



## Preview: 2016 Materials Research Society Fall Meeting & Exhibit

Hynes Convention Center and Sheraton Boston Hotel, Boston, Mass.

**Meeting:** November 27–December 2 | **Exhibit:** November 29–December 1

[www.mrs.org/fall2016](http://www.mrs.org/fall2016)

The Materials Research Society (MRS) will hold its 2016 Fall Meeting at the Hynes Convention Center and the Sheraton Boston Hotel in Boston, Mass., November 27–December 2. The Meeting will include a technical program, tutorials, an award ceremony, poster sessions, a career fair, and other special activities.

MRS Meetings focus on the interdisciplinary nature of materials research worldwide. Symposium organizers from around the world have created a program of 54 symposia that address leading-edge research and captures current progress in materials science and technology. The symposia are organized into the following nine clusters.

The **Broader Impact** cluster includes two symposia on teaching and learning in materials science and the business of materials technology.

The **Biomaterials and Soft Materials** cluster includes seven symposia that cover a diverse range of topics, including bioinspired materials,

materials for medical applications, and nanostructured polymers. In the area of materials for medical applications, particular emphasis will be placed on novel strategies to create on-demand and stimuli-responsive changes in material properties with both spatial and temporal control.

The **Electrochemistry** cluster contains five symposia focusing on charge transport, proton transfer, catalysis, storage, and sustainability. The individual symposia consist of technical sessions ranging from fundamentals to applications.

The **Electronics, Magnetics, and Photonics** symposia cover a range of advanced materials in electronic and photonic devices and their applications. Twelve symposia cover the properties and applications of molecular and polymeric semiconductors, diamond, 2D materials, oxides, and other materials.

The **Energy and Sustainability** cluster focuses on advanced nanomaterials and flexible devices for next-generation

photovoltaics, as well as materials and architecture for safe and low-cost electrochemical energy-storage technologies. Catalytic materials for energy and sustainability applications is also part of the program.

The **Mechanical Behavior and Failure Mechanisms of Materials** cluster includes seven symposia addressing mechanical behavior, including the strength and failure of materials from the nanoscale to the microscale. Both fundamental scientific aspects and applications are covered. Crystalline, nanocrystalline, intermetallic, and glassy systems are included.

The **Nanomaterials** cluster covers the synthesis and functionality of a broad range of nanomaterials, ranging from biomedical and energy materials to 1D, 2D, and 3D nanostructured materials. Recent advances in nanoelectronics, atomic-level interfacial engineering, defect control, nanoscale patterning, and self-assembly among emerging nanomaterials comprise separate themes.

The **Processing and Manufacturing** cluster is new and has roots in materials science, where processing is an essential component. The focus lies on the use of ion beams and plasmas in manufacturing, the importance of modeling in the manufacturing process, the development of sensor technology for environmental modeling, and roll-to-roll manufacturing



# 2016 MRS® FALL MEETING & EXHIBIT

## MEETING CHAIRS

				
<b>Bernard Bewlay</b> GE Global Research	<b>Silvija Gradečak</b> Massachusetts Institute of Technology	<b>Sarah Heilshorn</b> Stanford University	<b>Ralph Spolenak</b> ETH Zürich	<b>T. Venky Venkatesan</b> National University of Singapore



to achieve hybrid and hierarchical structures in device applications.

The **Theory, Characterization, and Modeling** symposia cover theoretical aspects of materials science, simulation and modeling, metrology, and state-of-the-art characterization methods. The symposia focus on silico materials chemistry to perform virtual syntheses of novel materials, the discovery of materials utilizing data mining, and pushing the limits in electron microscopy.

To complement these sessions, tutorials will be offered in several technical areas. A separate symposium will be held on engaged learning of materials science and engineering. This symposium will be complemented by tutorials and workshops focused on education, diversity, and the use of social media.

### Plenary session and awards

The **Plenary Session featuring the Fred Kavli Distinguished Lectureship in Materials Science** presentation will be held on Monday, November 28, at 6:30 pm, in the Sheraton Boston Hotel, second floor, Grand Ballroom. This year's speaker is **Ellen D. Williams**, Director of the Advanced Research Projects Agency (ARPA-E) in the US Department of Energy. ARPA-E advances high-potential, high-impact energy technologies that are too early for private-sector investment. Williams will use program and project examples to illustrate the role of complex materials and materials interfaces in cutting-edge energy technologies in her talk entitled "Advanced Research Projects Agency-Energy: Innovation for Impact."

The **Award Ceremony** will convene on Wednesday, November 30, at 6:30 pm, in the Sheraton Grand Ballroom. The David Turnbull Lectureship, MRS Medal, Materials Theory Award, MRS Postdoctoral Awards, Kavli Foundation Early Career Lectureship in Materials Science, Graduate Student Gold and Silver Awards, and Von Hippel Award will be presented.

The 2016 **Von Hippel Award**, MRS' highest honor, will be presented to **Charles M. Lieber**, Department of Chemistry and Chemical Biology, Harvard University, "for pioneering contributions

## HOTELS IN BOSTON

MRS receives meeting space at a greatly discounted rate as a result of contracting a large block of sleeping rooms at the official meeting hotels. In order to keep meeting costs as low as possible and minimize the financial risk to MRS, we encourage you to utilize official MRS housing while you are attending a MRS meeting. Hotels offering discounted rates for the 2016 MRS Fall Meeting are listed below. To make reservations, visit [www.mrs.org/fall-2016-hotels](http://www.mrs.org/fall-2016-hotels).

<p><b>☐ Sheraton Boston Hotel</b> 39 Dalton Street, Boston, MA 02199 617-236-2000 Group Rate: \$199/single or \$209/double plus applicable taxes and fees; additional persons are \$20/each. <b>Deadline: November 6, 2016</b></p> <p><b>☐ Boston Marriott Copley Place</b> 110 Huntington Avenue, Boston, MA 02116 617-236-5800 Group rate: \$194/single or \$210/double plus applicable taxes and fees; additional persons are \$20/each. <b>Deadline: November 2, 2016</b></p> <p><b>☐ Hilton Boston Back Bay Hotel</b> 40 Dalton Street, Boston, MA 02115 617-236-1100 Group rate: \$206 single/double or \$226 triple/quad plus applicable taxes and fees. <i>Group Code: MRS.</i> <b>Deadline: November 4, 2016</b></p>	<p><b>☐ The Westin Copley Place Boston</b> 10 Huntington Avenue, Boston, MA 02116 617-262-9600 Group Rate: \$195/single or \$205/double plus applicable taxes and fees; additional persons are \$20/each. <b>Deadline: November 6, 2016</b></p> <p><b>☐ Boston Park Plaza</b> 50 Park Plaza at Arlington Street, Boston, MA 02116 800-225-2008 Group Rate: \$170/single, \$170/double, \$190/triple, or \$210/quad plus applicable taxes and fees. <b>Deadline: November 4, 2016</b></p> <p><b>☐ Embassy Suites Boston at Logan Airport</b> 207 Porter Street, Boston, MA 02128 617-567-5000 Group Rate: \$155/single plus applicable taxes and fees; additional persons are \$10/each. <b>Deadline: November 7, 2016</b></p> <p><b>☐ The Colonnade Hotel</b> 120 Huntington Avenue, Boston, MA 02116 617-424-7000 Group Rate: \$195/single, \$195/double, \$225/triple, or \$255/quad plus applicable taxes and fees. <b>Deadline: November 4, 2016</b></p>
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to nanoscience, defining the foundations of rational synthesis of nanoscale wires, characterization of their fundamental physical properties, and the development of applications of these materials in chemistry, biology, and medicine."

Named after the late David Turnbull of Harvard University, the **David Turnbull Lectureship** is awarded to recognize the career contribution of a scientist to the fundamental understanding of the science of materials through experimental and/or theoretical research. **James De Yoreo**, of the Pacific Northwest National Laboratory, is cited "for transformational discoveries that have reshaped our understanding of crystallization science ..."

The **MRS Medal** recognizes an exceptional achievement in materials research in the past 10 years, and will be awarded to **Robert J. Cava**, Department

of Chemistry, Princeton University. He is cited "for pioneering contributions in the discovery of new classes of 3D topological insulators."

The **Materials Theory Award** recognizes exceptional advances made by materials theory to the fundamental understanding of the structure and behavior of materials. This year's recipient is **Gerbrand Ceder**, University of California, Berkeley, and Lawrence Berkeley National Laboratory, "for creating the field of computationally guided materials design, including the prediction of functional, thermodynamic, and kinetic properties, their integration with experiment, and the field of high-throughput computation."

The **MRS Postdoctoral Awards** recognize postdoctoral scholars who show exceptional promise, which may include



excellence in scientific research, leadership, advocacy, outreach, or teaching during their postdoctoral assignment.

The **Kavli Foundation Early Career Lectureship in Materials Science** recognizes **Andrea Alù**, Department of Electrical and Computer Engineering, The University of Texas at Austin, for significant novel contributions to materials science by a young researcher in the early stages of his/her career.

**Special sessions and events**

**Symposium X** talks provide Meeting attendees with an overview of leading-edge materials topics. **Alan Taub**, University of Michigan, USA, will present “Challenges to Reduce Weight in Transportation Applications” on Monday, November 28; **Steve Granick**, Institute for Basic Science, Center for Soft and Living Matter, South Korea, will discuss “Active Matter: Surprises and Research Opportunities” on Tuesday, November 29; **Bin Liu**, National University of Singapore, will address “Aggregation-Induced Emission: Materials and Biomedical Applications” on Wednesday, November 30; and **Nicola Spaldin**, ETH Zürich, Switzerland, will present

“Multiferroics: Past, Present, and Future” on Thursday, December 1. All of these talks will take place from 12:15 to 1:15 pm at the Sheraton Boston Hotel.

**Poster sessions**, an integral feature of MRS Meetings, will be held in the evenings. The Meeting chairs will award prizes of up to \$500 for the best posters during each session.

The **Focus on Sustainability** program will run seminars on incorporating sustainability into research in a comprehensive way, while considering real-world applications of these principles to product design and manufacture. The seminar is aimed at materials researchers at all career stages, from students to postdocs to faculty and industry researchers.

If you are searching for an introductory-level undergraduate materials science course that will hook your students, stop by the **Impact of Materials on Society** booth at the Public Outreach Center to view the new curriculum materials and engaging videos. MRS scientists and University of Florida faculty will be on hand to answer any questions.

An **ABET** (Accreditation Board for Engineering) Information and Evaluator Retraining Session will be offered to anyone

who wants to learn more about the process, is preparing for an upcoming accreditation visit, or wants to ask questions about how to prepare a materials department for an accreditation visit. The training will be held Tuesday evening (7:15–9:30 pm), and the session can be attended without registering for the Meeting.

The **National Science Foundation** will be participating at the Public Outreach Center. The Division of Materials Research will be present to discuss funding opportunities, how to write a successful proposal, diversity, and sustainability.

**iMatSci** will be held Tuesday and Wednesday, November 29–30, 2016, at the Hynes Convention Center. These finalists will present their technologies using various forms of media such as videos and prototypes. iMatSci is designed to showcase technologies that have not yet been productized, but where there is a working prototype or evidence of a repeatable process. The entities behind these innovations will generally be early stage and pre-revenue; however, iMatSci will also consider showcasing innovative technologies that are emerging from an existing corporate entity.

# TUTORIALS

The 2016 MRS Fall Meeting will feature eight tutorials covering a variety of topics to complement the technical sessions. The tutorials are free of charge to all attendees. An option to purchase tutorial notes, now available in color, at the preregistration price of \$35 will be available on the registration form. After the preregistration period ends, notes will be priced at \$45 and will be available at the Publications Desk on-site at the Meeting.

**All tutorials will be held on Sunday, November 27, in the Hynes Convention Center.**

<p><b>BI1</b> <b>BROADER IMPACT TUTORIAL</b> Effective Communications in Entrepreneurship 8:30 am–12:00 pm   Room 202</p> <p><b>BI2</b> <b>BROADER IMPACT TUTORIAL</b> Designing an Effective Broader Impact Component in Your Research Proposals 1:30 pm–5:00 pm   Room 202</p> <p><b>EC4</b> <b>Advanced Characterization of (Photo) Electrochemical Energy Materials</b> 8:30 am–5:00 pm   Room 203</p> <p><b>EM1</b> <b>Materials Science of Quantum Computing</b> 8:30 am–12:00 pm   Room 204</p>	<p><b>EM7</b> <b>The Fundamentals, Advanced Fabrication Approaches and Novel Applications of Functional Plasmonics</b> 8:30 am–12:00 pm   Room 209</p> <p><b>EM10</b> <b>Memristive Materials and Neuromorphic Devices</b> 1:30 pm–5:00 pm   Room 204</p> <p><b>ES1</b> <b>Grid-Scale Energy Storage—Materials, Manufacturing and Systems Aspects</b> 1:00 pm–5:00 pm   Room 210</p> <p><b>PM5</b> <b>Flexible Hybrid Electronics</b> 1:30 pm–5:00 pm   Room 209</p>
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[WWW.MRS.ORG/FALL-2016-TUTORIAL-SESSIONS](http://WWW.MRS.ORG/FALL-2016-TUTORIAL-SESSIONS)



Visit [www.mrs.org/fall-2016-imatsci-submission](http://www.mrs.org/fall-2016-imatsci-submission) for more information.

The **Women in Materials Science and Engineering Breakfast** will be held Wednesday, November 30, at 7:00 am.

Representatives from several government agencies will present overviews of **Federal Research Funding Opportunities** on Tuesday, November 29 (5:30–7:30 pm). This event has been reformatted to allow MRS Meeting attendees the opportunity to meet directly with various program officers after an overview from each agency in a small group setting to allow for one-on-one interactions, questions, and comments.

The **2016 MRS Fall Meeting Career Fair** will be held in the Hynes Convention Center, Level 2, The Hub—Hall D, Tuesday and Wednesday. The Career Fair will provide an opportunity for Meeting participants and top employers to discuss career opportunities and will feature recruiter and on-site interviews, career development sessions, and resume critiques and mock interviews. Students, postdocs, and seasoned professionals are all welcome.

A **professional development workshop** titled “Communications Skills for Individual Career Success” will be held Sunday, November 27, 1:00–4:00 pm, with a networking reception to follow, in the Sheraton Boston Hotel. Preregistration is required. The speakers are Cynthia Simpson, a chief business development officer with the Association for Women

2016 MRS FALL MEETING REGISTRATION RATES		
	PREREGISTRATION before 5:00 pm (ET) November 11, 2016	ON-SITE REGISTRATION after 5:00 pm (ET) November 11, 2016
Meeting Registration	\$645	\$765
Meeting Registration with MRS Member Discount	\$515	\$640
Student Registration	\$140	\$170
Student Registration with MRS Member Discount	\$110	\$140
Unemployed	\$135	\$165
Retired	\$165	\$195

*All 2016 MRS Fall Meeting registrations include MRS membership through December 2018.*

in Science, and Jocelyn Dunphy, a learning and organization development professional with a background in business communication training and coaching, career development strategies, and performance management.

The popular **Science as Art** competition will be held again at this Meeting. The competition is open to all registered Meeting attendees, with entries to be on display in the Exhibit Hall in the Hynes Convention Center. Multiple first-place and second-place awards of \$400 and \$200, respectively, will be presented. Guidelines and deadlines for entry will be available on the 2016 MRS Fall Meeting website.

A number of other events will take place throughout the Meeting, including other professional development opportunities. To stay up to date with

additional events and activities, access [www.mrs.org/fall2016](http://www.mrs.org/fall2016).

#### For more information

The deadline to preregister for the Meeting is **November 11, 2016, 5:00 pm (ET)**. International travelers are reminded to allow ample time to obtain a visa, if necessary. For additional details about the Meeting, contact MRS Member Services, Materials Research Society, 506 Keystone Drive, Warrendale, PA 15086-7573, USA; email [info@mrs.org](mailto:info@mrs.org), tel. 724-779-3003, and fax 724-779-8313. Details of various events and activities will be published in the Program and Exhibit Guide available on-site. The MRS website can be accessed for updated information on confirmed talks and details of special events, for more information on obtaining a visa, and for preregistration: [www.mrs.org/fall2016](http://www.mrs.org/fall2016).



## Attention 2016 MRS Fall Meeting Presenters!

Submit your research to *MRS Advances*, our new online journal devoted to impactful, rapid reports of work in progress on key materials topics.

Submissions accepted from October 31— November 17, 2016



mrs.org/mrs-advances



# 2016 MRS<sup>®</sup> FALL EXHIBITORS

[www.mrs.org/fall-2016-exhibit](http://www.mrs.org/fall-2016-exhibit)

**HYNES CONVENTION CENTER | LEVEL 2**

**Tuesday, November 29** 11:00 am – 5:30 pm  
**Wednesday, November 30** 11:00 am – 5:30 pm  
**Thursday, December 1** 10:00 am – 1:30 pm

A & N Corporation  
AAAS Science & Technology  
Policy Fellowships  
abcr GmbH  
Across International  
ACS Publications  
AdValue Technology, LLC  
Advanced Energy  
Advanced Polymer Materials Inc.  
Advanced Research Systems, Inc.  
Aerotech, Inc.  
Agnitron Technology, Inc.  
AIP Publishing  
Air Force Office of Scientific Research  
AIXTRON SE  
AJA International, Inc.  
Aldrich Materials Science  
Alemnis GmbH  
American Journal Experts  
American Physical Society  
Amuneal Manufacturing Corp.  
Andeen-Hagerling, Inc.  
Angstrom Engineering Inc.  
Angstrom Sciences Inc.  
Angstrom Scientific Inc.  
Annealsys  
Anton Paar USA  
Applied NanoStructures, Inc.  
Applied Surface Technologies  
Applied Vacuum Technology, LLC  
Asahi Spectra Co., Ltd.  
Asylum Research, an Oxford  
Instruments Company  
attocube systems Inc.  
Bio-Logic USA, LLC  
Biolin Scientific, Inc.  
Blue Wave Semiconductors, Inc.  
BNNT, LLC  
Brooks Automation, Inc.  
Bruker AFM Probes  
Bruker AXS  
Bruker Nano Surfaces  
Cambridge Polymer Group, Inc.  
Cambridge University Press/Materials  
Research Society  
Carl Zeiss Microscopy, LLC  
Chemat Technology, Inc.  
Cornell University  
CRAIC Technologies, Inc.  
CrystalMaker Software Ltd.  
CVD Equipment Corporation  
DCA Instruments, Inc.  
De Gruyter  
Delong America Inc.  
Denton Vacuum, LLC  
Digital Surf  
Dr. Fritsch Powder Shaping  
Technologies  
Duniway Stockroom Corporation  
Ebara Technologies, Inc.

Ecopia Corp.  
EDAX Inc.,  
AMETEK Materials Analysis Division  
Edinburgh Instruments Ltd.  
Electron Microscopy Sciences/Diatome  
EMSL Analytical, Inc.  
Energetiq Technology, Inc.  
Eulitha AG  
Evactron<sup>®</sup> by XEI Scientific, Inc.  
Everbeing International Corp.  
FEI Company  
FemtoTools AG  
Film Sense  
Filmetrics, Inc.  
Fischione Instruments  
FlackTek, Inc.  
Fraunhofer USA Center for Coatings  
and Diamond Technologies  
Frontics America Inc.  
Frontiers  
Furuya Metal Americas, Inc.  
Gamry Instruments  
Gatan, Inc.  
Geib Refining Corporation  
GNB Corporation  
Goodfellow Corporation  
Heidelberg Instruments Inc.  
Herzan LLC  
Hitachi High Technologies America, Inc.  
HORIBA Scientific  
Hummingbird Scientific  
Huntington Mechanical Laboratories, Inc.  
HVA, LLC  
Hysitron, Inc.  
ibss Group, Inc.  
ICSPI Corp.  
Image Metrology A/S  
Inert  
Innovative Photonic Solutions  
InRedox LLC  
Integrated Dynamics Engineering  
International Centre for Diffraction Data  
(ICDD)  
Intlvac Thin Film  
IOP Publishing  
ISS, Inc.  
J microTechnology, Inc.  
Janis Research Company, LLC  
Japan Science and Technology Agency  
Japan Society of Applied Physics  
JASCO  
JEOL USA, Inc.  
Kaufman & Robinson, Inc.  
KEYENCE Corporation  
Keysight Technologies  
KLA-Tencor Corporation  
Kleindiek Nanotechnik  
KP Technology Ltd.  
Kurt J. Lesker Company  
Kyocera International Inc.

Lake Shore Cryotronics, Inc.  
Lambda Technologies, Inc.  
Leybold USA Inc.  
Linseis Inc.  
Luxiv Vacuum Technologies  
M. Braun, Inc.  
MANTIS-SIGMA  
Mass Applied Science  
McGraw-Hill Education  
McVac Manufacturing Co. Inc.  
MDC Vacuum Products, LLC  
Micro Photonics Inc.  
MMR Technologies, Inc.  
Momentum Press  
Montana Instruments  
MTI Corporation  
NanoAndMore USA, Inc.  
NanoMagnetics Instruments  
Nanomechanics, Inc.  
Nanonics Imaging Ltd.  
Nanoscribe GmbH  
Nanosurf, Inc.  
National Reconnaissance Office  
Nature Publishing Group  
Neaspec GmbH  
Neocera, LLC  
NETZSCH Instruments North America, LLC  
NIST  
Nor-Cal Products, Inc.  
NT-MDT Co.  
Nuclear Science User Facilities  
Office of Naval Research  
OptiGrate Corporation  
OriginLab Corporation  
Oxford Instruments  
Oxford University Press  
PANalytical Inc.  
Park Systems Inc.  
Particle Sizing Systems, LLC  
Pfeiffer Vacuum  
Photon  
Physics Today  
Pine Research Instrumentation  
Plasmaterials, Inc.  
Princeton Scientific Corp.  
Protochips, Inc.  
PVD Products, Inc.  
Quantum Design, Inc.  
QuantumWise A/S  
R.D. Mathis Company  
Radiant Technologies, Inc.  
Razorbill Instruments Ltd.  
Reliable Corporation  
Renishaw Inc.  
RHK Technology, Inc.  
Rigaku Americas Corporation  
Rocky Mountain Vacuum Tech, Inc.  
Royal Society of Chemistry

Royal Society Publishing  
Rtec-Instruments, Inc.  
SAGE Publications  
Sandia National Laboratories  
SCIENION  
Scientia Omicron, Inc.  
Scientific Instruments Inc.  
Seki Diamond Systems  
Semiconsoft, Inc.  
Semilab  
Seren Industrial Power Systems, Inc.  
ShenZhen Nanotech Port Co., Ltd.  
SmarAct Inc.  
Solartron Analytical, AMETEK Advanced  
Measurement Technology  
Solid State Cooling Systems, Inc.  
Solmates B.V.  
SPECS Surface Nano Analysis, Inc.  
SPI Supplies/Structure Probe, Inc.  
Springer  
SPS-Europe B.V.  
STAIB Instruments, Inc.  
Strem Chemicals, Inc.  
Super Conductor Materials, Inc.  
SVT Associates, Inc.  
Synton-MDP AG  
TA Instruments  
Taylor & Francis  
TDC Corporation  
Ted Pella, Inc.  
Telemark  
Tescan USA Inc.  
Thermo-Calc Software Inc.  
Thermo Fisher Scientific  
Thermo Fisher Scientific (Alfa Aesar)  
THINKY USA, Inc.  
TMC, AMETEK Ultra Precision  
Technologies  
Toshima Manufacturing Co., Ltd.  
Trion Technology, Inc.  
Twente Solid State Technology B.V.  
U.S. Naval Research Laboratory  
UC Components Inc.  
Ultratech/CNT  
ULVAC Technologies, Inc.  
University of Manchester, School of  
Materials  
Vacuum Technology Inc.  
VAKSiS R&D and Engineering  
Vigor Tech US  
Wafer World Inc.  
Wiley  
WITec Instruments Corp.  
J.A. Woollam Company, Inc.  
World Scientific Publishing Co.  
Zurich Instruments Ltd.  
Zygo Corporation,  
AMETEK Ultra Precision Technologies