



40 years, one vision

www.mrs.org/timeline

by Gail A. Oare

On May 23, 1973, 300 scientists convened at The Pennsylvania State University to discuss phase transitions. The topic was crosscutting and the program deliberately designed to ensure representation of various research disciplines. The Meeting spanned basic to applied research, and included scientists from academia, industry, and government. In the early 1970s, researchers whose work crossed boundaries between conventional disciplines were largely ignored by the traditional professional societies. By the end of this three-day meeting, 215 of the attendees signed up as the first members of the new Materials Research Society, an organization that would pay a lot of attention to its members over the next 40 years.

Today, MRS plays host annually at its meetings to 11,000 scientists from around the world, participating across more than 100 topical symposia at its Spring and Fall Meetings. Along with them, an additional 6000 members are able to access the meeting content online. Every year, hundreds of researchers volunteer their talents and time to MRS to develop subsequent meetings and workshops, serve on editorial boards, and formulate initiatives to advance science education, career services, and public policy.

MRS's success is a story of the people who opened the doors to interdisciplinary inquiry and those who subsequently charted a path that led to remarkable research advances, professional partnerships, and public appreciation for the role of materials in our lives. These individuals—with their openness to and respect for new ideas and directions, entrepreneurial spirit, and commitment to excellence—created a very special and enduring MRS culture. Following is a small glimpse of what they made happen and what it holds for the future.

Opening up the dialogue

Meetings were essentially the only function of MRS in its early years and were not pure-research oriented. They “focused on the themes that were the object of the day-to-day multidisciplinary research in the major laboratories,” said 1979 MRS president R.J.H. Voorhoeve. “MRS became the home for people who identified as strongly, or more strongly, with their field of [research and development] than with their original university discipline.”

Furthermore, in order to make room for leading-edge research areas, no topic was to be hard-wired into the meetings, and everyone—active researcher and nonspecialist alike—was welcome to participate in the topical symposia. Within five years of the initial meeting at Penn State, Voorhoeve recalled, scientists were grabbing the opportunity to organize symposia in their fields and meeting attendance hit 1000.

Meeting logistics were carefully designed to further encourage interaction. Symposium organizers planned joint sessions on areas of overlap. Daytime discussions spilled over into the hallways. Discussions during the evening poster sessions, bolstered with snacks and beer, ran well into the night. Rustum Roy of Penn State—an initial driver and one of the founders of the Society in the early 1970s—devised a new type of symposium known as Symposium X that is offered during lunchtime, giving nonspecialists an overview of the latest developments in one of the frontier areas of materials research.

Researchers attending an MRS meeting for the first time, then and now, would find the experience memorable. “I was just 13 months as a graduate student at Stanford and my advisor, Bill Nix, sent me to the 1987 Fall Meeting in Boston,” Shef Baker said. “I had never been to a meeting like that before. The speaker would finish, and invariably someone would take them to task over this detail or that. Often, a heated debate would erupt among audience members. I was even more surprised to see the [same folks who had been arguing in the session] laughing over a beer later. I realized that those people really had their hearts in their work. It was exhilarating.





I was hooked.” Baker became MRS president in 2009.

“I remember my first poster presentation at the 2004 MRS Fall Meeting... I [was] very intimidated and nervous,” said Chris Bettinger, 2013 chair of the MRS News Editorial Board. “However, everyone in the audience and the session chairs were very supportive. It was a very positive first experience and one of the reasons I hold MRS in such high regard.”

Since no symposium was purely educational, short courses began to be offered for an additional fee in 1982. In 1995, these short courses became what is now the tutorial program, providing an educational overview of symposium topics, complimentary to participants.

While the Society’s programming decisions were firmly in the hands of the volunteers, managing the operations was becoming a huge challenge. In 1983, MRS established a headquarters in Pittsburgh when John B. Ballance was hired as MRS’s first executive director—just in time to help launch its first Spring Meeting (1984 in Albuquerque) and help navigate the major changes to come, including an increasing demand for its proceedings as the reputation of MRS meetings spread.

MRS “blue books” (as the Proceedings were known) were published by a



commercial publisher until 1985 when, with a small headquarters staff of three, MRS brought the Proceedings in-house in order to produce them faster and make them more affordable for a broader community. MRS was soon publishing dozens of books a year.

Around this same time, the slim newsletter known as the *MRS Bulletin* was being transformed into a magazine, featuring a collection of articles that provided an overview of a field under

the direction of a distinguished guest editor. MRS began to hear that newly published issues of *MRS Bulletin* were disappearing off literature tables in research laboratories, presumably taken by eager readers, and scientists began to join MRS simply to secure a personal subscription to the magazine.

At the same time, the establishment of an archival journal to serve interdisciplinary research became an imperative of MRS’s new Publications Committee and less than a year later, in 1986, the *Journal of Materials Research* published its first issue. The volunteers had by now established a close working relationship with a full professional headquarters staff who, together, were poised to usher the Society through its rapid growth.

With two annual meetings, the *MRS Bulletin*, and a new research journal, MRS was experiencing an annual membership growth of 25% or more and was nearly 10,000 members strong by 1990.

By 1995, as the Internet began to take hold, the Society launched its first website, The Materials Gateway, enabling research groups from all corners of the world to access information that previously had taken weeks or months to reach them. Within two years, meeting abstracts were being accepted online, eliminating long and unpredictable mailing delays. Email was now emerging as





became MRS president. Kaufmann was the 1985 MRS president.

Merrilea Mayo (2003 MRS president) remembered that “soon after I graduated with my PhD, I joined Sandia National Laboratories, and Jeff Brinker [organizer of the Better Ceramics Through Chemistry symposia series for MRS], who had an office next to mine ... dropped by my office to ask me who I thought might be good at organizing a superplasticity symposium for MRS. I gave him such a long list ... that he kind of hired me there and then to be a symposium organizer—for an organization I hadn’t even been involved with previously.” From there, Mayo championed numerous projects including the *Strange Matter* traveling science exhibition. This exhibition, created by the MRS Public Outreach Committee, has toured museums throughout the United States, Canada, Puerto Rico, and Mexico, reaching three million visitors over a 10-year period. In turn, it led to the development of a four-part public television NOVA series called *MAKING STUFF*, which reached nearly six million initial viewers in its own right.

Marty Green (2001 MRS president) said, “When I started working at Bell Labs, many of my colleagues were involved in MRS from its inception—Harry Leamy, John Poate, Walter Brown, and many others.... Most scientists were very ‘gung-ho MRS.’”

a publishing tool, and MRS began experimenting with electronic news alerts and newsletters that today we know as *Meeting Scene*® and *Materials360*®. And by the year 2000, the MRS Board of Directors made the entire MRS Online Proceedings Library free to all members—another bold step to lower the barrier across research areas.

With online publishing becoming more sophisticated, MRS recognized a valuable opportunity to broaden research communication. “Through one of their first true long-range strategic planning exercises, MRS focused on the future of their communication portfolio,” said 2010 MRS president Dave Ginley. “It was determined that we should partner to move us into the future of publishing. After an exhaustive selection process, Cambridge University Press was selected.” MRS publications went live in January 2011 on a modern publications website, soon followed by a new journal, marking the first step in the next era of publications for the Society.

Building new communities

Just as meeting chairs and topical symposium teams were cross-represented by institution type, discipline, geography, and gender, MRS’s Board of Directors and committees sought a similar balance. So a treasure trove of diversity

was brought to the committees and the Board as symposium organizers and meeting chairs looked to broader roles in the Society. They in turn recruited others. Julia Phillips received her invitation over the phone. “When I came to Bell Labs, I inherited the phone number that had belonged to Elton Kaufmann (who left Bell very shortly before I arrived). One day, Elton called me on that number and asked me to head a new working group on public relations.... That working group eventually became the Public Affairs Committee.” In 1995, Phillips





Because no topic was hard-wired into meetings, topical divisions did not exist in MRS and special groups began to form around demographic interests championed by individual members. In the early 1980s, when only 10% of its members were women, the Society supported a request to hold a regular networking event for women at its meetings. Today the Women in Materials Science and Engineering Forum—open to women and men—continues to thrive as a networking and professional education resource.

The first Student Chapter (now called University Chapters) was established in 1982, and MRS began providing travel support and funds for special chapter projects. Today, 75 chapters operate in the Americas, Europe, Africa, and the Middle East.

Technical excellence as a whole was recognized early on with the establishment in 1976 of the Von Hippel Award and many others to be added over the years, including some by private endowments. To date, over 136 awards have been given by MRS for technical and career excellence, and an additional 855 students from 25 countries have been recognized with Graduate Student Awards.

In the 1990s, recognizing the need to support research beyond the physical confines of its own meetings, MRS began to experiment with standalone workshops and help topical groups outside of MRS run specialty meetings. Also, by this time, the Society's style of meetings had been widely emulated around the world and international partnerships became a logical next step in inclusiveness on a global scale. In 2008, MRS partnered with MRS-China to hold the International Materials Research Conference in Chongqing, China, the first MRS Meeting to be held outside the United States.

"Planning a meeting in the heart of central China proved to be a cross-cultural learning experience for the MRS and its counterpart, the Chinese MRS," said Eric (Rick) Garfunkel, who co-chaired the Meeting. "The Meeting was considered a big success by all."

The following year, MRS began another bilateral partnership with Sociedad



Mexicana de Materiales (SMM) in the International Materials Research Congress in Mexico, a collaboration that continues to this day. Cooperation on international meetings has also extended to joint symposia with the European MRS and the Japanese Society of Applied Physics.

Today, more than 45% of MRS's members live outside the United States, and volunteers are focused on additional ways to engage researchers from around the world. Internet communication now makes participation on committees and task forces possible for researchers outside the United States, and MRS OnDemand® brings the MRS Meeting experience to all corners of the world through live streaming and video archives.

Solving real problems

MRS's mission has not only been about supporting the wonder of discovery but also to bring that knowledge to application. As the US federal government tightened research funding in the late 1980s, it became imperative for researchers to develop a closer dialogue with policymakers, and in 1990, MRS established the MRS Office of Public Affairs in Washington, DC. "Even to this day," said Ron Kelley, who directs the Office, "that vision was unique, and MRS has been the only materials organization to

invest for the long term in a Washington, DC presence." For the next 23 years, the MRS Government Affairs Committee and Board worked to inform funding and policy decision makers on the role of materials research. They participated in science coalitions, organized volunteer participation in Congressional Visits Day, supported policy sessions in Washington, DC, and involved MRS members at large in online letter-writing campaigns through the Materials Voice program.

In addition, MRS began a partnership with the Optical Society of America in 1996, and with The Minerals, Metals & Materials Society in 2008 to sponsor a total of 23 Congressional Science and Engineering Fellows, many of whom have gone on to careers in science policy. Measuring the impact of MRS's advocacy effort on funding is difficult, said 2007 MRS president Alan Hurd. But he notes, "Since the New Normal [in US federal funding] is 5% annual cuts, many consider staying level a win, and that has been the [MRS] story.... MRS can attribute a strong portion of that outcome, disproportionately large for the Society's size, to the high intensity of the advocacy effort."

The 21st century brought its own global challenges in energy and sustainability, solutions for which none of the physical sciences alone could address, nor could the multidisciplinary



environment. Included among these initiatives is the development of an educational course at the undergraduate level to build a bridge with the liberal arts department: *Impact of Materials on Society*. MRS has become sophisticated in using the successes of many of its initiatives as springboards to larger communications with the general public.

Enabling the future

These recent initiatives are the beginning of a new era for the Society's role as a leader in a widening range of innovative materials inquiry and collaboration. To support these efforts, the Materials Research Society Foundation was launched in 2012. "Our Foundation is focused on advancing the MRS Mission," said Todd M. Osman, the current MRS executive director. "The MRS Mentoring Program, our Grassroots Member Grants, and the expanded University Chapter program are just a few ways the Foundation is broadening service to the materials community."

The first 40 years of MRS has helped foster unprecedented growth in the understanding and application of materials. Several stories of some nascent research areas of the mid-20th century are reported by journalist Philip Ball in this issue of *MRS Bulletin*. Still, there is much more ahead as MRS members work to find technical solutions for the 21st century while developing lifelong collaborations and friendships.

"The challenge to MRS," states 2013 MRS president Orlando Auciello, "is to not lose track of how the MRS was started and to enable our members from all over the world to be important contributors to [the MRS] mission."

Gail A. Oare served the Materials Research Society for 27 years as director of meeting activities, director of membership affairs, and director of publications and marketing, which included guidance of information technologies prior to her retirement in 2011. Oare's leadership included interactions with volunteers across the spectrum of MRS governance and committees.

materials community provide a straight answer to these puzzles. Through an MRS volunteer-staff collaboration, the special 2008 issue of *MRS Bulletin*, "Harnessing Materials for Energy," provided an entry into this societal issue. This issue of *MRS Bulletin* led to an ongoing series of energy forums and symposia at MRS meetings, the Energy Quarterly feature in *MRS Bulletin*, and the landmark textbook *Fundamentals of Materials for Energy and Environmental Sustainability*.

Recognizing the enabling role of materials in sustainability, a second special *MRS Bulletin* issue, "Materials for Sustainable Development," exposed

many MRS members for the first time to the tenets of sustainability from experts outside the field of materials. Volunteers on the MRS Public Outreach Committee are now expanding on this theme with the *Strange Matter Green Earth* international science center exhibition program.

In order to address the special challenges of the new millennium, MRS refined its mission statement from promoting interdisciplinary materials research "of technological importance" to promoting interdisciplinary materials research "to improve the quality of life," and the Society stepped up to launch ambitious new initiatives to tackle critical issues from science education to the