

Preview: 2009 MRS Fall Meeting

Hynes Convention Center and Sheraton Boston Hotel, Boston, Massachusetts

Meeting: November 30–December 4 • Exhibit: December 1–3

www.mrs.org/F09



2009 MRS
fall meeting

Meeting Chairs:

Kristi Anseth

University of Colorado

Li-Chyong Chen

National Taiwan University

Peter Gumbsch

University of Karlsruhe

Ji-Cheng Zhao

The Ohio State University

The Materials Research Society will hold its 2009 Fall Meeting at the Hynes Convention Center and the Sheraton Boston Hotel in Boston, Mass., November 30–December 4, 2009. The meeting will include a technical program, tutorials, a plenary session, an awards ceremony, an equipment exhibit, poster sessions, a career center, funding seminars, and other special activities. Symposium proceedings will be published on the MRS Web site, where they will be available free online to MRS members.

The increasingly cross-disciplinary worldwide activity on materials research culminates every year in the MRS Fall Meetings. Symposium organizers from around the world have created a program of 50 symposia that addresses leading-edge research and captures the extraordinary progress in materials science and technology, featuring an exciting mix of well-established and popular topics. The symposia are organized in the following five clusters.

Information Processing and Sensing covers a broad range of materials, such as high-*k* dielectric, compound semiconductors, wide-gap semiconductors, multi-ferroic and ferroelectric, magnetic shape memory alloys, as well as organic spintronic. Challenges in large-scale processing of emerging materials or printable devices, as well as their applications and reliability issues, will be addressed.

Nanoscience and Technology addresses process, functionalization, and integration toward electronic, optoelectronic, or photo-voltaic devices of nanoparticles, graphene, nanotubes, and nanowires. Besides the science unique to nanoscale structures, including excitons and plasmon resonances, business in nanotechnology will also be featured.

Energy and the Environment focuses on materials research related to photo-voltaic and solar-cell materials, batteries and fuel cells, hydrogen storage materials, materials for nuclear energy, organic and inorganic materials and devices for energy harvesting and efficient usage, catalysts for energy and the environment, environmentally friendly materials synthesis, and renewable biomaterials and bioenergy.

Materials Across the Scales centers on materials modeling and simulation from quantum mechanics to mechanical properties, novel materials characterization techniques, materials in confining systems, and metamaterials.

In Health and Biological Materials, synthesis, processing, and applications of biomaterials will be covered in a dynamic range of symposia with a focus on the forefront of responsive materials, regenerative medicine, biointerfaces, nanobiotechnology, biomimetics, micro- and nanoscale processing techniques, nanoparticle assemblies for imaging and sensing, and biocompatibility of nanomaterials.

In addition to the technical symposia, Symposium X will feature lunchtime lectures aimed at a broad audience to provide meeting attendees with an overview of leading-edge topics. Poster sessions, an integral feature of MRS meetings, will be held during the evenings. The meeting chairs will award the best posters during each session with prizes of up to \$500. Winning posters will be displayed prominently throughout the week.

Special Sessions

The **Plenary Session** will be held on Monday, Nov. 30, 6:30 p.m. in the Grand Ballroom of the Sheraton Boston Hotel, at which **Andre K. Geim** of the University of Manchester, United Kingdom, will present a talk on “Materials in Flatland.” Geim will present an overview of his group’s work

on the electronic and optical properties of graphene, and speculate about future applications.

The **Awards Ceremony** will convene on Wednesday, Dec. 2, at 6:30 p.m. in the Grand Ballroom of the Sheraton Boston Hotel, at which the Von Hippel Award, Turnbull Lectureship, MRS Medal, and Graduate Student Awards will be presented. The ceremony will be followed by the **Von Hippel Award** address by **Tobin J. Marks** of Northwestern University on “Molecule-Based Organic and Hybrid Inorganic/Organic Electronics and Opto-Electronics.”

Edward J. Kramer of the University of California, Santa Barbara, is the recipient of the **David Turnbull Lectureship**. He will present his lecture, “Phase Transitions in Thin Block Copolymer Films,” on Dec. 2 at 12:15 p.m. in the Grand Ballroom of the Sheraton Boston Hotel. The **MRS Medalist** is **Gerbrand Ceder** of Massachusetts Institute of Technology who will present his award talk, “The Opportunities and Challenges for First Principles Materials Design and Applications to Li Battery Materials,” on Dec. 1 at 5:10 p.m. in Room 200 of the Hynes Convention Center.

Chad A. Mirkin of Northwestern University has been selected for the **Fred Kavli Distinguished Lectureship in Nanoscience**, supported by the Kavli Foundation. Mirkin will present his lecture on Nov. 29, 7:00 p.m., in the Grand Ballroom of the Sheraton Boston Hotel.

Other activities include the **Women’s Professional Development Workshop** and the **Women in Materials Science and Engineering Breakfast**, and **government agency seminars** that offer attendees information on funding available for materials research. Special **outreach activities** will take place in front of the entrance to the Hynes Convention Center to educate the general public on materials research. The activities include interactive, hands-on demonstrations about materials science and engineering, scheduled for Monday through Thursday from 11:30 a.m. to 1:30 p.m. In addition, a **Science as Art competition** will be held. The competition is open to all registered meeting attendees. Prizes of up to \$400 will be awarded. The deadline for entries closed on October 12, 2009.

Career Services, Student Events, and Networking Opportunities

MRS will host a **Career Center** for meeting attendees, to be held Dec. 1–3 at the Hynes Convention Center. Services include access to current job postings, a resume file for prospective employers, and on-site interview opportunities.

Gold and Silver Graduate Student Awards will be presented during the Awards Ceremony to graduate students whose academic achievements and current materials research display a high level of excellence and distinction.

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

Other Events Coinciding with the Meeting

MRS is holding the **X-Ray Scattering**

Methods for Characterization of Advanced Materials Workshop in Boston on Dec. 4. The aim of the workshop is to give the attendees valuable tools to help unravel the structural and micro- or nanostructural parameters of samples and/or devices. These techniques will help in the design of advanced materials or devices and/or in the quality control process. Academics, industrial laboratory staff, engineers, researchers, scientists, educators, and leading professionals in the field of high-*k* dielectrics, semiconductors, nanomaterials, thin film, energy storage materials, solar cells, H-storage materials, batteries, and advanced materials will be able to learn how classical and novel x-ray diffraction or scattering methods can help in their work. The workshop will conclude with a field trip to tour PANalytical's Applications Laboratory where attendees can see the latest developments in x-ray diffraction laboratory systems. Roundtrip transportation and refreshments will be provided. For registration information, access Web site www.mrs.org/x-ray_scattering.

On Dec. 1, 7:00 p.m.–9:00 p.m., a **re-training session** will be held for evalua-

tors for the **Accreditation Board for Engineering and Technology, Inc. (ABET)**.

For More Information

See the following pages for a list of tutorials, information on hotel and transportation arrangements, and for a list of exhibitors and of proceedings that will be available for order. MRS is offering some reimbursement for childcare expenses for Meeting attendees. For additional details, contact MRS Member Services.

The deadline to pre-register for the meeting is **November 13, 2009, 5:00 p.m. (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; e-mail info@mrs.org, tel. 724-779-3003, and fax 724-779-8313. Details of various events and activities will be published in the Meeting Guide available on site. The MRS Web site can be accessed for updated information on confirmed talks and details of special events, for more information on obtaining a visa, and for pre-registration: www.mrs.org/F09.

Plenary Speaker Andre K. Geim to Focus on Graphene

Andre K. Geim of the University of Manchester, United Kingdom, will deliver the plenary address at the 2009 Materials Research Society Fall Meeting in Boston on Monday, Nov. 30, at 6:30 p.m. in the Grand Ballroom of the Sheraton Boston Hotel. In his presentation, "Materials in Flatland," Geim will present an overview of his group's work on the electronic and optical properties of graphene, and speculate about future applications.

At the University of Manchester, Geim is Royal Society Research Professor, Langworthy Professor of Physics and director of the Manchester Centre for Mesoscience and Nanotechnology. In 2004–2005, Geim reported the discovery of free-standing two-dimensional crystals, including single layers of graphite, boron-nitride, several dichalcogenides, and complex oxides. Unexpectedly, these atomically thin sheets appeared to be stable under ambient conditions, exhibit high crystal quality, and be continuous on a macroscopic scale. For example, graphene (a free-standing monolayer of graphite) can be viewed as a flat fullerene molecule or as millions of carbon nanotubes unrolled and stitched together. Quasiparticles in graphene behave like massless relativistic fermions described



Andre K. Geim

by the Dirac equation rather than the standard Schrödinger equation that is used to describe the electronic properties of other materials. Geim's group has proven this in a series of elaborate experiments that led to a new paradigm of "relativistic-like condensed matter" where quantum relativistic phenomena can now be studied in bench-top nanoscience experiments. Geim's laboratory continues to report new phenomena in graphene such as the half-integer quantum Hall effect observable even at room tem-

perature and the optical opacity defined by the fine structure constant. Many new technologies based on graphene have been suggested and are being investigated in laboratories worldwide, especially for electronics applications.

Geim received his PhD degree from the Institute of Solid State Physics in Chernogolovka, Russia in 1987 and worked as a research scientist until 1989 at the Institute for Microelectronics Technology in Chernogolovka. He served a one-year Royal Society Visiting Fellowship at Nottingham University, England, after which he worked as a visiting researcher at the Ørsted Institute in Copenhagen, and a research officer at the University of Bath, then returned to Nottingham as a research associate. From 1994 to 2000, Geim was an associate professor at the University of Nijmegen, the Netherlands, then joined the faculty at the University of Manchester in 2001.

Among his awards and honors are the 2009 Körber European Science Prize, the 2008 Europhysics Prize (shared with Kostya Novoselov), and the 2007 Mott Prize. Geim has over 150 publications, including 14 *Science* and *Nature* research papers. He was elected Fellow of the Royal Society in 2007.