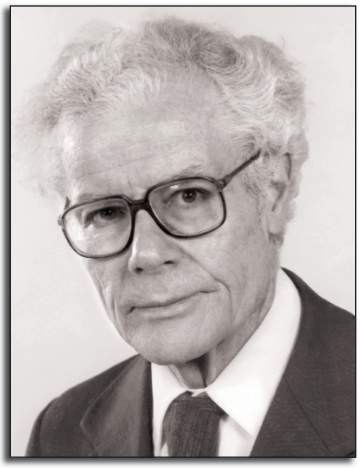
David Turnbull (1915–2007)—In Memoriam

David Turnbull passed away at his home in Cambridge, Massachusetts, on April 28, 2007, at the age of 92. A physical chemist by training, he laid the foundations of the quantitative study of the kinetics of phase transformations in condensed matter. He has been associated with the Materials Research Society from its inception. The Society's interdisciplinary charter resonated with the breadth of his scientific interests. He was a regular speaker and participant in the early symposia on laser- and ion-beam–induced phase transformations. Following his retirement in 1985, his friends established a fund at MRS to endow the David Turnbull Lectureship.



David Turnbull

In 1979, Turnbull received the third Von Hippel Award, the Society's oldest and highest honor, following awards to von Hippel himself and to William Baker of Bell Laboratories. On that occasion, Turnbull remarked, "It is not clear that I belong in this progression. I feel that I am in a position like that of a certain Linus. I'm sure you all know two famous persons named Linus, but you may not have heard of the Linus I am referring to. He was [...] the first Bishop of Rome following the Apostles Peter and Paul." That he was being characteristically modest becomes clear when one re-reads, almost thirty years later, his remarkably prescient acceptance speech on "Directions in Materials Science."[1]

Turnbull is best known for his formulation, in the late 1940s, of the classical theory of crystal nucleation from the melt, which he tested quantitatively in a series of experiments on undercooled liquid metal droplets. His measurements of the homogeneous crystal nucleation frequency in emulsified droplets of mercury[2] remain models of their kind. His qualitatively most spectacular result was that simple monatomic liquids, like copper or silver, could be undercooled to at least 80% of their absolute melting point. This demonstrated that the structure of liquids is fundamentally different from that of crystals, and it was the basis of F.C. Frank's proposal that the short range order in simple liquids has a polytetrahedral character, which favors the formation of (non-crystallographic) icosahedral clusters.

From undercooling to universal glass formation was a logical step: Turnbull predicted that all liquids could be cooled to the glassy state if their viscosity rose sufficiently sharply with the falling temperature. There was empirical evidence of such a rise, for which he developed, with Morrel Cohen, the now widely used free-volume model based on the probability of density fluctuations.[3] Confirmation came in 1959, when Pol Duwez discovered an amorphous phase in a splat-quenched Au-Si alloy—precisely at the eutectic composition predicted by Turnbull as most favorable for glass formation.

That these rapidly quenched amorphous metals were true glasses, like the well-known silicate or organic glasses, was proved by Turnbull and his associates by demonstrating that they exhibited the characteristic features of a glass transition: a discontinuity in the coefficient of thermal expansion and in the specific heat, and a rapid decrease of the viscosity upon heating. Turnbull's deep understanding of crystal nucleation also led him to the insight that it should be possible to bring alloys with a low liquidus and a high glass transition temperature into the glassy state at very low cooling rates if heterogeneous nucleants were eliminated, for example by fluxing. Together with Lindsay Greer and their students, he demonstrated this in 1982 on $Pd_{40}Ni_{40}P_{20}$, the first bulk metallic glass.[4]

Although Turnbull may be best known for his work on nucleation and glass formation, he has made many other key contributions to materials science. In the area of diffusion, he made, with R.E. Hoffman, the first measurements of short-circuit diffusion along grain boundaries and dislocations and, with F.C. Frank, he identified the interstitial mechanism for fast diffusion of noble metals in semiconductors. He extended the latter work to a broad study of fast diffusion of noble metals in polyvalent hosts. He maintained an interest in understanding the attachment of atoms from the liquid or amorphous phase to a growing crystal surface, especially under conditions of high pressure or large undercooling. He also made some of the early contributions to the analysis of grain growth and recrystallization.

David Turnbull was born in 1915 on a farm near Kewanee, Illinois. He obtained his BSc degree at Monmouth College in 1936 and his PhD degree in physical chemistry at the University of Illinois in Urbana in 1939. Between 1939 and 1946, he was a member of the faculty at the Case Institute of Technology. From 1946 until 1962, he was on the staff of the General Electric Research Laboratory in Schenectady, N.Y., where he was for a while the head of the Chemical Metallurgy section. In 1962 he became Gordon McKay Professor of Applied Physics at Harvard University, where he became emeritus in 1985. He was a member of the National Academy of Sciences. Besides the Von Hippel Award, he received the Japan Prize, the Acta Metallurgica Gold Medal, the New Materials Prize of the American Physical Society, the Franklin Medal, the Hume-Rothery Award

David Turnbull (bottom left) greets students and Turnbull Lecturers at the 2006 Materials Research Society Fall Meeting in Boston.

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of TMS-AIME, and many other honors. For many years he was co-editor, with Frederick Seitz and Henry Ehrenreich, of the well-known Solid State Physics Series.[5]

But even more than for his distinguished scientific career, David Turnbull will be remembered as a uncommonly wise and generous human being, who recognized and brought out the best in everyone. This made him, in spite of his understated style, a highly effective teacher and advisor to generations of students and associates. It is therefore fitting that his eponymous Lectureship at MRS recognizes both research and teaching "as exemplified by the life work of David Turnbull." An unforgettable example, indeed.

FRANS SPAEPEN
Harvard University

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MRS Members Participate in Congressional Visits Day

Members and staff of the Materials Research Society recently participated in the 2007 Science, Engineering & Technology (SET) Congressional Visits Day on May 1–2. This event, held annually, brings several hundred scientists, engineers, researchers, educators, and technology executives to Washington, DC to advocate for legislation important to the science community. This year's core message was the importance of competitiveness and innovation policies to sustaining U.S. technological leadership and in developing a skilled, creative, and effective workforce.

Participants first attended an orientation session at the American Association for the Advancement of Science (AAAS) on May 1, sponsored by SET. Speakers included Sharon Hays, Associate Director for Science, Office of Science & Technology Policy; Kei Koizumi, Director, R&D Budget Policy Program, AAAS; Chuck Atkins, Chief of Staff, House Committee on Science and Technology; Kathryn Clay, Professional Staff, Senate Committee on Energy and Natural Resources; and Bill Leinweber, Executive Vice President, Research!America.

This session was followed by a reception and awards ceremony at the Russell Senate Building, during which the George E. Brown Jr. SET Leadership Award was presented to Representative Nancy Pelosi (D-Calif.), Speaker of the House of Representatives and Senator Lamar Alexander (R-Tenn.), U.S. Senate Committee on Appropriations. This award is presented annually to individuals who have served as active leaders in the determination of Science/Engineering/Technology (SET) policy and have demonstrated strong public advocacy in support of a role for the federal government in research and who have taken specific actions to advance SET public policy.

That evening, MRS members held a separate orientation session to form MRS teams for the next day's Congressional Visits and to review background materials and issues to focus the MRS message.

Members of the Materials Research Society participated in the 2007 Science, Engineering & Technology Congressional Visits Day on May 1–2 to encourage their legislators to support the physical sciences.

On May 2, a group of 31 MRS members visited the offices of their representatives and senators to discuss relevant issues, and the effects and importance of these issues in their own Congressional district/state, as well as to the country as a whole. Members of Congress were encouraged to support the Administration's budget request for the American Competitiveness Initiative regarding the National Science Foundation (NSF), the Department of Energy (DOE) Office of Science, and the National Institute of Standards and Technology, aimed at doubling these appropriations over the next 10 years. Congressional members were also encouraged to increase support for Federal investments in research and development (R&D), with an emphasis on appropriations for science and technology in NSF, DOE, and the Department of Defense (DoD). They were also induced to support the Innovation bills that were being considered by the House and Senate at that time and to maintain the U.S. innovative edge by investing in basic research and education.

Although the SET Congressional Visits Day is held only once a year, MRS members are encouraged to visit their representatives and senators both in Washington and in their home districts to advocate for support for the physical sciences. For interested members, MRS can provide information on the current issues and pending legislation. For more information, contact Kathy D'Biagio at dbiagio@mrs.org.

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Materials Research Society Holds Elections for Officers and Directors

The MRS Board of Directors is the highest governing body of the Materials Research Society, responsible for establishing policy, monitoring progress of the Society toward its long-term goals, and setting the strategic directions for the major activities of the Society, including its meetings, publications, interactions with government agencies, and cooperative efforts with other professional societies throughout the world. The Board is composed of four elected Officers (President, Immediate Past President, Vice President, and Secretary), and up to 18 Board Members, 15 of whom are elected by the membership. A fifth officer (Treasurer) is appointed yearly from the Board. This year, MRS members will elect a Vice President (who will serve as President in 2009), and a Secretary and five Directors, who will serve three-year terms. The elected candidates will serve terms beginning January 1, 2008.

The ballot to vote will be online at www.directvote.net/mrs2007, beginning August 10 through 12:00 noon Eastern Daylight Time on September 14, 2007. Members with a valid e-mail address on file at MRS will receive their unique login information from the election service provider, Survey & Ballot Systems, by e-mail. **The e-mail will be from mrsvote@directvote.net.** (If necessary, members should modify their SPAM filters to accept this e-mail.) Members without an e-mail address on file, or having a shared address, or who have requested no e-mail messages from MRS will receive their login information by regular mail.

Although the election will be conducted online, members who wish to receive a paper ballot may contact Kathy D'Biagio at dbiagio@mrs.org, or 724-779-3004 ext. 102.

Following is a list of candidates and their biographical information and statements. This information is also available on the MRS Web site at **www.mrs.org/2007_election**, and will be available on the ballot site beginning August 10, 2007.

Candidates for Vice President/President-Elect

Shefford P. Baker
Cornell University

Shefford P. Baker is Associate Professor in Materials Science and Engineering at Cornell University. After completing an undergraduate degree in music and a brief career as a professional musician and music teacher, he went back to school, receiving his PhD degree in materials science and engineering at Stanford University in 1993. He was a staff scientist at the Max-Planck-Institut für Metallforschung in Stuttgart from 1993 to 1997 and joined the Cornell faculty in 1998.

Baker's research focuses on the unique mechanical properties of materials having microstructural or dimensional length scales in the nanometer regime. Recent achievements include discovery of a new microstructure in Ta thin films and characterization of the phase transformation that produces it, x-ray studies of stress states and relaxation in different texture components in thin metal films, dislocation dynamics simulations and analytical modeling of dislocation structures in thin layers, quantitative measurements of bonding at interfaces by time-dependent delamination experiments, and quantification of the structure-property relationships in the lamellar and interlamellar regions in trabecular bone as a function of age and vitamin D deficiency.

Baker has been very active in MRS. He has organized five symposia and taught numerous tutorials, was a 2004 MRS Fall Meeting Chair, served on the Public Outreach Committee, and was elected to the Board of Directors in 2005, where he serves as chair of the External Relations Committee. He generated a project to bring 100 High School Teachers to the F04 meeting and worked with PIs from several major science museums to create the Nanoscale Informal Science Education (NISE) Network and to promote and define the MRS role in it.

Candidate's Statement:

"By any measure, the growth and influence of MRS has been spectacular. From its start in 1973, MRS has become the world's leading society in materials science and engineering. MRS meetings are very highly regarded and are well-attended, not only by researchers, but by funding agents, business people, and the media—anyone who is interested in discovering hot topics on the leading edge of materials research.

It hasn't always been this way. Pre-MRS, materials research was more rigidly divided along disciplinary and topical lines. Those who started MRS realized that the essence of materials research—understanding relationships among processing, structure and properties—is universal and strove to create a society in which disciplinary divisions would not play a role. Over the years, MRS has evolved processes that ensure interdisciplinarity, quality, diversity, and innovation in almost all aspects of the Society, from meeting development to publications to governance.

The success of this approach is evident. However, there is still much to be done. The world continues to get smaller, and the problems people everywhere face continue to get bigger. Yet materials research and researchers continue to be divided by geography and discipline (still!). We must continue to reach out to better integrate the efforts of materials researchers in the future. I believe we can accomplish this with concerted efforts in several areas:

***Globalization:** As materials research continues to become more sophisticated around the world, we must find ways to make MRS activities more relevant and accessible without geographic limitations. Our international membership is significant at about 30%, but does not represent the geographic distribution of researchers. Simply put, we must be able to attract experts from across the globe if the state of the art in any field is to be represented in MRS.*

***Membership growth:** It is estimated that upwards of 100,000 people worldwide are engaged in materials research, yet we have only about 14,000 members. It is not possible to maintain true interdisciplinarity if only a fraction of materials researchers and their topics are represented in MRS. Thus, if MRS is to promote truly interdisciplinary materials research, we must serve a larger fraction of this group.*

***Meetings:** Research meetings continue to be the lifeblood of our society. However, important fields of materials research are not represented, which, in turn adversely affects membership. We must provide sufficient meeting capacity to meet the needs of our members while still maintaining the quality that has made MRS meetings famous.*

***Advocacy:** We must continue to communicate effectively with political leaders to help them understand the value of materials research to ensure both adequate funding and that policy and regulations (e.g., travel visa restrictions) are sensible. We can also play a significant role in promoting and facilitating research in critical areas such as energy and the environment.*

***Outreach:** To the extent that materials research is supported by the public, we must*

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ensure that taxpayers understand their return on this investment. Furthermore, research requires a steady influx of bright young minds. MRS has taken a leadership role in developing outreach projects (e.g., Strange Matter, *the NISE Network, and many others) that help the public understand the excitement and benefits of materials research. We must continue to innovate in this area.*

Information services: *MRS exists to facilitate the communication of research knowledge, and publications are a primary means of distributing information. While the* Bulletin *continues to be the general magazine of the materials research community and* JMR *is rising in the rankings and doing well, there is much work to be done. We must find desirable means of capturing meeting content and we must increase use of the Web for information distribution. In addition, we should think broadly about how materials research can best be published, archived, and accessed. I would like to see MRS achieve as high a reputation for publishing as it enjoys for meetings.*

Alliances: *Materials researchers are represented by different societies and organizations around the world. I believe that we can accomplish our goals much more effectively by working closely together with those groups. All of the areas listed above could potentially benefit from such collaborations. Our mutual goal should be to provide the most effective resources possible for facilitating materials research.*

It is a great honor and a privilege to be nominated to run for the Vice Presidency of the Materials Research Society. I am delighted about the prospect of being able to serve."

Ulrich M. Goesele
Max Planck Institute/ Duke University

Ulrich M. Goesele (also known as Gosele or Gösele) is Director at the Max Planck Institute of Microstructure Physics and Adjunct Professor of Electronic Materials at the Martin Luther University in Halle, Germany, as well as Adjunct Professor of materials science at Duke University in Durham, North Carolina. Prior to joining the Max Planck Institute, he was Professor of materials science at Duke University after working in the research labs of Siemens Corporation in Munich and the Max Planck Institute of Metal Research in Stuttgart, Germany. He held visiting appointments at the Atomic Energy Board in Pretoria, South Africa; at the IBM Watson Research Center in Yorktown Heights, New York; at the Massachusetts Institute of Technology, in Cambridge, MA; at Nippon Telegraph and Telephone Corporation LSI Laboratories in Atsugi, Japan; and at Harvard University, in Cambridge, MA. He received his PhD degree in physics from the University of Stuttgart. He is a Fellow of the American Physical Society, a Fellow of the Institute of Physics (UK), a Member of Leopoldina Academy, the oldest German scientific academy, and Honorary Professor of the Institute of Semiconductors of the Chinese Academy of Sciences in Beijing.

Goesele has been active in MRS for more than 25 years, mostly by attending as many Fall and Spring MRS Meetings as possible and presenting countless posters and talks. He acted as Symposium Organizer and was one of the Meeting Chairs of the first Spring Meeting after 9/11, with an historically low number of attendees. To his surprise, he was nevertheless elected to the MRS Board of Directors, on which he served from 2003–2005.

Goesele has worked in numerous areas of materials science in academia and industry throughout his career. His research interests include defects and diffusion processes in silicon and other semiconductors, science and technology of semiconductor wafer bonding, silicon-based photonic crystals and silicon photonics in general, self-organized fabrication of nanostructures, semiconductor nanowires, quantum dots, complex oxide nanostructures and nanoporous films such as porous alumina. His publications have collectively been cited more than 10,000 times with a correspondingly decent h-index. Over the years, he had the opportunity to be involved in the evaluation of hundreds of materials research related proposals, researchers, institutes, and programs as well as in materials-related industrial consulting jobs all over the world. He left Duke University, where he held a named chair in materials science, after being asked to help to build up the first Max Planck Institute in the eastern part of Germany after reunification. This required the transformation of a previous institute of the Academy of Sciences, an experience which certainly qualifies him to make tough decisions if required. More information on his present research and on his CV may be found at www.mpi-halle.eu.

Candidate's Statement:

"MRS has always impressed me by its ability to embrace newly emerging materials research related subjects and by its principle of involving researchers already early in their careers in the organization of MRS meetings as Symposium Organizers or Meeting Chairs. This is by no means standard in many other professional societies and increases the probability of getting lively meetings and counteracts the tendency of petrification in societies in which major decisions are made by the same cohort of people over long periods of time.

Most researchers know MRS mostly from its excellent Fall and Spring Meetings, which offer an opportunity to present and learn about new developments in materials research, encompassing the whole span of purely academic to more industrially relevant subjects. In the last five years, a clear opening towards soft and also biological materials has taken place taking into account the worldwide trend towards bio-related sciences.

After a thorough restructuring of its governance structure over the last years, MRS decided NOT to remain in its present, fairly comfortable, steady state since this would involve the risk of falling back in the competition of being the most relevant materials-related professional society and supplying the best services to its members. The outline for the planned future changes is given in a Strategic Goals Document. I will comment on some of the essential goals: Essentially doubling the MRS membership to 25,000 members by 2015 can be accomplished only by a further increase in the interdisciplinarity of MRS, a higher retention rate of meeting attendees, and the active pursuit of expanding the base of international members. This will certainly require a clear concept of the role of MRS among all the other regional MRS societies worldwide (founded based on the original U.S. model), such as the Chinese, Indian, African or European MRS. Strengthening MRS by increasing its international membership and at the same time supporting the development of the other regional MRS organizations will be a major challenge. The increase in membership should involve researchers from industry, academia, and government institutions, since otherwise an essential flavor of MRS meetings and also a root of its success would be lost.

It is obvious that valuable services to MRS members such as exciting meetings, publications and a Web-based information system on materials research results and products can only be offered in a sustainable fashion if this is done in a fiscally responsible way. It will be one of my goals to pay special attention to a further improvement of Web-based services offering, for example, the content of presentations at MRS meetings which will potentially be especially important for members outside of the U.S. Creative solutions will be required to offer high quality content for an affordable price.

MRS has made its basic decisions on its Strategic Goals for staying THE research society in the materials area. I basically agree with these goals. Presently and in the near future MRS needs implementation of these goals rather than new directions. To have been involved with MRS for many years was not only a pleasure but also involved a clear professional gain for me. Therefore, I would be honored to return some time and effort back to this outstanding society and serve the diverse membership of MRS as Vice President."

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Candidates for Secretary

J. Charles Barbour
Sandia National Laboratories

J. Charles Barbour is Deputy Director of the Exploratory Engineering and Technology Maturation Center at Sandia National Laboratories in Albuquerque, New Mexico. In this role, he helps set strategic directions for investment in science and technology to improve national security. His duties include oversight of materials science and component development programs for enhanced surveillance and radiation effects in semiconductor and optical materials. He manages a major U.S. Department of Energy (DOE) project to develop new methods for system level qualification through close coupling of experimentation with materials, device, and circuit modeling. This project is the embodiment of science-based engineering and is setting new directions for the DOE. One of his accomplishments in the past few years was the establishment of the nanomechanics thrust within the Center for Integrated NanoTechnologies (CINT), which is a DOE, Basic Energy Sciences, user facility co-managed by Sandia and Los Alamos National Laboratories. Prior to becoming a manager in 2000, Barbour was a member of the technical staff at Sandia for 13 years in the Radiation-Solid Interactions and Processing Department. In addition, he and his wife own a small business in which he is President.

Barbour received a BS degree in engineering physics from the Colorado School of Mines (1980) and a PhD degree in materials science and engineering from Cornell University (1986). He joined Sandia after one year in The Netherlands as a visiting scientist at the FOM Institute for Atomic and Molecular Physics (Amsterdam) and Philips Research Laboratories (Eindhoven). His personal research covers many topics in materials science, including: nanomechanics, diffusion and defect physics, thermodynamics and kinetics of amorphous alloy phase formation, corrosion science, ion-beam modification of materials, ion beam analysis, and microelectronics and photonics research. He is the author or co-author of more than 150 technical papers and holds several patents.

Barbour has been an active volunteer and member of MRS since 1982. He was a Meeting Chair for the 2006 MRS Spring Meeting and he is currently a member of the MRS Board of Directors (three-year term, begun January 2007). He served briefly on the Meetings Quality Subcommittee of the Technical Program Committee, before his election to the Board. He participated in the MRS strategic planning workshop (June 2001) to define the future direction of MRS and develop a new governance structure. Recently, he has served on the Entrepreneurship Task Force and the Meetings Quality Task Force. He has organized two MRS symposia, one on fundamental aspects of ion-solid interactions and the other on electrochemical processes. He has served as a member of the Membership Committee and as its Chair. Also, he is a Past President of the New Mexico Section of MRS and co-hosted a local meeting with the American Ceramics Society and the American Society for Metals. Barbour has organized conferences for and served on the International Committees for the Ion Beam Modification of Materials Conference and the Radiation Effects in Insulators Conference. He has also served on advisory boards at Los Alamos National Laboratory and New Mexico State University.

Candidate's Statement:

"The Materials Research Society is the premier organization that creates a forum for communicating breakthroughs at the cutting edge of materials research. The interdisciplinary nature of meetings presents a unique opportunity to network with peers while learning new fields. Our society brings together professionals from academia, industry, and government to serve as catalysts for generating new ideas and new fields. As Secretary, I would help to ensure this dynamic atmosphere of MRS remains alive and grows while creating a home for enduring fields of materials research. This vision is achieved by continually assessing the product of our society and reinventing ourselves to remain the technical society that both researchers and policy makers turn to first for information on challenging problems. MRS succeeds by providing the highest quality meetings that are found in the community and through publications with ever-increasing impact factors. We need to continue this good work and reach out in an inclusive way to the global community of materials researchers.

MRS can also play a vital role in transforming the way we learn and disseminate new information in a faster-paced world where everyone is instantly connected. Whether researchers are in the industrial, government, or academic sector, they have an increasing need to discover new materials or properties, invent new devices, and bridge the gap from discovery to application faster. Often the fastest route to bridge this gap is through close collaboration among these three sectors, and MRS can help foster these collaborations. Equally important, MRS should play its part as an equal among the technical societies to foster inter-society collaborations and inform policy makers of the critical role that the physical sciences play in the health of the global economy, security, and environment. In order to remain a vibrant technical society, MRS needs to convey the excitement of materials research to the next generation of students and invest in opportunities to bring students into MRS. As Secretary, I will continue to help establish a strategic vision that keeps MRS vibrant and balanced between fundamental and applied science. I consider MRS to be my home society and I am proud to have served MRS in a number of volunteer roles, including my present role on the Board of Directors. I would be pleased to now serve MRS as Secretary."

Bethanie J. Hills Stadler
University of Minnesota

Bethanie J. Hills Stadler is an Associate Professor in the Electrical and Computer Engineering Department at the University of Minnesota. Stadler received her BS degree from Case Western Reserve University (1990) and her PhD degree from the Massachusetts Institute of Technology (1994), both in materials science and engineering. Prior to joining the University of Minnesota, she was a National Research Council (NRC) postdoctoral fellow working in the Optoelectronics Division of the Air Force Rome Laboratory. Currently her group's mission is the integration of magnetic and optical materials with standard platforms to allow the development of practical devices and systems. At the moment, this includes integration of magneto-optical garnet waveguides and photonic crystals with magnets on photonic platforms for isolator applications. In magnetics, Stadler is working on magnetic nanowires for magnetoelectronics and sensor applications. In addition to her NRC fellowship, Stadler's honors and awards include various teaching awards, the NSF CAREER award, and the UMN McKnight Presidential Fellowship. Stadler has co-organized three MRS symposia in the areas of photonics and magnetics.

Stadler served as Meeting Chair for the 2004 MRS Fall Meeting and will complete a three-year term on the Board of Directors this December. As part of the Board, she has served on all three governing committees, including Vice Chair of the Operational Oversight Committee

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and currently chair of the Planning Committee. Stadler also served as Chair of the MRS Academic Affairs Committee for five years and as chair or member of various subcommittees and task forces. Finally, she founded and directed the Undergraduate Materials Research Initiative (UMRI) for three years.

Candidate's Statement:

"MRS is an exciting society in which to be active. As the premier society for emergent materials research, MRS is where people look to see what new ideas are just entering the pipeline. Because these new ideas are often at the interface between material science and other fields, MRS has been the best home for these topics as we have always excelled at interdisciplinarity. And, it is not just the meetings that draw people to MRS, but also a wide variety of other services, not the least of which are the MRS Bulletin *and the increasingly popular* Journal of Materials Research. *In fact, although MRS is toted as a "meetings society," 60% of our members renew each year without attending a meeting! (Note: If your membership runs out some years because you can't attend a meeting, you may want to consider renewing directly for $105.)*

I have recently taken to comparing the materials world with the four layers of a rainforest: the emergent layer, the canopy, the understory and the forest floor. (See for example: http://www.srl.caltech.edu/personnel/krubal/rainforest/Edit560s6/www/whlayers.html.) All of the layers are essential to the health of the forest. The important aspects of the analogy, however, are the emergent layer and the canopy. The emergent layer is made up of isolated islands that could change rapidly in a very dynamic forest. I would compare the canopy layer to established research fields, where exciting research has been conducted for longer timelines, but where growth is assured and dense synergy can be found. Stated more directly, I believe MRS needs to reconnect to established research areas to avoid losing 'community.' This should not happen at the expense of our focus on the emergent areas, but rather as a complement to it. This idea is not new. For example, a Meetings Quality Task Force proposed several years ago that the best mix for MRS meetings is 70% established research, 20% emergent research, and 10% new research. However, the trend in meetings has shown a reduction in established topics to 40–45% over the past decade. Now is the time to reverse this trend, by increasing services (meetings, Web, awards, etc) to the established fields, recognizing that they are still dynamic and exciting. As an emergent research area of today grows, MRS should seek to remain a home for those materials researchers to gather together at meetings, to disseminate results via publications (electronic and print), and to seek community through volunteer service."

Candidates for Board of Directors

Ian W. Boyd
London Centre for Nanotechnology/University College London

Ian W. Boyd is Head of Materials and Devices and Director of Nanoelectronics in the London Centre for Nanotechnology and holds a personal Chair in electronic materials in the Electronic and Electrical Engineering Department at University College London. Prior to joining UCL he was research scientist at North Texas State University and at Hughes Microelectronics in "Silicon Glen" in Scotland. He also worked as a medical physicist at Western General Hospital in Edinburgh. His technical interests include laser interactions with matter, oxidation of silicon, thin film deposition and nanotechnology. He has a 1st class honors BSc degree in applied physics, for which he received the Watt Medal and class prize, and a PhD degree in laser processing (both Heriot-Watt University).

Boyd has been active in MRS since 1980, when he gave his first student poster (in the Park Plaza Hotel in Boston), followed in subsequent years by further poster and oral presentations, invited talks, and advisory committee duties. He has also been Co-Chair of several MRS symposia: 'Symposium Y: Advanced Optical Processing of Materials' (April, 2003), and 'Symposium S: Magnetic Nanoparticles and Nanowires', (March, 2004.) He still presents posters. In 1988 he was a principal signatory to an historic document leading to the formation of the Federation of MRS Societies that led to the formation of the IUMRS. He is currently a member of the IUMRS Executive Committee.

He has served the *MRS Bulletin* both as a contributor, and as Associate Editor (Europe) since 1986, and on its broader editorial board since 1996. His involvement with other societies includes the Institute of Physics and the Institute of Electrical Engineering (a Fellow of both) the latter of which he is Manager of the Professional Network on Electronic Materials and Devices. He has also served on the Board of Delegates of E-MRS since 1988, as well as on the Executive Committee since 1992. Between 1994 and 1997, he was elected Vice-President and President of E-MRS, and served as Immediate Past President in 1998. He has delivered more than 40 invited talks, is author of more than 300 refereed scientific papers and one book, and has been editor of eight other books and proceedings. His citations have earned a Hirsch Index of 25.

Throughout his career, Boyd's research has involved the properties of, and the growth and processing of, electronic materials. His PhD degree was in laser processing applied to the electronics industry. His post-doctoral work in Texas involved non-linear, short pulse laser interactions with semiconductors, after which he became a tenured faculty member at University College London at the age of 25. After subsequently becoming the youngest professor in engineering at 35, he built up a 25-strong research team in electronic materials that now forms a core part of the new London Centre for Nanotechnology (LCN), of which he is a co-founder, and currently a member of the Executive Board. He has performed pioneering work in laser photo-chemistry, silicon oxidation, VUV lamp development and application, and consulted widely for numerous companies. He has chaired 14 symposia and conferences around the world—in the U.S., across Europe, and in Japan and Singapore.

Despite his demanding research and managerial roles, Boyd places great importance on the education of young scientists, and, unique amongst the LCN Directors, carries a full teaching load. He has lectured to thousands of students on electronic materials over his career, and recently established and developed a new MSc degree in nanotechnology at UCL, for which he is also course director. He has been involved in strategic planning on a number of industrial boards and advisory panels in the UK, Italy, France, Ireland, and Belgium. In 2005, he was awarded the Senior Medal and Yarwood Prize of the British Vacuum Society for his work in thin film technology.

Candidate's Statement:

"Since a mere slip of a lad, I have always considered MRS as my scientific home. It is a unique society, and I am proud to have been part of its development since relatively early days, where I grew to know many of the 'founding fathers.' It has developed the fundamentally important 'modus operandi' of being not only without boundaries across an astonishingly wide spectrum of science and technology, but also to fill the many potentially fertile gaps

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between established disciplines. It is in these areas where some of the biggest breakthroughs will undoubtedly occur in the years to come.

A major strength of MRS is its ability to fluidly adapt, and yet retain its rigidity. But more than this—MRS has now developed into such dynamic force that it now plays a key role in shaping the very future of materials science itself across the globe. This has occurred, not by accident, nor good fortune, but through MRS's encouragement of individual members to take on active roles in the Society and promote their own ideas for future development and collaboration. In turn, MRS has developed a comprehensive range of important services for individual members. It is essential that these are not only maintained, but encouraged to grow, not for the sake of expansion per se, but according to the needs and demands of the members. In this respect, it is extremely important for MRS, especially as competition is continually at the door, to listen to its membership.

There is no doubt that the MRS model has clearly been extremely successful. Its franchise has been adapted and adopted all around the world, and spawned more than 16 off-shoots in different stages of development and MRS can benefit greatly from this. Recent figures have shown that not only have the major Fall and Spring Meetings continued growing, but they have attracted a growing number of overseas attendees, attracted by the dynamic and open atmosphere – the lack of barriers. It is highly desirable, if not crucial, that MRS continues to develop this characteristic.

Publications continue to be a major challenge, especially in the light of recent successes in Nature and in the nanotechnology area and the Web remains as yet an uncertain and unoptimized arena, though by popular prediction, the way of the future. MRS has the membership advantage to play a dominant role here, but strategy needs to be carefully thought out, with consideration not only from within the U.S. but also from without.

Throughout these processes, quality must be maintained and improvements aspired to. And the decision a few years ago to serve Sam Adams, Anchor Steam and Sierra Nevada at many MRS congregational events was one such inspired step forward. I hope to play a part in the continuation of forward-looking inspirations."

Yves Chabal
Rutgers University

Yves Chabal is a Professor in the departments of Chemistry and Chemical Biology, Biomedical Engineering, and Physics and Astronomy, and the Director of the Laboratory for Surface Modification at Rutgers University. Prior to joining Rutgers in 2003, he was at Bell Labs (1980–2002), under AT&T, then Lucent Technologies, and finally Agere Systems. He holds an AB degree in physics from Princeton (1974), and MSc and PhD degrees in physics from Cornell (1977 and 1980). His technical interests include surface and interface science, micro- and opto-electronics, wet-chemical surface functionalization for sensing, atomic layer deposition, hydrogen storage, and nano-electronics, using infrared absorption spectroscopy as a main tool to investigate surface chemistries and interface formation mechanisms relevant to these materials problems.

Cabal has been active in many organizations, including MRS since 1980. He just co-chaired an MRS symposium on the "Characterization of Oxide/Semiconductor Interfaces for CMOS Technologies" (April 2007) and co-chaired the International Conference on Atomic Layer Deposition (June 2007). He also co-chaired the Sixth International Conference on Vibrations at Surfaces (1988), edited the book *Fundamental Aspects of Silicon Oxidation* (2000), and served on the editorial boards of *Vibrational Spectroscopy* (1991–1994) and *Chemical Physics Letters* (1991–1995). His involvement in other societies includes co-organizing APS focus and FIAP symposia on "Semiconductor Surface Processing" (1994) and on "Dynamics of Silicon Oxidation and Etching" (1998), serving as the Chair of the AVS Electronic and Materials Processing Division (1998), and on executive committees of the AVS Surface Science Division (1990–1994, 2007–). He is the author of over 260 refereed scientific papers, seven book chapters, and several patents. He is a Fellow of the American Physical Society and AVS, and received an IBM faculty award (2003), and the Rutgers Board of Trustees Award for Excellence in Research (2006). He is a co-founder of the Institute for Advanced Materials and Devices and Nanotechnology at Rutgers.

Chabal has worked in materials science most of his career. After his initial studies of clean metal and semiconductor surfaces, he contributed to the fundamental understanding of wet chemical cleaning (e.g. HF etching) and silicon oxidation for gate stacks, two important steps of semiconductor processing. More recently, his *in situ* infrared spectroscopy studies of atomic layer deposition have brought new insights into the formation of interfacial layer at semiconductor/oxide interfaces and the ALD growth process. He is also developing new chemical methods to better interface inorganic materials to organic and biological materials. Over the years, he has been probing the interaction of hydrogen in a variety of environments, most recently in storage materials for the hydrogen fuel economy.

Candidate's Statement:

"MRS is a vibrant and highly successful society. With good balance among academia, industry, and government participation, it has become a major platform for the advancement of interdisciplinary materials research. Its success comes from its adaptive structure with an ability to quickly promote new areas of research and from its high quality leadership with a commitment to engage the U.S. Congress. Its relationship with other scientific societies through its members and leaders is also an important element for a solid development.

As many large organizations, MRS is facing challenges that need to be addressed thoughtfully. While its membership is high and stable, it is important to include scientists and engineers from traditionally 'non-materials' fields that are just beginning to recognize the importance of materials research, such as biological and medical science. It is also crucial to take a leadership role in reaching out to populations that have been under-represented in all disciplines related to materials science. National funding agencies, universities, and industries are working hard to engage a broader (and more representative) spectrum of the populations with limited success. To assist in these efforts, MRS should proactively and creatively facilitate the participation and increase the visibility of students, faculty, and members of technical staff from under-represented groups. The participation of foreign researchers is also vital to the health and growth of the Society, and would be enhanced by an international presence at the governance level.

With a membership reflecting the world and U.S. populations, as well as new areas of materials science, a stronger and better defined identity will emerge. For all scientists, MRS should be the society to be represented by at all levels, to interact with leading researchers in materials science, and to participate in the exciting new developments in science.

The Web and other electronic media have become efficient means of communication. MRS must continue to proactively develop its Web site to facilitate access to relevant suppliers and journals for its members and to provide easy access to technical journal contents. It should use the Web as an effective means of promoting its programs, highlight achievements of members from under-represented groups, and better connect with its non-U.S. members. The Society should also continue its effort for complete electronic capture of the meeting contents."

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Gou-chung Chi
National Central University

Gou-chung Chi is Chair Professor of the Department of Physics and the Department of Optics and Photonics at the National Central University in Taiwan since 1994. Chi received a BS degree in physics at National Taiwan Normal University (1970), an MS degree in physics at Yale University (1973), and a PhD degree in solid state physics and materials, also at Yale University (1976).

Chi served as Deputy Minister of the National Science Council, Executive Yuan (2004–2006); Vice President of the Research, Development, and Evaluation Commission, Executive Yuan (1996–2000); Director of the Division of Opto-Electronics & Systems Laboratories (OES) at the Industrial Technology Research Institute (ITRI) (1992–1994); Director of the Division of Semiconductor Materials, Materials Research Laboratories at ITRI (1990–1992). During this time period, he led a research group studying red laser diodes and GaN blue LEDs. He was a member of Technical Staff at AT&T Bell Laboratories from 1977 until 1990, at which time he worked on magnetic bubble materials and III-V compound, optoelectronic materials. Prior to that, Chi was a Laboratory Instructor in the Department of Physics at the Norwegian University of Science and Technology.

In addition to membership in MRS, Chi is a member of the American Physical Society (USA), the Physics Society (Taiwan), and Electronics Devices and Materials Association (Taiwan). He served as Secretary of the International Union of Materials Research Society (IUMRS), 1995–1996. Some of his professional honors include ISI Citation Index Award (Applied Physics, Taiwan) in 2001; Best R&D Project Achievement Award (MOEA, Taiwan), 1996; Ten Most Distinguished Engineer Award (Taiwan) 1993; Exceptional Contribution Awards, AT&T Bell Laboratories, 1986 and 1988. He was named a member of the New York Academy of Science in 1980.

Candidate's Statement:

"Thirty years ago (1977), after Thanksgiving, I attended the MRS Fall meeting in Boston, and that was when I first became a member of MRS. I believe that was also the beginning of the Boston fall meeting tradition. Since then, I have been a faithful member of this great, successful society.

I have lived and worked in both the US and Taiwan, served as General Secretary for the International Union of Material Research Societies, and sponsored the ICEM conference in Taiwan. It's become clear to me that over the last few years, the global R&D community has begun to realize that international cooperation is the only way to bring science and technology to a new horizon. I've had the opportunity to promote international R&D cooperation in the government channel. This experience has convinced me to seek the opportunity to serve on the MRS Board. I believe it would be very rewarding, and that my service would be beneficial to the membership of MRS."

Duane B. Dimos
Sandia National Laboratories

Duane B. Dimos is Director of the Materials Science and Engineering Center at Sandia National Laboratories in Albuquerque, NM. This organization of approximately 200 people is engaged in research, development, and application engineering across the entire spectrum of materials science. Duane came to Sandia as a staff scientist in 1990 and has held several technical management positions at the lab since 1997, mostly in materials science and engineering. He also previously worked as a senior scientist at Air Products & Chemicals, Inc. and as a postdoc in the IBM Research Division at Yorktown Heights, NY. He has a BA degree in physics from University of California—Berkeley, and MS and PhD degrees in materials science and engineering from Cornell University.

His primary research interests are in the areas of electronic ceramics, rapid fabrication methods, ceramic synthesis and processing techniques, and microsystem materials and packaging. His work has spanned the range from fundamental understanding of materials properties to process integration and compatibility to advanced device technologies. He has published over 130 technical papers (including highly cited papers on ferroelectrics and high-temperature superconductors), edited four proceedings volumes and holds 11 patents.

Duane has been active in the Materials Research Society for roughly twenty years. He is one of the Meeting Chairs for the 2007 MRS Fall Meeting. He has also been a symposium organizer in previous years. In addition, Duane has served MRS as a member of the Government Affairs Committee, as a member of the committee to select the MRS/Optical Society of America Congressional Fellow, and as coordinator of the Public Affairs Forum in the MRS Bulletin.

He serves on the editorial board of several technical journals, university external advisory panels, and is a member of the Solid State Sciences Committee for the National Academies. He is a Fellow of the American Ceramic Society (ACerS) and a past Chair of the Basic Science Division of ACerS. He also helped establish a collaboration between ACerS and IMAPS (International Microelectronics and Packaging Society) to jointly sponsor an international conference on ceramic packaging technology, and served as the Technical Chair and General Chair of the meeting over two years.

Candidate's Statement:

"MRS is an outstanding society. By staying true to its roots of emphasizing the leading edge of materials research and continuing to embrace the full breadth of materials science, MRS has established itself as a major force in the materials community and as a strong advocate for the importance of our discipline. The vitality of new ideas and dedication of its members and staff to sustaining the dynamic environment that has been the trademark of MRS has been strongly reinforced to me through my role as a Meeting Chair for Fall 2007. It has been a privilege to look at the future of materials research in the context of planning the upcoming MRS meeting. As a Board member, I will continue to look for new ways that MRS can serve its members by serving the broad technical community and exploring leading-edge research topics.

Clearly a key area of focus for materials science and engineering is in energy and environmental issues. We have emphasized energy and environment in F07 as a natural consequence of the importance and relevance of these topics to our community. The combined challenges of meeting global energy needs in an environmentally sustainable manner may be THE challenge of this generation. From renewable energy technologies to a new future for nuclear energy to improved techniques for producing and better utilizing transportation fuels to technologies for better energy efficiency, materials research will have a critical contribution. The explosion in nanoscale science and technology is another area where MRS will continue to provide focus for the field. The rapid growth of interest in bio-related disciplines is also an exciting area of science and technology for which MRS provides a perfect forum. These topics and other exciting areas of materials research, including computation materials science, new in situ *dynamic characterization techniques, emergent behavior from multiple phenomena, etc., are what make the MRS and its meetings so exciting.*

As materials research becomes an increasingly global enterprise, it is important for MRS to continue to reach out and collaborate around the world, so that it can sustain its leadership role. As a Board member, I would

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support a strong focus on broad engagement, which is consistent with how science is done in our international community. In this context, I also believe that MRS must continue to reach out to youth and to their parents about the excitement of science and engineering so that we can help attract the best and brightest minds into research. MRS has an obligation to help make our story understood so that younger students can make well informed decisions about their future. Through a variety of exciting outreach efforts and in collaboration with other groups and societies, MRS has been a leader in this area and we must continue to provide strong leadership. Part of the importance of getting 'the story out' is to help inform the political process, which is vital to the health of our field. MRS has been very active and effective in the political arena, but we need to be constantly evaluating our approach and the effectiveness of our efforts.

An important role for the Board of Directors is to decide on the best ways for MRS to serve its members. The Society has worked diligently to provide more value to members through meetings, publications, and Web-based access. A number of new ideas have been developed to provide valuable and timely information to members. I look forward to the opportunity to help MRS decide how best to provide value to its members in this age of rapid communication and abundant information.

I have enjoyed my association with MRS and have been honored to serve the Society in a variety of capacities. I look forward to the chance to further serve MRS as a member of the Board of Directors."

Mary E. Galvin
Air Products and Chemicals, Inc.

Mary E. Galvin, a Principle Research Associate at Air Products and Chemicals, received MS and ScD degrees in polymer science at the Massachusetts Institute of Technology (MIT). After graduating from MIT, she joined Bell Laboratories where she eventually became a Distinguished Member of the Technical Staff. In 1998 she moved to the University of Delaware as a professor of materials science and engineering and in 2004 became a Distinguished Professor of materials science and engineering. As a senior associate at Air Products, Galvin is accountable to identify trends in materials and polymer science and institute programs in these disciplines to address new advances, and meet the business technology needs for growth at Air Products.

Galvin is a Fellow in the American Physical Society (APS) and has been active in the Materials Research Society as a symposium organizer, a Volume Organizer for the *MRS Bulletin*, and as one of the Meeting Chairs for the upcoming 2007 MRS Fall Meeting in Boston. She has served on commitees for the Polymer Physics Division of the APS. In addition she was a Technical Program Co-chair for the PMSE Division of the American Chemical Society (ACS). She has served as an editor or on the editorial boards of *Macromolecules, Journal of Macromolecular Science: Pure and Applied Chemistry*, and *Journal of Macromolecular Science, Polymer Reviews*. In 2001 she was a member of the Board of Reviewers for *Science*. She has also chaired two Gordon conferences, been a Counselor for the Gordon Research Conferences, co-chaired three Materials Chemistry Workshops for NSF and served on panels for the National Research Council.

Her thesis dealt with preparing blends and block copolymers of conducting polymers. While at Bell Laboratories she worked in several areas of materials science including the design of deep UV resists, the correlation between sequence distribution in copolymers and their miscibility in ternary polymer blends, and the design and utilization of electroactive polymers in organic light-emitting diodes. Her group at Delaware continued to focus on designing novel electroactive organic materials and establishing the structure/property relationships that govern the performance of these materials in light emitting diodes, photovoltaic cells and thin film transistors. At Air Products she manages a group and is the technical lead on a team developing and commercializing products for organic electronics. This team has recently commercialized a new product on the market for use as hole injection layers in organic light emitting diode display devices. She is also a member of the corporation's Technology Board, which reports to the Chief Technical Officer, and consists of senior technology members from all fundamental technology disciplines across the corporation.

Candidate's Statement:

"While I have actively participated in divisions of the ACS and APS, I have increasingly found that MRS is my primary professional society. My career has benefited tremendously from the high quality of MRS publications and participation in MRS meetings. MRS has several unique attributes: specifically it is interdisciplinary in nature and has a global reach through its participation in the International Union of Materials Research Societies. The MRS meetings, including the Fall and Spring Meetings, the joint meetings in Europe co-sponsored by the European-MRS, and the international meeting it plans to run in China in 2008, increase scientific discussion and collaborations. The exchange of knowledge and the excitement generated at these meetings serve to promote the careers of MRS members and advance the pace of development in materials science, thereby, increasing the value it brings to society. If elected I would enjoy working with MRS to promote its goals of providing the highest quality scientific meetings that attract a large and diverse cross-section of materials researchers.

My experience at Bell Labs, the University of Delaware, and Air Products has provided me with an appreciation of the roles that academia and industry play in advancing materials research. I believe that the long term health of materials research, the economy, and society requires that industry, academia, and the national labs work together more effectively. If elected I would work to promote collaboration between these three sectors and work with MRS to achieve its goals of advocating for R&D funding, international collaborations, and environmental responsibility through increased engagement with government representatives."

Charles C. Han
Chinese Academy of Sciences

Charles C. Han is currently a Professor and the Director of the Joint Laboratory of Polymer Science and Materials of the Institute of Chemistry, the Chinese Academy of Sciences (CAS). The Joint Laboratory of Polymer Science and Materials consists of two laboratories: The State Key Laboratory of Polymer Physics and Chemistry (Han is also the Director) and the CAS Key Laboratory of Engineering Plastics. Prior to joining CAS, he worked for NBS/NIST for 28 years. He advanced from a research scientist to a group leader, and finally became a NIST Fellow. He has a BS degree in chemical engineering from National Taiwan University, and a PhD degree from the University of Wisconsin, Madison, in physical chemistry, where he specialized in polymers.

Han has been active in MRS activities during his tenure at NBS/ NIST. He has chaired and co-chaired symposia in scattering in polymers and in polymer blends/alloys. He is also active and involved in many other societies, such as ACS, APS, AIChE, and Gordon Conferences. He was a Board member for the Division of Polymer Physics, APS. He is the author of more than 300 referred papers and 17 patents. He has also won many awards, including Dillon Medal of

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APS, Humboldt Fellowship award, and High Polymer Physics Prize of APS. He is currently an editorial board member of several polymer-related journals, and the Asian Editor for the journal *Polymer*.

Technically, Han has worked in the area of light scattering, neutron and x-ray scattering in polymers; in polymer dynamics of dilate, semidilute and concentrated solutions; in molecular conformation, domain structure and order-disorder transition of block copolymers; in equilibrium phase behavior as well as in the spinodal decomposition of polymer mixtures; in shear dependence of the static and kinetic phase behavior of polymer mixtures and its application in materials processing; and in phase separation and crystallization of polyolefin blends/alloys. He is currently a contractor for the Chinese Academy of Sciences as a professor and director for the JLPSM in the Institute of Chemistry. He is not only directing research, but also helps liaison between Chinese polymer research communities with many U.S. and European academic and industrial organizations and individuals in polymer and materials research.

Candidate's Statement:

"MRS is the world leading technical society on materials research. It is undoubtedly the major organization that scientists and engineers join to communicate their scientific and technical results, and also the major platform which publicizes the important materials research results to the general public and to the government.

Right now, the state of the Society is excellent, membership is high and stable, meeting attendance is thriving. Also, meetings and publications in new areas of materials research are being established, including bio, nano, and the combination of these with other traditional materials disciplines, such as metals, ceramics, and polymers. However, as MRS is enjoying its success in meetings and publications, we should always be aware that MRS is a multidisciplinary and forward-looking organization. MRS should always work for the members' needs in dealing with the manufacturing globalization issue and the materials and sustainable energy issues.

I believe I can bring to the MRS Board my experience in working with professional and technical societies, and my experience in working with organizations and research scientists and engineers in different areas and different countries. If I am elected to the Board, I can help expand the networking with international organizations, especially with Chinese organizations. I believe it is very important for MRS to be the central platform where the current and the future of the materials research knowledge is exchanged, directions are shaped, and momentum is generated for U.S., European, and Asian countries.

MRS is an outstanding society that will take up the responsibility of meeting the challenge of the new era in materials research. I would be honored to serve the members as one of the Board members."

Gregg S. Higashi
Intel Corporation

Gregg S. Higashi is the Principal Engineer for Phase Change Memory Materials Development at Intel Corporation. Prior to joining Intel in 2005, he was the Chief Technology Officer of the Front End Products Group at Applied Materials. And, before he joined Applied in 2002, Higashi spent 20 years at Bell Labs where he served in a number of different roles in research, development, and manufacturing of integrated circuits. His technical interests include surface chemical cleaning and passivation, gate dielectric formation and characterization, epitaxial growth and the science of interfaces, and chalcogenide thin film deposition and characterization. He has his BS and PhD degrees in physics from the Massachusetts Institute of Technology.

Higashi has been active in MRS since joining Bell Labs in 1982. He was an organizer of the "Symposium on Laser and Particle-Beam Chemical Processing for Microelectronics" (Fall 1987), the "Symposium on Surface Chemical Cleaning and Passivation for Semiconductor Processing" (Spring 1993), and the "Symposium on the Science and Technology of Semiconductor Surface Preparation" (Spring 1997). He served as one of the Meeting Chairs of the 2006 MRS Spring Meeting. He has also been active in the Front End Processes Focus Technical Advisory Board of SEMATECH and is presently a member of the University of California MICRO Policy Board. He is the co-author of over 90 technical papers.

Higashi has worked on materials science throughout his career. He did his PhD degree on the study of defects in chalcogenide glasses using photoluminescence. He started his career at Bell Labs studying surface photochemical reactions that eventually led to selective area growth of CVD Al. In this work he learned that surface chemical cleaning and passivation were critical to selective area growth and began studying this aspect of semiconductor processing. This work eventually led to the linkage of surface chemical cleaning and passivation to device fabrication and the formation of high quality gate oxides. This began the second phase of Higashi's career at Bell Labs. After 12 years in research he transitioned into IC development where he helped introduce 0.5 μm–0.09 μm technologies into manufacturing. In this capacity, he acted as a conduit between research and manufacturing as he introduced improved wafer cleaning technologies, nitrided gate oxides, selective Si epi, fast ramp RTA, and both high and low energy implantation technologies. As the Chief Technical Officer of the Front End Products Group at Applied Materials, Higashi had responsibility for the Technology Roadmaps of the Gate Dielectric, Rapid Thermal Processing (RTA, RTO, RTCVD), Implant, and Epi Products. At Intel, he has responsibility for the introduction of new materials, processes, and equipment for phase change memories.

Candidate's Statement:

"I began my interaction with MRS just after joining Bell Labs in 1982. My supervisor introduced me to the Society by pointing to the work going on in laser annealing and beam solid interactions, saying that this was where the action was and this was where I should concentrate my activities. I learned that MRS was a vibrant society where researchers worked on the fundamental science of exciting new processes, materials, and applications. I found myself drawn to research where applications were the principal objective, and I could see scientists trying to make a difference in our world and how we did things. I guess this appealed to the engineer in me that I had suppressed while majoring in physics. In any case, the multidisciplinary, goal-oriented nature of MRS aligned well with my personal goals and aspirations.

I maintained my interaction with MRS throughout my career while my career evolved from research to development to manufacturing and back again. I have always found and still find value in what the Society provides; an environment where researchers from industry, academia, and national labs can meet to discuss the latest developments in a host of new potential applications. The Society has the mindset and agility to jump on any of the exciting areas seeking new materials and processes to be successful.

MRS has always done this extremely well and owes much of its success to this model. As the Society and our community mature, however, I feel we need to do some things differently. One question we might ask ourselves is, 'How much of our work should be done for the sake of a discipline rather than hot new applications?' A similar question we might ask is, 'Now that our hot new application has matured and has moved from research to development or manufacturing how much

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should MRS continue to focus on this area?' These are the types of questions I feel we need to be asking as we mature and grow as a society. My personal opinion is that development and manufacturing are problem-rich environments and would benefit from sustained engagement with the MRS.

In closing, I would like to join with you in a discussion of these topics and any of the many other topics we need to address as a member of your Board of Directors. I feel that MRS can make good use of my experience and my perspectives on research, development, and manufacturing and hope you feel the same way."

Vladimir Matias
Los Alamos National Laboratory

Vladimir Matias is a Technical Staff Member at Los Alamos National Laboratory serving as Project Leader in the Superconductivity Technology Center. Prior to joining Los Alamos, he was at Oxxel, Oxide Electronics GmbH (Germany), and at Conductus, Inc. (Sunnvale, CA) where he worked as Senior Technical Staff Member and Supervisor. He has a BS degree in applied physics from California Institute of Technology, and a PhD degree in physics from Stanford University. He did a postdoctoral research fellowship at Delft University of Technology in The Netherlands.

Matias has extensive research experience in growth of metal-oxide, particularly high-temperature superconducting (HTS), thin films and measuring their electronic and structural properties. He has extensive experience with various physical vapor deposition processes, but especially reactive evaporation using MBE and ion-beam assisted deposition. He has a keen interest in *in situ* film monitoring for growth studies, and has worked on improving scientists' tools such as RHEED, ion scattering, photoemission, and LEEM. Matias has worked in academia on basic science, in industrial labs on applied scientific research, and in a national lab where he covered both basic and applied research. He has over 80 technical publications in peer reviewed journals, three patents issued (two of which are currently in use in industry) and a number of patent applications pending. He is an active member of MRS, APS, AAAS, AVS, and the New York Academy of Sciences. He has organized a number of meetings and has been on two Department of Energy review panels.

Within MRS, Matias has been active since 1986 when he was a graduate student. Most recently, he was a lead organizer on two symposia in 2003, "Frontiers in Superconducting Materials" and 2006 "*In Situ* Characterization of Film Growth and Interface Processes," and has been involved with other symposia organizations in the past. During F06, the symposium that he organized volunteered to experiment with a new content capture process using presentation audio and video. It was a very successful experiment with more than 60% participation from the presenters. The experiment has since been repeated on a larger scale at the S07 Meeting.

Candidate's Statement:

"MRS is truly unique among scientific societies. Because of that, I believe that it is also the best. In traditional scientific terms, MRS is decidedly multidisciplinary, encompassing a wide range of research disciplines such as materials science, physics, chemistry, biology, and engineering. Where else do chemists give a talk to physicists? Diversity within MRS means contrasting points of view to a common research subject, and that can be quite enlightening. This is a tremendous strength that needs to be preserved and encouraged further within the Society. As a Board member, I will promote policies that strengthen this core asset.

MRS is also known for organizing the best scientific conferences. The signature Fall and Spring Meetings have worked extremely well in the past. There is a lively exchange of information and ideas, but still a somewhat relaxed environment compared to many other societal conferences. These enormously successful meetings are a tribute to the wonderful professional staff that makes sure things happen that way. As our society has grown over the years, the challenge has become to maintain a manageable size of the meetings. A well-thought-out process for this is needed in order to continually improve the quality of the meetings. I am also worried that the meeting exhibit is in danger of diminishing in size and would like to explore ways to prevent this and to enhance the attendees' experience at the exhibit. For example, recent multimedia additions have been very successful. Finally, many MRS members are not active every year, as their memberships lapse without meeting attendance. We must actively work to recruit these past members back into the Society.

MRS is at the forefront among scientific societies in how we continue to adapt to the changing nature of science and society. But these are also the greatest challenges facing MRS. Traditionally, MRS has focused around two hallmarks: the Meetings, which continue to be very effective, and the Proceedings, which are at a point of transformation. The well-established "blue books" have been very useful in the past, but need to be superseded by an improved communication medium. MRS has already done well to put all the Proceedings online and thus within reach to all members. The ultimate goal, which I believe is achievable, should be to make the Meetings' content fully available to members after the events and in an easily accessible form. The electronic content capture currently being experimented on at MRS Meetings is a great opportunity for this and needs to be refined further. This also provides a great opportunity to motivate past members to come back to MRS.

A final important challenge revolves around improved outreach to the populace. Broad based groups, such as the Nanoscale Informal Science Education Network (NISE), are a good example of how to do this in collaboration with other institutions, and MRS can do more of that nationally. Opportunities also exist on an international level to do broad outreach by making global alliances. As an example, energy and environment are critical themes for the future of society worldwide, and MRS can play an enormous role in these areas via outreach.

I would be proud to serve on the MRS Board and to continue to make MRS the best scientific society."

Richard A. Vaia
U.S. Air Force Research Laboratory

Richard A. Vaia is currently Chair of the U.S. Air Force Research Laboratory's (AFRL) Nano-Science and Technology Strategic Technology Team and Research Leader for the Polymer Core Technology Area of AFRL's Materials and Manufacturing Directorate. He received his PhD degree in materials science and engineering at Cornell University in 1995. He was a distinguished graduate from Cornell's Air Force ROTC program and separated from the Air Force in 1999 as a Captain after his final assignment at AFRL. Coinciding with his work at AFRL, Vaia was Adjunct Professor at the Air Force Institute of Technology from 1996 to 1999 and at the University of Akron from 2003 to present.

Vaia has been active in MRS throughout his professional career. He has been organizer for various symposia (NanoPhase and NanoComposite Materials, Polymer Nanocomposites, Responsive Soft Matter), was a 2004 MRS Fall Meeting Chair, co-edited an *MRS Bulletin* issue (Polymer Nanocomposites) and served on the Program Development Subcommittee. He was appointed to the MRS Board of Director in 2006. His involvement in other societies includes APS and ACS, where he serves as Member-at-Large for the Division of Polymeric Materials Science and Engineering. Additionally, he serves

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on the editorial boards of *Chemistry of Materials*, *Macromolecules* and *Materials Today*. Vaia has authored over 100 refereed scientific papers and patents, and has been recognized twice as the Air Force Office of Scientific Research Star Team and as the Air Force Outstanding Scientist (2002).

Vaia's research focuses on the development of polymer nanocomposite technology where he has done extensive work on the fundamental physics, chemistry, interface and structure-property relationships underlying nanocomposite formation and performance. This work has enabled the development of niche aerospace applications of polymer nanocomposites, including self-passivation in aggressive space and rocket propulsion environments, self-deployable structures for satellites and morphing concepts for future unmanned vehicles. Most recently, his focus has moved to increasing functionality through the incorporation of bio-macromolecules, nanoparticles and associated concepts, including photonically-active organic–inorganic hybrid systems, shape memory nanocomposites, mechanoreceptors, and optically-triggered actuators. In his corporate leadership role, he has helped transition many nanoscience innovations into successful aerospace development programs, and he is responsible for crafting the Air Force Research Laboratory's Strategic Plan for how nanoscience innovations will enable future capabilities. He interacts broadly and successfully with scientists, technologists and executives, not only across the Department of Defense and the aerospace industry, but internationally, within both academia and government.

Candidate's Statement:

"The Materials Research Society has set the standard for creating a welcoming community that encourages and fosters exciting interdisciplinary cooperation at the very forefront of the physical sciences. As the materials enterprise accelerates into the global 21st Century, interdisciplinary perspective, whether based on scientific disciplines, technology development level, or geographic location, will become ever more important. Thus, our history and success positions MRS to become the global professional society for innovators and scientists to share concepts, insights and findings. It will be where they turn to maintain their grasp on the ever expanding technology horizon of materials.

To achieve this goal, I believe MRS must focus on three critical objectives. First, it must continue to strive for excellence in all that it does. Today, MRS's worldwide reputation resides on two incredible pillars of success: our world-class meetings, and our professional publications, such as the MRS Bulletin. These have been built by the Society's extraordinary assets: its membership, its volunteers, and its staff. Our future depends on the Society not only maintaining this solid foundation and outstanding products, but continuing to innovate—to find new ways to increase meeting quality, increase the value and accessibility of our publications, and provide rewarding experiences for our volunteers. Second, MRS must embrace and address the implications of the rapidly changing materials science landscape. The materials enterprise is increasingly global. The development time cycle of materials is continually decreasing. The responsibilities for social and environmental stewardship of new materials are increasing. Scientists and technologists are continually harnessing techniques and concepts from new fields, such as biology and biochemistry, to establish new material focuses such as bio-nano materials. Through innovative ideas that maintain our standard of excellence and improve our focus on the very forefront of innovation, MRS must expand its offering of products to enable the increasingly diverse global materials community to find their way to MRS, and to productively engage in our dynamic society. Finally, MRS must actively build the global materials community of the future. We must expand our ability to deliver the critical educational tools needed for K–12 science teachers to incorporate materials into their curriculum. Furthermore, we need to encourage grass-root university activities by undergraduates and graduates to build the Society's base of the future.

The challenge facing MRS today in achieving these objectives is balancing the necessary focus with efficient experimentation and rapid adoption of new approaches. Ultimately, this relies on the Society maintaining innovative, passionate members and volunteers. I believe the role of the MRS Board is to plot the course for the future and ensure the Society's tone is exciting and dynamic; thereby encouraging innovation in all that we do. Thirty-five years ago MRS was founded on an interdisciplinary perspective that today defines materials research and development. Now we must begin to define the approach that will epitomize the materials enterprise for the next 35 years."

MRS Seeks Nominations for 2008 Outstanding Young Investigator Award

The Materials Research Society is accepting nominations for the Outstanding Young Investigator (OYI) Award to be presented at the 2008 MRS Spring Meeting in San Francisco.

The OYI Award recognizes outstanding interdisciplinary scientific work in materials research by a scientist or engineer under the age of 36 (as of January 1, 2008). The award recipient must show exceptional promise as a developing leader in the materials area.

The award consists of a $5,000 prize, a presentation trophy, and a citation certificate. Reasonable travel expenses to attend the MRS Meeting at which the award is presented and the meeting registration fee will be reimbursed.

The deadline for submission of nominations is midnight Eastern time (U.S.) on October 1, 2007. For guidelines and application forms, access the MRS Web site at www.mrs.org/awards/ or contact Lorri Smiley, Materials Research Society, 506 Keystone Drive, Warrendale, PA 15086-7573, USA; e-mail awardsprogram@mrs.org. MRS

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