



2015 **MRS**® FALL MEETING & EXHIBIT
November 29 – December 4, 2015 | Boston, Massachusetts

CALL FOR PAPERS

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A Engaged Learning of Materials Science and Engineering in the 21st Century

BIOMATERIALS AND SOFT MATERIALS

- B Stretchable and Active Polymers and Composites for Electronics and Medicine
- C Tough, Smart and Printable Hydrogel Materials
- D Biological and Bioinspired Materials in Photonics and Electronics—Biology, Chemistry and Physics
- E Engineering and Application of Bioinspired Materials
- F Biomaterials for Regenerative Engineering
- G Plasma Processing and Diagnostics for Life Sciences
- H Multifunctionality in Polymer-Based Materials, Gels and Interfaces
- I Nanocellulose Materials and Beyond—Nanoscience, Structures, Devices and Nanomanufacturing
- J Wetting and Soft Electrokinetics
- K Materials Science, Technology and Devices for Cancer Modeling, Diagnosis and Treatment
- L Nanofunctional Materials, Nanostructures and Nanodevices for Biomedical Applications

NANOMATERIALS AND SYNTHESIS

- M Micro- and Nanoscale Processing of Materials for Biomedical Devices
- N Magnetic Nanomaterials for Biomedical and Energy Applications
- O Plasmonic Nanomaterials for Energy Conversion
- P Synthesis and Applications of Nanowires and Hybrid 1D-0D/2D/3D Semiconductor Nanostructures
- Q Nano Carbon Materials—1D to 3D
- R Harsh Environment Sensing—Functional Nanomaterials and Nanocomposites, Materials for Associated Packaging and Electrical Components and Applications

MECHANICAL BEHAVIOR AND FAILURE OF MATERIALS

- S Mechanical Behavior at the Nanoscale
- T Strength and Failure at the Micro- and Nanoscale—From Fundamentals to Applications
- U Microstructure Evolution and Mechanical Properties in Interface-Dominated Metallic Materials
- V Gradient and Laminate Materials
- W Materials under Extreme Environments (MuEE)
- Y Shape Programmable Materials

ELECTRONICS AND PHOTONICS

- Z Molecularly Ordered Organic and Polymer Semiconductors—Fundamentals and Devices
- AA Organic Semiconductors—Surface, Interface and Bulk Doping
- BB Innovative Fabrication and Processing Methods for Organic and Hybrid Electronics
- CC Organic Bioelectronics—From Biosensing Platforms to Implantable Nanodevices
- DD Diamond Electronics, Sensors and Biotechnology—Fundamentals to Applications
- EE Beyond Graphene—2D Materials and Their Applications
- FF Integration of Functional Oxides with Semiconductors
- GG Emerging Materials and Platforms for Optoelectronics
- HH Optical Metamaterials—From New Plasmonic Materials to Metasurface Devices
- II Phonon Transport, Interactions and Manipulations in Nanoscale Materials and Devices—Fundamentals and Applications
- JJ Multiferroics and Magnetoelectrics
- KK Materials and Technology for Non-Volatile Memories

ENERGY AND SUSTAINABILITY

- LL Materials and Architectures for Safe and Low-Cost Electrochemical Energy Storage Technologies
- MM Advances in Flexible Devices for Energy Conversion and Storage
- NN Thin-Film and Nanostructure Solar Cell Materials and Devices for Next-Generation Photovoltaics
- OO Nanomaterials-Based Solar Energy Conversion
- PP Materials, Interfaces and Solid Electrolytes for High Energy Density Rechargeable Batteries
- QQ Catalytic Materials for Energy
- RR Wide-Bandgap Materials for Energy Efficiency—Power Electronics and Solid-State Lighting
- SS Progress in Thermal Energy Conversion—Thermoelectric and Thermal Energy Storage Materials and Devices

THEORY, CHARACTERIZATION AND MODELING

- TT Topology in Materials Science—Biological and Functional Nanomaterials, Metrology and Modeling
- UU Frontiers in Scanning Probe Microscopy
- VV *In Situ* Study of Synthesis and Transformation of Materials
- WW Modeling and Theory-Driven Design of Soft Materials
- XX Architected Materials—Synthesis, Characterization, Modeling and Optimal Design
- YY Advanced Atomistic Algorithms in Materials Science
- ZZ Material Design and Discovery via Multiscale Computational Material Science
- AAA Big Data and Data Analytics for Materials Science
- BBB Liquids and Glassy Soft Matter—Theoretical and Neutron Scattering Studies
- CCC Integrating Experiments, Simulations and Machine Learning to Accelerate Materials Innovation
- DDD Lighting the Path towards Non-Equilibrium Structure-Property Relationships in Complex Materials

X *Frontiers of Material Research*

www.mrs.org/fall2015

The **MRS/E-MRS Bilateral Conference on Energy** will be comprised of the energy-related symposia at the 2015 MRS Fall Meeting.

Meeting Chairs

T. John Balk University of Kentucky
Ram Devanathan Pacific Northwest National Laboratory
George G. Malliaras Ecole des Mines de St. Etienne
Larry A. Nagahara National Cancer Institute
Luisa Torsi University of Bari "A. Moro"

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MOSCONE WEST | LEVEL 1

Tuesday, April 7
10:00 am – 5:30 pm
Wednesday, April 8
10:00 am – 6:00 pm

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Multiscale Mechanics of Biological, Bioinspired, and Biomedical Materials

Wednesday, April 22 | 12:00 pm - 1:30 pm (ET)

Mechanical property measurement protocols have their origins in metallurgy—metals being the first materials used on a broad industrial scale—as well as in mechanical and civil engineering. Recent decades have evidenced growing interest in applying these methods to biological materials or materials mimicking or replacing biological tissue. However, the mechanical properties of biological materials are highly variable and hard to determine by the traditional protocols. A more slowly emerging thought is that perhaps the mechanical theories underlying the testing protocols emanating from the metals field might not be fully applicable to highly complex, hierarchically organized biological materials and might need further development. The presentations in this webinar highlight the challenge of extending theoretical and applied mechanics to the level needed to satisfactorily and reliably determine the mechanical properties of biological and related materials

This webinar expands on research that is featured in the April 2015 Issue of *MRS Bulletin*.

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- October 21** Engineered Nanomaterials in Aerospace Applications

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- **3D Printing of Biomaterials**
- **In Situ Transmission Electron Microscopy**
- **Nanodiamond and Diamond Electronics**
- **Surface Characterization of Mechanical & Chemical Properties of Energy Storage Devices**
- **Elastic Strain Engineering**
- **Nanoindentation: Fundamentals and Frontiers**

2014

YEAR-END REVIEW



Tia Benson Tolle
2014 MRS President



Todd M. Osman
MRS Executive Director

"Coming together is a beginning; Keeping together is progress; Working together is success." Those simple but powerful words from Henry Ford could well describe the success of our own Materials Research Society (MRS). While continuing to honor the vision of our founding members—who over 41 years ago opened the doors to interdisciplinary inquiry, professional partnerships and public appreciation for the role of materials in our lives—each year an inspired new roster of volunteers comes together to find exciting and innovative ways to shape the Society and chart its path forward. 2014 was no exception. Here we outline just a few special achievements of the past 12 months. Then turn the page and find a remarkable array of people, projects, places, premiers and previews that defined the year—by the numbers!

The **Materials Research Society Foundation** was established in late 2012 to advance the MRS mission of promoting interdisciplinary materials research and ensure that MRS programs in education outreach and peer recognition continue to grow. Two years later, the Foundation has funded member-proposed outreach projects, University Chapter Special Projects, free electronic memberships for students studying in developing countries, and experiment kits to connect U.S. and African materials scientists and university students. And thanks to a generous donation by the Jiang Family Foundation, a new award honoring excellence in post-doctoral research was presented at the 2014 MRS Fall Meeting. Additional information on the Foundation and its good works are outlined on the last page of this report.

In publication news, the MRS partnership with Cambridge University Press continues to produce innovative new products and services. Just launched, **MRS Energy & Sustainability—A Review Journal** focuses on key topics in materials research and development as they relate to energy and sustainability. We're also pleased to announce new Open Access options for select MRS publications, with discounted rates for our MRS members.

Continuing our focus on energy and sustainability, a pioneering new international traveling science exhibition, **Strange Matter Green Earth (SMGE)**, is in predevelopment and will be a major Society focus as we move into 2015. This interactive exhibition will enable millions of people across the globe to explore ways in which advances in materials can lead to a more sustainable future. SMGE is modeled after the first traveling

science exhibition from MRS—**Strange Matter**, a dynamic showcase of materials science now in its second decade of touring, with recent museum locations in the United Arab Emirates (Abu Dhabi) and China (Hong Kong and Shanghai). **Strange Matter** illuminated the power of a traveling science center exhibition and launched MRS as a leader in public education and outreach.

The **MRS OnDemand®** platform and the **MRS OnDemand Webinar Series** continued to grow in 2014 and will expand in 2015 with Webinar Wednesdays. This new series features free, live webinars and event rebroadcasts throughout the year that provide valuable educational information on timely, interdisciplinary topics, all while networking with other researchers from around the world.

Career Central was also introduced in 2014, with the goal of preparing and inspiring the talented and enthusiastic next generation of materials professionals. Offering a new online Job Board for job seekers and employers, and Career Fairs at MRS Spring and Fall Meetings that provide on-site job interviews, mentoring sessions with senior scientists, resume critiques, mock interviews, and professional development seminars and workshops, Career Central is a one-stop shop for all professional development needs.

That segues to yet another pioneering project from MRS designed to support and inspire, **iMatSci—Innovation in Materials Science**. Added to the lineup of activities at the 2014 MRS Fall Meeting Technology Innovation Forum, iMatSci gathered educators, industry leaders, innovators and venture capitalists in one location to spur collaboration and accelerate the adoption of new materials technologies that deliver value in real-world applications. The program was successful beyond expectations and is one of the ways we are facilitating connections between materials researchers across sectors and around the world.

And as always, this is the perfect time for us to thank the over **1000 volunteers plus members, leadership, headquarters staff, vendors, advertisers, exhibitors, sponsors, host cities** and the **materials community** who make MRS "the world's leading scientific organization for researching, developing, and applying new and existing materials."* These volunteers don't just share in our success, they contribute to our success, and for that we are extremely grateful.

Tia Benson Tolle, PhD
2014 MRS President

Todd M. Osman, PhD
MRS Executive Director

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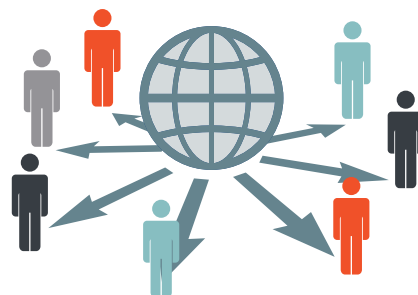
* *High-Voltage Design: Living Long and Still Prospering | EE Times | January 27, 2015*

2014 BY THE NUMBERS

Looking back to 2014, we are delighted to see all the Materials Research Society has accomplished. Our members, volunteers, exhibitors, sponsors, partners and headquarters staff are all to thank for the tremendous success of our Society. We are pleased to present a year-end review summary of some of our biggest achievements this past year.



- ◆ celebrated **41** years of service to the materials research community
- ◆ continued the success and growth of the Society with the help of over **1,000** volunteers from across the globe



- ◆ served an MRS membership of over **16,100**
- ◆ furthered our global reach by representing women and men from **80** countries around the world in our membership and meetings
- ◆ boasted **90** MRS University Chapters worldwide
- ◆ announced **5** Materials Research Society Foundation grants and **5** University Chapter Special Project Awards at the 2014 MRS Spring Meeting
- ◆ advanced **1** mission—to promote communication for the advancement of interdisciplinary materials research and technology to improve the quality of life

- ◆ offered **109** technical symposia at the 2014 MRS Spring and Fall Meetings, bringing in **12,445** total on-site attendees
- ◆ sold out the 2014 MRS Fall Meeting exhibit with **310** exhibitor booths
- ◆ expanded MRS Career Central to include a new online Job Board, professional development opportunities and enhanced Career Fairs at the MRS Spring and Fall Meetings, which accommodated **598** on-site job seekers

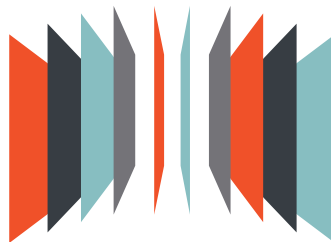
- ◆ garnered **4.2 million** page views on the MRS website
- ◆ strengthened MRS presence on social media, generating a viral reach of **643,772** on Facebook alone



- ◆ reported the latest breakthroughs in materials science through the MRS news site, *Materials360 Online*, yielding over **155,104** annual page views
- ◆ added **856** plenary and award talks, tutorial sessions, technical presentations, interviews and more to the MRS OnDemand® library
- ◆ recorded exclusive interviews with experts in the field during MRS Meetings via MRS TV, accumulating over **60,500** views on the 2014 MRS Spring Meeting playlist
- ◆ kicked off the MRS OnDemand Webinar Series with **3** live webinars, providing people in **51** countries access to valuable educational information on timely, interdisciplinary topics

- ◆ achieved record attendance of **1,516** at the XXIII International Materials Research Congress (IMRC), held in partnership with the Sociedad Mexicana de Materiales (SMM)
- ◆ managed **7** events through the MRS Conference Services Program, yielding a cumulative attendance of **1,669**

- ◆ increased combined downloads across all MRS publications, hosted on Cambridge Journals Online (CJO), to a total of over **1 million**



- ◆ continued to expand the breadth and scope of the MRS Book Collection, adding **7** books and textbooks to our portfolio

- ◆ ranked in the top **10%** of materials science journals with *MRS Bulletin*, which had an Impact Factor of **5.069** for 2014

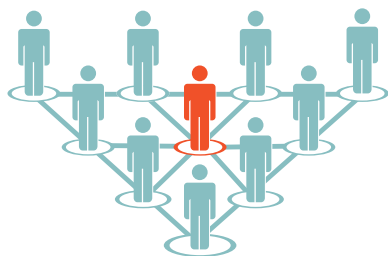
- ◆ improved the Impact Factor for *MRS Communications* by **24%** in its second year of publication

- ◆ sustained an impressive cited half-life of **>10** years for *Journal of Materials Research (JMR)*

- ◆ published the **1st** issue of the new *MRS Energy & Sustainability—A Review Journal*

- ◆ received **5.9 million** abstract views on the *MRS Online Proceedings Library (OPL)*

- ◆ achieved a readership of over **80,000** for the *Materials360*[®] e-newsletter



- ◆ honored **88** MRS members through the MRS Awards Program

- ◆ awarded the **1st** MRS Postdoctoral Awards at the 2014 MRS Fall Meeting

- ◆ continued to bring materials research to the public with the **12th** year of the international traveling exhibit, *Strange Matter*, reaching over **3.9 million** exhibition attendees in **5** countries to date



- ◆ sent **3,256** letters to the U.S. Congress through the MRS Materials Voice platform

- ◆ provided balanced coverage of science policy news in *MRS Bulletin* and *Materials360 Online*, with **52%** coverage of international (non-U.S.) stories

- ◆ hosted an introductory workshop for **8** institutions to learn about adopting the *Impact of Materials on Society* course at their college or university

- ◆ celebrated the **10th** Anniversary of the National Science Foundation's (NSF) Partnerships for Research and Education in Materials (PREM), where **52** students from minority-serving institutions joined us at the 2014 MRS Fall Meeting to participate in mentoring and professional development sessions

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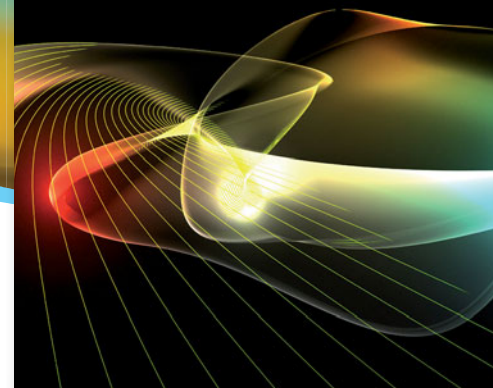
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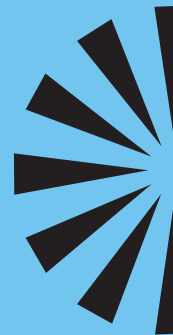
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