



## Preview: 2018 Materials Research Society Fall Meeting & Exhibit

Hynes Convention Center and Sheraton Boston Hotel, Boston, Massachusetts

Meeting: November 25–30, 2018 | Exhibit: November 27–29

[www.mrs.org/fall2018](http://www.mrs.org/fall2018)

The Materials Research Society (MRS) will hold its 2018 MRS Fall Meeting and Exhibit at the Hynes Convention Center and the Sheraton Boston Hotel in Boston, Mass., November 25–30. The Meeting will include technical programming, tutorials, an award ceremony, poster sessions, a career fair, and other special activities.

MRS meetings focus on leading interdisciplinary materials research in both fundamental and applied areas, coordinated by more than 200 scientists from both academia and industry worldwide. The Meeting's core is its technical program, which includes 57 symposia that are organized into the following nine clusters.

### Symposium clusters

The **General Interest** cluster features symposia on hot topics such as Machine Learning, Robotics, and the newest addition, Synthetic Biology—An Accelerator of Materials Research and Development.

The **Broader Impact** cluster includes symposia regarding sustainability in

materials science and preparing for a career in higher education in materials science.

The **Biomaterials and Soft Materials** cluster includes nine symposia that cover a diverse range of topics related to biomaterials and soft materials. Both experimental and modeling approaches will be emphasized, and organic and inorganic materials will range from the nano- to macroscale. Symposia will include topics on the fabrication, characterization, and application of soft materials and interfaces.

The **Characterization, Mechanical Properties and Structure–Property Relationships** symposia cover structure-property relationships, *in situ* and *in operando* analysis of electrochemical materials and interfaces, ultrafast optical probes for materials characterization, materials property changes under irradiation, and solid-state chemistry of inorganic materials.

The **Electronic, Photonic and Magnetic Materials** cluster focuses on a

broad range of advanced functional materials for electronics, sensing, and novel devices. Topics range from fundamental studies to device design, modeling, and industrial applications. The exciting and growing area of 2D materials beyond graphene will also be featured.

The **Energy—Transfer, Storage and Conversion** cluster is a range of 15 selected topics that highlights everything from flexible low-cost photovoltaics, advanced perovskite materials and devices for next-generation photovoltaics, to high-efficiency silicon photovoltaics. A symposium on nuclear waste management and a symposium on progress in practical solutions for carbon capture technology are featured as well.

The **Nanomaterials** cluster features four symposia that cover current progress in nanomaterials and nanotechnology. Carbon nanomaterials, such as graphene and carbon nanotubes, as well as related noncarbon materials, such as boron nitride, are topics of significant interest in the community. A connecting theme

## 2018 MRS® FALL MEETING & EXHIBIT

**Meeting Chairs**

				
<b>Kristen H. Brosnan</b> GE Global Research	<b>David A. LaVan</b> National Institute of Standards and Technology	<b>Patrycja Paruch</b> University of Geneva	<b>Joan M. Redwing</b> The Pennsylvania State University	<b>Takao Someya</b> The University of Tokyo

of the symposia in this cluster is assessing how the synthesis and structure of the nanomaterials affect their function and application.

The **Processing and Manufacturing** cluster features seven symposia that cover diverse processing topics such as plasma-based processing, architected materials processing, electromagnetic fields for materials synthesis, intermetallic alloys for structural and functional applications, and high-entropy alloys.

The **Thermal Properties and Thermoelectric Materials** cluster includes three symposia that cover a diverse range of topics, including all types of caloric materials, thermal analysis of materials, development of new thermal analysis methods, and emerging low-temperature thermal energy-conversion technologies.

### Plenary session and awards

The **Plenary Session Featuring The Fred Kavli Distinguished Lectureship in Materials Science** presentation will be held on Monday, November 26, at 6:30 pm, in the Sheraton Boston Hotel, Grand Ballroom. This year's plenary speaker, Paula T. Hammond, is the David

H. Koch Chair Professor of Engineering at the Massachusetts Institute of Technology and Head of the Department of Chemical Engineering.

The **MRS Awards and Recognition Program Featuring the Von Hippel Presentation** will convene on Wednesday, November 28, at 6:15 pm, in the Sheraton Grand Ballroom. The Von Hippel Award, David Turnbull Lectureship, MRS Medal, Materials Theory Award, The Kavli Foundation Early Career Lectureship in Materials Science, the inaugural MRS Nelson Buck Robinson Science and Technology Award for Renewable Energy, *MRS Bulletin* Postdoctoral Prize, MRS Postdoctoral Awards, Graduate Student Gold and Silver Awards, and the Arthur Nowick Graduate Student Award will be presented. For up-to-date award recipient information, visit [www.mrs.org/fall2018](http://www.mrs.org/fall2018).

### Special sessions and events

**Symposium X** talks provide Meeting attendees with an overview of leading-edge topics. Featured speakers are Sergei Kalinin, Oak Ridge National Laboratory (Monday); Dae-Hyeong Kim, Seoul National University (Tuesday); Mariana

Bertoni, Arizona State University (Wednesday); and Erik Bakkers, Technische Universiteit Eindhoven and Delft Technical University (Thursday).

**LATE NEWS—HOT TOPIC** events for the Fall Meeting include Symposium GI01: Machine Learning and Data-Driven Materials Development and Design and GI03: Synthetic Biology—An Accelerator of Materials Research and Development.

**Essentials of Getting Your Work Published**, a professional development offering, is planned as a Hub Stage event on Monday, November 26. New this year is **Essentials of Abstract Writing**, which will allow journal authors to have one-on-one critiquing of their abstracts at the Career Fair.

**Poster sessions** will be held in the evenings Monday through Thursday. The Meeting chairs will award prizes of up to \$500 for the best posters during each evening session.

The Government Affairs Committee will host **Research Funding Opportunities** sessions on Tuesday and Thursday. These sessions provide interaction between government agency presenters

## TUTORIALS—SUNDAY, NOVEMBER 25

[www.mrs.org/fall-2018-tutorial-sessions](http://www.mrs.org/fall-2018-tutorial-sessions)

The 2018 MRS Fall Meeting will feature 13 tutorials covering a variety of topics to complement the symposium sessions.

Tutorials are free of charge for all registered attendees. Tutorial notes are available at the preregistration price of \$35 until November 9.

After the preregistration period ends, notes will be available for purchase for \$45 on-site at the MRS/Cambridge Publications Booth 100 in the Exhibit Hall.

All tutorials will be held in the Hynes Convention Center on Sunday, November 25.

**BM01** 3D Printing of Passive and Active Medical Devices  
8:30 am – 12:00 pm

**EP01** Introduction to Pyroelectric, Piezoelectric and Ferroelectric Materials  
8:30 am – 12:00 pm

**EP06** Introduction to Quantum Spintronics  
1:30 pm – 5:00 pm

**EP08** Ultra-Wide-Bandgap Semiconductors—From Materials to Devices  
1:30 pm – 5:00 pm

**ET02** High-Efficiency Crystalline Silicon Photovoltaics—Fabrication, Devices and Testing  
1:30 pm – 5:00 pm

**ET06** The History of Li- and Li-Ion Batteries  
1:30 pm – 5:00 pm

**ET12** Advances in Synchrotron X-Ray and Quantum Monte Carlo Techniques with Applications to Functional Materials  
1:30 pm – 5:00 pm

**GI01** An Introduction to Machine Methods for Materials Science  
8:30 am – 5:00 pm

**NM03** Analytical Methods for Nanowires and Novel Device Concepts  
1:30 pm – 5:00 pm

**NM04 / BI01 / ET14** Life Cycle Analysis from an Industrial Perspective  
1:30 pm – 5:00 pm

**PM03** Flexible Hybrid Electronics  
1:30 pm – 5:00 pm

**PM05** Field-Assisted Sintering—Microwaves, SPS and Flash Sintering  
1:30 pm – 5:00 pm

**TP02** Thermal Characterization of Materials and Devices  
1:30 pm – 5:00 pm



and MRS membership. Invited talks will be followed by roundtable Q&A sessions with individual program managers. Confirmed agencies are the US Department of Energy—Office of Science; National Institutes of Health—National Institute of Biomedical Imaging and Bioengineering; National Science Foundation (NSF)—Division of Materials Research; and the NSF Division of Civil, Mechanical, and Manufacturing Innovation.

The **iMatSci Innovation Showcase** provides a platform for independent technology leaders and those at universities, research labs, and startup companies to demonstrate the practical applications of their materials-based technologies. The entities behind these innovations will generally be pre-revenue and seed-stage innovators that are actively seeking partners, funding, or avenues for moving toward product commercialization. However, iMatSci will also consider showcasing innovative technologies that are emerging from an existing corporate entity. iMatSci will take place on Tuesday, November 27 and Wednesday, November 28.

**Science in Video (SciVid)**, a high-impact materials science video competition, will showcase the finalists as they compete for recognition and prizes. Members will be asked to vote on their favorite videos to determine the People's Choice winner. A viewing station and instructions will be located at the Public Outreach Center in The Hub and in several locations throughout the Meeting. The SciVid awards ceremony will take place on The Hub Stage, Wednesday, November 28, at 3:00 pm. For more information, visit [www.mrs.org/sci-vid](http://www.mrs.org/sci-vid).

An **ABET (Accreditation Board for Engineering and Technology) 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 on Tuesday, November 27, from 7:15 pm to 9:30 pm, and the session can be attended without registering for the Meeting. Remote access will be available if unable to attend in person.

## 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 an MRS meeting. Hotels offering discounted rates for the 2018 MRS Fall Meeting are listed below. **To make reservations, visit [www.mrs.org/fall-2018-hotels](http://www.mrs.org/fall-2018-hotels).**

- **Sheraton Boston Hotel**  
39 Dalton St., Boston, Mass. 02199  
617.236.2000 or 888.627.7054  
Group Rate: \$208 single, \$218 double  
Additional persons: \$20 ea.\*  
**Deadline: November 4, 2018**
- **The Colonnade Hotel**  
120 Huntington Ave., Boston, Mass. 02116  
617.424.7000  
Group Rate: \$204 single, \$204 double,  
\$224 triple, \$254 quad\*  
**Deadline: November 2, 2018**
- **Boston Marriott Copley Place**  
110 Huntington Ave., Boston, Mass. 02116  
617.236.5800  
Group rate: \$202 single, \$219 double,  
\$229 triple, \$239 quad\*  
**Deadline: October 31, 2018**
- **Boston Park Plaza**  
50 Park Plaza at Arlington St.,  
Boston, Mass. 02116  
800.225.2008 or 617.426.2000  
Group Rate: \$180 single, \$180 double,  
\$200 triple, \$220 quad\*  
**Deadline: November 2, 2018**
- **Hilton Boston Back Bay Hotel**  
40 Dalton St., Boston, Mass. 02115  
617.236.1100  
Group Rate: \$215 single/double,  
\$230 triple/quad\*  
**Deadline: November 2, 2018**
- **Embassy Suites Boston at Logan Airport**  
207 Porter St., Boston, Mass. 02128  
617.567.5000  
Group Rate: \$159 single  
Additional persons: \$10 ea.\*  
**Deadline: November 6, 2018**
- **The Westin Copley Place**  
10 Huntington Ave., Boston, Mass. 02116  
617.262.9600  
Group Rate: \$204 single, \$214 double  
Additional persons \$20 ea.\*  
**Deadline: November 2, 2018**

\* plus applicable taxes and fees

[www.mrs.org/fall-2018-hotels](http://www.mrs.org/fall-2018-hotels)

New to this Meeting, a kick-off presentation for the **Open Data Challenge**, a team competition for students to curate or develop their own materials data set, and apply materials informatics to that data set to learn something new. The competition is open to anyone who is passionate about materials science, materials informatics, or open scientific data. There will be two opportunities to attend a kick-off session (Monday, November 26, at 3:00 pm and Wednesday, November 28, at 4:00 pm) on The Hub Stage. For more information, visit [www.mrs.org/open-data-challenge](http://www.mrs.org/open-data-challenge).

The **NSF** will provide Speed Coaching sessions at the Public Outreach Center. The Division of Materials Research will be present to discuss funding opportunities, future program ideas, and sustainability.

The **MRS Public Outreach Committee (POC)** is presenting two new professional development programs. Both will have limited participation availability, so program preregistration will be required:

**1. Communicating Science to Non-Specialists—Science Communication Workshop.** The POC, in collaboration with the Princeton Center for Complex Materials (PCCM), is planning a full-day interactive workshop, boxed lunch provided, on Sunday, November 25, from 8:00 am to 5:00 pm. This session is from the PCCM's Science Communication and Education Network Workshop Series, and is a proven NSF-funded model for scientists to engage in public and face-to-face interactions with group activities, discussions, and lectures. All participants will receive feedback and



time to reflect. There will be three modules discussing different topics in science. This is an excellent program to aid researchers in fulfilling their Broader Impacts criterion for governmental agency grant proposals.

## 2. Workshop: Effective Public Policy Engagement Strategies for Researchers.

The POC and Government Affairs Committee are teaming up with Massachusetts Institute of Technology's International Policy Lab to present a half-day interactive workshop on Sunday, November 25, from 1:00 pm to 5:00 pm.

This workshop will provide an essential introduction to the policymaking process through the lens of the US federal government, while providing specific steps researchers can take to engage policy stakeholders and articulate the policy implications of their work. Rather than focus on the policies and funding decisions that support research, it will instead provide an understanding of how research results can and should impact the difficult decisions policymakers must make. Participants will develop:

- A better understanding of the role research and evidence play in the creation of public policy
- Strategies for informing the policymaking community with research results

2018 MRS FALL MEETING REGISTRATION RATES*		
	PREREGISTRATION before 5:00 pm (ET) November 9, 2018	ON-SITE REGISTRATION after 5:00 pm (ET) November 9, 2018
Meeting Registration	\$720	\$860
Meeting Registration with MRS Member Discount	\$570	\$710
Student Registration	\$170	\$200
Student Registration with MRS Member Discount	\$130	\$160
Unemployed	\$150	\$180
Retired	\$180	\$200

\* 2018 MRS Fall Meeting registrations include MRS Membership from January 1, 2019 to December 31, 2019.

- An initial pitch for policy audiences
- An appreciation of the importance of building two-way dialogues with policymakers

More information on POC programs and registration information will be available online on the 2018 MRS Fall Meeting and Public Outreach pages.

### For more information

Registration for the 2018 MRS Fall Meeting includes a complimentary one-year membership to MRS beginning January 1, 2019, through December 31, 2019. **The deadline to preregister**

**for the Meeting is November 9, 2018, 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: [info@mrs.org](mailto:info@mrs.org) (email) or 724-779-3003 (phone). Details of various events and activities will be available via the MRS Meeting App and in the Program & Exhibit Guide available on-site. The MRS website can also be accessed for updated information on confirmed talks, details of special events, information on obtaining a visa, and preregistration: [www.mrs.org/fall2018](http://www.mrs.org/fall2018).

FOR DISCOUNTED PRICING ON MATERIALS-RELATED TITLES...



Visit the

## MRS/CAMBRIDGE PUBLICATIONS BOOTH 100

in the Exhibit Hall during the 2018 MRS Fall Meeting

Tuesday 11:00 am–5:30 pm

Wednesday 11:00 am–5:30 pm

Thursday 10:00 am–1:30 pm





# 2018 MRS® FALL EXHIBIT

## Hynes Convention Center | Level 2



[www.mrs.org/fall-2018-exhibit](http://www.mrs.org/fall-2018-exhibit)

Tuesday, November 27..... 11:00 am – 5:30 pm

Wednesday, November 28..... 11:00 am – 5:30 pm

Thursday, November 29..... 10:00 am – 1:30 pm

abcr GmbH  
 ACI Alloys, Inc.  
 Across International  
 ACS Publications  
 Admiral Instruments  
 AdValue Technology, LLC  
 Advanced Polymer Materials Inc.  
 Advanced Research Systems, Inc.  
 Aerotech, Inc.  
 AIP Publishing  
 AJA International, Inc.  
 Alemnis AG  
 Allwin21 Corp.  
 Alpha Space Test & Research  
 Alliances, LLC  
 American Physical Society  
 ANCORP  
 Andeen-Hagerling, Inc.  
 Angstrom Engineering Inc.  
 Angstrom Sciences Inc.  
 Angstrom Scientific Inc.  
 Anton Paar  
 Applied NanoStructures, Inc.  
 Asahi Spectra Co., Ltd.  
 Asylum Research, an Oxford  
 Instruments Company  
 attocube systems Inc.  
 B&W Tek  
 Barnett Technical Services  
 BASi  
 Bio-Logic USA, LLC  
 Blue Wave Semiconductors, Inc.  
 BNNT Materials, LLC  
 Bruker Nano  
 Bruker Nano-AFM  
 Cambridge University Press/  
 Materials Research Society  
 Cell Press  
 Chemat Scientific  
 Cobolt Inc.  
 Cornell University  
 CRAIC Technologies, Inc.  
 Cryogenic Control Systems, Inc.  
 CrystalMaker Software Ltd.  
 CVD Equipment Corporation  
 DataPhysics Instruments USA Corp.  
 DCA Instruments, Inc.  
 De Gruyter  
 Delcom Instruments  
 Delong America Inc.  
 Digital Surf  
 DOE Nanoscale Science Research  
 Centers  
 Duniway Stockroom Corporation  
 Ebara Technologies, Inc.  
 Ecopia Corp.

EDAX Inc., AMETEK Materials  
 Analysis Division  
 Edinburgh Instruments Ltd.  
 Electron Microscopy Sciences  
 Elsevier Ltd.  
 Energetiq Technology, Inc.  
 EvisionTEC, Inc.  
 Ephemeron Labs Inc.  
 Evactron® by XEI Scientific, Inc.  
 FemtoTools AG  
 Film Sense  
 Fischione Instruments  
 FlackTek, Inc.  
 Frontiers  
 Furuya Metal Americas, Inc.  
 Gamry Instruments  
 Gatan  
 Geib Refining Corporation  
 GNB KL Group  
 Goodfellow Corporation  
 Hamamatsu Corporation  
 HeatWave Labs, Inc.  
 Heidelberg Instruments Inc.  
 Herzan LLC  
 Hitachi High Technologies America, Inc.  
 HORIBA Scientific  
 Hummingbird Scientific  
 Huntington Mechanical Laboratories, Inc.  
 ID Quantique SA  
 InRedox LLC  
 Integrated Dynamics Engineering  
 International Centre for Diffraction  
 Data (ICDD)  
 IOP Publishing  
 ISS, Inc.  
 Janis Research Company, LLC  
 Japan Science and Technology Agency  
 JASCO  
 JEOL USA, Inc.  
 Kammrath & Weiss Technologies, Inc.  
 Kaufman & Robinson, Inc.  
 Keithley, A Tektronix Company  
 Keyence Corporation of America  
 KLA-Tencor Corporation  
 Kleindiek Nanotechnik  
 KMLabs, Inc.  
 KP Technology USA Inc.  
 Kurt J. Lesker Company  
 Lake Shore Cryotronics, Inc.  
 LDS Vacuum Products, Inc.  
 Leica Microsystems Inc.  
 Leybold USA Inc.  
 LIG Nanowise/NANOPSIS  
 Linkam Scientific Instruments  
 Linseis Inc.  
 M. Braun Inc.

Mad City Labs, Inc.  
 Malvern Panalytical  
 MANTIS-SIGMA  
 Mass Applied Science  
 Materion  
 Matheson Tri-Gas, Inc.  
 MDC Vacuum Products, LLC  
 MDPI AG  
 Metrohm USA, Inc.  
 MilliporeSigma  
 MKS Instruments  
 MMR Technologies, Inc.  
 MPF Products, Inc.  
 MSE Supplies LLC  
 MTI Corporation  
 Naieel Technology  
 Nano-Master, Inc.  
 NanoAndMore USA, Inc.  
 NanoMagnetics Instruments  
 Nanoscribe GmbH  
 Nanosurf, Inc.  
 Nanotronics  
 NANOVEA  
 National Reconnaissance Office  
 neaspec GmbH  
 Neocera, LLC  
 NETZSCH Instruments  
 North America, LLC  
 Nor-Cal Products, Inc., A Pfeiffer  
 Vacuum Company  
 NT-MDT America, Inc.  
 Nuclear Science User Facilities  
 Object Research Systems  
 Olympus America Inc.  
 Optics11 Inc.  
 OptiGrate Corporation  
 OriginLab Corporation  
 Oxford Instruments  
 Oxford University Press  
 Park Systems Inc.  
 Pfeiffer Vacuum  
 Photothermal Spectroscopy Corp.  
 Pine Research Instrumentation, Inc.  
 Pittcon 2019  
 Plasmaterials, Inc.  
 PLOS (Public Library of Science)  
 Princeton Scientific Corp.  
 PROTO  
 Protochips, Inc.  
 PVD Products, Inc.  
 Quantum Design, Inc.  
 R.D. Mathis Company  
 Radiant Technologies, Inc.  
 Raith America, Inc.  
 Reliable Corporation  
 Renishaw Inc.

RHK Technology, Inc.  
 Rigaku Americas Corporation  
 Rocky Mountain Vacuum Tech, Inc.  
 Royal Society of Chemistry  
 Royal Society Publishing  
 SAES Group  
 SAGE Publishing  
 Sahajanand Technologies Pvt. Ltd.  
 Science/AAAS  
 Scienta Omicron, Inc.  
 Seki Diamond Systems  
 SemiconSoft, Inc.  
 Semilab  
 Sine Scientific Instruments, Co. Ltd.  
 Software for Chemistry & Materials  
 Solid State Cooling Systems, Inc.  
 Sono-Tek Corporation  
 SPECS-TII, Inc.  
 SPI Supplies, Division of Structure  
 Probe, Inc.  
 Springer Nature  
 SPS-Europe B.V.  
 STAIB Instruments, Inc.  
 Stanford Advanced Materials  
 Strem Chemicals, Inc.  
 Super Conductor Materials, Inc.  
 Synton-MDP AG  
 TA Instruments-Wafers LLC  
 Taylor & Francis Group  
 Ted Pella, Inc.  
 Telemark  
 TERA-print, LLC  
 TESCAN-USA  
 The Electrochemical Society  
 Thermo Fisher Scientific  
 THINKY USA, Inc.  
 Toho Technology Inc.  
 Tokyo Ohka Kogyo Co., Ltd.  
 Toshima Manufacturing Co., Ltd.  
 TOYOTECH LLC  
 Trion Technology, Inc.  
 UC Components Inc.  
 ULVAC Technologies, Inc.  
 Vacuum Technology Inc.  
 VAT Group  
 Vigor Tech USA, LLC  
 Wafer World Inc.  
 Wiley  
 WITec Instruments Corp.  
 J.A. Woollam Company, Inc.  
 Yuasa System Co., Ltd.  
 ZEISS Microscopy  
 Zurich Instruments AG  
 Zygo Corporation, AMETEK Ultra  
 Precision Technologies