

AVS annual symposium, Industrial Physics Forum have broad appeal

From advanced surface engineering to applied surface science, from nanomanufacturing to biomaterials, from vacuum technology to ultrabright light sources, AVS's 53rd annual International Symposium and Exhibition offers a huge variety of presentations, lectures, workshops, and topical conferences.

For the first time, AVS: Science and Technology of Materials, Interfaces, and Processing is holding its annual meeting—held from Sunday, 12 November through Friday, 17 November, at the Moscone West convention center in San Francisco—in conjunction with the annual American Institute of Physics' Industrial Physics Forum.

The IPF convenes industry executives, research managers, academics, and science-policy decision makers. According to AIP, the forum fosters the sharing of business knowledge and research collaboration and allows leaders in physics to keep current on research and policy developments that affect the physical sciences community. IPF sessions also provide attendees with opportunities to exchange ideas with physics leaders who face similar research and business challenges. Bringing the two events together was a sound choice, organizers said.

"IPF brings in a set of very distinguished invited speakers," said Terry Michalske, director of biological and energy sciences at Sandia National Laboratories and this year's symposium program chair. "We felt our attendees would certainly benefit, and [AIP and AVS] were able to come to an agreement on a topical area that we both had a lot of energy around—nanomanufacturing. It's very synergistic for us to pool our efforts here."

Nanotechnology

Among this year's four IPF sessions, all at the convention center, is "Examples of Nanotechnology Manufacturing" at 8:00am on Monday, 13 November. Talks will look at new technologies that have been or will be enabled through the use of nanostructures. "Beyond CMOS: Emerging Materials and Devices," another IPF session at 2:00pm Monday,

will examine needs and options that might extend the recent decades of rapid improvements in information technology devices. "Nanotechnology and Society," at 8:00am Tuesday, 14 November, will explore environmental, safety, health, and economic issues from industrial and regulatory perspectives. IPF's fourth session, "Frontiers in Physics," will be at 2:00pm Tuesday and is not part of the nanotechnology topical conference. The session addresses the most exciting applied-physics research going on today. Other sessions will focus on the manufacture of quality nanosized building blocks, their assembly into devices and systems, the processing of patterned surfaces, and the measurement control standards needed for manufacturing. A reception for IPF and AVS symposium registrants will be at 7:30pm Sunday, 12 November, at the Renaissance Parc 55 Hotel.

Sunday afternoon will feature two all-invited symposium plenary sessions, both at 3:00pm at the convention center. One will consider science and technology challenges that are critical for a clean and abundant supply of energy, and the other is on biomaterial interfaces, a topic especially relevant for disease diagnostics and treatment.

Following the plenary sessions Sunday is a 6:00pm talk by lecturer and journalist Paul Roberts on "The End of Oil: Dependence, Depletion, and Denial." Roberts will discuss his belief that despite recent support for "renewables" and a corresponding rise in energy rhetoric, US energy policy, industrial strategy, and political culture remain committed to hydrocarbons—even as the unsustainability of a petroleum-based economy becomes clearer.

AVS's plenary lecture will be given by Stefan Hell, director at the Max Planck Institute for Biophysical Chemistry in Göttingen, Germany, on "Far-field Fluorescence Microscopy at the Macromolecular Scale." The lecture is at noon Monday in the convention center.

A talk on the operation of scientific instrumentation in near-Earth space from 1958 to the present will be at 2:00pm Wednesday, 15 November at the con-

vention center and will trace the development of instruments over the years and the impact of their observations. The talk aims to provide context for a special history session to follow on "Franklin and the Future." That session is at 8:00am Thursday, 16 November at the convention center and is co-hosted by AVS's vacuum technology division and history committee and the Center for History of Physics at AIP. To begin the session, Joyce Chaplin, a distinguished historian of science at Harvard University, will speak on "Benjamin Franklin's Science—in Public and Private." The session will also include future-oriented presentations on monolayer films, the outlook for electrophotography, the physics and technology that emerged from Franklin's kite experiment, and prospects in the generation of high voltages.

Special offerings

Other events include a mixer for symposium attendees and exhibitors from 5:00 to 6:30pm Monday at the convention center; a poster session will follow. Exhibits are Tuesday through Thursday in the exhibit hall during symposium hours. Exhibitor workshops, a series of brief technical presentations, are Tuesday through Thursday in the exhibit hall stage area during coffee and lunch breaks. Topics include surface science tools and processes, vacuum technology, and nanotechnology-related surface-science tools. An exhibit reception will be from 5:00 to 6:00pm Tuesday in the exhibit hall.

Eight AVS short courses throughout the week will address vacuum and equipment technology, materials and interface characterization, and materials processing.

Poster sessions are 6:00pm Tuesday and 5:30pm Thursday in the convention center's third-floor lobby. Topics include surface science, etching and process integration, vacuum technology, magnetic interfaces and nanostructures, high-pressure discharges, thin film, and advanced surface engineering. For more information consult the society's website at <http://www.avs.org>.

Sessions with invited speakers

Sunday, 12 November

afternoon

Energy Science and Technology. *Hansen, Arvizu, Westwell, Goldston, Murray*
Miniaturization Challenges in Biotechnology. *Colvin, Natan, Craighead*

Monday, 13 November

morning

Catalytic Chemistry of Hydrocarbons. *Wachs, Bartels*
Gas-Surface Reaction Dynamics. *Harrison, Schoenlein*
Organic Surface Modification and Nanoscale Chemical Patterning. *Ivanisevic, Textor, Nealey*
Etching for Advanced Interconnect I. *Oehrlein*
Advanced Gate Fabrication. *Joubert*
Nucleic Acids at Surfaces I. *Knoll*
Nanoscale Imaging Techniques. *Novotny*
IPF: Examples of Nanotechnology Manufacturing. *Wolfe, Siegel, Verbrugge, Alivisatos, Baker*
ALD and Applications I. *Sung*

afternoon

Catalysis for the Hydrogen Economy. *Norskov, Gorte*
Contacts, Interfaces, and Defects in Semiconductors. *Brillson*
Functionalization of Semiconductor Surfaces. *Yoshinobu*
Developing Methods for Data Analysis. *Ohlhausen*
Surface and Interface Science of MEMS and NEMS. *Blushan*
Manufacturing and Scientific Challenges for Plasma Processing at 32 nm. *Watanabe, Kang, Verove*
Nucleic Acids at Surfaces II. *Goldberg*
IPF: Beyond CMOS: Emerging Materials and Devices. *Gargini, Coufal, Mayberry, Vogel, Bonnell*
ALD and Applications II. *Elam*

Tuesday, 14 November

morning

Vacuum Generation and Measurement. *Looney*
Microbe-Surface Interactions. *Busscher*
IPF: Nanotechnology and Society. *Alderson, Maynard, Ostraat, Zhang, Johnson*
Reactivity of Metal Clusters. *Schneider*
Zinc Oxide. *Couffs*
Water-Surface Interactions. *Hemminger*
Environmental Materials and X-Ray Spectroscopies. *Vicenzi, Woodruff*
Magnetic Nanostructures, Nanoparticles, and Interfaces. *Weller, Farle, Liu, Jin*
Material Aspects of MEMS and NEMS. *Hone, Ghodssi*
Plasma Patterning. *Hayashi*
Plasma Surface Interactions. *Donnelly*
Biodiagnostic Innovation. *Kasianowicz*
Nanoscale Structures and Characterization. *Krupenkin*
Nanoscale Manipulation and Assembly. *Chidsey, Morita, Crommie*
Materials for Flexible Substrates, Displays, and Optoelectronics. *Loy*

afternoon

Extreme High Vacuum and Vacuum Metrology. *Stutzman*
Cells at Surfaces. *Tanaka*
Surface Structure and Morphology. *Robinson*
Materials for Power Electronics. *Lenahan, Hobart*
Magnetic Thin Films and Multilayers. *Arena*
Fabrication and Characterization of MEMS and NEMS. *Howe*
Emerging Plasma Applications. *Bourham*
Etching for Advanced Interconnect II. *Ohtake*
Microfluidics, MEMS, and Lab-on-a-Chip. *Klapperich, Lee*
Nanoscale Devices and Detection. *Ralph*
Process Integration and Modeling for Nanoscale Semiconductor Devices. *Giles, Briere*
IPF: Frontiers in Physics. *Roukes, Leemans, Soljacic, Blandford*
Surface Functionalization for Selective Area ALD. *Bent, Delabie, Kessels*

Wednesday, 15 November

morning

Electron, Photon, and Ion-Beam Induced Desorption and Their Effects on the Dynamics of Accelerators. *Molvik*
Materials Coatings for Reduction of Outgassing. *Setina*
Ultra-Bright Light Sources. *Umbach, Jacobsen, Larabell, Kirz, Wurth*
Reactions on Metal and Bimetallic Surfaces. *Pierce, Barteau, Frenken*
New Directions in Compound Semiconductors. *Wanke, Zhang, Jones*
Electronic and Vibrational Excitations and Dynamics. *Johnson, Uvdal*

Molecular Ion Sources and Characterization of Biomaterials. *Mahoney, Braun*
Magnetic Imaging. *Hellwig, Wulfhekel, Crooker, Plummer*
Glancing Angle Deposition I. *Lu*
Plasma Deposition. *Ho*
Biointerfacial Modification and Bioimmobilization. *Vörös, Healy*
Nanotribology and Nanomechanics. *Carpick*
International Developments in Nanoimprint Lithography. *Schift, Chou, Hiroshima, Soles, Lee*
Thin Films for Photovoltaics and Energy Applications. *Venkatasubramanian*

afternoon

Space-Based Vacuum Applications and Instrumentation. *Wüest, Hecht*
Ultra-Bright Light Sources. *Eberhardt, Williams, Havenith, Heinzmann*
Growth Processes on Metal and Semiconductor Surfaces. *Jia, Hannon*
Magnetic Semiconductors. *Gamelin, Idzerda*
Organic Film Growth and Characterization. *Engstrom, Bernasek*
Imaging and Characterization of Biological Materials. *Heeren, Cooks*
Exchange Bias and TMR. *Schuller, Mathon, Hayakawa*
Glancing Angle Deposition II. *Robbie*
Plasma-Wall Interactions and Plasma Sources. *Ullal, Hoffman*
Atmospheric and Microplasmas. *Muñoz-Serrano*
Nanolithography and Patterning. *Willson*
Nanotube Devices and Processes. *Hersam, Roth*
Thin Films for Energy Applications in Photovoltaics, Fuel Cells, Hydrogen Storage, and Batteries. *Notten*

Thursday, 16 November

morning

Special History Session: Franklin and the Future. *Chaplin, Richmond, Schein, McGrath, Dylla*
Organic Electronic Materials and Devices. *Marks*
Reactivity of Oxide Surfaces I. *Dohnalek*
High-k Dielectric Characterization. *Garfunkel*
Self-assembled Monolayers. *Barrena*
Ultra-thin Films and Buried Interfaces. *Giannuzzi*
Spin Injection. *Petukhov, Luepke*
Pulsed Plasmas in Surface Engineering. *Anders*
Hard and Nanocomposite Coatings: Synthesis, Structure, and Properties. *Suresh*
Plasmas in Bioscience. *Oehr*
Plasmas and Polymers. *D'Agostino*
Plasmonic Methods and Submicron Structures for Biology and Medicine. *Chilkoti, Maeda*
Biological and Molecular Applications of Nanoscale Structures. *Timp, Austin*
Fundamentals in Thin-Film Deposition. *Blank*

afternoon

Contacts to Organic and Molecular Devices. *Hsu, Gundlach*
Reactivity of Oxide Surfaces II. *Fukui*
Electronic Properties of High-k Dielectrics, Ferroelectrics, and Their Interfaces. *Cho, Singh*
Tribology. *Harrison*
Combined Methods or Multiple Methods. *Fulghum*
Plasma Processing for High-k/III-Vs and Smart Materials. *Pang*
Plasma Modeling. *Sawin*
Biomolecule-Surface Characterization I. *Griesser*
Nanoscale Material Processing. *Malliaras*
Sensors, Metrology, and Control. *Muller*
Field Emission. *Shaw*
Pulsed Laser Deposition of Thin Films. *Yalisov, Chrisey*

Friday, 17 November

morning

Molecular Electronics. *Walker*
Oxide Surfaces and Interfaces. *Selloni*
High-k Dielectric and Multifunctional Oxide Growth and Processing. *Schaeffer, Doolittle*
Coatings with Enhanced Thermal Stability and MAX Phases. *Leyens, Jansson*
Wear Mechanisms, Tribochemistry, and Nanotribology. *Erdemir*
Diagnostics. *Chang*
Biomolecular Surface Characterization II. *Saavedra*
Nanowires. *Samuelson*
In Situ/Ex Situ and Real-Time Monitoring and Characterization. *Ludwig, Redwing*