REDDEMANN, Advanced Molecular Films GmbH and Universität zu Köln, Germany, K. CHENG, AMF GmbH, Germany, A. BÖKER, DWI-Leibniz-Institute for Interactive Materials, RWTH Aachen University; Lehrstuhl für Makromolekulare Materialien und Oberflächen, RWTH Aachen University, Germany, K. REIHS, Advanced Molecular Films GmbH, Germany	

Anticipated Schedule
Thursday Morning, November 13, 2014

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, November 13, 2014

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		

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

2D Materials Poster Session
6:00 pm

2D-ThP1 Extremely Low Impact Energy SIMS Characterization of Graphene, **A.V. MERKULOV**, F. HORREARD, CAMECA, France, W. STRUPINSKI, ITME, Poland, A. DAVIS, CAMECA Instruments Inc

2D-ThP2 Site-Specific Immobilization of Tetrazine modified Green Fluorescent Protein on Trans-cyclooctene Surfaces, **D. CLARK**, University of Delaware

2D-ThP3 Synthesis and Characterization of Large-Area and Highly Crystalline Molybdenum Disulfide Atomic Layers by Chemical Vapor Deposition, **Y. KIM**, S.-H. PARK, J.S. KIM, Y.H. KO, Sungkyunkwan University, Republic of Korea, C. JEON, Korea Basic Science Institute, Republic of Korea, C.-Y. PARK, Sungkyunkwan University, Republic of Korea

2D-ThP4 Application of Coatings Deposited by PVD on Tools for Machining Components of the Oil and Gas Industry, **W. MATTES**, M.F. PAIVA JUNIOR, Centro Universitário - Católica de Santa Catarina, Brazil

2D-ThP6 XPS Depth Profiling: A Viable Alternative to Secondary Ion Mass Spectrometry, **M.D. WILLIAMS**, Clark Atlanta University, B.R. STROHMEIER, Thermo Fisher Scientific

2D-ThP7 Investigation of Luminescent Properties of $Ca_5(PO_4)_3OH:Gd^{3+},Pr^{3+}$ Phosphor for Application in Displays, Phototherapy Lamps and Thermoluminescence Dosimetry, **P. MOKOENA**, University of the Free State, South Africa, L. CHITHAMBO, Rhodes University, South Africa, H.C. SWART, O.M. NTWAEABORWA, University of the Free State, South Africa

2D-ThP8 Influence of the Deposition Time in Optical and Electric Characteristics of Ge Nanoparticles Grown in SiO_2 by LPCVD Technique, **M. MEDEROS VIDAL**, S.N. MESTANZA MUÑOZ, Federal University of ABC, Brazil, I. DOI, J.A. DINIZ, University of Campina, Brazil

2D-ThP9 Enhanced Electrical Conductivity of Transparent Carbon Nanotube Sheet by Acid Treatment, **J. KIM**, University of Texas at Dallas

2D-ThP10 Effect of Ar Overpressure Ratio on the Growth of Graphene on Cu(111) by Catalytic Dissociation of Ethylene, **H. GEISLER**, S. MURRAY, SUNY College at Oneonta, E.W. ONG*, University at Albany-SUNY, Z.R. ROBINSON, Naval Research Laboratory, T.R. MOWLL, P. TYAGI, C.A. VENTRICE, JR., University at Albany-SUNY

2D-ThP11 CVD Processes for the Growth of Single Layer Transition Metal Dichalcogenides and Alloys, **A. NGUYEN**, D. BARROSO, E. PRECIADO, V. KLEE, S. BOBEK, C. LEE, S. NAGHIBI, I. LU, G. VON SON PALACIO, T. EMPANTE, K. BROWN, K. YANG, A. NGUYEN, P. RIGAS, W. COLEY, L. BARTELS, University of California - Riverside

2D-ThP12 Transparent Conductive Electrodes based on Graphene/Metal-Nanoparticles Compound Composite for Thin Film CIGS Solar Cell, **J.M. KIM**, Y.H. JOO, C.I. KIM, Chung-Ang University, Republic of Korea

2D-ThP13 Layer by Layer Etching of CVD MoS_2 with Low Damage using Atomic Layer Etch System, **T.Z. LIN**, G. YEOM, Sungkyunkwan University, Republic of Korea

2D-ThP14 Making Graphene Nanoribbons: A Theoretical Exploration, **J.W. WANG**, Depatment of Physics, Southeast University, China

2D-ThP15 Studying Graphene & Other 2D Materials With A Multiprobe Cryogenic System That Provides For Simultaneous Raman & Other Optical Modalities With A Wide Variety of Functional SPM Probes, J. ERNSTOFF, Nanonics Imaging Ltd., Israel, **A. LEWIS**, Hebrew University of Jerusalem, Israel, O. ZINOVIEV, A. KOMISSAR, E. MAAYAN, Nanonics Imaging Ltd., Israel

2D-ThP17 Development of Low-k Dielectric for Graphene device, **Y.G. LEE**, L. CHENG, University of Texas at Dallas, Y. KIM, Gwangju Institute of Science and Technology, G. MORDI, Samsung, HH. HWANG, A. LUCERO, University of Texas at Dallas, BH. LEE, Gwangju Institute of Science and Technology, J. KIM, University of Texas at Dallas

2D-ThP18 Charge Exchange and Energy Loss of Slow Highly Charged Ions Passing Through Carbon Nano Membranes, **R. HELLER**, R.A. WILHELM, Helmholtz-Zentrum Dresden - Rossendorf, Germany, E. GRUBER, R. RITTER, TU Wien - Vienna University of Technology, Austria, S. FACSKO, Helmholtz-Zentrum Dresden - Rossendorf, Germany, F. AUMAYR, TU Wien - Vienna University of Technology, Austria

2D-ThP19 Electronic, Magnetic and Transport Properties of MoS_2 and its Hybrid Structures, **J.W. WANG**, Southeast University, China

2D-ThP20 An Efficient Dry-Transfer Technique with Thermal Annealing for Enabling High-Performance Multilayer MoS_2 Transistors, **XUQIAN ZHENG**, R. YANG, Z. WANG, P.X.-L. FENG, Case Western Reserve University

Atom Probe Tomography Focus Topic
Room: Hall D - Session AP-ThP

Atom Probe Tomography Poster Session
6:00 pm

AP-ThP1 Nanoscale Semiconductor and Oxide Characterization using Atom Probe Tomography, **D.J. LARSON**, M. ULFIG, D. LENZ, D. LAWRENCE, D. OLSON, D.A. REINHARD, T.J. PROSA, P.H. CLIFTON, T.F. KELLY, CAMECA Instruments Inc.

AP-ThP2 Characterization of Advanced Li Ion Battery Cathode Materials by Atom Probe Tomography, **A. DEVARAJ**, R.J. COLBY, M. GU, C.-M. WANG, S.A. THEVUTHASAN, Pacific Northwest National Laboratory

AP-ThP3 Atom Probe Tomography and Correlative Microscopy of Complex Heterogeneous Materials for Energy and Environmental Applications, **S.A. THEVUTHASAN**, A. DEVARAJ, D.E. PEREA, R.J. COLBY, Pacific Northwest National Laboratory, T. TYLISZCZAK, D. SHUH, Lawrence Berkeley National Laboratory

* ASSD Student Award Finalist

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

Applied Surface Science Poster Session
6:00 pm

AS-ThP1 Formation of Pt, Rh, and Pd Nanoclusters on a Graphene Moire Pattern on Cu(111), **E. SOY**, Z. LIANG, M. TRENARY, University of Illinois at Chicago

AS-ThP2 Valence Band Offsets of Two Rare Earth Oxides on $Al_xGa_{1-x}N$ ($0 \le x \le 0.67$) as Measured by Photoelectron Spectroscopy, **M. BRUMBACH**, A. ALLERMAN, D. WHEELER, S. ATCITTY, J. IHLEFELD, Sandia National Laboratories

AS-ThP3 Surface Electronics of Individual Si-doped GaN Wires Studied by Synchrotron-Radiation XPEEM Spectromicroscopy, **O.J. RENAULT**, N. CHEVALIER, J.W. MORIN, CEA-LETI, France

AS-ThP4 Analysis of Silicon Nitride and Oxynitrides with Spectroscopic Ellipsometry Compared to Analysis by Rutherford Backscattering Spectroscopy, **J.H. LEE**, Samsung Electronics Co., LTD., Republic of Korea

AS-ThP5 Modulation of the Work Function of Fullerenes C_{60} and C_{70} by Atom Metal Adsorption: A Theoretical Study, **S. XU**, Weifang University of Science and Technology, China

AS-ThP6 Characterization of Nanostructured Cu-Zn Oxides Used for Photocathodic Water Splitting, **S. RAMAN**, J.F. MOULDER, Physical Electronics Inc., S. BANARJEE, Washington University, St. Louis, Y. MYUNG, H. IM, J. PARK, Korea University, P. BANARJEE, Washington University, St. Louis

AS-ThP7 Embedded SiGe Alloy Nanoparticles formed by Co-Sputtering of Si, Ge, **A. HERNÁNDEZ-HERNÁNDEZ**, Universidad Autonoma del Estado de Hidalgo, Mexico, L.A. HERNÁNDEZ-HERNÁNDEZ, Instituto Politécnico Nacional, Mexico, F. DE MOURE-FLORES, Facultad de Quimica - UAQ, Mexico, J.G. QUIÑONES-GALVÁN, Instituto Nacional de Investigaciones Nucleares, Mexico, M. MELÉNDEZ-LIRA, Cinvestav-IPN, Mexico

AS-ThP8 Impact of a Mixed Oxide's Surface Composition and Structure on Its Adsorptive Properties: The Case of the α-$(Fe,Cr)_2O_3(0001)$ Surface, M.A. HENDERSON, **M.H. ENGELHARD**, Pacific Northwest National Laboratory

AS-ThP9 Analysis of Metal Particles by Proximal Excitation of Al and Mg$k\alpha$ X-rays, C.F. MALLINSON, **J.E. CASTLE**, University of Surrey, UK

AS-ThP10 XPS Sputter Depth Profiling of Organometallic Multilayer Materials Using Massive Argon Cluster Ions, **S.J. HUTTON**, Kratos Analytical Limited, UK, T. BENDIKOV, Weizmann Institute of Science, Israel, W. BOXFORD, SC. PAGE, J.D.P. COUNSELL, Kratos Analytical Limited, UK

AS-ThP11 XPS of Liquids: Chemical Bonding in Ionic Liquids and on Tribo-Films Formed on Cast Iron, **H.M. MEYER**, J. QU, H. LUO, W. BARNHILL, Oak Ridge National Laboratory

AS-ThP12 X-ray Photoelectron Spectroscopy for Electronic Structure and Valence Information, R.G. WHITE, Thermo Fisher Scientific, UK, **T. LEVESQUE**, Thermo Fisher Scientific

AS-ThP13 Mapping Chemical and Mechanical Property Degradation in PV Modules, **K.M. STIKA**, C.S. WESTPHAL, DuPont Central Research and Development, J. KAPUR, DuPont Packaging & Industrial Polymers, R.G. RATY, J. LI, DuPont Central Research and Development, J. KOPCHICK, W. GAMBOGI, B. HAMZAVYTEHRANY, A. BRADLEY, DuPont Photovoltaic Solutions, J.R. MARSH, B. FOLTZ, DuPont Central Research and Development

AS-ThP14 Surface and Interface Studies of Flexible Front Sheets for PV Modules, **L. ZHANG**, N.J. GLASSMAKER, B.B. SAUER, DuPont Central Research and Development

AS-ThP15 Multi-technique Surface Analysis of Catalytic Systems with XPS, ISS and UPS, **B. SGAMMATO**, Thermo Fisher Scientific, UK

AS-ThP16 Multifunctional Ultra-High Vacuum Apparatus for Studies of the Interactions of Chemical Warfare Agents on Complex Surfaces, **W.O. GORDON**, U. S. Army Edgewood Chemical Biological Center, E.M. DURKE, Excet, Inc., A.R. WILMSMEYER, Augustana College, J.R. MORRIS, Virginia Tech

AS-ThP17 A New Transfer Vessel to Facillitate the Characterization of Air-Sensitive Materials, **R.G. WHITE**, T.S. NUNNEY, Thermo Fisher Scientific, UK, H.M. MEYER, Oak Ridge National Laboratory

AS-ThP18 Large-Area Secondary Ion Mapping: An Essential Component of Industrial Problem-Solving, **K.G. LLOYD**, J.R. MARSH, DuPont Corporate Center for Analytical Sciences

AS-ThP19 *In Situ* Ar Plasma Cleaning of Samples Prior to Surface Analysis, **V. SMENTKOWSKI**, H. PIAO, General Electric Global Research Center, C.A. MOORE, XEI Scientific

AS-ThP20 Discrete Distribution Profile Model for Characterization of Ultra-Thin Surface Films, **T. BENDIKOV**, T. TOLEDANO, H. COHEN, Weizmann Institute of Science, Israel

AS-ThP21 Study of Focused Ion-beam Induced Auger Electron Spectroscopy for Three Dimensional Chemical Analysis, **H. PARVANEH**, R. HULL, Rensselaer Polytechnic Institute

AS-ThP22 Million-fold Differences in Excited State Life -Times Above/Below Core Level IP's, G. LUCOVSKY, C.C. CHENG, North Carolina State University, **D. NORDHEIM**, Stanford University, J.L. WHITTEN, North Carolina State University

AS-ThP23 XAS and XPS Spectra O and N K-edge, and Shallow Core States, e.g., Si L2,3, Ti, L2,3, G. LUCOVSKY, **C.C. CHENG**, North Carolina State University

AS-ThP24 Co-solvent Enhanced Zinc Oxysulfide Buffer Layers in Kesterite Cu2ZnSnSe4 Solar Cells, **K.X. STEIRER**, R.L. GARRIS, J. LI, National Renewable Energy Laboratory, M. DZARA, Rochester Institute of Technology, P.F. NDIONE, K. RAMANATHAN, I. REPINS, G. TEETER, C.L. PERKINS, National Renewable Energy Laboratory

AS-ThP25 Analysis of Metal Nanoparticles by Auger, XPS and TEM, **W.D. JENNINGS**, Case Western Reserve University, C.V. BISHOP, The Best Mode Company, J. COWEN, Case Western Reserve University, J.S. HAMMOND, D.F. PAUL, Physical Electronics USA

AS-ThP26 Characterization of the Electrical & Mechanical Properties of Ultra-Thin, Nano-scale Films using Acoustic Wave Devices, **B. FISHER**, TALAWAH Technologies Inc. & The University of Central Florida

Biomaterial Interfaces
Room: Hall D - Session BI-ThP

Biomaterial Interfaces Poster Session

6:00 pm

BI-ThP2 Electroassembled Cell Populations in Microfluidic Gradient Generators for Biomolecule Screening, **C. WOLFRAM**, University of Maryland, College Park, X. LUO, The Catholic University of America, H.C. WU, C.Y. TSAO, M. GUO, G.W. RUBLOFF, W.E. BENTLEY, H. SINTIM, University of Maryland, College Park

Spectroscopic Ellipsometry Focus Topic
Room: Hall D - Session EL-ThP

Spectroscopic Ellipsometry Poster Session

6:00 pm

EL-ThP1 Spectroscopic Ellipsometry Study of Optical Constants of the Crude Oil-Seawater System, **N. KHALILOVA**, A. MAMEDOV, N. MAMEDOV, Azerbaijan National Academy of Sciences, Azerbaijan

EL-ThP2 Ellipsometric Characterization of Rare-Earth-Doped Y_2O_3 for Up-Conversion in Thin Film Solar Cells, **A. GASIMOV**, E. MAMMADOV, Azerbaijan National Academy of Sciences, Azerbaijan, A.L. JOUDRIER, IRDEP, S. BABAYEV, Azerbaijan National Academy of Sciences, Azerbaijan, C. ANDRIAMIADAMANANA, N. NAGHAVI, IRDEP, N. MAMEDOV, Azerbaijan National Academy of Sciences, Azerbaijan, J.F. GUILLEMOLES, IRDEP

EL-ThP3 Indium Doped Zinc Oxide as a Transparent Conductor Oxide Replacement for Thin Film Solar Cells Applications, **N. SUN**, R. SUN, Angstrom Sun Technologies Inc., N.J. ALEXANDER, H. EFSTATHIADIS, SUNY College of Nanoscale Science and Engineering

EL-ThP4 An Innovative High-speed Spectroscopic Ellipsometry and its Novel Applications, **G. CHIN**, ULVAC Inc., Japan

EL-ThP5 Spectroscopic Ellipsometry Studies of Amorphous Silicon Based Photovoltaic Devices, **M.M. JUNDA**, L. KARKI GAUTAM, R.W. COLLINS, N.J. PODRAZA, University of Toledo

EL-ThP6 High Speed Spectroscopic Ellipsometry Technique for On-line Monitoring in 600x1200mm Standard Sized Solar Panel Production, C. MAJOR, G. JUHASZ, P. PETRIK, Mta Ttk Mfa, Hungary, ZG. HORVATH, MTA Wigner, Hungary, **M. FRIED**, Hungarian Academy of Science, Hungary

Helium Ion Microscopy Focus Topic
Room: Hall D - Session HI-ThP

Aspects of Helium Ion Microscopy Poster Session

6:00 pm

HI-ThP1 Fabrication of Single Atom Tip and Characteristics of Gas Field Ion Source at Room Temperature, **I.-Y. PARK**, B. CHO, C. HAN, J. KIM, N.-K. CHUNG, S.J. AHN, KRISS, Korea

HI-ThP2 Probing Structural Aspects of <10 nm-sized Young Soot, M. SCHENK, University of Bielefeld, Germany, S. LIEB, University of Southern California, H. VIEKER, A. BEYER, **A. GÖLZHÄUSER**, University of Bielefeld, Germany, H. WANG, University of Southern California, K. KOHSE-HÖINGHAUS, University of Bielefeld, Germany

HI-ThP3 Fabrication of Carbon Nanotube Nanogap Electrodes by Helium Ion Sputtering for Molecular Contacts, C. THIELE, Karlsruhe Institute of Technology, Germany, H. VIEKER, **A. BEYER**, Bielefeld University, Germany, B.S. FLAVEL, F. HENNRICH, Karlsruhe Institute of Technology, Germany, D.M. TORRES, T.R. EATON, University of Basel, Switzerland, M. MAYOR, M.M. KAPPES, Karlsruhe Institute of Technology, Germany, A. GÖLZHÄUSER, Bielefeld University, Germany, H.V. LÖHNEYSEN, R. KRUPKE, Karlsruhe Institute of Technology, Germany

HI-ThP4 High Resolution UHV Helium Ion Microscopy of Work Function, Step Edges and Crystal Structure, **G. HLAWACEK**, Helmholtz-Zentrum Dresden - Rossendorf, Germany, M. JANKOWSKI, R. VAN GASTEL, H. WORMEESTER, H.J.W. ZANDVLIET, B. POELSEMA, University of Twente, Netherlands

HI-ThP6 Ion Beam Analysis in a Helium Ion Microscope, **N. KLINGNER**, R. HELLER, G. HLAWACEK, S. FACSKO, J. VON BORANY, Helmholtz-Zentrum Dresden - Rossendorf, Germany

In-Situ Spectroscopy and Microscopy Focus Topic
Room: Hall D - Session IS-ThP

In-Situ Spectroscopy and Microscopy Poster Session

6:00 pm

IS-ThP1 *In Situ* Synchrotron Radiation Photoemission Spectroscopy Study of Property Variation of Ta_2O_5 Film during the Atomic Layer Deposition, **S.Y. LEE**, Sungkyunkwan University, Republic of Korea, C. JEON, Korea Basic Science Institute, Republic of Korea, Y. KIM, Sungkyunkwan University, Republic of Korea, J. LEE, Korea Basic Science Institute, Republic of Korea, C.-Y. PARK, Sungkyunkwan University, Republic of Korea

IS-ThP2 Application of LEEM, PEEM and STM/ncAFM Techniques to Graphene on Metal Surfaces, A. THISSEN, **V. SIMIC-MILOSEVIC**, SPECS Surface Nano Analysis GmbH, Germany

IS-ThP3 Quantum Cascade Laser Cavity Ring Down Spectroscopy: New Method for the Characterization and Detection of Aerosols, E.M. DURKE, **A.M. BUONAUGURIO**, Excet, Inc./Edgewood Chemical Biological Center, J.M. EDMONDS, Edgewood Chemical Biological Center

MEMS and NEMS
Room: Hall D - Session MN-ThP

MEMS and NEMS Posters

6:00 pm

MN-ThP1 Study on Aspect Ratio Characterization of Polydimethylsiloxane (PDMS) Pillar Arrays for Mechanobiological Traction Forces, **Y.H. TANG**, National Applied Research Laboratories, Taiwan, Republic of China, Y.H. LIN, Instrument Technology Research Center, Taiwan, Republic of China

MN-ThP2 Mixing Effect of PDMS Microchannel with Biaxial Orientation Entry and Various Arrangements of Microstructures, **P.L. CHEN**, Y.H. TANG, ITRC, NARL, Taiwan, Republic of China, Y.S. LIN, Hungkuang University, Taiwan, Republic of China, C.N. HSIAO, M.H. SHIAO, Y.H. LIN, ITRC, NARL, Taiwan, Republic of China

MN-ThP3 An Integrated Volatile Organic Compounds Sensing Module for Exhaled Air Analysis, **P.-K. HUANG**, C.-Y. KUO, P.-H. KUO, T.-H. TZENG, S.-S. LU, W.-C. TIAN, National Taiwan University, Taiwan, Republic of China

MN-ThP4 Direct Compression Bonding Process on a Disposable Bio-Microfluidic Chip, F.C. HSIEH, Instrument Technology Research Center, National Applied Research Laboratories, Taiwan, Republic of China, Y.C. OU, Instrument Technology Research Center, National Applied Research Laboratories, P.H. LIN, **C.S. YU**, Instrument Technology Research Center, National Applied Research Laboratories, Taiwan, Republic of China

Manufacturing Science and Technology
Room: Hall D - Session MS-ThP

Manufacturing Science and Technology Poster Session

6:00 pm

MS-ThP1 Development of Dispersed C_{60}-Molecules/Al Composite Materials Using Nanocrystalline Al Powder Synthesized by Pulsed Wire Evaporation Method, **D. MUTO**, A. MATSUMURO, Aichi Institute of Technology, Japan

MS-ThP2 Reliability Improvement in Metal Hard-mask based Cu/Ultra Low-K Interconnects by Damage Reduction, **M.D. HSIEH**, United Microelectronics Corporation, Taiwan, Republic of China

MS-ThP3 Structure, Field Emission and Magnetic Properties of CNx Powders Synthesized by a Polymerization Process, **C.X. ZHAI**, L.L. ZHAO, Z.Y. ZHANG, Northwest University, China

MS-ThP4 Electrical Contact Resistance Characteristics of 28nm HK/MG Gate-Last Process with Advanced Manufacture Technology, **C.P. HSU**, C.L. LU, Y.C. LIN, F.Y. CHANG, K.Y. LIAO, C.L. CHEN, United Microelectronics Corporation, Taiwan, Republic of China, L. CHEN, C. HUANG, C. CHEN, Tokyo Electron Taiwan, Republic of China, J. TSAI, Y. HSIAO, A. WANG, Hermes Epitek, Taiwan, Republic of China

MS-ThP5 Double Patterning Critical Open of Dual Damascene Approach for 14nm Node Beyond, **S.C. TSAI**, United Microelectronics Corporation, Taiwan, Republic of China

MS-ThP6 Vertical Poly Dimethylsiloxane (PDMS) Fluidic Channel Fabrication by Rapid Prototyping, **Y.H. LIN**, P.L. CHEN, NARL, Taiwan, Republic of China, Y.S. LIN, Hungkuang UniversityHungkuang University, Y.H. TANG, C.C. YANG, M.H. SHIAO, C.N. HSIAO, NARL, Taiwan, Republic of China

MS-ThP7 Fabrication of Deeply Striped Pattern Structures by ICP-RIE Technique on the Lithium Niobate Substrate, **C.M. CHANG**, M.-J. HUANG, J.Y. SU, N.N. CHU, C.N. HSIAO, M.H. SHIAO, ITRC, NARL Taiwan, Republic of China

MS-ThP8 A Cellulose Based Hydrophilic, Oleophobic Hydrated Filter for Water/Oil Separation, **Z. LIU**, L.B. HU, K. ROHRBACH, University of Maryland, College Park

MS-ThP9 Fabrication of Micro ring Resonators for Nonlinear Optics Applications using Silicon Nitride Film Deposited at Room Temperature Overcoming the Stress Limitation, **A.R. RICARDO DO NASCIMENTO JR.**, L.T. TIAGO MANERA, J.A. ALEXANDRE DINIZ, A.R. R. SILVA, M.V. VINICIUS PUYDINGER DOS SANTOS, University of Campinas, Brazil, A.C. CERQUEIRA S. JR., National Institute of Telecommunications, Brazil, L.A. A. M. BAREA, N.C. C. FRATESCHI, University of Campinas, Brazil

Nanometer-scale Science and Technology
Room: Hall D - Session NS-ThP

Nanoscience Division Poster Session

6:00 pm

NS-ThP1 Gallium Nitride Nanoparticle Synthesis using Non-Thermal Plasma with N_2 Gas and Ga Vapors, **J.H. KIM**, Korea Research Institute of Standards and Science, Republic of Korea, K.H. YOU, Korea Advanced Institute of Science and Technology, Republic of Korea, S.J. YOU, D.J. SEONG, Y.H. SHIN, Korea Research Institute of Standards and Science (KRISS), Republic of Korea

NS-ThP2 Plasma Etch Process Simulation for $L1_0$-Phase FePt Magnetic Media Fabrication with Embedded Mask Patterning Method, **J. ZHU**, P. QUARTERMAN, J. WANG, University of Minnesota

NS-ThP3 Imaging and Spectroscopy of Infrared Absorption Enhancement in the Near-Field of Plasmonic Array with the PTIR Technique, **J. CHAE**, B. LAHIRI, G. HOLLAND, A. CENTRONE, National Institute of Standards and Technology

NS-ThP5 A Novel Method for the Formation of Pt Metal Nanoparticle Array on Dimpled Ta using Nanosecond Pulsed Laser Dewetting, **E. OWUSU-ANSAH**, C. HORWOOD, University of Calgary, Canada, H.A. EL-SAYED, Technische Universität, Germany, V. I. BIRSS, Y. SHI, University of Calgary, Canada

NS-ThP6 Nanoparticles Produced by Laser Ablation in Liquid Enviroment, A. HERNÁNDEZ-HERNÁNDEZ, Universidad Autonoma del Estado de Hidalgo, Mexico, L.A. HERNÁNDEZ-HERNÁNDEZ, Instituto Politécnico Nacional, Mexico, **F. DE MOURE-FLORES**, Facultad de Quimica - UAQ, Mexico, J.G. QUIÑONES-GALVÁN, Instituto Nacional de Investigaciones Nucleares, Mexico, M. MELÉNDEZ-LIRA, Cinvestav-IPN, Mexico

NS-ThP7 Dielectrophoretic Manipulation of Nickel Nanowires, **M.V. PUYDINGER DOS SANTOS**, R. MAYER, K.R. PIROTA, F. BERON, S. MOSHKALEV, J.A. DINIZ, University of Campinas, Brazil

NS-ThP9 Electron Tunneling in Weak Coupled Triple Quantum Dots: Sensitivity to Symmetry Violation, **I.N. FILIKHIN**, B. VLAHOVIC, North Carolina Central University

Fundamentals & Biological, Energy and Environmental Applications of Quartz Crystal Microbalance Focus Topic
Room: Hall D - Session QC+AS+BI+MN-ThP

Fundamentals & Biological, Energy and Environmental Applications of Quartz Crystal Microbalance Poster Session

6:00 pm

QC+AS+BI+MN-ThP1 *In Situ* Toxic Nano-Material Sensing Method Using DNA Immobilized Quartz Crystal Microbalance, **K. JANG**, S. LEE, J. YOU, C. PARK, J. PARK, S. NA, Korea University, Republic of Korea

QC+AS+BI+MN-ThP2 Mechanics of Multicontact Interfaces Studied with a QCM, R. KÖNIG, S. HANKE, J. VLACHOVÁ, D. JOHANNSMANN, **A. LANGHOFF**, Clausthal University of Technology, Germany

Scanning Probe Microscopy Focus Topic
Room: Hall D - Session SP+AS+EM+NS+SS-ThP

Scanning Probe Microscopy Poster Session

6:00 pm

SP+AS+EM+NS+SS-ThP1 Artifacts in Scanning Tunneling Microscopy Images of Highly Oriented Pyrolytic Graphite that can be Confused with Carbon Nanotubes, **M. GASSELLER**, J. RITCHIE, E. MCCARTHY, Mercyhurst University

SP+AS+EM+NS+SS-ThP2 Fabrication of Single-Walled Carbon Nanotube Probe and Processing of Single Nanometer Scale Pit with High-Aspect-Ratio of Highly Oriented Pyrolytic Graphite Using by STM, **S. OHSUMIMOTO**, A. MATSUMURO, Aichi Institute of Technology, Japan

SP+AS+EM+NS+SS-ThP3 Probing the Electronic Structure of the Layered Electride Ca_2N, **J. HA**, NIST/Maryland Nano Center, University of Maryland, H. BAEK, NIST & Seoul National University, Republic of Korea, D. ZHANG, NIST/Maryland Nano Center, University of Maryland, Y. KIM, S. KIM, Y.J. SONG, Sungkyunkwan University, Republic of Korea, Y. KUK, Seoul National University, Republic of Korea, J.A. STROSCIO, NIST

SP+AS+EM+NS+SS-ThP5 Improving the Accuracy of Atomic Force Microscopy in Nanometrology for Linewidth Measurements, **J.Y. SU**, N.N. CHU, M.H. SHIAO, C.N. HSIAO, Instrument Technology Research Center, National Applied Research Laboratories, Taiwan, Republic of China

SP+AS+EM+NS+SS-ThP6 A Comparison between a Carbon Nanotube AFM Probe and a Focused Ion Beam Modified Probe Applied to Nanometrology, J.Y. SU, Y.H. LIN, **N.N. CHU**, M.H. SHIAO, C.N. HSIAO, Instrument Technology Research Center, National Applied Research Laboratories, Taiwan, Republic of China

SP+AS+EM+NS+SS-ThP8 The Effect of Electrochemical Potential on Single Molecule Conductance, **E. SANCHEZ**, R. AGUILAR, BUAP, Mexico, S. AFSARI, Temple University, Z. LI, Ball State University, E. BORGUET, Temple University

Thin Film
Room: Hall D - Session TF-ThP

Thin Films Poster Session

6:00 pm

TF-ThP1 Synthesis of Multilayered MgO/Ag/MgO Thin Films in the (001) and (111) Orientations by Pulsed Laser Deposition, **D. VELAZQUEZ**, R. SEIBERT, Z. YUSOF, L. SPENTZOURIS, J. TERRY, Illinois Institute of Technology

TF-ThP2 Development of CNT/Ni Composite Plated Films with Excellent Mechanical Properties, **S. YAMADA**, Aichi Institute of Technology, Japan, H. ITO, Aichi Institute of Technology, A. MATSUMURO, Aichi Institute of Technology, Japan

TF-ThP3 Fabrication of Dispersed C_{60} Molecules/TiN Composite Film Using by Simultaneous Deposition Method with Both Heating Evaporation and Sputtering, **Y. ISHIYAMA**, A. MATSUMURO, Aichi Institute of Technology, Japan

TF-ThP4 Improved Reflectance of M/Si Bilayers for Extreme Ultraviolet Lithography Reflective Mirror, **C.-T. LEE**, D. CHIANG, P.-K. CHIU, H.-P. CHEN, C.N. HSIAO, National Applied Research Laboratories, Taiwan, Republic of China

TF-ThP5 ZnO Self-Assambled Nanoparticles Embedded within a Silicon Oxide Thin Film Produced by Reactive RF Sputtering, A. LARA-SANCHEZ, Universidad Autonoma de Chihuahua, Mexico, A. HERNANDEZ-HERNANDEZ, Universidad Autonoma del Estado de Hidalgo, Mexico, M. ZAPATA-TORRES, CICATA-Legaria del IPN, Mexico, **M.A. MELENDEZ-LIRA**, Cinvestav-IPN, Mexico

TF-ThP6 XPS and STEM Studies on DC Reactive Magnetron Sputtered Al_2O_3 Thin Films, **P. SANKARAN**, PSG College of Technology, India, N. KUMAR, CSIR-CECRI, India, H. SHAIK, G.M. RAO, Indian Institute of Science, India, J. KUMAR, R. BALASUNDARAPRABHU, PSG College of Technology, India

TF-ThP7 Self Assembled InAs Quantum Dots Grown on Si (100) by MBE for Monolithic Integration, **S.KR. JANA**, N.N. HALDER, S.M. DINARA, S. GHOSH, P. MUKHOPADHYAY, A. BAG, M. MAHATA, A. CHAKRAORTY, S. KABI, D. BISWAS, IIT Kharagpur, India

TF-ThP8 Characterization of Fluorine-doped Al_2O_3 Films Deposited by High-Power Impulse Magnetron Sputtering, **B. LIAO**, Instrument Technology Research Center, Taiwan, Republic of China, C.N. HSIAO, ITRC, NARL, Taiwan, Republic of China, C.C. LEE, National Central University, Taiwan, Republic of China

TF-ThP9 Formation of ZnGaON Films Prepared by Two Types of co-Sputtering using ZnO or Zn Target and their Optical Properties, **J. IWATA**, Y. HIRANO, H. SASE, H. KATSUMATA, Meiji University, Japan

TF-ThP10 Fabrication and Characterization of Polystyrene based Janus Particles for Controlled Assembly, **D.M. TOPASNA**, G.A. TOPASNA, Virginia Military Institute

TF-ThP11 Studies of Porosity in Ceramic Titanium Nitride Oxide PVD Coatings, **Z. WANG**, J. CROWSHAW, M. AKKAOUI, Tanury Industries

TF-ThP12 Enhancement of Structural, Optical and Electrical Properties through Post-Annealing of N-doped ZnO Thin Films Grown by Reactive Magnetron RF-Sputtering, **L.A. HERNANDEZ-HERNANDEZ**, Instituto Politécnico Nacional, Mexico, A. HERNANDEZ-HERNANDEZ, Universidad Autonoma del Estado de Hidalgo, Mexico, F. DE MOURE-FLORES, Facultad de Quimica - UAQ, Mexico, J.S. ARIAS-CERON, CINVESTAV-IPN, Mexico, J.G. QUIÑONES-GALVAN, Instituto Nacional de Investigaciones Nucleares, Mexico, J.R. AGUILAR-HERNANDEZ, G.S. CONTRERAS-PUENTE, Instituto Politécnico Nacional, Mexico, M.A. MELENDEZ-LIRA, CINVESTAV-IPN, Mexico

TF-ThP13 Temperature Dependence of the Luminescence Bands of GaN Films Grown by Close Space Sublimation, L.A. HERNANDEZ-HERNANDEZ, **J.R. AGUILAR-HERNANDEZ**, Instituto Politécnico Nacional, Mexico, F. DE MOURE-FLORES, Facultad de Quimica - UAQ, Mexico, R. MENDOZA-PEREZ, Universidad Autonoma de la Ciudad de Mexico, G.S. CONTRERAS-PUENTE, Instituto Politécnico Nacional, Mexico, O. DE MELO, Universidad de la Habana, Cuba, G. SANTANA, UNAM, Mexico, M. LOPEZ-LOPEZ, CINVESTAV-IPN, Mexico

TF-ThP14 Growth and Characterization of Aluminum Oxide for M/I/S Junctions, **Z. BARCIKOWSKI**, University of Maryland, College Park, J. POMEROY, National Institute of Standards and Technology (NIST)

TF-ThP15 Low–Temperature Thin Dielectric Films Obtained by ECR–CVD for Application in Non–Volatile Memories, **D. MATEOS**, J.A. DINIZ, University of Campinas, Brazil, S.N. MESTANZA MUÑOZ, Federal University of ABC, Brazil, N. NEDEV, M.A. CURIEL ALVAREZ, Autonomous University of Baja California, Mexico, M. MEDEROS VIDAL, Federal University of ABC, Brazil, B. VALDEZ, G. MONTERO, Autonomous University of Baja California, Mexico

TF-ThP16 MOCVD Growth of 2-D MgZnO Wurtzite Thin Films for Solar-blind Detector Applications, **J. REYNOLDS**, J.E. ROWE, L. REYNOLDS, D.E. ASPNES, North Carolina State University

TF-ThP17 Investigation of RF-sputtered Tin Sulfide Thin Films with *In Situ* and Post-Deposition Heating for Photovoltaic Applications, R.E. BANAI, **J.J. CORDELL**, J.R. NASR, R.E. URENA, N.J. TANEN, J.R.S. BROWNSON, M.W. HORN, Penn State University

TF-ThP18 A Feature Rich Stencil for Rapid Thin Film Process Development, **C. STANTON**, ElectroMask, Inc.

TF-ThP19 Sputter-Deposited Carbon Fuses in Long-Term Digital Data Storage, **J. BAGLEY**, H. WANG, A. DIWAN, R.C. DAVIS, B. LUNT, M.R. LINFORD, Brigham Young University

TF-ThP20 Low Hydrogen Silicon Nitride Films Deposited by Plasma Enhanced Chemical Vapor Deposition, **E. DOUGLAS**, A. STARBUCK, C. DEROSE, Sandia National Laboratories

TF-ThP21 Enhancing the Water Vapour Barrier Properties of Polymer Substrates with ALD Metal Oxide Films, **KL. JARVIS**, G. GRIFFITHS, Australian Nuclear Science and Technology Organisation (ANSTO), Australia, L. HYDE, Melbourne Centre for Nanofabrication (MCN), Australia, P. EVANS, G. TRIANI, Australian Nuclear Science and Technology Organisation (ANSTO), Australia

TF-ThP22 Sol-Gel Deposited TiO_2 Thin Films for Propane Gas Sensors, **I.A. GARDUÑO-WILCHES**, A. MALDONADO ÁLVAREZ, CINVESTAV-IPN, México, D.R. ACOSTA-NAJARRO, Universidad Nacional Autonoma de México

TF-ThP23 Investigation of Optical Property and Crystalline of the Sliver Mirror in the 35 Krad Co-60 Radiation Environment, **P.-K. CHIU**, D. CHIANG, C.T. LEE, Y.W. LIN, C.N. HSIAO, Instrument Technology Research Center, National Applied Research Laboratories, Taiwan, Republic of China

TF-ThP24 Transition Metals Ion Implantation into AlInN/GaN Thin Films, **A. MAJID**, University of Gujrat, Pakistan, J.J. ZHU, ISCAS, Beijing, China

TF-ThP25 Effect of Mg Doping Concentration on Resistance Switching Behavior of Oxygen Deficient Mg-doped Al_2O_3 Films, **K. LEE**, Y. KIM, T. KIM, H. NA, H. SOHN, Yonsei University, Korea

TF-ThP26 Failure of Semiclassical Models to Describe Resistivity Size Effect in sub 15nm Films., **D.L. YATES**, University of Central Florida, X. LIU, Carnegie Mellon University, D. CHOI, Korea Railroad Research Institute, Republic of Korea, P. SCHELLING, University of Central Florida, K. BARMAK, Columbia University, K.R. COFFEY, University of Central Florida

TF-ThP27 Mechanical Properties and Oxdation Resistance of Co-sputtering Deposited Zr-Y-N Coatings, Z.T. WU, Z.B. QI, Xiamen University, China, D.F. ZHANG, Xiamen University, **Z.C. WANG**, Xiamen University, China

Tribology Focus Topic
Room: Hall D - Session TR-ThP

Tribology Poster Session
6:00 pm

TR-ThP1 AFM Colloidal Probe Study on Asperity-Mediated Adhesion and Topography Alteration of Silica Microspheres Sliding on Mica, Sapphire, SiC and Glass Substrates, **Y. GAN**, Harbin Institute of Technology, China

TR-ThP2 Nanocomposite Hf-B-C Hard Coatings by Low Temperature CVD, **E. MOHIMI**, J.R. ABELSON, T. OZKAN, K. WALSH, S. BABAR, P.J. SEMPSROTT, G.S. GIROLAMI, University of Illinois at Urbana Champaign, A.A. POLYCARPOU, Texas A&M University

TR-ThP3 Stress Analysis of TiSiN and TiAlN Coatings using Scratch Testing and Raman Spectroscopy, **J.S. RESTREPO**, Instituto de Investigaciones en Materiales - UNAM, Mexico, E. CAMPS, Instituto Nacional de Investigaciones Nucleares, Mexico, S. MUHL, Universidad Nacional Autónoma de México

TR-ThP4 The Corrosion-Wear Mechanisms of CoCrMo Alloys Coated with TiAlN/TiAl Multilayer, **M. FLORES**, O. JIMENEZ, E. RODRIGUEZ, Universidad de Guadalajara, Mexico, E. ANDTADE, Universidad Nacional Autonoma de Mexico

TR-ThP5 Improving the Surface Hardness of Plasma Nitrided 316L Stainless Steel, **P. ABRAHA**, S. MIKASHIMA, Meijo University, Japan

FRIDAY SPECIAL EVENTS

8:00 a.m. Tutorial: Atomic Modeling and the Computational Design of New Materials, Surfaces and Interface — 315 (CC)

CC = Baltimore Convention Center
H = Sheraton Inner Harbor

= New Attendee Networking Events

FRIDAY SHORT COURSES

8:30 a.m. Vacuum System Design

LOCATION: All AVS Short Courses will be held at the Sheraton Inner Harbor Hotel (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)

	2D Materials Focus Topic Room: 310 - Session 2D+EM+MS+NS-FrM 2D Materials: Device Physics and Applications **Moderator:** D. Gunlycke, Naval Research Laboratory	Atom Probe Tomography Focus Topic Room: 301 - Session AP+AS+NS+SS-FrM Correlative Surface and Interface Analysis with APT **Moderator:** A. Devaraj, Pacific Northwest National Laboratory
8:20 am	**2D+EM+MS+NS-FrM1 Invited** 1, 2, 3... Ripples, Gaps and Transport in Few-layer Graphene Membranes, **C.N. LAU**, University of California, Riverside	**AP+AS+NS+SS-FrM1 Invited** Correlative Transmission Electron Microscopy and Atom Probe Tomography of Interfaces in CdTe, **D.R. DIERCKS**, J.J. LI, C.A. WOLDEN, B.P. GORMAN, Colorado School of Mines
8:40 am	Invited talk continued.	Invited talk continued.
9:00 am	**2D+EM+MS+NS-FrM3** Photoinduced Doping in Heterostructures of Graphene and Boron Nitride, **J. VELASCO JR.**, L. JU, UC Berkeley, E. HUANG, Stanford University, S. KAHN, C. NOSIGLIA, H.-Z. TSAI, UC Berkeley, W. YANG, Beijing National Laboratory for Condensed Matter Physics, Republic of China, T. TANIGUCHI, K. WANTANABE, National Institute for Materials Science (NIMS), Japan, Y. ZHANG, Fudan University, Republic of China, G. ZHANG, Beijing National Laboratory for Condensed Matter Physics, Republic of China, M.F. CROMMIE, A. ZETTL, F. WANG, UC Berkeley	**AP+AS+NS+SS-FrM3** Atom Probe Compositional Analysis of Nanoscale Precipitates in Nb-Ti Micro-alloyed Steels, **M. KAPOOR**, G.B. THOMPSON, University of Alabama, R.M. O'MALLEY, Nucor Steel
9:20 am	**2D+EM+MS+NS-FrM4** Two-dimensional Resistance Map of Graphene p-n Junction in the Quantum Hall Regime, **N.N. KLIMOV**, S. LE, C.A. RICHTER, National Institute of Standards and Technology (NIST), J. YAN, University of Massachusetts, Amherst, E. COMFORT, J.U. LEE, SUNY-University of Albany, D.B. NEWELL, National Institute of Standards and Technology (NIST)	**AP+AS+NS+SS-FrM4** Nanoscale Imaging of Li and B in Glass Samples, a Comparison of ToF-SIMS, NanoSIMS, and APT, **Z. ZHU**, Z.Y. WANG, J. LIU, J. CRUM, J.V. RYAN, D.K. SCHREIBER, J.J. NEEWAY, Pacific Northwest National Laboratory
9:40 am	**2D+EM+MS+NS-FrM5** Electrical Breakdown and Current Carrying Ability of Multilayer MoS_2 Transistors, **P.X.-L. FENG**, R. YANG, Z. WANG, Case Western Reserve University	**AP+AS+NS+SS-FrM5 Invited** Application of (S)TEM and Related Techniques to Atom Probe Specimens, **W. LEFEBVRE**, D. HERNANDEZ-MALDONADO, F. CUVILLY, F. MOYON, University of Rouen, France
10:00 am	**2D+EM+MS+NS-FrM6** Lithography-free Fabrication of Graphene Devices, **N.F.W. THISSEN**, R.H.J. VERVUURT, Eindhoven University of Technology, Netherlands, J.J.L. MULDERS, FEI Electron Optics, Netherlands, J.W. WEBER, A.J.M. MACKUS, W.M.M. KESSELS, A.A. BOL, Eindhoven University of Technology, Netherlands	Invited talk continued.
10:20 am	**BREAK**	**BREAK**
10:40 am	**2D+EM+MS+NS-FrM8 Invited** Electronic Transport in Transition Metal Dichalcogenides, **J. APPENZELLER**, Purdue University	**AP+AS+NS+SS-FrM8 Invited** APT Analysis of Biological Materials, **D.E. PEREA**, J. LIU, J.A. BARTRAND, N.D. BROWNING, J.E. EVANS, Pacific Northwest National Laboratory
11:00 am	Invited talk continued.	Invited talk continued.
11:20 am	**2D+EM+MS+NS-FrM10** Controlled Synthesis and Fuel Cell Application of Carbon Nanowalls, **H. KONDO**, S. IMAI, K. ISHIKAWA, M. SEKINE, M. HORI, Nagoya University, Japan, M. HIRAMATSU, Meijo University, Japan	
11:40 am	**2D+EM+MS+NS-FrM11** Fabrication of Wearable Graphene and MoS_2 Field Effect Transistors, **Z. RAZAVI HESABI**, M.-Y. TSAI, C.A. JOINER, A. TARASOV, P. CAMPBELL, T. ROY, B. BEATTY, E.M. VOGEL, Georgia Institute of Technology	

	Applied Surface Science **Room: 316 - Session AS+MC+SS-FrM** **Practical Surface Analysis II** **Moderators:** S.J. Pachuta, 3M Company	**Conservation Studies of Heritage Materials Focus Topic** **Room: 313 - Session CS-FrM** **Conservation Studies of Modern Heritage Materials 3** **Moderators:** K.J. Gaskell, University of Maryland, College Park, N. Havercroft, ION-TOF USA, Inc.
8:20 am	**AS+MC+SS-FrM1** Vector Potential Photoelectron Microscopy, **R. BROWNING**, R. Browning Consultants	
8:40 am	**AS+MC+SS-FrM2** Hydrogen and Chemical Quantification of an Organic Coating, **P. MACK**, Thermo Fisher Scientific, UK	
9:00 am	**AS+MC+SS-FrM3** Mechanical Strain Induced Tunable Reflective and Conducting Silver Nanorods Embedded PDMS Film, **P. GOEL***, J.P. SINGH, Indian Institute of Technology, India	**CS-FrM3 Invited** Faces from the Past: Microbeam Imaging and Analysis of Artifacts from ancient Mesoamerica, **T. ROSE**, J.M. WALSH, Smithsonian Institution
9:20 am	**AS+MC+SS-FrM4** Visualization of the Absorption of Chemical Warfare Agents and Associated Simulants in Heterogeneous Paint Coatings, **K.A. COOLEY**, T.P. PEARL, M.J. VARADY, OptiMetrics, Inc., a DCS company, M.P. WILLIS, B.A. MANTOOTH, Edgewood Chemical and Biological Center	Invited talk continued.
9:40 am	**AS+MC+SS-FrM5** Surface Analysis of Electronic Materials, R.L. OPILA, **K.J. JONES**, J. CHURCH, University of Delaware, R. GUPTA, V. PALLEM, B. LEFEVRE, Air Liquide, X. LIN, University of Delaware	**CS-FrM5** Atomic Layer Deposited Diffusion Barriers on Non-ideal Silver and Bronze Cultural Heritage Objects, **A. MARQUARDT**, University of Maryland, College Park, E. BREITUNG, E-Squared Art Conservation, G. GATES, T. DRAYMAN-WEISSER, The Walters Art Museum, G.W. RUBLOFF, R.J. PHANEUF, University of Maryland, College Park
10:00 am	**AS+MC+SS-FrM6** Controlled Contact Angle of Reduced TiO_2 Surfaces, **S. ROSENTHAL**, P.M. MCGUIGGAN, Johns Hopkins University	**CS-FrM6** Studies of the Effects of Cleaning Protocols on Museum-based Plastics using Advanced Surface Analysis Techniques, **A.L. FRICKER**, D.S. MCPHAIL, Imperial College London, UK, B. KENEGHAN, Victoria and Albert Museum, UK
10:20 am	**BREAK**	**BREAK**
10:40 am	**AS+MC+SS-FrM8** Lewis Base Sites on the Nitrogen-Doped Graphite Surfaces Probed by CO_2 Adsorption, **T. KONDO**, R. SHIBUYA, S. MOROHOSHI, D. GUO, J. NAKAMURA, University of Tsukuba, Japan	**CS-FrM8 Invited** Microchemical Characterization of 19th Century Nanotechnology-Daguerreotype Photographs, **E. VICENZI**, Smithsonian Institution
11:00 am	**AS+MC+SS-FrM9** Towards Spin-FETs: Growth and Characterization of Magnetoelectric Chromium Oxide Films on Graphene, **S.C. STUART**, E. SACHET, J.-P. MARIA, J.E. ROWE, D.B. DOUGHERTY, North Carolina State University, M. ULRICH, Army Research Office	Invited talk continued.
11:20 am	**AS+MC+SS-FrM10** Energy Loss Of Highly Charged Ions Implanted In MOS Dielectric Films, **R. SHYAM**, D.D. KULKARNI, D.B. CUTSHALL, J.E. HARRISS, W.R. HARRELL, C.E. SOSOLIK, Clemson University	**CS-FrM10** The Application of Advanced Surface Analysis Techniques to the Study of Museum-Based Problems, **D.S. MCPHAIL**, Imperial College London, UK
11:40 am	**AS+MC+SS-FrM11** Conduction Band-edge(CB) Transport States by X-Ray Absorption Spectroscopy (XAS), **G. LUCOVSKY**, C.C. CHENG, J.L. WHITTEN, North Carolina State University	

* ASSD Student Award Finalist

	Spectroscopic Ellipsometry Focus Topic Room: 304 - Session EL+AS+BI+EM+SS-FrM Application of SE for the Characterization of Organic and Biological Materials **Moderator:** Tino Hofmann, University of Nebraska-Lincoln	Electronic Materials and Processing Room: 311 - Session EM+EN-FrM Nitrides for LED and PV Device Applications **Moderator:** N. Dietz, Georgia State University
8:20 am	**EL+AS+BI+EM+SS-FrM1 Invited** Multimodal Optical and Mass Spectrometric Imaging of Cells and Tissues, **D.W. MOON**, DGIST, Republic of Korea	**EM+EN-FrM1 Invited** Future High Efficiency LEDs with Enhanced Quality of Light, **M. STRASSBURG**, T. SCHIMPKE, M. MANDL, I. STOLL, I. PIETZONKA, H.-J. LUGAUER, OSRAM Opto Semiconductors GmbH, Germany, D. BICHLER, B. HUCKENBECK, OSRAM GmbH, Germany, X. WANG, J. LEDIG, F. STEIB, A. WAAG, TU Braunschweig, Germany, B. GALLER, OSRAM Opto Semiconductors GmbH, Germany
8:40 am	Invited talk continued.	Invited talk continued.
9:00 am	**EL+AS+BI+EM+SS-FrM3** Sum Decomposition of Mueller Matrices from Beetle Cuticles, **H. ARWIN**, R. MAGNUSSON, Linköping University, Sweden, E. GARCIA-CAUREL, A. DE MARTINO, LPICM-CNRS, Ecole Polytechnique, France, K. JÄRRENDAHL, Linköping University, Sweden, R. OSSIKOVSKI, LPICM-CNRS, Ecole Polytechnique, France	**EM+EN-FrM3** The Capricious Effect of Heating on the Surface Photovoltage in Si-doped GaN, **J.D. MCNAMARA**, K.L. PHUMISITHIKUL, A.A. BASKI, M.A. RESHCHIKOV, Virginia Commonwealth University
9:20 am	**EL+AS+BI+EM+SS-FrM4** Polymer- and Ceramic-Supported Hybrid Gas Separation Membranes Characterized by Ellipsometry, **I.A. MERGOS**, H. VERWEIJ, The Ohio State University	**EM+EN-FrM4** Atomic Layer Deposition of III-Nitride Alloys using Hollow-Cathode Plasma Source for Post-CMOS Processing and 3D Integration, C. OZGIT-AKGUN, A. HAIDER, **A.K. OKYAY**, N. BIYIKLI, Bilkent University, Turkey
9:40 am	**EL+AS+BI+EM+SS-FrM5** Spectroscopic Ellipsometry Methodology for Analysis of Thin Films with Significant Surface Non-idealities: Combining Through-the-Substrate and Film-Side Measurements, **J. LI**, University of Toledo, L. MANSFIELD, National Renewable Energy Laboratory, P. PRADHAN, University of Toledo, H. DU, S. GLENN, J. MANN, A. NORMAN, K. RAMANATHAN, National Renewable Energy Laboratory, R.W. COLLINS, University of Toledo, G. TEETER, D. LEVI, National Renewable Energy Laboratory	**EM+EN-FrM5 Invited** Development of Nitride Nanorod Light-emitting Diode Array, C.G. TU, C.H. LIAO, Y.F. YAO, C.Y. SU, H.S. CHEN, W.H. CHEN, C. HSIEH, H.T. CHEN, Y.W. KIANG, **C.-C. YANG**, National Taiwan University, Taiwan, Republic of China
10:00 am	**EL+AS+BI+EM+SS-FrM6** A Classical Model for Depolarization through Incoherent Superposition of Dipoles Driven by Evanescent Fields, **K. HINGERL**, University Linz, Austria	Invited talk continued.
10:20 am	**BREAK**	**BREAK**
10:40 am	**EL+AS+BI+EM+SS-FrM8** The Development Of Highly-Oriented 3D Nanostructures For Use With Ultra-Thin Layer Chromatography And Ellipsometry, **E. PFAUNMILLER**, University of Nebraska Lincoln, D. PEEV, D. SEKORA, University of Nebraska-Lincoln, S. BEERAM, University of Nebraska Lincoln, C. RICE, M. SCHUBERT, T. HOFMANN, D. HAGE, University of Nebraska-Lincoln	**EM+EN-FrM8 Invited** Trends in Production Scale MOCVD Equipment for Nitride Semiconductors, **A. GURARY**, Veeco Instruments, Inc.
11:00 am		Invited talk continued.
11:20 am		**EM+EN-FrM10** Growth of GaN on Sapphire, Si (111), and Ge/Si (111) using a Pulsed Electron Beam Deposition (PED) Process, **N. AREFIN**, University of Oklahoma, M.H. KANE, Texas A&M University, K. HOSSAIN, Amethyst Research Inc, B.N. PRITCHETT, Oklahoma Geological Survey, M.B. JOHNSON, P.J. MCCANN, University of Oklahoma
11:40 am		**EM+EN-FrM11** Growth Template Impact on the Properties of InN Epilayers Grown by High-Pressure CVD, **S. GAMAGE**, M.K.I. SENEVIRATHNA, Georgia State University, H. BABAR, I.T. FERGUSON, University of North Carolina at Charlotte, R. COLLAZO, North Carolina State University, N. DIETZ, Georgia State University

	Electronic Materials and Processing **Room: 314 - Session EM+NS+TF-FrM** **Transparent Electronics** **Moderator:** L.M. Porter, Carnegie Mellon University	**Plasma Science and Technology** **Room: 305 - Session PS1-FrM** **Plasma Sources** **Moderator:** S.A. Vitale, MIT Lincoln Laboratory
8:20 am		**PS1-FrM1 Invited** Small High Density Plasma Sources for Focussed Ion Beam Applications, **R. BOSWELL**, Australian National University, Australia
8:40 am		Invited talk continued.
9:00 am	**EM+NS+TF-FrM3 Invited** Transparent Amorphous Oxide Semiconductors: Interfacial Chemistries and New Applications, **G.S. HERMAN**, Oregon State University	**PS1-FrM3** A Remote Microwave Plasma Source for Reactive Gas Generation, **X. CHEN**, I. POKIDOV, K. WENZEL, C.X. JI, MKS Instruments, Inc.
9:20 am	Invited talk continued.	**PS1-FrM4** Mechanisms for Plasma Density Distribution Control using a Large Diameter Radial Line Slot Antenna Microwave Plasma Source, **T. IWAO**, T. HIRANO, A. SUZUKI, Tokyo Electron Limited, Japan, P. VENTZEK, Tokyo Electron America, K. ISHIBASHI, Tokyo Electron Limited, Japan
9:40 am	**EM+NS+TF-FrM5** HMDSO/O_2-Plasma-Deposited Organic-Inorganic-Hybrid Materials as Gate Dielectrics for MgZnO Thin Film Transistors and Encapsulation Layers for Solar Cells, Y.S. LI, C.H. TSAI, I.C. CHENG, **J.Z. CHEN**, National Taiwan University, Taiwan, Republic of China	**PS1-FrM5** The NEPTUNE Bipolar Source: A New Instrument for Surface Treatment Applications, **D.R. RAFALSKYI**, A. AANESLAND, LPP, CNRS - Ecole Polytechnique, France
10:00 am	**EM+NS+TF-FrM6** Solution Processed Oxide Semiconductor and Dielectric Thin Films: Towards High Performance, Low Temperature ZnO Field-effect Transistors with Low Operation Voltage, **Y. LIU**, H. KATZ, Johns Hopkins University	**PS1-FrM6** Process Optimization by Phase Control in Multi-Frequency Capacitive RF Plasmas, **J. SCHULZE**, E. SCHUENGEL, West Virginia University, A. DERZSI, I. KOROLOV, Z. DONKO, Hungarian Academy of Science, Hungary
10:20 am	**BREAK**	**BREAK**
10:40 am	**EM+NS+TF-FrM8 Invited** Metal Oxide Conductors and Semiconductors: From Materials to Device Applications, **E. FORTUNATO**, R. MARTINS, FCT-UNL and CEMOP-UNINOVA, Portugal	**PS1-FrM8** Controlling the Flux of Reactive Species in Electron Beam Generated Plasmas, **S.G. WALTON**, D.R. BORIS, E.H. LOCK, S.C. HERNANDEZ, TZ.B. PETROVA, G.M. PETROV, Naval Research Laboratory
11:00 am	Invited talk continued.	**PS1-FrM9** Ignition Delay in Electronegative Pulsed Dual Source Tandem Plasmas, **S. SRIDHAR**, L. LIU, D.J. ECONOMOU, V.M. DONNELLY, University of Houston
11:20 am	**EM+NS+TF-FrM10** Influence of Oxygen Diffusion in Transparent $In_{0.9}Sn_{0.1}O_x$ Film on Effective Work Function Change, **T. NABATAME**, NIMS, Japan, H. YAMADA, Shibaura Institute of Technology, Japan, A. OHI, NIMS, Japan, T. OISHI, Shibaura Institute of Technology, Japan, T. CHIKYO, NIMS, Japan	**PS1-FrM10** A Global Model for Ignition Delay of Pulsed Electronegative Plasmas, **L. LIU**, S. SRIDHAR, D.J. ECONOMOU, V.M. DONNELLY, University of Houston
11:40 am	**EM+NS+TF-FrM11** Transparent Conducting Films from Ultraporous Aerogels of Single-Walled Carbon Nanotubes / PEDOT:PSS Composites, **X. LIU**, L.M. PORTER, M.F. ISLAM, Carnegie Mellon University	**PS1-FrM11** Ion Energy Distribution Control Using Phase Locked Harmonic Drive, A. ZAFAR, North Carolina State University, Y. ZHANG, University of Michigan, T. KUMMERER, North Carolina State University, D.H. CLARK, Plasmatherm Inc., M.J. KUSHNER, University of Michigan, D. COUMOU, MKS Instruments, **S. SHANNON**, North Carolina State University

	Plasma Science and Technology **Room: 308 - Session PS2-FrM** **Plasma Surface Interactions II** **Moderator:** R. Martin, IBM T.J. Watson Research Center	**Scanning Probe Microscopy Focus Topic** **Room: 312 - Session SP+AS+BI+EM+NS+SE+SS-FrM** **Probe-Sample Interactions and Emerging Instrument Formats** **Moderators:** S. Allen, The University of Nottingham, UK, C.A. Ventrice, Jr., University at Albany-SUNY
8:20 am	**PS2-FrM1** Enhancement of Surface Migration by Photoemission-assisted Plasma for Atomic-Scale Surface Smoothing, **A. SAIJIAN**, Y. KOTANIKAWA, Y. OHTOMO, S. OGAWA, Y. TAKAKUWA, Tohoku University, Japan	
8:40 am	**PS2-FrM2** Silicon Etching using CW, Synchronized Pulsed and Bias Pulsed Cl_2 Plasma, **O. MOUREY**, G. CUNGE, C. PETIT-ETIENNE, M. DARNON, P.D. BRICHON, E. DESPIAU-PUJO, E. LATU-ROMAIN, O. JOUBERT, LTM - MINATEC - CEA/LETI, France	**SP+AS+BI+EM+NS+SE+SS-FrM2** 2013 ASSD Student Award Talk: New Insights into Nanoscale Adhesion from *In Situ* TEM Studies, **T.D.B. JACOBS**, J.A. LEFEVER, University of Pennsylvania, J. LIU, University of Wisconsin-Madison, D.S. GRIERSON, SysteMECH LLC, K.E. RYAN, P.L. KEATING, J.A. HARRISON, United States Naval Academy, K.T. TURNER, R.W. CARPICK, University of Pennsylvania
9:00 am	**PS2-FrM3** Utilizing Absorption, Emission, and Fluorescence Spectroscopies to Elucidate the Energetics of Plasma-Surface Interactions, J.M. BLECHLE, R.B. DAVIDSON, E.J. SUTOR, **E.R. FISHER**, Colorado State University	**SP+AS+BI+EM+NS+SE+SS-FrM3 Invited** Development and Applications of SPM inside TEM, **X.D. BAI**, Chinese Academy of Sciences, China
9:20 am	**PS2-FrM4** Transmission of Plasma-Generated Free Radicals through Dielectric Films, **F.A. CHOUDHURY**, G. SABAT, University of Wisconsin-Madison, Y. NISHI, Stanford University, J.L. SHOHET, University of Wisconsin-Madison	Invited talk continued.
9:40 am	**PS2-FrM5 Invited** Gas-Phase Chemistry and Plasma Surface Interactions, **M.J. GOECKNER**, University of Texas at Dallas	**SP+AS+BI+EM+NS+SE+SS-FrM5** Nanoscale Mapping of the W/Si(001) Schottky Barrier using Ballistic Electron Emission Microscopy, **C. DURCAN**, University of Albany-SUNY, V.P. LABELLA, University at Albany-SUNY
10:00 am	Invited talk continued.	**SP+AS+BI+EM+NS+SE+SS-FrM6** Local Probing of Superconductivity in Half Heusler Compounds, **H. BAEK**, NIST & Seoul National University, Republic of Korea, J. HA, D. ZHANG, NIST/Maryland Nano Center, University of Maryland, Y. NAKAJIMA, P.S. SYERS, X. WANG, K. WANG, J. PAGLIONE, University of Maryland, Y. KUK, Seoul National University, Republic of Korea, J.A. STROSCIO, NIST
10:20 am	**BREAK**	**BREAK**
10:40 am	**PS2-FrM8** Plasma Induced Roughness Formation on Photoresist Examined by HBr Plasma-Beam Etching, Y. ZHANG, **M. SEKINE**, K. ISHIKAWA, K. TAKEDA, H. KONDO, M. HORI, Nagoya University, Japan	**SP+AS+BI+EM+NS+SE+SS-FrM8 Invited** Going Slow and Going Fast: Near-Equilibrium Force Spectroscopy and High-Speed AFM Imaging of Biomolecular Assembly, **A. NOY**, Lawrence Livermore National Laboratory
11:00 am	**PS2-FrM9** Novel Gases for Obtaining High Etch Selectivity of Oxide to Nitride for Contact Etch, **V. SURLA**, L. DANIEL, R. GUPTA, V. PALLEM, Air Liquide	Invited talk continued.
11:20 am	**PS2-FrM10** Dielectric Barrier Discharges: Statistical Analysis of Discrete Filaments and Multi-filament Dynamics, **F.J.J. PEETERS**, R.F. RUMPHORST, Eindhoven University of Technology, Netherlands, M.C.M. VAN DE SANDEN, FOM institute DIFFER, Netherlands	**SP+AS+BI+EM+NS+SE+SS-FrM10** Multimodal Intermittent Contact Atomic Force Microscopy: Topographical Imaging, Compositional Mapping, Subsurface Visualization and Beyond, **S.D. SOLARES**, George Washington University
11:40 am	**PS2-FrM11** Single Step Conversion of Metal/Polymer Films to Flexible, Electrically Conductive Patterns by a Scanning Atmospheric-Pressure Microplasma Process, **S. GHOSH**, R. YANG, A.C. BARNES, S. ROWAN, C.A. ZORMAN, P.X.-L. FENG, R.M. SANKARAN, Case Western Reserve University	

	Surface Science **Room: 309 - Session SS+EM-FrM** **Semiconductor Surfaces and Interfaces 2** **Moderators:** R.A. Bartynski, Rutgers, the State University of New Jersey, K.W. Kolasinski, West Chester University	**Thin Film** **Room: 307 - Session TF+AS-FrM** **Thin Film Characterization** **Moderator:** M.R. Davidson, University of Florida
8:20 am	**SS+EM-FrM1** Two Dimensional Supramolecular Ordering of Oligothiophene Molecules on the Si(111) √3×√3-Ag Surface, R. LIU, Lakehead University, Canada, C. FU, D.F. PEREPICHKA, McGill University, Canada, **M.C. GALLAGHER**, Lakehead University, Canada	**TF+AS-FrM1** Stability of Platinum Silicide Thin Films above 1000°C, **R.T. FRYER**, R.W. MEULENBERG, G.P. BERNHARDT, R.J. LAD, University of Maine
8:40 am	**SS+EM-FrM2** Interface Formation between a Self-Assembled Monolayer and an Organic Semiconductor, **S.J. POOKPANRATANA**, H.-J. JANG, A.N. BRIGEMAN, J.I. BASHAM, O.A. KIRILLOV, D.J. GUNDLACH, National Institute of Standards and Technology (NIST), O.D. JURCHESCU, Wake Forest University, C.A. RICHTER, C.A. HACKER, NIST	**TF+AS-FrM2** Bulge Testing for Mechanical Characterization of sp^2/sp^3 Carbon Thin Films, **J. ROWLEY**, R.C. DAVIS, R.R. VANFLEET, N. BOYER, Brigham Young University, S. LIDDIARD, M. HARKER, Moxtek, Inc, L. PEI, Brigham Young University
9:00 am	**SS+EM-FrM3** Reactions of Benzoquinone with Hydrogen Terminated Silicon Surfaces, R.L. OPILA, **M. CHEN**, N.A. KOTULAK, N.J. SCHREIBER, University of Delaware	**TF+AS-FrM3** Time Dependent Dielectric Breakdown Measurements of Porous Organosilicate Glass using Mercury and Solid Metal Probes, **D. PEI**, University of Wisconsin-Madison, M.T. NICHOLS, Applied Materials, S.W. KING, J.M. CLARKE, Intel Corporation, Y. NISHI, Stanford University, J.L. SHOHET, University of Wisconsin-Madison
9:20 am	**SS+EM-FrM4** High-Quality Monolayers Derived from Short Alkyne Chains on Si(111) Surfaces, **S. PUJARI**, A. FILIPPOV, S. GANGARAPU, H. ZUILHOF, Wageningen University, Netherlands	**TF+AS-FrM4** The Equivalent Width as a Figure of Merit for XPS Narrow Scans, **M.R. LINFORD**, B. SINGH, Brigham Young University, J. TERRY, Illinois Institute of Technology
9:40 am	**SS+EM-FrM5** Surface Modification of Antimonide-Based Compound Semiconductor Superlattices using ALD, **E. CLEVELAND**, J. NOLDE, C. CANEDY, E. AIFER, Naval Research Laboratory	**TF+AS-FrM5 Invited** Characterization of Epitaxial Oxides for Electronics, Magnetics, and Photoactivity, **T.C. KASPAR**, Pacific Northwest National Laboratory
10:00 am	**SS+EM-FrM6** Mechanism Changes Caused by Metal Catalyst During Silicon Etching in V_2O_5 + HF Solutions, **K.W. KOLASINSKI**, W.B. BARCLAY, West Chester University	Invited talk continued.
10:20 am	**BREAK**	**BREAK**
10:40 am	**SS+EM-FrM8** Selective Wet Etching of III-V Semiconductors with HCl, H_2O_2, and α-Hydroxy Acid Mixtures, **P.L. MANCHENO-POSSO**, R. JAIN, A.J. MUSCAT, University of Arizona	**TF+AS-FrM8** Low Energy Ion Scattering Data Analysis for Ultra Thin Films using TRBS, **T. GREHL**, P. BRÜNER, ION-TOF GmbH, Germany, B. DETLEFS, E. NOLOT, H. GRAMPEIX, CEA-LETI, France, E. STEINBAUER, P. BAUER, Johannes Kepler University, Austria, H.H. BRONGERSMA, ION-TOF GmbH, Germany
11:00 am	**SS+EM-FrM9** Modeling of Contact Resistance with Dissimilar Materials, **P. ZHANG**, Y.Y. LAU, R. GILGENBACH, University of Michigan	**TF+AS-FrM9** Polarization-dependent X-ray Absorption Fine Structure Analysis of TES Pentacene Thin Films, **B. POLLAKOWSKI**, Physikalisch-Technische Bundesanstalt (PTB), Germany, J. WADE, JS. KIM, Imperial College London, UK, F.A. CASTRO, National Physical Laboratory (NPL), UK, J. LUBECK, R. UNTERUMSBERGER, Physikalisch-Technische Bundesanstalt (PTB), Germany, A. ZOLADEK-LEMANCZYK, National Physical Laboratory, UK, B. BECKHOFF, Physikalisch-Technische Bundesanstalt (PTB), Germany
11:20 am	**SS+EM-FrM10** Enhanced Ruthenium Bondpad through Damascene Metallization Process, **B. ZINN**, Texas Instruments	**TF+AS-FrM10** Surface Induced Phases in Organic Thin Films: Methods of Crystal Structure Solutions, **R. RESEL**, C. RÖTHEL, A. PICHLER, Graz University of Technology, Austria, I. SALZMANN, Humboldt University, Germany, R.G. DELLAVALLE, O. ROSCONI, University Bologna, Italy, T. DINGEMAN, Delft University of Technology, Netherlands, C. SIMBRUNNER, University Linz, Austria
11:40 am	**SS+EM-FrM11** Lanthanum Quantification for Optimization of Advanced High-k/Metal Gate Stacks using Low Energy Electron X-ray Emission Spectrometry, E. MARTINEZ, CEA, LETI, MINATEC Campus, France, C. TROUILLER, STMicroelectronics, France, M.P. MORET, N. MOREL, CAMECA, France, **A. DAVIS**, CAMECA Instruments Inc, P. CAUBET, STMicroelectronics, France, F. BERTIN, CEA, LETI, MINATEC Campus, France	

Tribology Focus Topic
Room: 303 - Session TR-FrM

Applications of Novel Materials In Tribology
Moderator: B.L. Mooney, United States Naval Academy

8:20 am	**TR-FrM1 Invited** Direct Adhesion between Stiff Materials: Characterization and Applications in Nanomanufacturing, **K.T. TURNER**, University of Pennsylvania	
8:40 am	Invited talk continued.	
9:00 am	**TR-FrM3** Compound, Nanometric Cushion for Enhancing Tribological Characteristics of Hard Films, K. GOTLIB-VAINSHTEIN, O. GIRSHEVITZ, C.N. SUKENIK, Bar Ilan University, Israel, D. BARLAM, Ben Gurion University, Israel, **S.R. COHEN**, Weizmann Institute of Science, Israel	
9:20 am	**TR-FrM4** Friction Effects by Surface Roughness and Sliding Speeds at Oil Lubricating Conditions, **G. WANG**, X. NIE, University of Windsor, Canada, J. TJONG, Ford Motor Company, Canada	
9:40 am	**TR-FrM5** Basal Plane Surface Functionalization of Graphene Nanoplatelets, **J.D. SCHALL**, Oakland University	
10:00 am	**TR-FrM6** Nanoscale Wear of Patterned PMMA Structures, **Y. JIANG**, Z.B. MILNE, University of Pennsylvania, M. FALLET, J.A. HARRISON, United States Naval Academy, R.W. CARPICK, K.T. TURNER, University of Pennsylvania	
10:20 am	**BREAK**	
10:40 am	**TR-FrM8 Invited** Improving Automotive Engine Efficiency through Tribological Testing, **P.M. LEE**, Southwest Research Institute	
11:00 am	Invited talk continued.	
11:20 am	**TR-FrM10** *In Situ* Study of Growth Mechanisms and Kinetics of ZDDP Antiwear Tribofilms in Nanoscale Single-Asperity Contacts, **N.N. GOSVAMI**, University of Pennsylvania, J.A. BARES, BorgWarner Powertrain Technical Center, F. MANGOLINI, University of Pennsylvania, A.R. KONICEK, A.M. SCHILOWITZ, D.G. YABLON, ExxonMobil Research and Engineering, R.W. CARPICK, University of Pennsylvania	
11:40 am		

Anticipated Schedule
Friday Morning, November 14, 2014

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
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TIME	SESSION	ROOM
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Feldman, L.C.: HI+2D+AS+BI+MC-ThM13, 165
Felmy, A.: AP+AS+EN+NS+SS-ThA4, 172
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Fleurial, J.P.: EN+AS+EM+SE-TuM13, 110
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Petrosky, J.: AC+AS+MI+SA+SS-MoM11, 90
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Petrov, I.G.: TF+PS+SE-MoM4, 96
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Pfadler, T.: EM2-ThA8, 174; EN+EM+MN+NS+TR-MoA10, 100
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Pham, C.: TF+PS-TuM5, **115**
Phaneuf, R.J.: CS-FrM5, 191; SS-TuP23, 134
Phelps, R.: MC+2D+AP+AS-MoA11, 101
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Placencia, D.: EM-MoA10, **100**; EM-TuP20, 130
Plank, H.: NS+HI-TuM10, 112; TF+PS-TuM6, 115
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Podraza, N.J.: EL+AS+EM+EN+SS-ThM1, **163**; EL+AS+EM+EN+SS-ThM11, 163; EL+AS+EM+EN+SS-ThM4, 163; EL+AS+EM+EN+SS-ThM5, 163; EL-ThP5, 183
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Poirier, D.: AS+MC+SS-TuA1, 119
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Polat, E.O.: 2D+EM+MI+MN+NS+SS+TF-ThA11, 172
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Pouch, S.: SP+AS+BI+NS+SS-ThA4, 178
Poulose, J.: PS-TuP10, **132**
Pouyet, E.: CS-ThA6, 173
Povey, I.M.: EM+2D-TuA8, 120
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Qin, X.: EM+2D-TuA7, **120**; SD-WeA11, 156
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Rahman, T.S.: 2D+AS+BI+PS+SS-TuM3, 108; 2D+AS+EM+MI+MN+NS+TF-WeA3, 150; 2D+AS+HI+NS+SS-ThM6, 162; 2D+EM+MI+MN+NS+SS+TF-ThA8, 172; MG-WeM5, 142
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Reese, M.O.: EN+AS+EM+SE-WeM10, 140
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Reidy, R.: NS+HI-TuM11, 112
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Reinke, P.: SS+AS+NS-ThA7, 178
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Robinson, Z.R.: 2D+AS+HI+MC+NS+PS+SP+SS-TuA10, 119; 2D+EM+NS+PS+SS+TF-MoM3, 90; 2D-ThP10, 181; EM1-WeM5, 139; TF+PS-TuM3, 115
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Rogero, C.: MS+PS+TF-ThA1, 175
Rogers, J.A.: BI+AS+MN+NS-TuM10, **109**
Rohrbach, K.: MS-ThP8, 185
Rohrer, G.S.: MC+AP+AS-MoM6, 92
Rojas, O.: MS+PS+TF-ThA6, **175**
Rojo, T.: 2D+AS+BI+PS+SS-TuM12, 108; TF+AS+EM-TuA8, 126
Roke, S.: BI+AS-WeM10, **139**; BI+AS-WeM12, 139
Roldan Cuenya, B.: NS+AS-WeA4, 155; NS-WeM5, 143
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Rosenberg, R.A.: BI+AS-TuA1, **120**
Rosenthal, S.: AS+MC+SS-FrM6, **191**
Rosowski, F.: IS+AS+MC+SS-TuM1, 111
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Ross, P.N.R.: IS+2D+MC+NS+SP+SS-WeA10, 153
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Roy, S.: BI+AS-WeM3, 139
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Roy, T.: 2D+EM+MS+NS-FrM11, 190
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Ruiz, S.: VT-MoM5, 97
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Rumbach, P.: PS+SE-ThA3, **176**
Rumphorst, R.F.: PS2-FrM10, 194
Rupich, S.: EN+EM+MN+NS+TR-MoA3, 100
Russell, T.P.: NS+HI-TuM1, 112
Rusz, J.: AC+AS+MI+SA+SS-MoM5, **90**
Rutigliani, V.: EM-TuM6, 110
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Ryzhkov, M.V.: AC+AS+MI+SA+SS-MoA6, 98
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Sadana, D.K.: MC+2D+AP+AS-MoA1, 101
Saddow, S.: TF+PS+SE-MoM5, 96
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Saini, K.K.: EL+AS+EM+MC+SS-ThA8, **173**; EN+EM+MN+NS+TR-MoA4, 100; SS+EN-MoM11, 96
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Sando, S.: NS+HI-TuM11, 112
Sandoval, T.: SS+AS+NS-ThA10, **178**
Sanghera, J.S.: VT-MoA10, 105
Sangiovanni, D.G.: TF+PS+SE-MoM4, 96
Sangwan, V.K.: 2D+AS+HI+NS+SS-ThM4, 162
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EXHIBIT PROGRAM

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Sponsors • Corporate Members • Advertisements and Promotions • Free Attractions

EXHIBIT HALL EVENTS

EXHIBIT HALL SCHEDULE

Nov. 11	Tuesday	10am - 5:00pm
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- Raffle Drawings
- AVS Store: Gifts/Souvenirs
- Ask The Experts - Vacuum Technology
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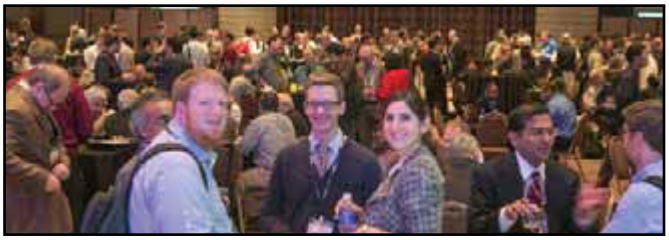
- Caricatures & Massages
- AVS History Display

Special Events & Attractions

WELCOME MIXER - Monday 5:30pm - 7:30pm
Convention Center Ballroom III



Monday, November 10 5:30 - 7:30
FUN and NETWORKING at its best!
The Welcome Mixer offers food, refreshments, music and the opportunity to casually interface with fellow AVS attendees and exhibitors from around the world. Everyone is welcome at the Mixer!

ASK THE EXPERTS BOOTH **BOOTH 823**

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:
Duniway Stockroom,
SAES Getters & MKS Instruments

CAREER CENTER **BOOTH 1121**

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

AVS STORE, MEMBERSHIP & EDUCATION CENTER **BOOTH 1720**

- Videos
- Books
- Monographs
- Membership Services
- AVS Logo Items

4th Annual Foosball Tournament

Join the competition in Booth 1501. Sign up begins at the Welcome Mixer Monday evening in Ballroom III - Convention Center or sign up during exhibit hours in booth 1501.

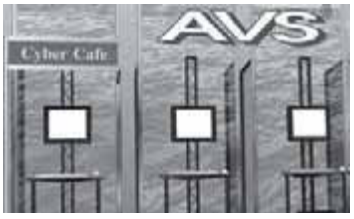
1st Place Takes Home the Grand Prize !!

Hosted and Sponsored by:
Gamma Vacuum

Double Down BlackJack Tournament

Sign up at the Welcome Mixer Monday evening or in **Booth 1711** 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 !

E-MAIL PAVILION **BOOTH 234**



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 119

Visit the Special Events booth for your FREE AVS-61 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 Shimadzu Scientific Booth 201 who generously sponsored this event.**

MASSAGE THERAPISTS — BOOTH 1615

Free Chair Massages! Unwind and enjoy some relaxation. You will find your ticket in your registration kit. **Generously Sponsored by Super Conductor Materials. Tickets must be validated at Booth 413.**

AVS HISTORY DISPLAY — BOOTH 1707

Celebrate the history of AVS with a step back in time. Six decades of history will be on display.

AVS PHOTO BOOTH LOCATED IN THE SPECIAL EVENTS BOOTH 1615

Bring your friends to the exhibit hall for your free AVS-61 Souvenir.

Generously sponsored by Zeon Chemicals. Stop by Zeon's booth #1307 to show your appreciation!

EXHIBITOR TECHNOLOGY SPOTLIGHT SESSIONS — BOOTH 716

Keep up to date with the latest technology! Exhibitors showcase new products, services and applications during brief 20 minute presentations. Sessions are scheduled during the technical session breaks. **Be one of the first to arrive and receive an AVS-61 souvenir!**

COMPANY NAME	TIME
TUESDAY MORNING	
Brooks Automation	10:20
Bruker Corporation	10:40
TUESDAY LUNCHTIME	
Thermo Scientific	12:40
PHYSICAL ELECTRONICS	1:00
KRATOS	1:20
Bruker	1:40
TUESDAY AFTERNOON	
Asylum	4:00
WEDNESDAY MORNING	
Dupont™ Kalrez® and Vespel®	10:20
SPI Supplies	10:40
WEDNESDAY LUNCHTIME	
STAIB	12:40
CS Clean Systems, Inc.	1:00
Nanonics	1:20
Prevac sp. z o. o.	1:40
WEDNESDAY AFTERNOON	
FOCUS GmbH	4:00
THURSDAY MORNING	
INFICON	10:20
Thermo - Raman	10:40

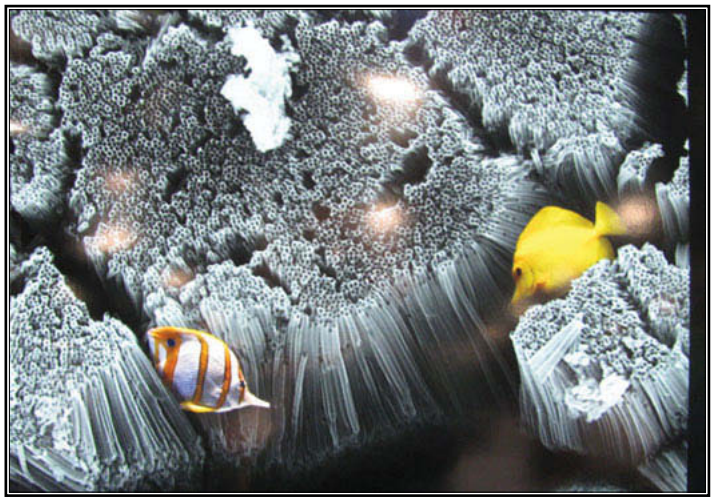
Special Events & Attractions

ART ZONE / CONTEST — BOOTH 1116

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.

First Place: $500
Second: $250
Third: $100

Generously Sponsored by R.D. Mathis



RAFFLE ZONE — BOOTH 1709

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...**

RAFFLE SPONSORS

- Advanced Energy Industries, Inc.
- Scientific Instrument Services
- LAM Research
- Oxford Instruments
- PHPK Technologies
- Plasma-Therm
- Precision Plus Vacuum Parts
- Vacuum Research Corp.
- RBD Instruments
- RD Mathis
- RF VII, Inc.
- ION-TOF USA
- Bruker Corporation
- Semicore
- UC Components
- Kurt J. Lesker

GRAND PRIZE VALUED AT $2000 WILL BE AWARDED ON THURSDAY DURING THE EXHIBIT FINALE

Sponsored by:

Kurt J. Lesker® Company

Sponsors & Corporate Members

AVS wishes to thank the following companies for their generous support

AVS-61 SPONSORS

AIP Journal of Applied Physics
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Elettra-Sincrotrone Trieste
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Gamma Vacuum
GE
ION-TOF USA
J.A. Woollam Company, Inc.
Kyma
Kratos Analytical
Kurt J. Lesker Company
Lam Research Corporation
Los Alamos National Laboratory
MKS Instruments
Oxford Instruments
PHPK Technologies
Physical Electronics
Plasma-Therm
Precision Plus Vacuum Parts
RBD Instruments, Inc.
R.D. Mathis Company
RF VII Inc.
RHK Technology, Inc.
SAES Getters USA
Scientific Instrument Services, Inc.
Semicore Equipment, Inc.
Shimadzu Scientific Instruments
SPECS Surface Nano Analysis, Inc.
Super Conductor Materials
UC Components
Varian/Agilent
Vacuum Research Corp.
Zeon Chemicals L.P.

2014 CORPORATE MEMBERS

Advanced Energy Industries Inc.
AJA International, Inc.
Altair Technologies, Inc.
BellowsTech, LLC
Bruker Nano Surfaces
Capitol Vacuum Parts
CeramTec North America
Denton Vacuum LLC
Duniway Stockroom Corp
EP Laboratories, Inc.
Evans Analytical Group
FMG Enterprises, Inc.
Gamma Vacuum
Helium Leak Testing, Inc.
Innovative Vacuum Solutions, Inc.
INTELLIVATION LLC
ION-TOF USA Inc.
J.B. Anderson & Son, Inc..
Kratos Analytical
Kurt J. Lesker Company
Lam Research Corporation
MKS Instruments Inc
Nordiko Technical Services Limited
Pfeiffer Vacuum Technology
Physical Electronics
Plasmaterials Inc
Precision Plus Vacuum Parts
Process Materials Inc
R.D. Mathis Company
RBD Instruments, Inc.
RF VII Inc.
RHK Technology Inc.
SAES Getters USA, Inc.
SPECS Surface Nano Analysis GmbH
SPI Supplies
Staib Instruments, Inc.
Super Conductor Materials Inc
Ted Pella, Inc.
Thermo Fisher Scientific
UC Components Inc
Vacuum Research Corp.
Vacuum Technology & Coating
VAT Inc
VG Scienta, Inc.
XEI Scientific, Inc.

Exhibitor Quick Reference Guide

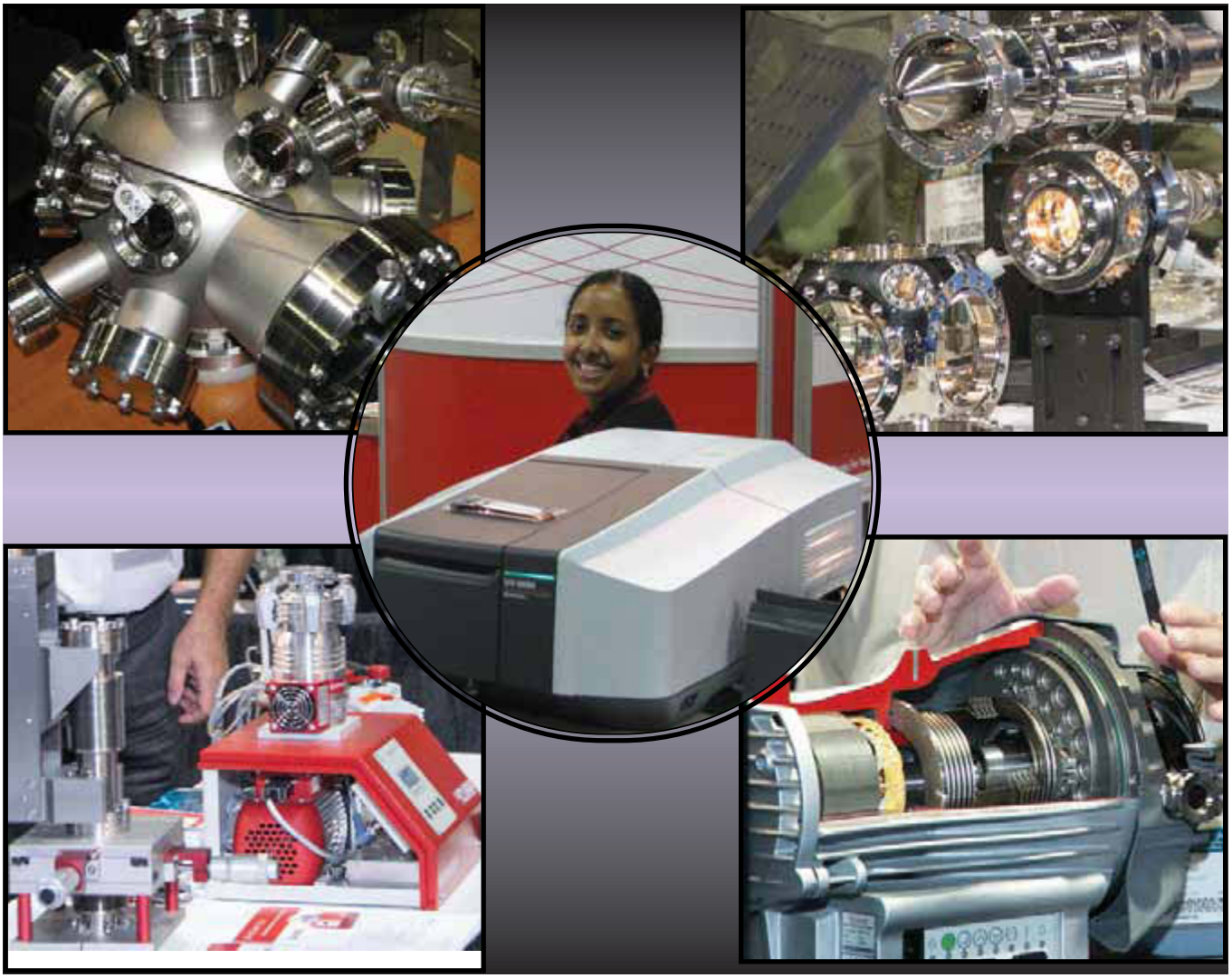
Booth	Company
319	A&N Corporation
518	Accurion Inc.
1311	Agilent Technologies, Vacuum Products Division
1325	AIP Publishing
202	AJA International, Inc.
1327	American Institute of Physics - Physics Today Survey Booth
1516	Angstrom Sun Technologies Inc.
519	Applied Surface Technologies
1317	Applied Vacuum Technology, Inc.
307	Asylum Research an Oxford Instruments Company
1606	Atlas Technologies
823	AVS Ask the Experts Vacuum Technology Division
1116	AVS Art Zone & Contest
1715	AVS BlackJack Tournament
1121	AVS Career Center
1719	AVS Chapters
234	AVS E-Mail Pavilion
716	AVS Technology Spotlight Sessions
1501	AVS Foosball Tournament
1717	AVS Future Sites
1707	AVS History Booth
1621	AVS Publications
1709	AVS RAFFLE ZONE
119	AVS Special Events Booth 1
1615	AVS Special Events Booth 2
1720	AVS Store & Membership
1500	BellowsTech, LLC
108	Blue Wave Semiconductors, Inc.
507	Brooks Automation
1313	Bruker Nano Surfaces Division
1515	CAMECA Instruments, Inc.
1605	Capitol Vacuum
208	Capovani Brothers Inc.
316	CeramTec North America
213	COSMOTEC, Inc.
1416	CRC Press Taylor & Francis
521	CS Clean Systems, Inc.
506	Duniway Stockroom Corp.
510	Dupont™ Kalrez® and Vespel®
415	Eagle Instrument Services
1412	Ebara Technologies
1501	Edwards Vacuum
1410	Elsevier BV
1612	Ensure Scientific Group
1413	Extrel CMS
1425	Film Sense
1421	FOCUS GmbH
1509	Friatec N.A. LLC
1501	Gamma Vacuum
1510	Geowell Vacuum Co., Ltd.
411	Glas-Col, LLC
1506	Hanbell Vacuum Technology Co., Ltd.
211	HeatWave Labs Inc.
311	Hiden Analytical, Inc.
1701	Hine Automation
107	HIS Vacuum Components
1427	Hitachi High Technologies America, Inc.
317	Horiba Scientific
517	Huntington Mechanical Labs
1610	HVA, LLC
1502	Impedans Ltd.
1406	INFICON
1403	Inland Vacuum Industries, Inc.
1407	Insplorion AB
420	InstruTech, Inc.
1119	Intel Corporation
1418	Intercovamex S.A. de C.V.
511	Intlvac Thin Films
407	ION-TOF USA
1411	IOP Publishing, Inc.
221	J.A. Woollam Co., Inc.
1419	J.B. Anderson & Son, Inc.
418	Kashiyama-USA Inc.
1611	KDF
1507	Kimball Physics Inc.
401	Kratos Analytical
301	Kurt J. Lesker Company
1607	Labtec Sales Partners LLC
1513	Lehighton Electronics Inc.
102	Linde Electronics and Specialty Gases
1522	Maney Publishing
513	Mantis Deposition, Inc.
1405	Mass-Vac, Inc.
101	McAllister Technical Services
320	McVac Manufacturing
106	MDC Vacuum Products, LLC
1603	Meaglow Ltd.
614	MKS Instruments
1409	Nanonics Imaging Ltd
1520	nanoRANCH/Micromatter
1705	National Nanotechnology Infrastructure Network (NNIN)
1524	Neocera, LLC
103	NIST/CNST
1426	NIST/ORM
1401	Nonsequitur Technologies
207	Nor-Cal Products, Inc.
1703	Oerlikon Leybold Vacuum USA, Inc.
1609	Omley Industries, Inc.
1508	Oregon Physics LLC
1616	Osaka Vacuum USA, Inc.
306	Oxford Instruments
206	Pfeiffer Vacuum Technology, Inc.
1601	PHPK Technologies
201	Physical Electronics
709	Physics Today Exhibitor Lounge
512	Phytron, Inc.
1518	Plasma Sensors
200	Plasmaterials, Inc.
416	Precision Ceramics USA, Inc.
1402	Precision Plus Vacuum Parts
310	Prevac sp. z o.o.
610	R.D. Mathis Company
312	RBD Instruments, Inc.
1319	Renishaw, Inc.
700	RF VII Inc.
1521	RHK Technology Inc.
514	Rocky Mountain Vacuum Tech., Inc.
1512	SAES Getters USA
417	Scientific Instrument Services, Inc.
516	Scientific Instruments, Inc.
104	Semiconsoft, Inc.
520	Semicore Equipment, Inc.
401	Shimadzu Precision Instruments
401	Shimadzu Scientific Instruments
515	Solid Sealing Technology, Inc.
618	SPECS Surface Nano Analysis, Inc.
410	SPI Supplies
406	Springer (New York)
421	Staib Instruments
1526	Strem Chemicals, Inc.
413	Super Conductor Materials
109	Synergy Systems Corporation
219	T&C Power Conversion, Inc.
1321	Telemark
1614	TGM Inc.
1301	Thermo Scientific
1608	TMPI Precision Cleaning Services
1423	Torreyvac Inc.
209	Transfer Engineering & Mfg, Inc.
214	UC Components
301	UHV Design Ltd.
217	Ultratech/Cambridge NanoTech
210	Vacuubrand, Inc.
606	Vacuum Research Corp.
110	Vacuum Technology & Coating - Cowan & Company LLC
1420	Vacuum Technology, Inc.
1417	Vergason Technology, Inc.
318	VG Scienta
1702	VG Scienta Ltd.
212	XEI Scientific
1404	Yugyokuen Ceramics Co., Ltd.
1307	Zeon Chemicals L.P.
1511	Zhejiang Value Mechanical & Electrical Products Co., Ltd.

Exhibit Hall Floor Plan

PRODUCT LOCATOR

Not sure what company supplies 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
Angstrom Sun Technologies Inc.	1516
Applied Surface Technologies	519
Brooks Automation	507
CAMECA Instruments, Inc.	1515
Horiba Scientific	317
Insplorion AB	1407
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McVac Manufacturing	320
MKS Instruments	614
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Oregon Physics LLC	1508
Oxford Instruments	306
Pfeiffer Vacuum Technology, Inc.	206
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RHK Technology Inc.	1521
SAES Getters USA	1512
SPECS Surface Nano Analysis, Inc.	618
Staib Instruments	421

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Extrel CMS	1413
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INFICON	1406
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Kratos Analytical	401
McVac Manufacturing	320
MKS Instruments	614
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NIST/CNST	103
Nonsequitur Technologies	1401
Osaka Vacuum USA, Inc.	1616

Analytical Instrumentation (Continued)	Booth
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Physical Electronics	201
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RBD Instruments, Inc.	312
Renishaw, Inc.	1319
RF VII Inc.	1700
Scientific Instrument Services, Inc.	417
Shimadzu Scientific Instruments	401
SPECS Surface Nano Analysis, Inc.	618
Staib Instruments	421
Thermo Scientific	1301
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Atomic Layer Deposition Systems	
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Physical Electronics	201
Prevac sp. z o.o.	310
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SPECS Surface Nano Analysis, Inc.	618
Staib Instruments	421
Thermo Scientific	1301
VG Scienta	318

Bellows Contacts	
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McAllister Technical Services	101
Torreyvac Inc.	1423

Bellows: Miniature Metal	
BellowsTech, LLC	1500
McVac Manufacturing	320
MDC Vacuum Products, LLOC	106
Torreyvac Inc.	1423

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Bonding Techniques	Booth
Kurt J. Lesker Company	301
NIST/CNST	103
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Plasmaterials, Inc.	200
Super Conductor Materials	413
Yugyokuen Ceramics Co., Ltd.	1404

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MKS Instruments	614
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Semicore Equipment, Inc.	520
Torreyvac Inc.	1423

Chemical: Surface Treating Services	
McVac Manufacturing	320
Meaglow Ltd.	1603
NIST/CNST	103

Chillers, Cooling Systems	
Brooks Automation	507
Capovani Brothers Inc.	208
McVac Manufacturing	320
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Scientific Instrument Services, Inc.	417
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Couplings: Flexible Shaft	Booth
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Applied Vacuum Technology, Inc.	1317
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Intlvac Thin Films	511
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Kimball Physics Inc.	1507
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Mantis Deposition, Inc.	513
Mass-Vac, Inc.	1405
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McVac Manufacturing	320
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RF VII Inc.	1700
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Vergason Technology, Inc.	1417
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VG Scienta Ltd.	1702

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Angstrom Sun Technologies Inc.	1516
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Hiden Analytical, Inc.	311
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RBD Instruments, Inc.	312
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SPI Supplies	410
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Mantis Deposition, Inc.	513
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Impedans Ltd.	1502
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Mantis Deposition, Inc.	513
Prevac sp. z o.o.	310
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FOCUS GmbH	1421
HeatWave Labs Inc.	211
Kimball Physics Inc.	1507
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Labtec Sales Partners LLC	1607
Mantis Deposition, Inc.	513
McAllister Technical Services	101
Oregon Physics LLC	1508
Prevac sp. z o.o.	310
Staib Instruments	421
Super Conductor Materials	413
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Yugyokuen Ceramics Co., Ltd.	1404

Electroforming Services	
BellowsTech, LLC	1500

Electroforms: Custom	
BellowsTech, LLC	1500

Equipment, Used	Booth
Capitol Vacuum	1605
Capovani Brothers Inc.	208
Duniway Stockroom Corp.	506
Eagle Instrument Services	415
Ebara Technologies	1412
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Hine Automation	1701
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RF VII Inc.	1700
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A&N Corporation	319
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Pfeiffer Vacuum Technology, Inc.	206
Precision Plus Vacuum Parts	1402
Scientific Instrument Services, Inc.	417
Solid Sealing Technology, Inc.	515
Torreyvac Inc.	1423
UC Components	214
Vacuubrand, Inc.	210

Fittings, Gaskets, Flanges, Seals *Continued...*

Continued...

Fittings, Gaskets, Flanges, Seals	Booth
VG Scienta	318
VG Scienta Ltd.	1702
Yugyokuen Ceramics Co., Ltd.	1404

FT-IR

MKS Instruments	614
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Prevac sp. z o.o.	310
Renishaw, Inc.	1319
Shimadzu Scientific Instruments	401
Thermo Scientific	1301

Gas Control Systems

CeramTec North America	316
Hiden Analytical, Inc.	311
HIS Vacuum Components	107
Linde Electronics and Specialty Gases	102
McVac Manufacturing	320
MDC Vacuum Products, LLOC	106
MKS Instruments	614

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A&N Corporation	319
Agilent Technologies, Vacuum Products Division	1311
Duniway Stockroom Corp.	506
Edwards Vacuum	1501
Hiden Analytical, Inc.	311
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Instrutech, Inc.	420
Kurt J. Lesker Company	301
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MKS Instruments	614
Pfeiffer Vacuum Technology, Inc.	206
Precision Plus Vacuum Parts	1402
RBD Instruments, Inc.	312
Scientific Instrument Services, Inc.	417
Vacuubrand, Inc.	210
Vacuum Research Corp.	606
VG Scienta	318
VG Scienta Ltd.	1702

GC-MS / LC-MS	Booth
Hiden Analytical, Inc.	311
INFICON	1406
McVac Manufacturing	320
NIST/ORM	1426
Scientific Instrument Services, Inc.	417
Shimadzu Scientific Instruments	401

Glassware

A&N Corporation	319
RBD Instruments, Inc.	312
Scientific Instrument Services, Inc.	417

Glove Boxes

Glas-Col, LLC	411
McVac Manufacturing	320
Vacuum Technology, Inc.	1420

Ion / Electron Guns

FOCUS GmbH	1421
Friatec N.A. LLC	1509
HeatWave Labs Inc.	211
Hiden Analytical, Inc.	311
Intlvac Thin Films	511
ION-TOF USA	407
Kimball Physics Inc.	1507
Kurt J. Lesker Company	301
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Neocera, LLC	1524
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Prevac sp. z o.o.	310
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Ion Beam Deposition Systems/Guns	Booth
4Wave, Inc.	1424
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CeramTec North America	316
HeatWave Labs Inc.	211
Hiden Analytical, Inc.	311
Impedans Ltd.	1502
Intlvac Thin Films	511
Kurt J. Lesker Company	301
Mantis Deposition, Inc.	513
McAllister Technical Services	101
McVac Manufacturing	320
NIST/CNST	103
Rocky Mountain Vacuum Tech., Inc.	514
Semicore Equipment, Inc.	520

Leak Detectors	
A&N Corporation	319
Agilent Technologies, Vacuum Products Div.	1311
Capovani Brothers Inc.	208
Duniway Stockroom Corp.	506
Hiden Analytical, Inc.	311
INFICON	1406
MKS Instruments	614
Oerlikon Leybold Vacuum USA, Inc.	1703
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Torreyvac Inc.	1423

Machining (Bulk and Special)	
Applied Vacuum Technology, Inc.	1317
Atlas Technologies	1606
FOCUS GmbH	1421
Kurt J. Lesker Company	301
McVac Manufacturing	320
MDC Vacuum Products, LLOC	106
Oregon Physics LLC	1508
Precision Ceramics USA, Inc.	416
Scientific Instrument Services, Inc.	417
Super Conductor Materials	413
Torreyvac Inc.	1423

Machining (Repair, Refurb, Mods)	Booth
Atlas Technologies	1606
McAllister Technical Services	101
McVac Manufacturing	320
Precision Ceramics USA, Inc.	416
Precision Plus Vacuum Parts	1402
Scientific Instrument Services, Inc.	417
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AJA International, Inc.	202
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Labtec Sales Partners LLC	1607
Mantis Deposition, Inc.	513
Plasmaterials, Inc.	200
SPI Supplies	410
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AJA International, Inc.	202
Capovani Brothers Inc.	208
Hanbell Vacuum Technology Co., Ltd.	1506
Impedans Ltd.	1502
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Labtec Sales Partners LLC	1607
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AJA International, Inc.	202
CAMECA Instruments, Inc.	1515
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KDF	1611
Kurt J. Lesker Company	301
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Dupont™ Kalrez® and Vespel®	510
Horiba Scientific	317
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NIST/CNST	103
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RHK Technology Inc.	1521
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Staib Instruments	421
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Accurion Inc.	518
Angstrom Sun Technologies Inc.	1516
Asylum Research an Oxford Instruments Company	307
Bruker Nano Surfaces Division	1313
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FOCUS GmbH	1421
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SPI Supplies	410
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Angstrom Sun Technologies Inc.	1516
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Capovani Brothers Inc.	208
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Hanbell Vacuum Technology Co., Ltd.	1506
HeatWave Labs Inc.	211
Hiden Analytical, Inc.	311
Intercovamex S.A. de C.V.	1418
Prevac sp. z o.o.	310
RBD Instruments, Inc.	312
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CAMECA Instruments, Inc.	1515
Horiba Scientific	317
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AJA International, Inc.	202
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Kurt J. Lesker Company	301
Labtec Sales Partners LLC	1607
NIST/CNST	103
Super Conductor Materials	413

Process Controllers/Monitors	
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Horiba Scientific	317
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Hanbell Vacuum Technology Co., Ltd.	1506
HeatWave Labs Inc.	211
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Hiden Analytical, Inc.	311
Impedans Ltd.	1502
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Tubing/Piping/Bellows Assemblies	Booth
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Omley Industries, Inc.	1609
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Horiba Scientific	317
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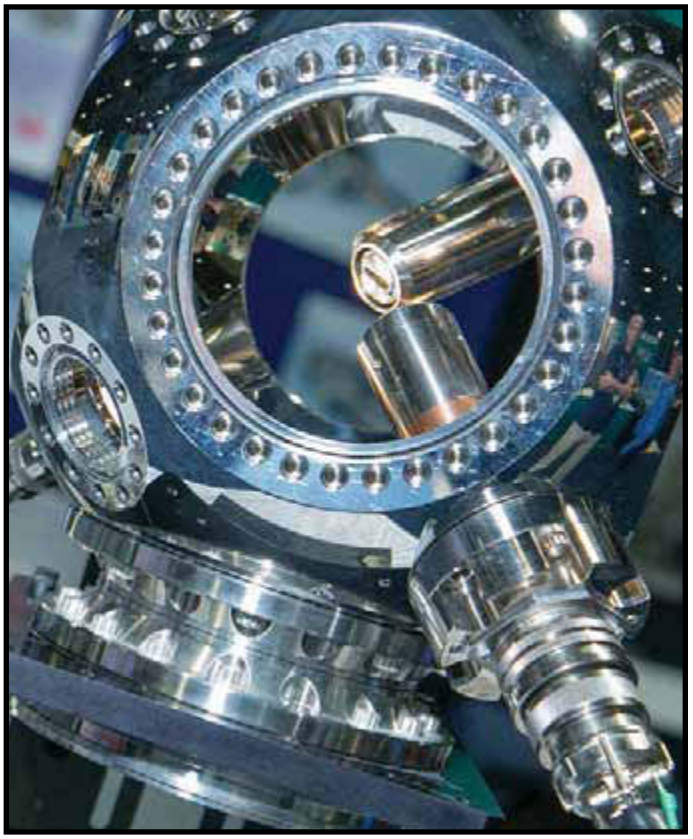
Shimadzu Scientific Instruments	401
Thermo Scientific	1301



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A&N Corporation	319
Agilent Technologies, Vacuum Products Div.	1311
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Friatec N.A. LLC	1509
Gamma Vacuum	1501
Geowell Vacuum Co., Ltd.	1510
HeatWave Labs Inc.	211
Hine Automation	1701
J.B. Anderson & Son, Inc.	1419
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Labtec Sales Partners LLC	1607
McVac Manufacturing	320
MDC Vacuum Products, LLOC	106
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RBD Instruments, Inc.	312
SPECS Surface Nano Analysis, Inc.	618
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Torreyvac Inc.	1423
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Vacuum Technology Division
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New York, NY 10038
Phone: 212-248-0200
Have Questions? We have answers! The Vacuum Technology Division is pleased to host Ask the Experts at booth 425. Bring us your problems with vacuum system specifications, troubleshooting, process control, contamination, and we'll do our best to point you to a good solution. Ask the Experts is an, unbiased, open forum with the resources to discuss and help solve vacuum related issues. **Generously sponsored by Duniway Stockroom, MKS Instruments and SAES Getters.** Visit the "A.T.E" booth and receive a free gift for challenging us!

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www.avs.org
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Generously sponsored by R.D. Mathis

AVS BlackJack Tournament **1715**
The Black Jack Tournament is a competition in which players compete against each other. Each player begins with an equal number of chips at the beginning of each round. The objective is not to win chips from the bank but to end up with more chips than the other players. The deal rotates. It moves around the table giving every player a chance to bet first and the other players can then bet accordingly. The player who has the most chips at the end of the round progresses to the next round. Depending on sign-up there will be at least three rounds. The PRIZE goes to the player in the last round with the most chips. Normal BlackJack rules apply. **Registration begins at the Welcome Mixer Monday at 5:30pm in Ballroom III of the Convention Center.**

AVS CAREER CENTER **1121**
Direct inquiries to heather@avs.org
The AVS Professional Leadership Committee will be hosting the AVS Career Center, open to all attendees, for the purpose of connecting job seekers with potential employers. The goal is to facilitate contact and networking during the Conference. In an attempt to create more opportunities for employers to find qualified applicants for job openings and for applicants to have more opportunities to learn about potential employers there will be a Job Fair during the Symposium. 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. 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.

AVS Chapters **1719**
AVS Chapters from around the country will announce and display their events for 2015.

AVS E-MAIL PAVILION **234**
Keep in touch with the outside world. Check your e-mail, flights, print boarding passes, etc. **Generously sponsored by Specs Surface Nano Analysis.**

AVS Exhibitor Technology Sessions **716**
Exhibitors will introduce new products, services and applications during brief 20 minute presentations. Sessions are scheduled during all technical session breaks. Come early and receive an AVS-61 souvenir!

AVS FOOSBALL TOURNAMENT **1501**
Sponsored and Hosted by Gamma Vacuum. Sign ups begin at the Welcome Mixer on Monday evening in Ballroom III in the convention center. You may also sign up as soon as the exhibit hall opens on Tuesday.
Great Prizes to be won !!!

AVS FUTURE SITES **739**
AVS-61 (2015) will take place in San Jose, California. Stop by booth 739 for information and a gift that will help you remember San Jose!

AVS HISTORY **739**
Come and see the history of the AVS meeting such as the 2003 meeting where Charlie Duke played an important role. The AVS run was first done here in 1982 organized by Larry Kazmerski. Ted Madey was the Program chair at the 1986 AVS here.

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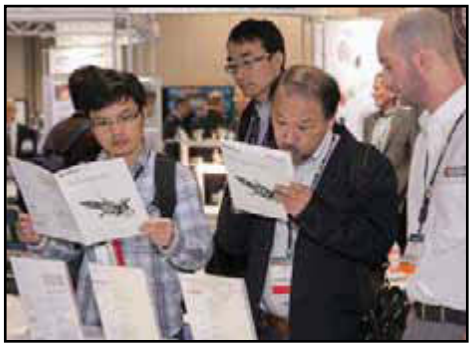

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Semicore Equipment, Inc., a Silicon Valley based manufacturer, supplies, services and supports Sputtering, Evaporation, Thin Film PVD systems for the electronics, optical, solar energy, medical, military, academic and related high technology industries worldwide. Semicore's products provide quality coatings on a variety of materials including plastic films, glass, ceramics, metals and hybrid substrates and range from R&D to high-performance production level systems at a competitive price.

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Double Down BlackJack Tournament

Sign up at the Welcome Mixer Monday evening or in **Booth 1711** 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.
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- Gas Load
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- Gas Load = Pump Throughput

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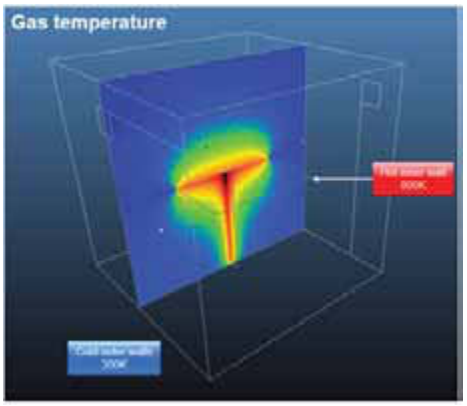

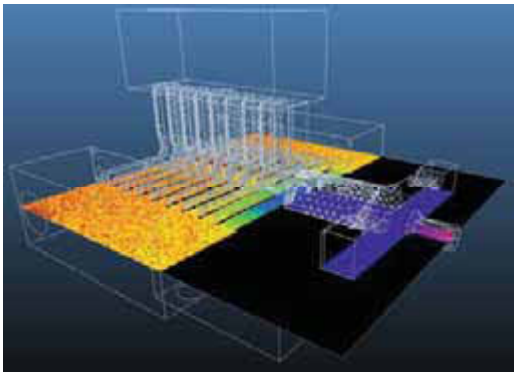

Sunday, November 9, 2014

In conjunction with the
AVS 61st International
Symposium & Exhibition

Baltimore Convention Center
Baltimore, Maryland

Time: 1:00 p.m.- 5:00 p.m.
Cost: $100 / $35 (student)

Phone: 530-896-0477
Fax: 530-896-0487
E-mail: heather@avs.org

Roberto Kersevan, Vacuum Group,
Technology Dept., CERN

The **MOLFLOW+** tutorial will first recall some basic concepts of gas dynamics in molecular flow regime, i.e. when molecular collisions can be neglected. The tutorial will be based on the modification of some 3D models already created. It will follow as much as possible a step-by-step format, highlighting the main features of the program, all of its options and commands, and advanced features as well for any participants who may already have used one of the previous versions of the code.

The tutorial will be divided in modules of increasing complexity and depth, with a Q&A session ending each module. The software package runs on Windows-based PC/laptops, which will not be provided by the conference. Each participant is expected to have his or her own computer. Further information will be made available a few days prior to the date of the course on a dedicated page at http://test-molflow.web.cern.ch/content/molflow-downloads.

Whenever possible, pre-recorded videos or animations will be used as a trace for each module, so that each participant can re-run the videos later and review any parts of them which could deserve a closer scrutiny. Whenever possible, precise bibliographical references will be given, together with comparison and benchmarking with published data and results.

AVS Tutorial

Tip Reliability in Atomic Force Microscopy: The Science of Nanoscale Wear, with Applications to Nanometrology and Nanofabrication

Sunday, November 9, 2014

In conjunction with the
AVS 61st International
Symposium & Exhibition

Baltimore Convention Center
Baltimore, Maryland

Time: 1:00 p.m.– 5:00 p.m.
Cost: $100 / $35 (student)

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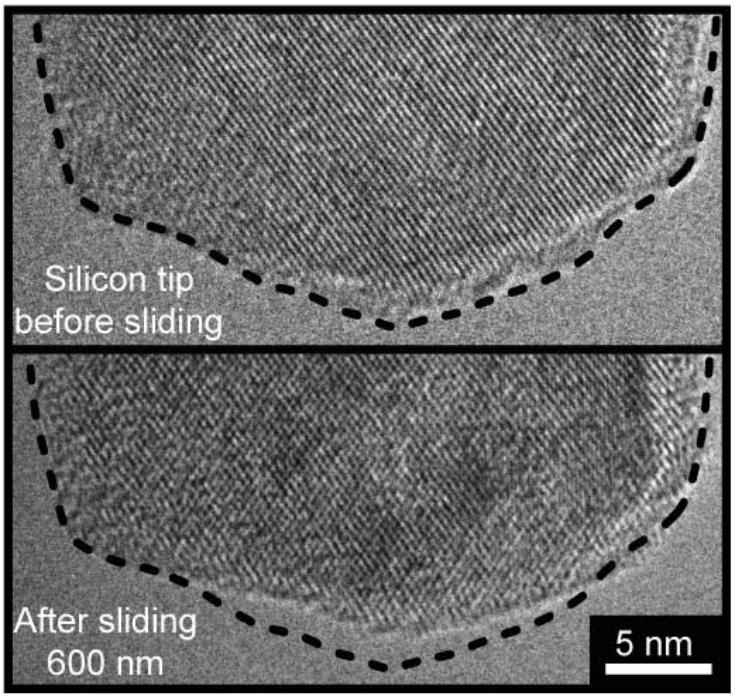

Robert W. Carpick, University of Pennsylvania
Judith A. Harrison, United States Naval Academy
Tevis Jacobs, University of Pittsburgh
Kevin T. Turner, University of Pennsylvania

The atomic-level stability of atomic force microscope (AFM) tips is crucial not only for high quality and reproducible image acquisition, but also for quantitative nanometrology and for reliable tip-based nanomanufacturing methods. This tutorial will educate participants on the latest in the understanding of tip reliability in AFM, with a particular focus on applications that depend on the stable performance of AFM tips. We will first discuss research and industrial applications of AFM, and then review continuum and atomic-scale contact mechanics theories which are crucial for understanding the tip-sample contact. We will then present methods for characterizing, observing, and modeling of tip wear including the use of atomistic simulations. This will include discussion of different types of tip changes, including fracture, plasticity, atomic attrition, and contamination. Finally, we will discuss how specific applications are affected by tip stability, and within this context, the state-of-the-art for increasing tip reliability.

AVS Tutorial

Quartz Crystal Microbalance with Dissipation Monitoring (QCM-D)-Technology and Applications

Friday, November 14, 2014

In conjunction with the
AVS 61st International
Symposium & Exhibition

Baltimore Convention Center
Baltimore, Maryland

Time: 9:00 a.m.– 4:00 p.m.
Cost: $100 / $35 (student)

Phone: 530-896-0477
Fax: 530-896-0487
E-mail: heather@avs.org

Gabriel Ohlsson, Biolin Scientific/Q-Sense

This tutorial will start with an introduction to the Quartz Crystal Microbalance with Dissipation monitoring (QCM-D) technology, its working principle and a brief historical overview. Thereafter the participants will be introduced to a variety of application areas that are supported by this technology as well as the QCM-D instrumentation. It will also be highlighted how QCM-D can be used in combination with other sensing technologies, such as ellipsometry, electrochemistry and light microscopy, in order to extract more information about the sample material.

Next part in the tutorial will be a live demonstration of the Q-Sense Omega Auto to show how a representative QCM-D measurement can be performed. The Q-Sense Omega Auto enables several parallel experiments in fully automatic mode.

The last section of the tutorial will focus on QCM-D data analysis and interpretation. Several aspects and approaches of data analysis will be discussed in detail, including the Sauerbrey equation and viscoelastic modeling. This tutorial will be given by speakers from both industry and academia.

AVS Tutorial

Atomic Modeling and the Computational Design of New Materials, Surfaces and Interfaces

Friday, November 14, 2014

In conjunction with the
AVS 61st International
Symposium & Exhibition

Baltimore Convention Center
Baltimore, Maryland

Time: 8:00 a.m.– 12:00 p.m.
Cost: $100 / $35 (student)

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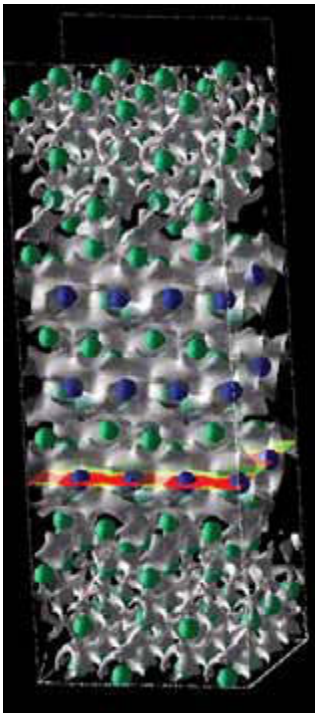

Image: Atomic positions and electron density calculated for an aluminum 2139 alloy containing a Al_2Cu precipitate

Dr. Donald Brenner, North Carolina State University

The combination of new atomic modeling tools and approaches, faster computers, better algorithms and more effective data analysis techniques is turning the decades-long goal of the bottom-up computational design of new materials into a reality. With a focus on large-scale atomic simulation, first-principles thermodynamics, and high throughput computing, this tutorial will begin with a review of these advances that will include their historical development, the underlying physics going into each tool, and their relative strengths and weaknesses. The remaining part of the tutorial will focus on specific examples of where atomic modeling has led to new insights, data and directions for exploring advanced materials that is not achievable by experiment alone. Examples will be drawn from different technological applications, including friction, wear and lubrication, shock loading of armor and energetic materials, and new materials for energy generation and storage.

The material presented and level of discussion will be aimed at students interested in broadening their knowledge of computation as applied to materials development, experimentalists looking to incorporate computation into their research, and others looking to update their knowledge of computational materials development.

AVS 61st INTERNATIONAL SYMPOSIUM & EXHIBITION
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3J. Materials Characterization in the Semiconductor Industry
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3P. Tribology

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Member*	Full Week	A) ☐	$630	A) ☐	$760
Non-Member**	Full Week	B) ☐	$750	B) ☐	$905
Student Member*		C) ☐	$210	C) ☐	$255
Student Non-Member**		D) ☐	$250	D) ☐	$305
Early Career Member (within 5 years of highest degree)*		E) ☐	$315	E) ☐	$385
Early Career Non-Member (within 5 yrs of highest degree)*		F) ☐	$375	F) ☐	$455
Technical Specialist Member (B.S. degree or equiv.)		Y) ☐	$300	Y) ☐	$365
Technical Specialist Non-Mem. (B.S. degree or equiv.)		Z) ☐	$345	Z) ☐	$420
One Day (please circle days)		☐	$375	☐	$455
Two Day (please circle days)		☐	$650	☐	$730

J) Sunday K) Monday L) Tuesday M) Wednesday N) Thursday O) Friday

AVS Honorary Member*	H) ☐	$0		
AVS Emeritus Member*	Q) ☐	$0		
(Sunday/Friday) Tutorial	T) ☐	$100	T) ☐	$115
(Sunday/Friday) (Student)	U) ☐	$ 35	U) ☐	$ 45

Please indicate which tutorial: _____

EXHIBITS ONLY	X) ☐	$0	X) ☐	$20

VOLUNTARY CONTRIBUTION: $_____

Total amount paid $ _____

***MEMBERS:** AVS Full Week, Student, Early Career, and Technical Specialist registrant fees INCLUDE your 2015 AVS Membership Renewal Dues. You will receive a membership renewal confirmation following the Symposium.
****NON-MEMBERS:** AVS Full Week, Student, Early Career and Technical Specialist Non-Member registrants will receive an automatic complimentary 2015 electronic AVS membership. Report to the AVS Store (Exhibit Hall) with any additional questions.

4. JOB DESCRIPTION

4A.	*Corporate Officer*	*4G.*	*Professor*
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4D.	*Staff Scientist*	*4J.*	*Group Leader*
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4F.	*Engineer*	*4L.*	*Other (specify)* _____

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AVS-61 Companion Tours 2014:

The Charm City – Baltimore

Welcome back to Baltimore! Come and join me as we explore the many neighborhoods of Baltimore and a day trip into Washington DC.

On **Monday**, we will start with our traditional tour of our host city, which consists of nine different neighborhoods. We begin our tour in the Inner Harbor, where most of us will have our hotels. We'll then travel to Fells Point, a historic waterfront neighborhood in the southeastern part of Baltimore. From there, we'll visit Little Italy. Little Italy is one of Baltimore's busiest restaurant areas. Easily accessible by their free bus system, this is an area you might want to visit for dinner one night. Next, we'll be visiting the place where inspiration was sewn, the Mary Pickersgill Flag House. This is where our Star-Spangled Banner Flag was created. Next we'll be visiting the neighborhood of Mount Vernon. This neighborhood has been designated a National Landmark Historic District. This is one of Baltimore's oldest neighborhoods that was originally the home for the rich and famous. The defining feature of the neighborhood is the original Washington Monument, built in 1815, to commemorate our first president, George Washington. Our morning tour ends with visits to the Francis Scott Key Memorial and Edgar Allan Poe's grave. The afternoon part of our tour includes a tour of Fort McHenry National Monument and Historic Shrine. Fort McHenry is famous for its role in the War of 1812, when it successfully defended the Baltimore Harbor from an attack by the British navy in September of 1814. It was during this bombardment that Frances Scott Key was inspired to write the poem "The Star Spangled Banner" which was put to music and became the United States' national anthem. Our tour concludes at Federal Hill for views and pictures of Baltimore's skyline.

Anyone care to join me as we indulge our culinary palettes as we head out on a food tour on **Tuesday**? For our first culinary stop, we will be visiting Fells Point where we will have a short tour and be stopping at one of their famous Eastern European restaurants for a tour and samples. From there we will continue on to lunch in Little Italy where we will enjoy antipasto, meatballs and homemade ravioli at 2 different restaurants. Our last stop will be a tour of the Wockenfuss Candy Factory. While there, we'll take a tour, taste some of their candy, have time for shopping, and be leaving with a goodie bag!

On **Wednesday**, we hit the road to Washington DC. Come and enjoy our National Capital without the hassle of trying to find parking. We will be traveling to the National Mall and Memorial Park. While there, we will be visit the famous Washington Monument. One of the most impressive sights in DC is the Washington Monument, a 555 foot marble obelisk. It towers over Washington as it honors our first President, George Washington. It has just opened in May after major renovations. We will also visit the Lincoln Memorial, which honors our 16th President, Abraham Lincoln…..who comes from my home state of Illinois. We will have a chance to walk in the National Park to the Vietnam Veterans Memorial. This beautiful piece of art contains the names of over 58,000 American heroes who gave their lives fighting in a war that was very controversial in our country. It's a very emotional sight to see, as you'll see mementos that loved ones have brought to honor their fallen family members. After lunch and free time to see other things in the National Mall, we'll continue on our bus tour around Washington DC.

Last year, the companions requested a tour of the Phillips Seafood Packing Plant. Those operations closed and were moved overseas, but I'll get you the next best thing on **Thursday**. We'll be having lunch, included in the tour price, at the Phillips Seafood restaurant after a tour of the National Aquarium. With over 17,000 animals in 10 different ever-changing exhibits, such as Blacktip Reef, Dolphin Recovery, Animal Planet Australia: Wild Extremes and more, we'll enjoy a fun-filled morning. The tour even includes a 4D experience! The Aquarium's 4D immersion Theater is equipped with 4D capabilities, which combines the high-definition drama of a 3D film with special sensory effects that are built into the theater seats and environment. After lunch at Phillips Seafood Company, we'll be traveling by free bus to Walters Art Museum, where we will enjoy a docent guided tour. Special thanks go out to Glenn Gates, a conservation scientist who is a member of AVS, who invited us to the museum.

As in other years, we will gather in the conference hotel lobby in the morning so plan to bring your breakfast and join us even if you are not coming on a tour that day. Tuesday, with a later starting time, I'll be over at the registration area if you have any questions before 10 am and at the conference hotel at 10.

I hope you will enjoy the program that I've planned and hope you'll join us in the fun of exploring Baltimore.

Marilyn Ruzic, Tour Coordinator
companiontours@avs.org

****

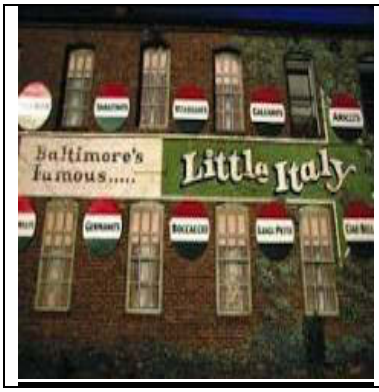
PLEASE NOTE: ***Tour operators have a minimum number required for the tours to go. Please check the tour descriptions for that number. Please check with me at registration on Sunday to see if the tour will go.***

****

Marilyn Ruzic will be available in the AVS Registration area in the Lobby of the Baltimore Convention Center from 2 – 6 on Sunday and in the lobby of the conference hotel before the start of each tour. She will be happy to assist with any questions. If Marilyn is not available, please consult the staff at the AVS Registration Manager's counter and they will contact her for you.

****

Monday, November 10th: Baltimore City Tour




8:30 a.m.	Meet in the conference hotel lobby
8:45 a.m.	Meet our tour guide and board our bus
9:00 a.m.	Depart for our city tour of Baltimore • Inner Harbor • Fells Point • Little Italy • Mary Pickersgill Flag house • City Hall • Mt. Vernon and the Washington Monument • Francis Scott Key Memorial • Grave of Edgar Allan Poe
11:30 am	Lunch on our own and time to explore the Inner Harbor
1:00 pm	Board bus to Fort McHenry
2:30 pm	Tour continues on to Federal Hill
3:00 pm	Federal Hill stop for views of Baltimore skyline and pictures
4:00 pm	Arrival back at the conference hotel

$80.00 Before October 9th
$90.00 After October 9th if space is available

***** Tour guide gratuity not included / Minimum for tour to run: 25 *****

Tuesday, November 11th: Baltimore Food Tour

NOTE THE LATER STARTING TIME

10:00 am	Gather in the conference hotel lobby
10:45 am	Meet our tour guide and board our bus
11:00 am	Fells Point food tour
12:15 pm	Little Italy food tour (lunch included)
2:00 pm	Depart for Wockenfuss Candy Factory
4:00 pm	Arrive back at the conference hotel

$ 99.00 Before October 9th
$109.00 After October 9th if space is available

***** Tour guide gratuity not included / Minimum for tour to run: 20 *****

****

Wednesday, November 12th: Washington DC

8:30 am	Gather in the conference hotel lobby
8:45 am	Meet our tour guide and board our bus at the Convention Center
9:00 am	Depart for Washington DC
10:00 am	Arrive in DC for driving/walking tour • Washington Monument • Lincoln Memorial • Vietnam Veterans Memorial
12:30 pm	Lunch on our own – free time at National Mall
2:00 pm	Board bus to continue tour around DC
4:00 pm	Bus arrives at Conference Center

$72.00 Before October 9th
$82.00 After October 9th if space available

***** Tour guide gratuity not included / Minimum for tour to run: 25 *****

Thursday, November 13th:
National Aquarium and Walters Art Museum


8:45 am	Meet in conference hotel lobby
9:00 am	Walking to National Aquarium
12:00 noon	Lunch at Phillips Seafood Company (included)
2:00 pm	Free bus to Walters Art Museum for tour
	Return to hotel by bus at your leisure

$80.00 Before October 9th
$90.00 After October 9th

***** Minimum for tour to run: 15 *****

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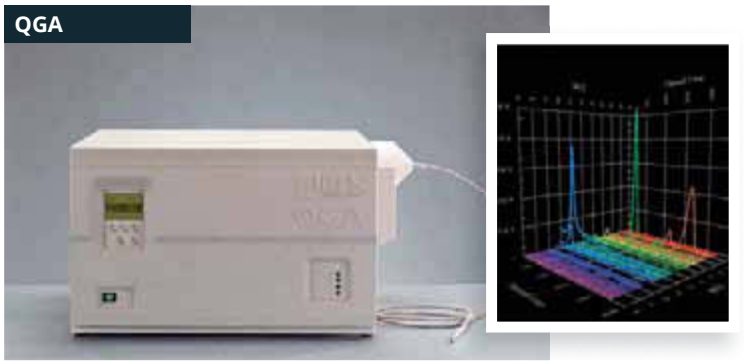

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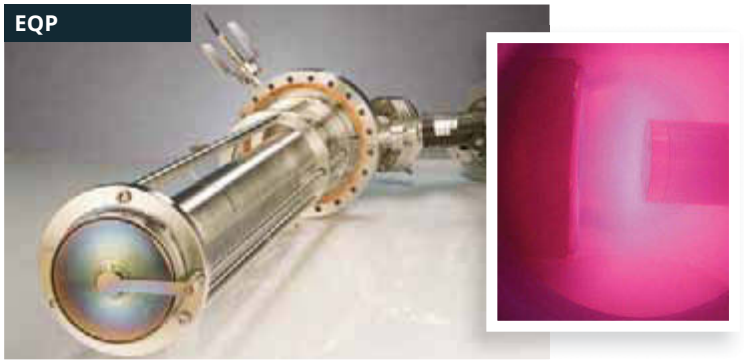

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May 26–29, 2015
San Diego, CA

37th Annual Symposium on Applied Surface Science (Surface Analysis 2015)
June 2–4, 2015
Golden, Colorado

The 13th International Symposium on Sputtering and Plasma Processes
July 8–10, 2015
Kyoto, Japan

20th International Conference on Secondary Ion Mass Spectrometry (SIMS XX)
September 13–18, 2015
Seattle, Washington

31st North American Molecular Beam Conference (NAMBE 2015)
October 4–7, 2015
Mayan Riviera, Mexico

Shanghai Thin Films Conference
October 23–25, 2015
Shanghai, China

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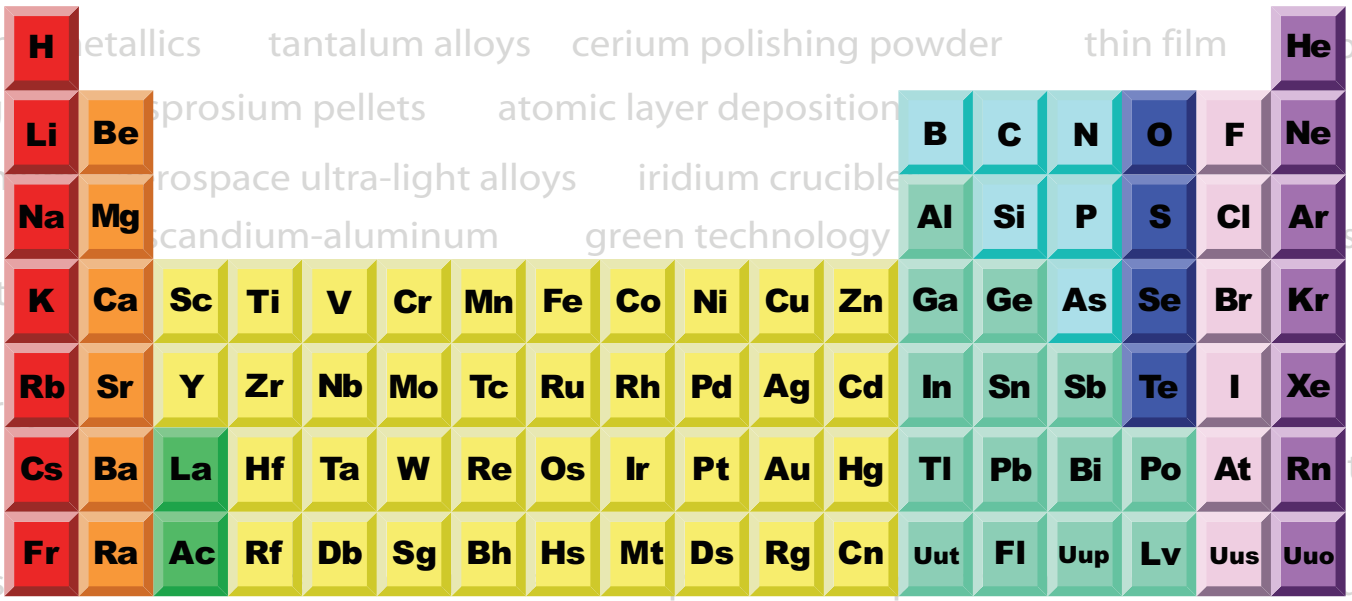

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