



MRS **Materials Research Society**

Advancing materials. Improving the quality of life.

What is Materials Science...

Understanding how materials are put together, how they can be used, how they can be changed, how they can be improved—or creating new materials that have never existed before—that's materials science.

From the Stone Age to today's nanotech era, the quality and even the length of our lives have depended on our ability to manipulate the materials around us. Iron underpinned the Industrial Revolution and transformed transportation via steam engines and railways. Whole industries have risen on devices made possible by materials with marvelous properties, such as the silicon chip. And the newest jet airplanes fly more efficiently, and golf drives soar farther, thanks to the latest composites. Materials have changed our history and continue to shape our future.

Modern materials scientists manipulate and change materials based on fundamental understandings of how the materials are put together, often on the invisible scale of atoms. They look for connections between the underlying **structure** of a material, its **properties**, how **processing** changes it, and what the material can do—its **performance**. Their work touches on many different fields, including chemistry, biology, physics and engineering, and you can find them working in industries, laboratories and universities around the world.

Today, there are about 300,000 different known materials, but as materials scientists continue to create and combine materials in new ways, the number is almost infinite. Pioneers in materials science are designing unique materials that will bring vital new technologies within reach—everything from cost-effective fuel cells and solar panels, to quantum computers and ultralight, ultrastrong automobiles. With visionary talent, interdisciplinary thinking and dogged determination, a wild idea becomes a world-changing breakthrough!



The Materials Research Society

The Materials Research Society (MRS) was established in 1973 by a visionary group of scientists who shared the belief that their professional interests were broader in scope than existing single-discipline societies, and that a new *interdisciplinary* organization was needed. Today MRS is a growing, vibrant member-driven organization of almost 16,000 materials researchers from academia, industry and government, and a recognized leader in the advancement of interdisciplinary materials research. Headquartered in Warrendale, Pennsylvania (USA), MRS membership now spans over 80 countries, with more than 40% of members residing outside the United States.

MRS members are engaged and enthusiastic professionals hailing from physics, chemistry, biology, mathematics and engineering—the full spectrum of materials research—and they choose MRS because it is important to their work and their careers. In MRS they find an environment for collaboration and open exchange of ideas across all scientific disciplines. Where students and Nobel Laureates come together to share their research. Where multilateral projects are a global enterprise. And where the ultimate goal is to advance materials that improve the quality of life.

The tremendous growth and success of our Society is the result of member input and the energetic efforts of many MRS volunteers. They offer their precious time, their spirit, their expertise and their unique perspectives for the betterment of the materials community worldwide. These volunteers, together with our exhibitors, sponsors, partners and headquarters staff, are the framework upon which our Society will continue to flourish.

Looking ahead, we at the Materials Research Society dream of a world with a stable environment and abundant and clean energy and water. We imagine a vibrant, interdisciplinary materials enterprise that engages all demographics and geographic regions. And we affirm our commitment to be a leader in these endeavors... serving the scientific community and advancing the global quality of life.



MRS Meetings — Convene, Connect, Collaborate

MRS has long been known as a “great meetings society”—serving as a major international stage for the examination of current and emerging materials research. Mirroring membership, MRS meetings are multidisciplinary and multinational, attracting global experts and providing a glimpse of the future of materials science.

At the heart of the meetings portfolio are the **MRS Spring and Fall Meetings and Exhibits**. These gatherings continue to grow, and in many instances, set new records in technical scope and attendance. Researchers from all scientific fields, backgrounds and employment sectors—students to Nobel Laureates—converge annually in San Francisco and Boston to exchange technical information, network with friends and colleagues, and contribute to the advancement of materials research. Large-scale exhibits add to the interactive meeting experience as companies from around the world present innovative products and services to the scientific community, and in turn, gather information to develop products and establish partnerships for a new era.

The model for these meetings is unique to MRS. Society leadership literally hands over control of each meeting to five new volunteer Meeting Chairs—materials researchers working in the field, with firsthand knowledge of what is most important to the community. Year after year, meeting after meeting, these new Chairs, together with their Symposium Organizers and numerous other volunteers and MRS staff, create exciting, informative, world-renowned events that carry on the “great meetings society” legacy. From a balanced array of fundamental, emerging and new symposium topics, to poster sessions, tutorials, professional development and career opportunities, special talks and forums, government agency sessions, and educational outreach and advocacy activities, there is definitely something for every professional need.

While MRS Spring and Fall Meetings are at the core of the meetings portfolio, MRS continues to enhance its service to the global materials community with the MRS Workshop Series and collaborative international efforts. The **MRS Workshop Series**, for example, was created in direct response to member requests for smaller, more interactive events with a concentrated, designated focus. These 2-3-day Workshops offer attendees a more in-depth review of important topics than is typically available in a “snapshot” symposium.

MRS is also committed to building meetings that expand research and industrial partnerships across borders. For the past several years, MRS has collaborated with the Sociedad Mexicana de Materiales on its annual conference, the **International Materials Research Congress (IMRC)**. For the 2012 MRS Spring Meeting, MRS partners with the **Japan Society of Applied Physics (JSAP)** on 11 of its 54 technical symposia. And the energy-related symposia at the 2012 MRS Fall Meeting define the second annual **MRS/E-MRS (European MRS) Bilateral Conference on Energy**. Additional meeting collaborations are also in planning stages with partners in Asia and Africa, as well as in Central America and South America.

Going a step further, MRS also offers its trademark talents of meeting expertise and operational infrastructure to other scientific communities in need of conference support. It's a perfect arrangement for both sides of the collaboration—the scientific communities maintain their programming autonomy while MRS provides its communications, logistics and business management forte.

Not one to rest on its laurels, MRS continues to examine the role of MRS meetings in the ever-changing and ever-expanding materials research landscape. How can we improve our existing meetings, utilize new media, provide forums for public policy discussion, help educate both researchers and the public, and disseminate technical and non-technical information in the most efficient manner? The answer to these questions, and more, will help us create meetings that will best serve the broad materials community—to create a global classroom of sorts—for advancing materials and improving the quality of life.





The Materials Gateway — Read, Share, Submit


MRS print and electronic publications provide the R&D community with a vast collection of high-quality information on critical, cutting-edge materials research. From our flagship peer-reviewed journal—*MRS Communications*—to *MRS Bulletin*, *Journal of Materials Research (JMR)* and the *MRS Online Proceedings Library (OPL)*, the goal has always been to identify and respond to the evolving needs of the materials community.

An historic partnership with Cambridge University Press brought a new era for MRS. With the full suite of MRS publications now delivered on Cambridge's powerful electronic platform, Cambridge Journals Online (CJO), MRS members and the materials community enjoy easy access to journal content and key information. For authors, this partnership provides an ever-expanding audience of leading academic, industrial and government researchers worldwide.

With the launch of *MRS Communications* in mid-2011, the first of many new publishing ventures expected to result from the MRS/Cambridge partnership came to fruition. This online-only, “letters and prospectives” journal is designed to serve the fast-moving international materials research community. While focused on reporting cutting-edge materials research, *MRS Communications* affords authors an exceptionally rapid review process, time-to-publication, and swift reach to a global audience.

MRS, however, has a long tradition of industry-leading publications. Since its inception in 1975, *MRS Bulletin* has long been the news magazine of record for the materials community. In addition to monthly “theme articles” written by leaders in their fields, the *Bulletin* also delivers timely commentary, features, news and trends to keep the materials community apprised of information important to their research and their profession.

Journal of Materials Research, a long-standing archival journal on interdisciplinary materials research, was launched by MRS in 1986. Edited by renowned materials scientists from the world's most respected research facilities, each issue covers a wide range of materials topics. Special focus issues are also published to provide readers with a comprehensive look at current research in targeted areas of interest.



For materials research libraries, the **MRS Symposium Proceedings Series** has been a staple since the print volumes were introduced in the early 1980s. Now also available in electronic format as the **MRS Online Proceedings Library**, this massive database includes nearly 100,000 proceedings papers and continues to be a standard reference in many areas of materials science. In addition to proceedings, MRS also produces select monographs, handbooks and textbooks to serve its members and the materials community. Newest offerings include the **Handbook of Modern Ion Beam Materials Analysis, 2nd Edition** and the textbook, **Fundamentals of Materials for Energy and Environmental Sustainability**.

MRS is also focusing on an **expanded news program** as well as **social media efforts** that will increase content value and accelerate information access. Already in place is **Materials360®**, a twice-monthly electronic newsletter that delivers “snapshots” of what's new in the materials research community—research alerts, product and service summaries, professional opportunities and global news. For those with limited time or resources to attend MRS and other materials-related conferences, there is **Meeting Scene**. On-the-spot reporters deliver daily summaries of technical presentations and events to readers around the world. Add our strategic use of social media—Facebook, LinkedIn, Twitter, YouTube and blogs—and MRS is primed to not only generate and distribute relevant and quality information, but also to gather feedback, insight and inspiration to better serve its constituents.

With a nod to the future, MRS will continue to explore ways to effectively cover emerging technologies via multimedia approaches that are smart, fresh and innovative... and that will foster growth of a virtual global materials community.






Science Education and Public Outreach — Participate, Educate, Fascinate

In addition to its focus on building and growing a better MRS, the Society has also developed a far-reaching series of programs that expose students, teachers, and life-long learners to the excitement of discovery and the significance of science in their daily lives. For interested MRS members, these programs provide an opportunity to participate in outreach activities, support national STEM (science, technology, engineering and math) education initiatives, and play a significant role in developing and nurturing the next generation of materials scientists.

A long standing focus of the Society's outreach activities is **Strange Matter**— a traveling interactive museum exhibit where users enter the fascinating, practical, occasionally bizarre and often beautiful world of materials science through over a dozen hands-on experiences. The exhibition includes programs to equip science professionals and university students with outreach materials, encouraging them to become involved in public education in their local communities. Over 2 million visitors have seen the exhibit since its debut in 2004 and an estimated 3 million additional students, teachers and families have benefitted from the downloadable guidebooks (available in English, French and Spanish) and the award-winning Strange Matter Web site. The Strange Matter exhibit continues to tour North America and plans for an international Strange Matter are now underway.

MRS also plays a leading role in the **Nanoscale Informal Science Education Network (NISE Network)**—a program created to engage the public in advances in nanoscale research, to capture the imagination of young people who may subsequently choose careers in nanoscale science or technology, and to foster new partnerships among research institutions and informal science centers. MRS Meetings are now considered key events for the informal science education community to meet, network, collaborate and educate. In addition,



MRS members and NISE Network science educators annually collaborate and participate in NanoDays, a nationwide festival of educational programs about nanoscale science and engineering and its potential impact on the future.

When considering mechanisms for reaching the general public and conveying the excitement and implications of materials science, one medium clearly comes to the forefront—television. MRS proudly teamed with NOVA, the flagship PBS science documentary series, to produce a four-part PBS primetime series on materials entitled **MAKING STUFF: Stronger, Smaller, Cleaner, Smarter**. Premiering in early 2011, the series presented dramatic stories about how materials changed history and are shaping our future. The first episode reached 5.7 million viewers, with almost 15 million viewing the series overall!

MRS also enjoys a long-standing partnership with **Discoveries and Breakthroughs Inside Science (DBIS)**, a syndicated science and engineering news service which brings 90-second stories, in both English and Spanish, to the public, showcasing ways in which science influences our daily lives. Through 2011, 56 materials stories have reached an estimated 62 million television viewers.

As evidenced above, the scientific process is no longer just about generating ideas, but about freely sharing those ideas with broader audiences. Now more than ever, the ability to recruit students, attract collaborators, and secure funding is tied to the ability to successfully bring research out of the laboratory and to the general public. MRS is committed to building sustainable partnerships and collaborations to increase the effectiveness of its education and outreach efforts. Through its continuum of **educational symposia** and **professional development workshops** at MRS meetings, an **ever-expanding awards portfolio**, a **University Chapter program** that is now international in scope, and participation in activities like NanoDays and the NISE Network, MRS is well-positioned to engage, educate and fascinate into the next decade.



Advocacy — Step Up, Speak Out

MRS contributes to the development of science and technology policy by responding to, and initiating, opportunities to interact nationally and internationally with government officials and public and private organizations. Led by the MRS Government Affairs Committee (GAC), these volunteer-powered efforts have been far-reaching, consistent and unbiased, building trust and respect in Washington, D.C., both on Capitol Hill and within government agencies.

In recent years, MRS has produced a number of significant accomplishments—strengthening relationships and building new ones through **Congressional visits**, establishing itself as a scientific resource for policymakers, extending its relationships with leadership in federal agencies, and collaborating with sister societies and other advocacy organizations when a larger voice for science was required.

MRS also encourages member and community engagement in advocacy. For subscribing members, MRS offers **Intersections: Materials Research & Science Policy**—a quarterly electronic newsletter featuring timely information on emerging public policy issues, Federal programs, funding opportunities, and other news affecting the materials science and engineering communities. The **Materials Voice** email/letter-writing tool allows members a convenient way to create and send personalized letters to their representatives on Capitol Hill. And for those interested in a more extensive public policy learning experience, MRS sponsors two **Science and Engineering Congressional Fellows** each year, one in partnership with the Optical Society (OSA), the other in conjunction with The Minerals, Metals & Materials Society (TMS).

On an international level, MRS has collaborated with the European MRS (E-MRS) and MRS China (C-MRS) on the **2011 World Materials Summit**—an invitation-only gathering of world-renowned technical experts and policymakers, assembled to focus on the materials research needs of our emerging energy economy. Held in Washington, D.C., the Summit also hosted the first **Student Congress**, bringing together graduate students and postdoctoral associates selected from around the world to engage in the critical issues facing us today.

The current economic climate poses many challenges for MRS and the materials community, whose research priorities are critically affected by both federal and international mandates. With that in mind, MRS will continue to build relationships with policymakers, being vigilant in maintaining its position as an unbiased source of scientific perspective. MRS will also expand coverage of policy matters to MRS members, encourage their active grassroots participation, and increase global partnerships to increase the international impact of its advocacy efforts.



MRS Mission

The Materials Research Society is an organization of materials researchers from academia, industry, and government that promotes communication for the advancement of interdisciplinary materials research to improve the quality of life.

MRS Vision

The Materials Research Society will build a dynamic, interactive, global community of materials researchers to advance technical excellence by providing a framework in which the materials disciplines can convene, collaborate, integrate and advocate.



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