




## Preview: 2012 Materials Research Society Spring Meeting & Exhibit

Moscone West Convention Center and  
San Francisco Marriott Marquis  
San Francisco, California


**Meeting:** April 9–13

**Exhibit:** April 10–12 [www.mrs.org/spring2012](http://www.mrs.org/spring2012)


2012 MRS  
SPRING MEETING  
Meeting Chairs




**Lara A. Estroff**  
Cornell University



**Jun Liu**  
Pacific Northwest  
National Laboratory



**Kornelius Nielsch**  
University  
of Hamburg



**Kazumi Wada**  
University  
of Tokyo

The 2012 Materials Research Society Spring Meeting will be held April 9–13, 2012, in San Francisco, Calif. The spring meetings have grown considerably in recent years, and this year's meeting looks to be the largest yet. The scientific sessions will include many new and developing areas of materials research as well as some well-established and popular topics, with 11 of the 54 symposia co-sponsored by the Japan Society of Applied Physics

(JSAP). To complement the scientific sessions, tutorials will provide detailed introductions to particularly exciting areas of research, while the exhibit will showcase products of interest to the materials community. The technical meeting and exhibits will be located at the Moscone West Convention Center and San Francisco Marriott Marquis.

Making up the core of the Meeting are the five topical clusters of the technical program.

**Electronics and Photonics** will include symposia with a focus on electronic and photonic materials, devices, and processing. In addition, superconductors, organic electronics, and Si photonics for interconnects, sensing, and imaging will be covered.

**Materials Science and Materials Chemistry for Energy** will include photovoltaics, energy conversion and storage, materials science for catalysis, solid-state ionics and complex oxides, thermoelectrics, nuclear materials, and electrochromics.

**Nanostructured Materials and Devices** will feature the production and characterization of nanomaterials with additional symposia devoted to new

trends in carbon materials, nanomagnetism, thermoelectric nanostructures, metamaterials, nanoplasmonics, and topological insulators.

**Biological, Biomedical, and Bio-inspired Materials** will cover a wide range of topics from DNA nanotechnology to plasma processing for life sciences. Several symposia will explore the critical issues involved in interfacing biological systems with synthetic materials such as organic electronics, nanoparticles, and medical implants. Other areas to be covered include mechanobiology, the design of cellular microenvironments, and the synthesis of new materials based on biological building blocks.

The cluster on **General Materials Science** will round out the meeting with symposia on computation, *in situ* and local characterization techniques, rare-earth materials, functional particles, ionic liquids, and materials science education.

**Symposium X** on Frontiers of Materials Research will feature presentations for the broad materials community. With general concern about the environmental impact of the rapidly increasing volume of air traffic, fuel-cells systems represent a solution to cleaner power and enhanced energy efficiency. K. Andreas Friedrich of the German Aerospace Center (DLR)/University of Stuttgart will address DLR's work—both experiments and modeling—on fuel-cell systems for aircraft applications to support or replace the existing systems.

Symposium X speaker Koichi Kitazawa of the Japan Science and Technology Agency (JST) will address current emphasis in Japan on game-changing energy technologies, in light of the recent Fukushima nuclear incident. The Japa-

### 2012 MRS Spring Meeting Registration Rates

	<b>Pre-Registration</b> Before 5:00 p.m. EST, March 23, 2012	<b>On-Site Registration</b> After 5:00 p.m. EST, March 23, 2012
Member	\$495	\$595
Student Member	\$110	\$140
Nonmember	\$595	\$695
Student Nonmember	\$135	\$165
Unemployed/Retired	\$135	\$165



nese government has announced that it will follow a policy to decrease the level of dependence on nuclear energy, hence the country's need to find novel energy sources and novel routes for substantial energy savings as soon as possible. In particular, Kitazawa sees opportunities emerging from a nanotechnology approach.

Hod Lipson of Cornell University directs the Creative Machines Lab, which focuses on making machines that create, and machines that are creative. He has led work in areas that include multimaterial functional rapid prototyping. In Symposium X, he will describe the evolution of additive manufacturing technologies and chronicle the past and future journey of three-dimensional printers that can currently fabricate, layer by layer, objects of almost any material—from nylon to glass, from chocolate to titanium—and with any complex geometry. Lipson will extend his talk to control over the multimaterial composition of matter with unprecedented fidelity as well as control over active behavior.

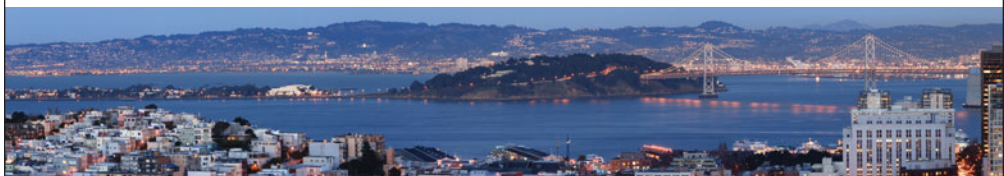
To coincide with the release of the *MRS Bulletin* special issue, "Materials for Sustainable Development," a forum titled "The Many Facets of Sustainable Development" will be held on Monday, April 9. This event will feature economists, social scientists, and industrial ecologists to discuss other, broader aspects of sustainable development and bring new perspectives to the materials

## Hotels in San Francisco

The 2012 MRS Spring Meeting will be held at the Moscone West and San Francisco Marriott Marquis in San Francisco. For your convenience, special room rates have been arranged at the hotels listed below. Rooms are limited at these rates, so make your reservations early. Your patronage of the official hotels enables MRS to secure the meeting space at a greatly reduced cost. Check the MRS website for more information: [www.mrs.org/spring2012](http://www.mrs.org/spring2012).

■ **HEADQUARTER HOTEL**  
**San Francisco Marriott Marquis**  
 55 Fourth Street  
 San Francisco, CA 94103  
 Phone: 1-801-832-4532 or  
 1-800-266-9432  
 Fax: 1-415-486-8153

■ **InterContinental San Francisco**  
 888 Howard Street  
 San Francisco, CA 94103  
 Phone: 1-800-381-9552  
 Fax: 1-415-616-6581



research community. The forum will feature several keynote speakers in the morning, followed by panel discussions on specific case studies in the afternoon.

An awards ceremony will be held at which this year's Outstanding Young Investigator and recipient of the Innovations in Materials Characterization Award—endowed by Toh-Ming Lu and Gwo-Ching Wang—will be recognized, MRS Fellows will be honored, and Gold and Silver Graduate Student Awards will be presented to graduate students

for symposium papers that exemplify significant and timely research. The inaugural Mid-Career Researcher Award, made possible through an endowment established by Aldrich Materials Science, will also be presented.

The Meeting will include a plenary address and a talk by the recipient of the Kavli Lectureship on Nanoscience, both yet to be announced.

Poster sessions will be held in the Moscone West (Exhibit Hall) on Tuesday from 5:00 p.m. to 8:00 p.m. and on



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Live updates on the go, straight from the 2012 MRS Spring Meeting!

The materials landscape is constantly changing. With new research, awards, publications and conferences announced daily, it's never been more vital to stay up-to-date. Connect with fellow materials scientists from around the globe, talk with exhibitors that interest you and share thoughts with MRS staff through our powerful social media channels. Plus, you'll receive exclusive MRS content before anyone else. Visit [www.mrs.org/socialmedia](http://www.mrs.org/socialmedia) today to view all of our social media channels: Facebook, LinkedIn, Twitter and Vimeo.



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# TUTORIALS

Monday, April 9, 2012  
Moscone West Convention Center

## **TUTORIAL A: Thin-Film Silicon and Related Materials for Solar Cells and Displays**

9:00 am-5:00 pm Room 2003

## **TUTORIAL E: Fundamentals of Emerging Nonvolatile Memories**

9:00 am-5:00 pm Room 2005

## **TUTORIAL F: Overview of Phase-Change Materials, Their Physics and Applications**

9:00 am-5:00 pm Room 2004

## **TUTORIAL G: Materials Issues and Reliability of GaN-Related Optical and Electron Devices and Materials**

9:00 am-5:00 pm Room 2007

## **TUTORIAL I: Coated Conductors—20-Year History, Status, and Prospects**

9:00 am-5:00 pm Room 2009

## **TUTORIAL L: Silicon Photonics and Sensing Technology**

1:30-5:00 pm Room 2012

## **TUTORIAL N: Fundamentals and Applications of Piezotronic Effect for Energy Conversion and Semiconductor Device Development**

1:30-5:00 pm Room 2010

## **TUTORIAL O: Li-ion Batteries to Supercapacitors to Metal-Air Batteries—Energy Storage Systems to Satisfy High-Energy and High-Power Applications**

8:30 am-12:00 noon Room 2024

## **TUTORIAL W: Design and Processing of Organic, Polymer, and Dye Solar Cells—From Nanostructure Control of the Cell Architecture to Large-Area Module Upscaling**

9:00 am-4:15 pm Room 2002

## **TUTORIAL EE: Physics and Devices for Nanocarbon Materials**

9:00 am-12:00 noon Room 2006

## **TUTORIAL HH: Oxide Heterostructures and Nanostructures—Fabrication, Properties, Magnetic Coupling, and Applications**

8:30 am-5:00 pm Room 2011

## **TUTORIAL II: Introduction to Nanoscale Materials Modification by Photon, Ion, and Electron Beams**

1:30-5:00 pm Room 2022

## **TUTORIAL MM: Topological Insulators—Theory and Experiment**

1:30-5:00 pm Room 2000

## **TUTORIAL QQ: Interactive Tutorial on Techniques in Mechanobiology**

9:00 am-5:00 pm Room 2020

## **TUTORIAL SS: A Laboratory X-Ray Characterization Primer on Techniques to Characterize Biological Materials and the Micron-, Nanometer- and Angstrom-Length Scales—From Tomography to Diffraction Mapping**

1:30-5:00 pm Room 2018

## **TUTORIAL WW: Plasmas for Life Sciences—Foundations and Applications**

1:30-5:00 pm Room 2016

Wednesday and Thursday from 8:00 p.m. to 11:00 p.m. at the San Francisco Marriott Marquis.

The meeting chairs will sponsor a Best Poster Award competition, selecting recipients each night on the basis of the posters' technical content, appearance, graphic excellence, and presentation quality.

The popular Science as Art competition will again be held at this Meeting. The competition is open to all registered meeting attendees, with entries to be on display in the Moscone West Convention Center. Multiple first-place and second-place awards of \$400 and \$200, respectively, will be presented at the Meeting. The deadline for entries is February 15, 2012 (5:00 p.m. EST). Guidelines are available on the 2012 MRS Spring Meeting website, under "Special Events."

MRS will host a Career Center; services offered to attendees include access to current job postings, a resume file for prospective employers, and on-site interview opportunities.

Graduate students and members of MRS University Chapters are invited to attend the student mixer reception. Also, chapter officers and faculty advisors are invited to attend a meeting of MRS University Chapter representatives to compare notes on recent activities and brainstorm on new projects and issues of common concern. Those interested in starting new chapters are welcome.

Presentations on funding opportunities from U.S. government agencies and various events for professional development and public outreach are also planned.

The deadline to pre-register for the

Spring Meeting is **March 23, 2012** (5:00 p.m. EST). International travelers are reminded to begin the visa process early. For additional information on the Spring 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 & Exhibit Guide available on-site. The MRS website can be accessed for updated information on confirmed talks and details on special events, for more information on obtaining a visa, and pre-registration at [www.mrs.org/spring2012](http://www.mrs.org/spring2012).



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Arradance, Inc.  
Asylum Research  
Attolight AG  
BioLogic USA  
Blue Wave Semiconductors  
Bruker  
Buchi Corporation  
Cambridge NanoTech Inc.  
Cambridge University Press  
Carbolite, Inc.  
CRAIC Technologies, Inc.  
CRC Press-Taylor & Francis Group LLC  
Cryogenic Limited  
CrystalMaker Software Ltd.  
CSM Instruments Inc.  
EBARA Technologies, Inc.

### **Moscone West Level 1**

Tuesday, April 10  
11:00 am – 8:00 pm

Wednesday, April 11  
11:00 am – 5:00 pm

Thursday, April 12  
10:00 am – 1:30 pm

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Janis Research Company, Inc.  
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Johnsen Ultravac Inc.  
KD Scientific  
KP Technology Ltd.  
Kurt J. Lesker Company  
Lake Shore Cryotronics, Inc.  
MANTIS Deposition Ltd.  
Materials Analysis Technology Inc.  
Metrohm USA, Inc.  
Mettler-Toledo, LLC  
Microtrac Inc.  
MicroXact Inc.  
MMR Technologies, Inc.  
MTI Corporation  
MV Laboratories Inc.  
NanoAndMore USA Inc.  
Nanofactory Instruments AB  
NANOLANE  
Nanonics Imaging Ltd.  
National Electrostatics Corp.  
NBM Design, Inc.  
Neocera, LLC  
Netzsch Instruments N.A. LLC  
NIST  
Nor-Cal Products, Inc.

Oerlikon Leybold Vacuum  
Omicron NanoTechnology USA, LLC  
Oxford Instruments America  
PANalytical Inc.  
Park Systems Inc.  
Photon Technology International, Inc.  
Physical Electronics  
Plasma-Therm LLC  
Plasmaterials, Inc.  
Protochips, Inc.  
Radiant Technologies, Inc.  
Renishaw Inc.  
RHK Technology, Inc.  
Rigaku Americas Corporation  
Rigaku Raman Technologies  
Rocky Mountain Vacuum Tech, Inc.  
Seki Diamond Systems  
Semicore Equipment Inc.  
Solarton Analytical (AMETEK)  
SonoPlot, Inc.  
South Bay Technology, Inc.  
SPECS Surface Nano Analysis, Inc.  
SPI Supplies, Division of  
Structure Probe, Inc.  
SPIE  
Springer  
STAIB Instruments, Inc.  
SunaTech Inc.  
SVT Associates, Inc.  
Ted Pella, Inc.  
Twente Solid State Technology B.V.  
United Mineral & Chemical Corporation  
VG Scienta, Inc.  
Wiley  
WITec Instruments Corp.  
XEI Scientific, Inc.