

Preview: 2005 MRS Fall Meeting

Hynes Convention Center and Sheraton Boston Hotel, Boston, Massachusetts
Meeting: November 28–December 2 • Exhibit: November 29–December 1

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Meeting Chairs:

Yang-Tse Cheng

General Motors R&D Center

David S. Ginley

National Renewable Energy Laboratory

Kathryn E. Uhrich

Rutgers University

Ralf B. Wehrspohn

Paderborn University

The Materials Research Society will hold its 2005 Fall Meeting at the Hynes Convention Center and the Sheraton Boston Hotel in Boston, Mass., November 28–December 2, 2005. The meeting will include a technical program; tutorials; a plenary session; an awards ceremony; an equipment exhibit, including Research Tools Seminars; poster sessions; a career center; funding seminars; and other special activities. Symposium proceedings will be published on the MRS Web site, where they will be available free on-line to MRS members.

Featured Events

Among the featured events at the meeting will be a “fashion show” on wearable smart materials and a hydrogen fuel cell car race for high school students and teachers.

The “Wearables Runway” will feature some of the most advanced clothing and unique accessories made possible by materials research. Recent successes include the integration of solar cells, flexible displays, and lighting in fabrics. According to the meeting chairs, “Future clothes can become a virtual skin that can act and think autonomously, save us in cases of emergency, warn us of dangers, and help monitor our health.” The fashion show will be held in the Exhibit Hall on the second level of the Hynes Convention Center on Tuesday and Wednesday, November 29–30. This activity is co-sponsored by the University of Paderborn, Germany, and MRS.

The **Hydrogen Fuel Cell Model Car Challenge** is sponsored by General Motors, the U.S. Department of Energy, the National Renewable Energy Laboratory, and MRS. Races are scheduled during the 2:30–3:30 p.m. coffee break on Monday, November 28, in Ballroom A on the third floor of the Hynes. Meeting attendees can stop by the Boylston Hallway throughout the day to watch the cars being assembled.

MRS is also holding two special forums, one on materials education and the other on commercialization.

Symposium PP on **Materials Science Education** will host panel discussions in the Berkeley Room of the Sheraton Hotel on “Funding for Educational Innovations in Materials” on November 29, 1:30–2:30 p.m.; “Accreditation” on November 30, 11:00–noon; and “Undergraduate Research in Materials Science” later that day beginning at 4:00 p.m.

Symposium QQ will cover the spectrum of activities involved in commercializing inventions in a session intriguingly titled “**IP, TT, VC, IPO, and U.**” This session will consist of a late afternoon of talks on Monday, beginning at 4:00 p.m., featuring 20-minute presentations on topics such as patent protection and technology transfer within university programs. The session concludes with a panel discussion, beginning at 5:40 p.m.

Symposium X, which provides a lunchtime series of overviews on topics of general interest delivered for the nonspecialist, opens with a lecture by Loet Leydesdorff of the Amsterdam School of Communications Research. Leydesdorff will address the intersection of a knowledge-based society and the economy. This will be followed by talks throughout the week on “smart” clothes and on soft materials, from biological materials to flexible electronics.

Technical Program

Forty-two technical symposium topics, grouped into seven clusters, will provide an expansive overview of cutting-edge themes. The **Energy and the Environment** cluster will cover topics ranging from the hydrogen cycle, next-generation batteries and solid-state lighting to materials and technologies for direct thermal-to-electric energy conversion and life-cycle analysis tools for “green” materials and process selection. Before the technical sessions begin, a tutorial will be given by instructors from the Department of Energy’s recently established Centers of Excellence for vehicular hydrogen storage. The instructors will focus on the three materials classes chosen by DOE—metal hydrides, chemical hydrides, and carbon-based materials—as the most promising for meeting the application requirements of high-volumetric and gravimetric storage densities.

In the area of organic photovoltaic

(OPV) devices, covered by Symposium D, Konarka Technologies is reporting an efficiency of 4.8% for a device that has been sent to a government laboratory for certified measurement, and an efficiency above 5% for devices measured in their own laboratory. Achievement and verification of such efficiencies bring to light the potential for OPVs as a low-cost, commercially viable renewable energy technology. Strides have also been made in the organic light-emitting diode (OLED) community in the race to replace current lighting technologies. The group of S. Forrest of Princeton University will report on white-emitting phosphor-based OLEDs with efficiencies greater than 25 lumens/W. This already exceeds the efficiency of an incandescent bulb, which is typically 15 lumens/W. Pathways to much higher efficiencies will be presented by several contributions in Symposium D.

Various aspects of biomimetic materials, biomaterials, and cell-interactive materials will be presented in the **Bio-Organic/Inorganic Composites** cluster. Additional symposia include topics on interfaces in organic and molecular electronics and flexible and printed electronics, photonics, and biomaterials.

The impact of materials at the nanoscale will be discussed in the areas of sensors, catalysis, semiconductors, and the dynamics of small confining systems in the cluster of symposia within **Nano- to Microstructured Materials**. Degradation processes in nanostructured materials will be discussed as well as assembly at the nanoscale. Symposium S on Nanomaterials and the Environment will bring together experts from a broad range of disciplines to discuss the application of nanotechnology to the environment for the purposes of sensing and monitoring, remediation and treatment, and prevention of pollution; the impact of nanotechnology on the environment, including potential health and environmental effects of nanomaterials, will also be addressed. Societal, regulatory, and policy issues, along with nomenclature and measurement standards, will also be topics of discussion. The symposium will hold panel discussions on Thursday, December 1 on Policy and Legal Approaches to Nanotechnology (from 10:15 a.m. to noon) and on Ethical and Legal Aspects of Nanomaterials and the Environmental Regulation (3:15–5:00 p.m.).

The **Smart Materials and Devices** cluster will include research on multiferroic materials and electroresponsive polymers. Symposium T on Ferroelectric Thin Films includes invited speakers O. Auciello (Argonne National Laboratory), "Synchrotron Studies of Size Effects"; H.H. Kohlstedt (IFK-EKM, FZ Jülich, Germany), "Tunneling Effects in Ferroelectrics"; S. Narayan (Symetrix Corp.), "FeRAM Integration"; M. Okuyama (Osaka University, Japan), "BiFeO₃ Ferroelectrics"; and A. Pertsev (Ioffe Institute, Russia), "Phenomenological Theory."

Mechanical Behavior includes symposia on surface interactions and engineering, amorphous and nanocrystalline metals, micro- and nanomechanics of structural materials, and mechanisms of mechanical deformation in brittle materials. **Electronics and Photonics** includes symposia on materials for transparent electronics, semiconductor materials, GaN and related materials, and nanoscale optics and photonics based on metals. Photophysical properties of monolayers on nanomaterials and surfaces, magnetic sensors and sensing systems, and fabrication and characterization methods for novel magnetic nanostructures will also be covered.

Symposium topics under the cluster of **General Interest** include actinides, solid–solid interfaces, and combinatorial methods and informatics in materials science. The cluster also addresses progress achieved with *in situ* electron microscopy; scanning probe microscopy; and growth, modification, and analysis by ion beams at the nanoscale.

Poster sessions will be held Monday through Thursday, beginning at 8:00 p.m. in the Hynes Convention Center, second level. The meeting chairs will sponsor a Best Poster Award competition, selecting posters each night on the basis of technical content, appearance, graphic excellence, and presentation quality.

Plenary Session and Awards Ceremony

The plenary speaker will be **Alan I. Taub**, executive director of GM Research & Development at General Motors Corp., presenting a talk on "Materials Challenges for the Automotive Industry in the 21st Century." The plenary session is scheduled for November 28 at 6:00 p.m. in the Grand Ballroom of the Sheraton Boston Hotel.

The **awards ceremony** will convene on Wednesday, November 30, at 6:00 p.m. in the Grand Ballroom of the Sheraton Boston Hotel, at which **Robert Langer** of the Massachusetts Institute of Technology will

receive the Von Hippel Award and present the Von Hippel address on "Biomaterials for Drug Delivery and Tissue Engineering." **Eugene E. Haller** of the University of California–Berkeley/Lawrence Berkeley National Laboratory is the recipient of the David Turnbull Lectureship. He will present his lecture, "Isotopically Controlled Semiconductors," on Tuesday November 29 at 5:05 p.m. in the Grand Ballroom, Sheraton Boston Hotel. The MRS Medal will be presented to **Reshef Tenne** of the Weizmann Institute of Science. Tenne will give his medalist presentation on "Inorganic Nanotubes and Inorganic Fullerene-Like Materials—From Concept to Applications" on Wednesday November 30 at 5:05 p.m. in Room 210 of the Hynes Convention Center.

Government Seminars

A congressional communication workshop will present a tutorial on the U.S. legislative process and describe where, when, and how MRS members can effectively communicate with their representatives, senators, and government agencies. The workshop will be held on Tuesday, November 29, 5:30–7:00 p.m. in the Hynes Convention Center. Computer access to *Materials Voice*, the MRS Web-based tool for writing letters to legislators in Washington, D.C., will be made available during the week for members who wish to send messages to their legislators on current issues of concern.

Following the workshop will be a seminar about programs and funding opportunities in the National Science Foundation. The Department of Energy and the Department of Defense will hold seminars on Thursday, December 1, at 6:00 p.m. and 7:00 p.m., respectively.

For the second time at an MRS meeting, a complimentary workshop will be offered on writing grant proposals for government funding. The workshop is being held by the U.S. National Institutes of Health on Sunday, November 27, 6:30–8:00 p.m. at the Sheraton Boston Hotel.

Career Services, Student Events, and Networking Opportunities

MRS will present gold and silver **Graduate Student Awards** to graduate students for symposium papers that exemplify significant and timely research. On Wednesday evening, all finalists will be honored at the awards ceremony.

Graduate students and members of MRS University Chapters are invited to attend the **student mixer** reception on Monday night, November 28, 7:00–8:00

p.m. Also, chapter officers and faculty advisors are invited to attend a **meeting of MRS University Chapter representatives** on Wednesday, November 30, at noon to compare notes on recent activities and brainstorm new projects and issues of common concern. Those interested in starting new chapters are also welcome.

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


Face-to-face networking opportunities will be available during a mixer scheduled for Monday, November 28, at 7:30 p.m. for participants of the **Entrepreneur Challenge** launched by MRS last month—see article in this issue of *MRS Bulletin*.

The MRS Public Outreach Committee is presenting the **Women in Materials Science & Engineering Breakfast** on Wednesday morning, November 30, at 7:00 a.m. where panelists will introduce a discussion on "The 'Leaky Pipeline' of Women in Science: Does it leak more in your country than in others?" "Leaky pipeline" refers to a phenomenon in which a disproportionate number of women leave the sciences at each career stage. Panelists Debra R. Rolison (Naval Research Laboratory), Huifang Lang (Aldrich Chemical Company), and Suzi Jarvis (Trinity College, Ireland) will lead an open discussion of this phenomenon, and how the Materials Research Society can help.

Locations of these activities will be announced closer to the meeting.

For More Information

See the following pages for a matrix of symposium sessions, a list of tutorials, profiles of exhibitors, and information on hotel and transportation arrangements. Details of various events and activities will be published in the *Meeting Guide* on-site. International travelers are reminded to allow ample time to obtain a visa, if necessary; more information is available on the MRS Web site. For additional details about the meeting, contact MRS Member Services, Materials Research Society, 506 Keystone Drive, Warrendale, PA 15086-7573, USA; e-mail info@mrs.org, tel. 724-779-3003, and fax 724-779-8313.

The deadline to pre-register for the meeting is **November 11**. The MRS Web site can be accessed for updated information on confirmed talks and details of special events, and for pre-registration: www.mrs.org. 

Robert Langer to Receive 2005 Von Hippel Award for Drug Delivery and Tissue Engineering

The 2005 Von Hippel Award, the Materials Research Society's highest honor, will be presented to Robert Langer, Institute Professor at the Massachusetts Institute of Technology. Langer is being recognized for his "pioneering accomplishments in the science and application of biomaterials in drug delivery and tissue engineering, particularly in inventing the use of materials for protein and DNA delivery. His achievements in interdisciplinary research have generated new medical products, created new fields of biomaterials science, and inspired research programs throughout the world." Langer will accept the honor during the awards ceremony at the 2005 MRS Fall Meeting in Boston on November 30 at 6:00 p.m. in the Grand Ballroom of the Sheraton Boston Hotel, where he will then present his award lecture "Biomaterials for Drug Delivery and Tissue Engineering."

As the world leader in the application of materials science to drug delivery and tissue engineering, Langer has pioneered the synthesis of biocompatible polymers, such as the poly(anhydride) family of materials that exhibit controlled degradation in the body, and has shown how new materials can be applied in a broad range of medical technology, including anticancer therapy, vaccine development, gene therapy, and tissue engineering. Over 60 million people worldwide utilize controlled release medications each year and annual sales in this area are currently in excess of \$50 billion. Polymeric drug delivery systems, based largely on Langer's discoveries, have permitted drug therapies that otherwise would not be possible and have reduced health care costs by allowing minute quantities of drugs to be precisely delivered over prolonged times while avoiding systemic complications.

During the last several decades, polymeric drug delivery technology has produced several medical breakthroughs, including transdermal delivery systems and long-acting reservoirs for steroid contraceptives. Prior to 1976, it was widely believed that similar approaches for proteins and other macromolecules, such as gene therapy vectors, were impossible. Conventional wisdom of the time suggested that macromolecular transport through polymer matrices would be too slow to be useful. Langer solved this problem by controlling the separation of solute and matrix during fabrication of the device, ensuring that transport would occur in aqueous channels rather than



Robert Langer

through the matrix itself (*Nature* **263** [1976] p. 797). Subsequently, Langer refined his approach to polymeric drug delivery systems by designing a new class of poly(anhydride)s that undergo hydrolytic surface erosion at controlled rates (*J. Polym. Sci., Part A: Polym. Chem.* **25** [1987] p. 3373).

He collaborated with Henry Brem of Johns Hopkins University to demonstrate the use of poly(anhydride)s in the treatment of brain cancer (*Sci. Am.: Sci. and Med.* **3** [1996] p. 52). Using basic principles of polymer science and polymer physics, Langer developed the first approved surface-eroding polymers; he worked with neurosurgeons and oncologists to convert this basic discovery into a life-saving treatment for brain cancer, the Gliadel system, which was approved by the U.S. Food and Drug Administration in 1996 and is widely used in Europe as well. More clinical applications are expected to follow as Langer has developed new strategies for using polymers to deliver genes and to create long-circulating injectable drug carriers.

Extending beyond drug delivery, Langer's contributions are revolutionizing the field of tissue engineering. Langer has developed materials that can be used in new approaches to deliver mammalian cells. This concept, which Langer pioneered with Joseph Vacanti at Harvard, has permitted the creation of new skin, such as for burn victims or for patients with skin ulcers, and which is now widely used. Other tissues such as liver and cartilage have been grown in animals by using Langer's approach. His seminal contributions outlining an approach to tissue regeneration and repair have been adopted by dozens of academic and industrial research organizations worldwide. Smith


and Nephew, Reprogenesis, and other companies have licensed this technology and are pursuing its commercial development very aggressively. Langer's article in *Science* **260** (1993) p. 920, lays the foundations of the field.

Langer's contributions, discoveries, and inventions have been recognized by numerous honors and awards, including the Charles Stark Draper prize (2002), considered the equivalent of the Nobel Prize for engineers and the world's most prestigious engineering prize, from the National Academy of Engineering; the Gairdner Foundation International Award (1996), of which he is the only engineer to receive; the Dickson Prize for Science (2002); Heinz Award for Technology, Economy and Employment (2003); the Harvey Prize (2003); the John Fritz Award (2003), given previously to inventors such as Thomas Edison and Orville Wright; and the General Motors Kettering Prize for Cancer Research (2004). Langer also shared the 2005 Dan David Prize of \$1 million, of which he donated several scholarships of \$15,000 each to outstanding doctoral students throughout the world. He also received the Albany Medical Center Prize in Medicine and Biomedical Research (2005), the largest prize in the United States for medical research. In 1998, he received the Lemelson-MIT prize, the world's largest prize for invention for being "one of history's most prolific inventors in medicine." In 1989, Langer was elected to the Institute of Medicine of the National Academy of Sciences, and in 1992 he was elected to both the National Academy of Engineering and to the National Academy of Sciences. He is one of very few people ever elected to all three U.S. National Academies and the youngest in history (at age 43) to ever receive this distinction.

Langer has written over 850 articles. He also has over 500 issued or pending patents worldwide, one of which was cited as the outstanding patent in Massachusetts in 1988 and one of 20 outstanding patents in the United States. Langer's patents have been licensed or sublicensed to over 100 pharmaceutical, chemical, biotechnology, and medical device companies; a number of these companies were launched on the basis of these patent licenses. He served as a member of the U.S. Food and Drug Administration's SCIENCE Board, the FDA's highest advisory board, from 1995 to 2002 and as its chair from 1999 to 2002.

He has also served, at various times, on over 15 boards of directors and 30 scientific advisory boards of such companies as Wyeth, Alkermes, Mitsubishi Pharmaceuticals, Warner-Lambert, and Momenta Pharmaceuticals. Langer has received honorary doctorates from the ETH (Switzerland), the Technion (Israel), the Hebrew University of Jerusalem (Israel), the Universite Catholique de Louvain (Belgium), the University of Liverpool (England), the University of Nottingham (England), Albany Medical College (USA), the Pennsylvania State University (USA), and Uppsala University (Sweden).

Upon receiving his ScD degree in chemical engineering from the Massachusetts Institute of Technology in 1974, Langer became a research associate at Children's Hospital Medical Center of the Harvard Medical School in Boston—a position he still holds. From 1988 to the present, his professional appointments include the Whitaker College of Health Sciences, Technology, and Management; the Harvard-MIT Division of Health Sciences and Technology; and his current position in the Department of Chemical Engineering at MIT as Institute Professor, MIT's highest honor awarded to a faculty member.

The MRS Von Hippel Award includes a \$10,000 cash prize, honorary membership in MRS, and a unique trophy—a mounted ruby laser crystal, symbolizing the many-faceted nature of materials research. The award recognizes those qualities most prized by materials scientists and engineers—brilliance and originality of intellect, combined with vision that transcends the boundaries of conventional scientific disciplines, as exemplified by the life of Arthur von Hippel (<http://vonhippel.mrs.org>). 

MRS Fall Meeting Plenary Speaker Alan I. Taub to Address Materials Challenges for the Automotive Industry

Alan I. Taub, executive director of GM Research & Development at General Motors Corp., will present the plenary talk at the 2005 Materials Research Society Fall Meeting in Boston on November 28 at 6:00 p.m. in the Grand Ballroom of the Sheraton Boston Hotel. The title of his talk is "Materials Challenges for the Automotive Industry in the 21st Century."

"Fuel economy requirements, emissions regulations, and the push for energy independence are key factors driving the auto industry to increase vehicle efficiency," said Taub. In his talk, he will describe ways in which GM is pursuing efficiency improvements through powertrain enhancements and mass reduction, by use of materials.

Taub was named executive director of General Motors R&D in 2004, where he is responsible for GM's seven science laboratories in Michigan and India. These laboratories focus on a wide range of technologies, including advanced powertrain systems, computer-based design and analysis systems for vehicle engineering, electronics and information-based vehicle systems, new materials and fabrication processes, more environmentally friendly fuels and lubricants, and more efficient emission control systems.

Before joining GM, Taub was with Ford Motor Company, managing the




Alan I. Taub

Materials Science Department, where he was responsible for advanced automotive body, chassis, and powertrain materials. Later, he became manager of North American vehicle crash safety and, prior to leaving Ford, he was in product development as manager of vehicle engineering for the Lincoln brand. Taub joined GM in 2001.

After receiving a BS degree in materials engineering in 1976 from Brown University and master's and PhD degrees in applied physics from Harvard University in 1977 and 1979, respectively, Taub worked for nearly 15 years in research and development with General Electric. There, he was awarded 26 patents and

authored more than 60 papers. For nine years, Taub conducted research on the mechanical and electrical properties of materials, later leading a superconducting materials team that pioneered technology breakthroughs for commercial adoption by GE's medical group. He ultimately managed GE's materials properties and processes laboratory.

Responsible now for GM's advanced technical work activity, Taub manages a portfolio of major innovation programs of strategic importance to the company. He oversees global technology collaboration, which is managed through technology offices around the world that coordinate government and industry partner projects and collaborative research at leading international universities. Taub also serves as the interface between R&D and the rest of GM on advanced technology development and implementation.

Taub was a member of the USCAR Automotive Composites Consortium (1993–1997) and served with the Materials Technical Team of the Partnership for a New Generation of Vehicles (1995–1997). He has been an active member of MRS and serves on the advisory boards of several institutions, including Harvard, Brown, the Massachusetts Institute of Technology, Northwestern University, and the National Science Foundation. 



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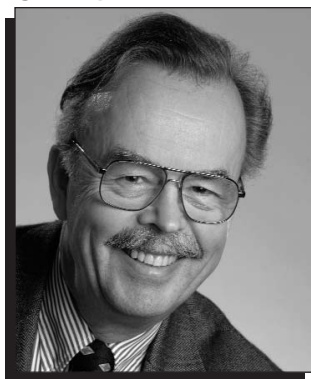
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Eugene E. Haller Selected for 2005 David Turnbull Lectureship for Isotopically Engineered Semiconductors

The Materials Research Society's David Turnbull Lectureship recognizes the career of a scientist who has made outstanding contributions to understanding materials phenomena and properties through research, writing, and lecturing, as exemplified by David Turnbull of Harvard University. This year, Eugene E. Haller of the University of California at Berkeley has been selected to deliver the 2005 David Turnbull Lecture. Haller is a professor of materials science and holds the Liao-Cho Innovation Endowed Chair at UC Berkeley with a joint appointment at Lawrence Berkeley National Laboratory. Haller is cited for his "pioneering achievements and leadership in establishing the field of isotopically engineered semiconductors, for outstanding contributions to materials growth, doping, and diffusion, and for excellence in lecturing, writing, and fostering international collaborations." He will be presented with the award at the 2005 MRS Fall Meeting in Boston during the awards ceremony on Wednesday, November 30 at 6:00 p.m. in the Grand Ballroom of the Sheraton Boston Hotel. He will deliver his lecture, "Isotopically Controlled Semiconductors," on Tuesday, November 29 at 5:05 p.m. in the Grand Ballroom, Sheraton Boston Hotel.

Along with launching the field of isotopically engineered semiconductors, Haller was among the first researchers to recognize the importance of hydrogen forming electrically active centers in semiconductors. He has made innovative contributions to the development of far-infrared semiconductor detectors for space-borne applications. Recently, he collaborated with colleagues at the Lawrence Berkeley National Laboratory in the area of nitride semiconductors, resulting in identifying a bandgap of 0.7 eV for high-quality InN films, in contrast to the previously believed bandgap of 1.9 eV.

With the end of the Cold War around 1989, large quantities of highly enriched stable isotopes of numerous multi-isotopic elements, separated in the facilities of the former Soviet Union, became available. Haller established contacts with these sources, and acquired monoisotopic ^{70}Ge , ^{73}Ge , ^{74}Ge , and ^{76}Ge in sufficient quantities to grow pure bulk single crystals. He then designed experiments to exploit the unprecedented control over isotope content. In addition to Ge, Haller has explored other semiconductors, including GaAs, GaP, GaSb, Si, and AlGaAs/GaAs multilayer structures, embarking on a broad



Eugene E. Haller

range of studies of these isotopically engineered materials involving the contributions of researchers worldwide. One area of study, for example, is diffusion in solids.

The understanding and control of diffusion processes is of utmost importance for many fields, including semiconductor device processing. Accurate knowledge of diffusion mechanisms and coefficients enables more realistic modeling and superior control of doping profiles and device characteristics. Most impurity diffusion processes are assisted by native point defects (vacancies and self-interstitials), and therefore a thorough understanding of self-diffusion lies at the heart of the understanding of any diffusion process. Haller has devised isotopically controlled multilayer structures that are chemically and structurally homogeneous, but have alternating layers of different isotopes. Upon annealing at high temperatures, the isotopes interdiffuse, and the resulting concentration depth profiles are measured with secondary ion mass spectrometry. Using this method, the self-diffusion, as well as the simultaneous self- and dopant diffusion, in numerous semiconductors has been determined over a wide temperature range. The unprecedented quality of the results has enabled the identification of the microscopic diffusion mechanisms. The results of the diffusion studies will be crucial for reaching the ambitious goals set in the Semiconductor Industry Association (SIA) roadmap.

In the field of isotopically controlled semiconductors, Haller has also made many outstanding collaborative contributions to the fundamental understanding of the effects of isotopic composition on vibrational frequencies (phonons), thermal conductivities, direct and indirect bandgaps, elastic constants, lattice parameters,

photoluminescence, and far-infrared spectroscopy. Haller expects that isotopically controlled semiconductors will find applications in quantum computing, nanoscience, and spintronics. In addition to pure isotopic materials studies, Haller has done pioneering research using these materials in combination with neutron transmutation doping (NTD) to achieve new standards in the uniform doping of silicon and germanium.

Haller's gallium- and antimony-doped germanium photoconductors and his NTD Ge thermistors have become the detectors of choice for astronomical, astrophysical, and cosmological observations from earthbound and space-borne telescopes. Haller was involved in applying uniaxial stress to Ge:Ga detectors, which moves the photoconductive onset to twice the wavelength of unstressed photoconductors. The Space Infrared Telescope Facility, renamed Spitzer Space Telescope, is equipped with several liquid-helium-cooled arrays of detectors fabricated in Haller's laboratory. This facility is the fourth and final element in NASA's Great Observatories Program and is an important scientific and technical cornerstone of the new Astronomical Search for Origins Program. Haller's NTD Ge thermistors are also widely used by high-energy physicists for the detection of neutrinos and the elusive dark-matter particles.

In the area of education, Haller was instrumental in introducing the electronic materials program at UC Berkeley, which is now a popular option within the Materials Science and Engineering graduate program. Haller is known for his lucid lectures, both in the classroom and in invited lectures at scientific meetings, as well as invited talks at academic institutions and government and industrial laboratories worldwide. Audiences of nonscientists have also benefited from Haller's numerous lectures given to university and national laboratory staff as well as students at high schools and community colleges.

Upon receiving his PhD degree in nuclear and applied physics from the University of Basel, Switzerland, Haller performed postdoctoral work at the university, and then at the Lawrence Berkeley National Laboratory, where he later joined the staff as senior faculty scientist and now heads the Electronic Materials Program in the Materials Science Division. He has held visiting professorships at the Max Planck Institute for Solid-State Research in

Stuttgart, Imperial College London, the DLR (German Aerospace Corp.) in Berlin, and Keio University in Tokyo. His awards and honors include the Alexander von Humboldt U.S. Senior Scientist Award (1986), two Miller Research Professorships (1990, 2001), the Max Planck Research

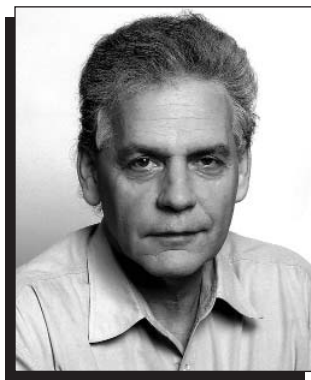
Prize (1994), and the James McGroddy Prize for New Materials from the American Physical Society (1999). He is a fellow of the American Physical Society and the American Association for the Advancement of Science, as well as a member of the editorial advisory boards

of the *Journal of Applied Physics Reviews*, *Journal of Physics and Chemistry of Solids*, and *Materials Science Foundations*. Haller has served on several advisory boards, has published over 600 articles, and holds three patents. MRS

Reshef Tenne Named 2005 MRS Medalist for Inorganic Fullerenes

The Materials Research Society has selected Reshef Tenne of the Weizmann Institute of Science in Rehovot, Israel, to receive the MRS Medal for 2005, "for realizing that nanoclusters of layered compound materials (e.g., MoS_2 , WS_2) can be made to fold into hollow cage structures, in analogy to graphitic carbon. These structures, known as 'inorganic fullerene-like structures,' constitute a materials class with exciting new properties." Tenne will receive the medal at the 2005 MRS Fall Meeting in Boston during the awards ceremony on Wednesday, November 30 at 6:00 p.m. in the Grand Ballroom of the Sheraton Boston Hotel. He will give his medalist presentation on "Inorganic Nanotubes and Inorganic Fullerene-Like Materials—From Concept to Applications" on Wednesday, November 30 at 5:05 p.m. in Room 210 of the Hynes Convention Center.

Tenne opened the field of inorganic fullerene-like nanostructures with his introduction of WS_2 nanostructures, published in *Nature* 360 (1992) p. 444. Until then, carbon and carbon-like materials were the only known candidates for fullerene and nanotube formation. Tenne and his research group showed that layered materials such as MoS_2 are characterized by their anisotropic two-dimensional structure and usually appear as platelets, which can be visualized as a deck of cards made of molecular sheets. Molecular slabs made of Mo atoms are sandwiched



Reshef Tenne

between two sulfur planes, with strong Mo-S covalent bonds, stacked together through weak van der Waals forces. The propensity of such layered materials to form hollow, closed structures stems from the excess energy of the dangling bonds in the rim atoms, which becomes critical when the size of the particles shrinks below $\sim 0.1 \mu\text{m}$. While a bulk Mo atom is bound to six sulfur atoms, a rim Mo is bound to only four sulfur atoms. Likewise, the sulfur atoms in the periphery of the layer are bound to only two Mo atoms, as compared with three in the bulk. Since the relative number of rim to bulk atoms increases when the size of the sheet shrinks, the planar nanostructures become unstable and fold into seamless polyhedra or nanotubes.

The technology learned from synthesizing MoS_2 and WS_2 has been extended, by Tenne and others, to other materials such as selenides, halides, oxides, and other systems. Tenne furthermore developed practical applications of inorganic fullerene-like structures for lubrication and as shock-resistant nanocomposites. This technology, which has been licensed to ApNano Materials Inc., has been attracting worldwide industrial attention.

Tenne studied chemistry and physics at the Hebrew University of Jerusalem, earning his PhD degree in 1976. He spent three years at the Battelle Memorial Institute's Geneva Research Center in Switzerland, first as a postdoctoral fellow and later as a member of the technical staff. In 1979, he joined the Weizmann Institute, was granted tenure six years later, and was promoted to full professor in 1995.

Tenne is head of Weizmann's Department of Materials and Interfaces and director of the Gerhard M.J. Schmidt Minerva Center for Supramolecular Architecture. In 2003, he also became the first director of the new Helen and Martin Kimmel Center for Nanoscale Science. He holds the Drake Family Chair of Nanotechnology and received the Kolthoff Award from the Technion in Haifa in 2005. The author of numerous articles, book chapters, and review articles, Tenne has been active in pre-college education outreach for over a decade and serves on several national and international advisory committees. MRS

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www.mrs.org/publications/jmr/

2005 MRS FALL MEETING LODGING AND TRAVEL

A block of rooms has been reserved for MRS meeting attendees at the hotels listed below. The Materials Research Society has negotiated special discount rates at these hotels. Your patronage makes the meeting possible by securing the space needed for this event at a greatly reduced rate.

When making your reservations, mention the Materials Research Society's meeting to receive the special rate.

A Hotel Reservation Form is available on the MRS Web site (www.mrs.org).

DEADLINE FOR HOTEL RESERVATIONS: NOVEMBER 4, 2005

Rooms are limited—reserve yours early!

Sheraton Boston Hotel and Towers

39 Dalton Street
Boston, MA 02199
617-236-2000
Fax 617-236-1702

Room Rate:
\$160 Single*
\$170 Double*

Boston Marriott/Copley Place

110 Huntington Avenue
Boston, MA 02116
617-236-5800
Fax 617-937-5685

Room Rate:
\$155 Single*
\$170 Double*
\$185 Triple*
\$200 Quad*

Westin Hotel/Copley Place

10 Huntington Avenue
Boston, MA 02116
617-262-9600
Fax 617-424-7502

Room Rate:
\$157 Single*
\$175 Double*

Hilton Boston Back Bay

40 Dalton Street
Boston, MA 02115
617-236-1100
Fax 617-568-6739

Room Rate:
\$153 Single*
\$153 Double*

Boston Park Plaza Hotel

64 Arlington Street
Boston, MA 02116
617-426-2000
Fax 617-423-1708

Room Rate:
\$149 Single*
\$149 Double*

** plus Massachusetts tax, currently 12.45%*

Airline Transportation

MRS is offering special, discounted fares directly through American Airlines and US Airways as a service to MRS Fall Meeting attendees.

Local Transportation

Taxicabs are available around the clock. The average fare to the Back Bay area hotels is approximately \$25-35.

Shuttle service is available beginning at 7:00 a.m. each day. The average fare to the Back Bay area hotels is \$12.00 per person.

For more information on other ground transportation to and from Logan International Airport, call MASSPORT, 24 hours a day, at 1-800-23-LOGAN.

Parking

Parking in the public parking garages in the city costs approximately \$25 per day. Parking is available in the garage between the Boston Marriott and the Westin Hotels at Copley Place. There is also parking at the Prudential Center Complex. Parking in hotel parking garages costs approximately \$37 per day for overnight parking.

Child Care

Check with the Concierge Desk at the individual hotels for a comprehensive roster of licensed and bonded sitters.

2005 MRS FALL SYMPOSIUM TUTORIALS

Details available on the MRS Web site

SUNDAY • NOVEMBER 27

Symposium A

On-Board Hydrogen Storage—Breakthroughs and Barriers

1:30 – 5:00 p.m.

Room 202, Hynes Convention Center

Symposium D

Organic Photovoltaic Cells Engineering and Polymeric Light-Emitting Diodes

1:30 – 5:00 p.m.

Room 203, Hynes Convention Center

Symposium M

Nanoimprint Technology and Printed Organic Thin-Film Transistors

1:30 – 5:00 p.m.

Room 201, Hynes Convention Center

Symposium P

Quantum Confined Semiconductor Nanostructures—Fabrication, Characterization, and Spectroscopic Properties

1:00 – 5:00 p.m.

Room 210, Hynes Convention Center

Symposium Ra/Rb

Nanoscale Sensors—From Molecules to Devices

9:00 a.m. – 4:00 p.m.

Room 208, Hynes Convention Center

Symposium T/U/W

Smart Materials—Fundamentals and Applications

9:00 a.m. – 4:00 p.m.

Room 200, Hynes Convention Center

Symposium GG

Nanoscale Manipulation and Mega-Enhancement of Light-Utilizing Surface Plasmons

1:30 – 5:00 p.m.

Room 209, Hynes Convention Center

Symposium II

Novel Characterization Methods for Magnetic Nanostructures

1:30 – 5:00 p.m.

Room 204, Hynes Convention Center

TUTORIAL ATTENDANCE IS OPEN TO ALL MEETING ATTENDEES AT NO EXTRA CHARGE.

www.mrs.org/meetings/fall2005/ for the most up-to-date information on all MRS Fall Meeting activities.

2005 MRS FALL MEETING SYMPOSIUM SESSION LOCATOR

2005 MRS FALL MEETING SESSION LOCATOR								
SYMP.	TITLE	LOCATION	MONDAY, NOVEMBER 28			TUESDAY, NOVEMBER 29		
			a.m.	p.m.	eve.*	a.m.	p.m.	eve.*
A	The Hydrogen Cycle—Generation, Storage, and Fuel Cells **Tutorial-Sunday	Room 311 (Hynes)	A1: Challenges & Requirements for H2 Fuel Cell Vehicles	A2: Fuel Cells		A3: Fuel Cells, Electrodes, & Solid Oxide Fuel Cells	A4: Solid Oxide Fuel Cells	
B	Next-Generation Batteries, Supercapacitors and Other Storage Materials	Room 310 (Hynes)	B1: 3D & Microbatteries	B2: Phosphate-Cathode Materials		B3: Layered Cathodes	B4: Vanadium Oxide & Other Cathodes	
C	Material Innovations for High-Performance Building Systems	Room 307 (Hynes)				C1	C2	
D	Organic & Nanostructured Composite Photovoltaics & Solid-State Lighting **Tutorial-Sunday	Room 304 (Hynes)	D1: OLEDs for Solid State Lighting I	D2: OLEDs for Solid State Lighting II	D3: Posters	D4: Organic Photovoltaics I	D5: Organic Photovoltaics II	D6: Posters
E	Electrochromic Materials & Applications	Room 305 (Hynes)				E1: Switchable Mirrors E2: Polymers for Electrochromics I	E3: Inorganic Electrochromics	E4: Posters
F	Materials & Technologies for Direct Thermal-to-Electric Energy Conversion	Room 313 (Hynes)	F1: Thermoelectrics Research Directions & Oxides I	F2: Oxides II & New Directions	F3: Posters	F4: Low-Dimensional Structures I (Films & Particles)	F5: Low-Dimensional Structures II (Bulk: Pressed & Self Assembled)	
G	Life-Cycle Analysis Tools for "Green" Materials & Process Selection	Room 303 (Hynes)	G1/S1: LCA Principles Room 203-Hynes	G2: Hydrogen Economy		G3: Photovoltaics	G4/S4: Nanomaterials—Biological & Environmental Interactions	
H	Multifunctional Energetic Materials	Room 301 (Hynes)	H1: Synthesis & Processing I	H2: Synthesis & Processing II		H3: Characterization	H4: Mechanisms I	H5: Posters
I	Interfaces in Organic & Molecular Electronics II	Room 302 (Hynes)	I1: Theory of Electron Transport in Molecules & at Molecule-Metal Interfaces	I2: Single Molecule Dynamics at Interfaces	I3: Posters	I4: Charge Transport & Spectroscopy of Molecular Junctions	I5: Electron Transport & Scanning Probe Microscopy	
J	Biomimetic Polymers & Gels	Room 201 (Hynes)	J1: Gels & Self Assembly in Biopolymer Systems I	J2: Gels & Self Assembly in Biopolymer Systems II	J3: Posters	J4: Drug & Gene Delivery	J5: Functional Biomimetic Systems I	
K	Engineering Biointerfaces via Cell-Interactive Materials	Room 204 (Hynes)						
L	Mechanical Behavior of Biological & Biomimetic Materials	Room 206 (Hynes)	L1: Soft Tissue I L2: Viscoelastic Response I	L3: Hard Tissue I L4/BB1: Hard Tissue II	L5: Posters	L6/NN4: Scanning-Probe Techniques Back Bay C-Sheraton L7: Viscoelastic Response II	L8: Biomimetic Hard Materials L9: Hard Tissue III	
M	Flexible & Printed Electronics, Photonics, & Biomaterials **Tutorial-Sunday	Room 306 (Hynes)	M1: Nanopatterning & Nanoimprint	M2: Patterning of Biomolecules	M3: Posters	M4: Emerging Patterning Techniques	M5: Printed OLEDs, Displays	M6: Posters
N	Dynamics in Small Confining Systems VIII	Room 202 (Hynes)	N1	N2		N3	N4	
O	Nanoparticles & Nanostructures in Sensors & Catalysis	Room 200 (Hynes)	O1: Catalysis I	O2: Biosensors I	O3: Posters	O4: Catalysis II	O5: Chemical Sensor I	O6: Posters
P	Quantum Confined Semiconductor Nanostructures—Fabrication, Physical Properties, & Applications **Tutorial-Sunday	Room 210 (Hynes)	P1: Theoretical Concepts of Semiconductor Nanocrystals	P2: Optical & Electronic Properties	P3: Posters	P4: Synthesis Shape Control & Application in Biology	P5: Synthesis, Characterization & Applications in Biology	P6: Semiconductor Nanostructures—Growth & Optical Properties

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2005 MRS FALL MEETING SESSION LOCATOR								
SYMP.	WEDNESDAY, NOVEMBER 30			THURSDAY, DECEMBER 1			FRIDAY, DECEMBER 2	
	a.m.	p.m.	eve*	a.m.	p.m.	eve*	a.m.	p.m.
A	A5: Grand Challenge of Hydrogen Storage	A6: Carbon-Based Hydrogen Storage		A7: Complex Metal Hydrides for Vehicular Hydrogen Storage	A8: Hydrogen Storage in Complex Metal Hydrides	A9: Posters	A10: Carbon-Based Hydrogen Storage/H ₂ Generation	A11: H ₂ Generation/Purification
B	B5: Supercapacitor	B6: Anodes	B7: Posters	B8: Characterization & Other Battery Chemistries	B9: Electrolytes			
C								
D	D7: Excitons & Charge Transport I	D8: Excitons & Charge Transport II D9: Hybrid Photovoltaics	D10: Posters	D11: Dye-Sensitized Photovoltaics	D12: Nanocrystalline & Novel Photovoltaics	D13: Posters	D14/11: Interfaces in Organic & Hybrid Devices Room 302-Hynes	
E	E5: Polymers for Electrochromics II E6: Inorganic/Organic Electrochromics I	E7: Inorganic/Organic Electrochromics II						
F	F6: Low-Dimensional Structures III (Nanowires & New Materials)	F7: Thermionics and Photovoltaics	F8: Posters	F9: Half Heusters, Thallium Tellurides, & Skutterudites	F10: Clathrates & New Measurement Techniques	F11: Posters	F12: Devices	
G	G6: Global Warming & End-of-Life Case Studies	G6: LCA Tools & Case Studies						
H	H6: Mechanisms II H7: Theory & Modeling	H8: Theory II						
I	I6: Photoemission Spectroscopies & Energy Level Alignment at Molecule/Metal & Molecule/Semiconductor Interfaces	I7: Spectroscopy & Dynamics at Interfaces		I8: Metal-Molecule & Semiconductor-Molecule Interfaces	I9: Organic Semiconductors—Growth & Transport	I10: Posters	I11/D14: Interfaces in Organic & Hybrid Devices	I12: Polymer-Inorganic Interfaces & Devices
J	J6: Design, Synthesis & Characterization of Biomaterials	J7: Scaffolds for Cell & Tissue Engineering		J8: Functional Biomimetic Systems II				
K	K1: Engineered Bio-Interfaces I	K2: Engineered Bio-Interfaces II	K3: Posters	K4: Engineered Bio-Interfaces III		K5: Posters		
L	L10: Soft Tissue II L11: Creatures I	L12: Creatures II L13: Biomimetic Soft Materials I		L14: Biomimetic Soft Materials II L15: Biomimetic Soft Materials III				
M	M7: Printed OTFTs	M8: Inkjet Printing	M9: Posters	M10: Soft Lithography & PDMs Applications				
N	N5	N6	N7: Posters	N8	N9			
O	O7: Biosensors II	O8: Chemical Sensor II	O9: Posters	O10: Catalysis III	O11: Sensor & Biosensor	O12: Posters	O13: Catalysis & Sensor	
P	P7: Electronic & Transport Properties	P8: Quantum Dots in Photonic Structures—Hybrid Semiconductor/Plasmonic Nanostructures	P9: Posters	P10: Electrical, Electronic Properties and Devices I P11: In-Room Posters	P12: Silicon Nanocrystal & Nanowires	P13: Posters	P14: Nanorods, Nanocrystals and Carbon Nanotubes (CNT) P15: In-Room Posters	

2005 MRS FALL MEETING SYMPOSIUM SESSION LOCATOR

2005 MRS FALL MEETING SESSION LOCATOR								
SYMP.	TITLE	LOCATION	MONDAY, NOVEMBER 28			TUESDAY, NOVEMBER 29		
			a.m.	p.m.	eve.*	a.m.	p.m.	eve.*
Q	Degradation Processes in Nanostructured Materials	Room 209 (Hynes)	Q1: Carbon Nanotubes I	Q2: Nanotube & Radiation		Q3: Carbon Nanotubes II	Q4: Nanocomposites	Q5: Degradation at Nanometer Scale—Fundamental Processes and Mechanisms Q6: Posters
Ra	Assembly at the Nanoscale—Toward Functional Nanostructured Materials **Tutorial-Sunday	Room 207 (Hynes)	Ra1/Rb1: Plenary Session I Ra2/Rb2: Plenary Session II Ballroom A-Hynes	Ra3: Biomimetics I Ra4: Electrically Directed Assembly	Ra5/Rb5: Posters	Ra6: Nanostructures for Biology & Medicine I Ra7: Nanostructures for Biology & Medicine II	Ra8: Magnetic Nanostructures I Ra9: Magnetic Nanostructures II	Ra10: Biomimetics II Ra11/Rb11: Posters
Rb		Room 208 (Hynes)		Rb3: Nanowires, One-Dimensional Nanostructures I Rb4: Alternative Nanofabrication Techniques I		Rb6: Nanowires, One-Dimensional Nanostructures II Rb7: Nanowires, One-Dimensional Nanostructures III	Rb8: Nanowires, One-Dimensional Nanostructures IV Rb9: Alternative Nanofabrication Techniques II	Rb10: Alternative Nanofabrication Techniques III Rb11/Ra11: Posters
S	Nanomaterials and the Environment	Room 203 (Hynes)	S1/G1: LCA Principles	S2: Nanotechnology Enabled Sensors for Environmental Monitoring I		S3: Synthesis of Environmentally Benign Nanocomposites	S4/G4: Nanomaterials—Biological & Environmental Interactions	S5: Posters
T	Ferroelectric Thin Films XIII **Tutorial-Sunday	Back Bay D (Sheraton)	T1: Piezoelectrics	T2: Ferroelectric Thin-Film Processing Science	T3: Posters	T4: Ferroelectrics Processing	T5: Field Effects & Gate Dielectrics	
U	Multiferroic Materials **Tutorial-Sunday	Republic A (Sheraton)	U1: Ferromagnetic Shape-Memory Theory U2: Ferromagnetic Shape-Memory Alloys I	U3: Ferromagnetic Shape Memory Actuators U4: Martensitic Microstructures & Microactuators	U5: Posters	U6: Magnetolectric Bulk Materials U7: Multiferroic Nanostructures	U8: Magnetolectric Thin Films I U9: Magnetolectric Thin Films II	
V	Materials & Devices for Smart Systems	Independence West (Sheraton)	V1: Piezoelectric Actuators	V2: Novel Devices & Systems	V3: Posters	V4: Shape-Memory Alloys & Magnetostrictive Devices	V5: Nanometer-Scale Processing & Properties	V6: Posters
W	Electroresponsive Polymers & Their Applications **Tutorial-Sunday	Gardner (Sheraton)	W1: Polymer Sensors & Their Applications I	W2: Polymer Sensors & Their Applications II		W3: Polymer Actuator I	W4: Polymer Actuator II	W5: Posters
X	Frontiers of Materials Research	Grand Ballroom (Sheraton)		X1			X2	
Y	Surface Interactions & Surface Engineering for Manufacturing Applications	Back Bay A (Sheraton)	Y1: Macro-manufacturing	Y2: Mechanical & Functional Properties of Thin Films		Y3: Micro/Nano-manufacturing	Y4: Photo/Laser/Plasma-Based Manufacturing	
Z	Amorphous & Nanocrystalline Metals for Structural Applications	Constitution A (Sheraton)	Z1: Deformation & Fracture of Nanostructured Metals I Z2: Deformation & Fracture of Amorphous Metals I	Z3: Structure of Nanocrystalline Metals Z4: Structure of Amorphous Metals	Z5: Posters	Z6: Deformation & Fracture of Nanostructured Metals II Z7: Deformation & Fracture of Amorphous Metals II	Z8: Processing of Nanostructured Metals Z9: Processing of Amorphous Metals I	
AA	Micro- & Nano-mechanics of Structural Materials	Republic B (Sheraton)	AA1: <i>Ab-initio</i> & Grain Boundaries	AA2: Atomistics		AA3: Microstructure & Deformation	AA4: Dislocations	
BB	Mechanisms of Mechanical Deformation in Brittle Materials	Liberty (Sheraton)		BB1/L4: Hard Tissue II Room 206-Hynes		BB2: Brittle Deformation in Ceramics & Nanoscale Materials	BB3: Modelling & Simulations	BB4: Posters
CC	Photophysical Properties of Monolayers on Nanomaterials & Surfaces	Room 300 (Hynes)	CC1: Metal Nanoparticles—Electronic Properties CC2: Ligands & Nanoparticles	CC3: Nanoparticles I CC4: Chromophores & Nanoparticles		CC5: Ligands & Nanoparticles' Shape CC6: Nanoparticles II	CC7: Nanoparticles' Coatings CC8: Nanoparticles & Biomolecules	
DD	Materials for Transparent Electronics	Room 309 (Hynes)	DD1: Transparent Conducting Oxides I	DD2: Transparent Conducting Oxides II		DD3: Transparent Thin-Film Transistors	DD4: Zinc-Oxide Film Growth & Device Application	DD5: Posters

2005 MRS FALL MEETING SYMPOSIUM SESSION LOCATOR

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SYMP.	WEDNESDAY, NOVEMBER 30			THURSDAY, DECEMBER 1			FRIDAY, DECEMBER 2	
	a.m.	p.m.	eve*	a.m.	p.m.	eve*	a.m.	p.m.
Q	Q7: Magnetic Nanocomposites	Q8: Miscellaneous Processes & Mechanisms at Nanometer Scale Q9: Degradation Processes in Nanostructured Materials		Q10: Nanomaterials and Ionizing Radiation Q11: Degradation at Nanometer Scale				
Ra	Ra12: Semiconductor Nanostructures I Ra13: Semiconductor Nanostructures II	Ra14: Molecular Electronics I Ra15: Molecular Electronics II	Ra16/Rb16: Posters	Ra17: Supramolecular Assemblies I Ra18: Supramolecular Assemblies II	Ra19: Semiconductor Nanostructures III Ra20: Supramolecular Assemblies III	Ra21: Nanostructures for Biology & Medicine III Ra22/Rb22: Posters	Ra23: Nano/Molecular Electronics Ra24: Nanostructured Oxides	
Rb	Rb12: Alternative Nanofabrication Techniques IV Rb13: Alternative Nanofabrication V	Rb14: Nanowires V Rb15: Nanowires VI Medal Award Talk Presentation Room 210-Hynes	Rb16/Ra16: Posters	Rb17: Nanoparticles I Rb18: Nanoparticles II	Rb19: Carbon Nanotubes I Rb20: Carbon Nanotubes II	Rb21: Carbon Nanotubes III Rb22/Ra22: Posters	Rb23: Nanoparticles III Rb24: Carbon Nanotubes IV	
S	S8: Nanomaterials for Treatment & Remediation	S7: Nanotechnology-Enabled Sensors for Environmental Monitoring II		S8: Policy & Legal Approaches for Nanotechnology	S9: Regulation of Nanotechnology & Nanomaterials			
T	T6: Characterization I	T7: Characterization II		T8: Size Effects & Nanoscale Phenomena	T9: Size Effects II T10: Posters			
U	U10: Oxide Multiferroics I U11: Oxide Multiferroics II	U12: Magneto-Electric Theory U13: Ferromagnetic Shape Memory Alloys II						
V	V7/W6: Polymer Actuator III	V8: Piezoelectric Materials	V9: Posters	V10: Sensor Materials & Devices	V11: Rheological Systems			
W	W6/V7: Polymer Actuator III Independence West-Sheraton	W7: Polymer Actuator IV		W8: Polymers, Dielectrics & Charge Storage Properties				
X		X3			X4			
Y	Y5/NN7: Surface Eng.—Scanning Probe Microscopy Session Back Bay C-Sheraton Y6: Polymeric-Biological Materials	Y7: Modeling & Simulation	Y8: Posters	Y9: Tribology				
Z	Z10: Deformation & Fracture of Nanostructured Metals III Z11: Deformation & Fracture of Amorphous Metals III	Z12: Structural Evolution I Z13: Processing of Amorphous Metals II	Z14: Posters	Z15: Deformation & Fracture of Nanostructured Metals IV Z16: Deformation & Fracture of Amorphous Metals IV	Z17: Amorphous Metals—Ductility & Dual-Phase Systems I Z18: Amorphous Metals—Ductility & Dual-Phase Systems II			
AA	AA5: Size Effects & Nanomaterials	AA6: Nanomaterials	AA7: Posters	AA8: Nanoindentation & Testing	AA9: Tribology	AA10: Posters	AA11: Coatings & Multilayers	
BB	BB5: Deformation in Semiconductors	BB6: Environmental Influences & Direct Imaging of Deformation						
CC	CC9: Nanotubes I CC10: Nanotubes II	CC11: Assembly of Particles CC12: Photophysical Properties		CC13: Theory on Nanoparticles I	CC14: Theory on Nanoparticles II			
DD	DD6: Organic- & Carbon-Related Materials for Transparent Electronics							

2005 MRS FALL MEETING SYMPOSIUM SESSION LOCATOR

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SYMP.	TITLE	LOCATION	MONDAY, NOVEMBER 28			TUESDAY, NOVEMBER 29		
			a.m.	p.m.	eve.*	a.m.	p.m.	eve.*
EE	Progress in Semiconductor Mats. V—Novel Materials and Electronic & Optoelectronic Applications	Constitution B (Sheraton)	EE1: Infrared Materials & Devices	EE2: Quantum Dot Structures & Devices	EE3: Posters	EE4: Terahertz Materials & Devices	EE5/FF7: Nitride Mats. for Dev. Gr. Ballroom-Sheraton EE6: Nanostructured Semiconduct. & Novel Mat. & Devices Turnbull Award Talk Presentation	EE7: Posters
FF	GaN, AlN, InN, and Related Materials	Grand Ballroom (Sheraton)	FF1: UV & White Light LEDs FF2: VPE:GaN	FF3: Dopants & Defects FF4: MBE:GaN Constitution B-Sheraton		FF5: Electronic Devices I FF6: InN	FF7/EE5: Nitride Materials for Devices	FF8, FF9, FF10, FF11, FF12, FF13, F14: Posters
GG	Plasmonics—Nanoscale Optics & Photonics Based on Metals **Tutorial-Sunday	Room 308 (Hynes)	GG1: Metallic Nanostructures—Synthesis & Optical Properties	GG2: Structured Metallic Films	GG3: Posters	GG4: Microscopy & Imaging	GG5: Plasmonic Waveguides & Devices	GG6: Posters
HH	Magnetic Sensors & Sensing Systems	Room 308 (Hynes)						
II	Fabrication & Characterization Methods for Novel Magnetic Nanostructures **Tutorial-Sunday	Room 312 (Hynes)	II1: Novel Characterization Techniques for Magnetic Nanostructures I	II2: Novel Characterization Techniques for Magnetic Nanostructures II II3: Patterned & Ultrathin Magnetic Films		II4: Magnetic Semiconductors I	II5: Magnetic Semiconductors II II6: Magneto-Electronics & Spintronics	II7: Posters
JJ	Actinides—Basic Science, Applications, & Technology	Independence East (Sheraton)	JJ1: Electronic Structure Theory	JJ2: Superconductivity		JJ3: Electronic Structure—Experiments	JJ4: Actinide Materials	JJ5: Posters
KK	Solid-Solid Interfaces from Observation to Modeling	Fairfax A (Sheraton)	KK1: Grain Boundaries—Ceramics & Liquids	KK2: Grain Boundary Structure		KK3: Grain Boundary Migration & Diffusion	KK4: Alloys & Inclusions	KK5: Posters
LL	Combinatorial Methods & Informatics in Materials Science	Back Bay B (Sheraton)	LL1: Electronic Materials & Devices I	LL2: Electronic Materials & Devices II	LL3: Posters	LL4: Polymers & Coatings	LL5: Polymers & Biopolymers	
MM	In-Situ Electron Microscopy of Materials	Hampton (Sheraton)	MM1: Mechanical Properties I MM2: Mechanical Properties II	MM3: Mechanical Properties III MM4: Magnetic/Electrical Properties		MM5: Phase Transformations MM6: Annealing/Grain Growth	MM7: Nanomaterials I MM8: Nanomaterials II	MM9: Posters
NN	Scanning Probe Microscopy in Materials Research	Back Bay C (Sheraton)	NN1: Nanoscale Data Storage & Patterning with Scanning Probes NN2: Studying Surfaces with Noncontact AFM & STM	NN3: Latest Developments in Scanning Probe Techniques		NN4/L6: Scanning Probe Techniques NN5: Scanning Probe Applications in Biology	NN6: Scanning Probe Applications in Organic & Polymeric Materials	
OO	Growth, Modification, & Analysis by Ion Beams at the Nanoscale	Commonwealth (Sheraton)	OO1: Swift, Heavy & Light Ions I—Fundamentals & Applications OO2: Sputtering, Surface Topography, Ripples & Dots	OO3: Focused Ion Beams OO4: Structural Modifications I—Defect Accumulation, Amorphization, Strain Engineering, Grain Orientation Control	OO5: Posters	OO6: Swift, Heavy & Light Ions II—Fundamentals & Applications OO7: Metallic Nanoparticles in SiO ₂ & Other Insulators	OO8: Semiconducting Nanoparticles in SiO ₂ & Other Insulators OO9: Structural Modifications II—Defect Accumulation, Amorphization, Strain Engineering, Grain Orientation Control	
PP	Forum on Materials Science Education	Berkeley (Sheraton)				PP1	PP2	PP3: Posters
QQ	IP, TT, VC, IPO, and U	Liberty (Sheraton)		QQ1				

*Poster Sessions: All Evening Poster Sessions Located in Exhibiton Hall D (Hynes)

**Refer to Tutorial Schedule Shaded Blocks: No Session

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SYMP.	WEDNESDAY, NOVEMBER 30			THURSDAY, DECEMBER 1			FRIDAY, DECEMBER 2	
	a.m.	p.m.	eve*	a.m.	p.m.	eve*	a.m.	p.m.
EE	EE8: Zinc Oxide Materials & Devices Including Alloys I	EE9/FF18: Zinc Oxide Materials & Devices Including Alloys II Grand Ballroom-Sheraton	EE10: Posters	EE11: Dilute Nitride & Bismide Semiconductors	EE12: Advanced Dielectrics & Si-Based Materials			
FF	FF15: Electronic Devices II FF16: Contacts to HEMTs FF17: Electrical/ Transport Properties	FF18/EE9: Zinc Oxide Materials & Devices Including Alloys II		FF19: Visible LED + LD FF20: Optical Properties	FF21: Bulk + HVPE FF22: Structural	FF23, F24, F25, F26, F27, F28, F29, F30: Posters	FF31: Nano structures—InGaN	
GG	GG7: Photonic Crystals & Cavity Effects							
HH			HH1: Posters	HH2	HH3			
II	II8: Magnetic Nanowires & Nanotubes II9: Magnetic Nanoparticles & Nanocomposites I	II10: Magnetic Nanoparticles & Nanocomposites II II11: Magnetic Disks, Dots & Rings						
JJ	JJ6: High Pressure	JJ7: Actinide Chemistry I		JJ8: Actinide Chemistry II	JJ9: Actinide Chemistry III			
KK	KK6: Oxide/Metal Interfaces	KK7: Interfaces with Silicon		KK8: Metal/Metal & Oxide/Oxide Interfaces				
LL	LL6: Nanomaterials & Catalysts	LL7: Sensors, Materials & Devices		LL8: Artificial Intelligence—Design	LL9: Artificial Intelligence—Data Management			
MM	MM10: Gas-Solid/ Liquid-Solid/Oxidation I MM11: Gas-Solid/ Liquid-Solid/Oxidation II	MM12: Irradiation MM13: Microstructure/ Instrument Development						
NN	NN7/Y5: Surface Engineering—Scanning Probe Microscopy Session NN8: Scanning Probe Applications in Tribology	NN9: Mechanical Properties Studies with Scanning Probes	NN10: Posters	NN11: Scanning Probes Applied to Magnetic Materials NN12: Electronic Materials Studied with Scanning Probes I	NN13: Electronic Materials Studied with Scanning Probes II			
OO	OO10: Ion-Beam Analysis I Back Bay C-Sheraton OO11: Nanomasks & Nanopatterning, Ion-Beam Mediated Self-Organization	OO12: Ion-Beam Analysis II OO13: Structural Modifications IV—Defect Accumulation, Amorphization, Strain Engineering, Grain Orientation Control	OO14: Posters	OO15: Nanotubes & Nanowires—Beam-Induced Formation & Modification OO16: Structural Modifications IV—Defect Accumulation, Amorphization, Strain Engineering, Grain Orientation Control	OO17: Magnetic Materials—Material Synthesis for Spintronics, Sensors & Data Storage			
PP	PP4	PP5						
QQ								

*Poster Sessions: All Evening Poster Sessions Located in Exhibition Hall D (Hynes)

**Refer to Tutorial Schedule Shaded Blocks: No Session

2005

Forthcoming from MRS at special pre-meeting prices...

Boston, MA
FALL MEETING

NOVEMBER 28 – DECEMBER 2

MRS

2005 Fall Meeting Symposium Proceedings

These books are scheduled
for publication by
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MRS

Materials Research Society

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NOTE: All volumes on this list will also be published electronically on the Web with FREE access for all current MRS members.

A: The Hydrogen Cycle— Generation, Storage and Fuel Cells

Editors: A. Dillon, C. Filiou, J. Ohi, C. Olk
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(Fall Exhibitors as of September 21, 2005)

Hynes Convention Center • Second Level
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Tuesday, November 29	12:00 noon - 6:00 pm
Wednesday, November 30	10:00 am - 6:00 pm
Thursday, December 1	10:00 am - 1:30 pm

Ice cream and energy breaks will be held in the Exhibit Hall on Tuesday and Wednesday afternoon.

The MRS Exhibit, held in conjunction with the 2005 MRS Fall Meeting, will feature more than 200 international exhibitors from all sectors of the materials science and engineering communities. Meeting attendees are invited to visit the exhibit to learn more about the latest techniques and advances in the swiftly evolving world of materials research directly from the manufacturers, suppliers and developers. Convenient to the technical session rooms and scheduled to complement the program, the MRS Fall Exhibit offers everything you need all under one roof.

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APPLIED NANOFLUORESCENCE, LLC
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Applied NanoWorks, located in Albany, NY, offers optically clear metal oxides and high performance nano-phosphors to meet the most demanding industrial applications. Their sub10 nm zinc oxide and titanium dioxide are the only optically clear, aqueous-based colloids on the market today, and can be used to enhance UV absorption, modify refractive index and increase hardness and chemical resistivity. Their non-toxic nanophosphors are bright, long lasting and ideal for next generation lighting devices.

APPLIED SURFACE TECHNOLOGIES
co2clean@aol.com
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BOOTH 1017

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ASYLUM RESEARCH
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ATTOCUBE SYSTEMS AG
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BOOTH 620

Key Products: Scanning Probe Microscopy; Nanopositioning; Low-Temperature Equipment

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BOOTH 608

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BOOTH 300

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CHEMSPEED TECHNOLOGIES AG
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COMSOL, INC.
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BOOTH 725

Key Products: COMSOL Multiphysics (formerly called FEMLAB)

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**MRS Corporate
 Affiliate**

Cree is an advanced semiconductor company that leverages its expertise in silicon carbide (SiC), gallium nitride (GaN), silicon (Si) and silicon (Si) materials technology to produce new and enabling semiconductors. The products include blue, green and ultraviolet (UV) light emitting diodes (LEDs), near UV lasers, radio frequency (RF) devices, power switching devices and compound semiconductor substrates and epitaxial layers. Targeted applications for these products include solid-state illumination, optical storage, wireless infrastructure and power switching. For more information on Cree, please visit www.cree.com.

CROSSLIGHT SOFTWARE INC.
info@crosslight.com
www.crosslight.com

BOOTH 1019

Key Products: LASTIP; APSYS; PICS3D

Crosslight Software Inc. is an international company headquartered in Vancouver, Canada, which for over a decade has been dedicated to providing state-of-the-art CAD tools and in-depth physical models of semiconductor devices to technical and scientific communities around the world. Crosslight Software (formerly Beamtek Software) was the first commercial company providing CAD tools for electrical and optical modeling of laser diodes (LD), and it has maintained the leadership position in that field since then. The top product, PICS3D, won the Commercial Technology Award from Laser Focus World in 1998.

CRYOGENIC CONTROL SYSTEMS, INC.
sales@cryocon.com
www.cryocon.com

BOOTH 802

Key Products: Temperature Controllers; Temperature Monitors; Sensors

Cryogenic Control Systems, Inc. (Cryo-con) is a manufacturer of precision electronic instrumentation for both laboratory and industrial process control applications. Cryo-con's state-of-the-art cryogenic temperature controllers apply the latest technology available to attain unsurpassed measurement accuracy and control stability. Cryo-con will demo the newest addition to its line, the Model 12 and Model 14 Cryogenic Temperature Monitors featuring Ethernet connectivity with built-in web server and data logging capabilities.

CRYOMECH, INC.
sales@cryomech.com
www.cryomech.com

BOOTH 903

Key Products: Cryorefrigerators; Cryostats; Liquid Nitrogen Plants; Pulse Tubes

Cryomech, Inc. manufactures cryorefrigerators, cryostats, liquid nitrogen plants and liquid helium plants. All of Cryomech's products are based on the Gifford-McMahon Cycle and Pulse Tube Cycle cryorefrigerators. Our Pulse Tube Cycle cryorefrigerators produce cryogenic temperatures as low as 2.8 K without displacers, which increases their reliability while decreasing vibrations and mean times between maintenance. Standard cryostats are available for most of the standard laboratory experiments. Our portable liquid nitrogen plants are easy to install and maintain since they produce LN₂ directly from the air in many remote sites.

2005 MRS FALL EXHIBITORS

CRYSTAL SYSTEMS, INC.
sales@crystalsystems.com
www.crystalsystems.com

BOOTH 909

Key Products: Sapphire; Ti:Sapphire

Manufacturer of Sapphire, Ti:Sapphire and Silicon for use in optics, IR applications, windows, domes, laser rods, lenses, prisms, filters, substrates and other optical and non-optical applications. Crystal Systems provides a wide range of material grades to meet customer's requirements. Material ranges from economically priced to the highest quality sapphire currently available for demanding applications in Defense, Laser Technology, Electronics, Life Sciences and Research.

CSM INSTRUMENTS INC.
usinfo@csm-instruments.com
www.csm-instruments.com

BOOTH 1023

Key Products: Tribometers; Scratch Testers; Indentation; Calotest

CSM Instruments offers a wide range of instruments and testing services for surface mechanical properties characterization, including: nano and micro indentation (for hardness and modulus); Revetest, nano and micro scratch (thin film adhesion, fracture and deformation); tribometers (also high temperature and linear reciprocating options); and Calotest. 3D-imaging options are available with the ConScan or AFM objective. The new Open Platform allows several measurement modules to be combined on an automated sample stage for high throughput quality control (multi-sample) applications. The new Nano Tribometer allows simulation of low load tribological contacts; e.g., in MEMS, microsystems and other devices. CSM Instruments offers complete contract testing and consulting services.

CVD EQUIPMENT CORPORATION
(part of the NY ♥ Nanotech Pavilion)
info@cvdequipment.com
www.cvdequipment.com ; www.firstnano.com; www.stainlessdesign.com

BOOTH 1033

Key Products: CVD Equipment; Carbon Nano Tube/Wire Synthesis; Gas and Liquid/Vapor Delivery Equipment

CVD Equipment Corporation (CVD) and its divisions, First Nano and Stainless Design Concepts (SDC), provide products and services for the silicon, III-V, II-VI, optoelectronics, solar cell, superconductivity, abrasive and nanotechnology markets. CVD products include diffusion, oxidation, annealing and LPCVD furnaces, LPE, HVPE, MOCVD, VPE, RTP, PECVD, sputter ETCH; Si/SiGe epitaxial deposition (UHVCVD); custom CVD, fluidized bed technology; and quartzware. First Nano products include FN 3000 Carbon Nano Tube/Wire Synthesis equipment. SDC products include ultra high purity gas and chemical delivery systems, including: process source gas cabinets, valve manifold boxes, inert gas delivery systems, OEM manufacturing, bulk precursor delivery systems, chemical delivery systems, chemical valve manifold boxes, and exhaust gas conditioning.

DCA INSTRUMENTS, INC.
dcausa@optonline.net
www.dca.fi

BOOTH 520

Key Products: MBE; Diffusion Sources; PLD

DCA Instruments specializes in the design and manufacture of high-quality UHV deposition systems, offering standard systems for the following deposition techniques: III-V, II-VI, CMT-MBE, metal MBE, UHV sputtering, UHV laser ablation, and UHV CVD. DCA Instruments also offers a wide range of MBE components which are retrofittable to the majority of existing systems. Components include effusion cells, soft-action magnetically driven linear shutters, a 'zero-wobble' substrate manipulator and a self-regulating mercury source.

DENTON VACUUM, LLC
info@dentonvacuum.com
www.dentonvacuum.com

BOOTH 701

Key Products: Sputter Coaters; High Vacuum Carbon Evaporators; Thin Film Deposition Systems

Denton Vacuum is a leading U.S. manufacturer with over four decades of leadership in design, manufacture and support of thin film deposition systems for science and industry. Reliability and support are assured—spare parts are always available for rapid delivery. We carry a full line of EM systems and accessories. Stop by to see our newest generation of sample preparation systems. Ask about our special show promotion. Quality products, dependable customer service and a commitment to your satisfaction and success.

EDAX INC.
info.edax@ametec.com
www.edax.com

BOOTH 318



Key Products: Energy Dispersive X-ray; EBSD; X-ray Detectors

Founded in 1962, EDAX, Inc. is the leader in X-ray instrumentation for micro-analysis, crystallographic and micro-XRF systems. With facilities in every continent, EDAX is well positioned to support our extensive and expanding base of satisfied customers worldwide. The X-ray microanalysis (EDX and WDS) products offer the highest performance, while for electron backscatter diffraction (EBSD), the TSL products are market leaders. Integrated products include the Pegasus—a powerful combination of EDS/EBSD and Trident—a unique combination of EDS, EBSD and WDS. The Eagle III micro-XRF elemental analyzer provides non-destructive sample analysis with lower limits of detection.

ELECTRON MICROSCOPY SCIENCES/DIATOME U.S.
sgkck@aol.com
www.emsdiasum.com

BOOTH 723

Key Products: Microscopy Supplies; Chemicals; Lapping and Polishing Equipment

Electron Microscopy Sciences (EMS) will have on display their comprehensive line of chemicals (material embedding kits), supplies and equipment (polishers, grinders, manipulators, disc punches, tripods, and lapping machines) for microscopy and all of the related material research fields. As well, Diatome will be exhibiting their Diamond Knives for materials microtomy, including the unique UltraSonic Oscillating Diamond knife for compression free sections.

ELSEVIER
usinfo-f@elsevier.com
www.elsevier.com

BOOTH 118

Key Products: Books; Journals; Electronic Products

Come and visit the Elsevier booth...Browse through the latest books and journals in the field of materials science and take advantage of special discounts available to all MRS attendees. Find out how your institution can get six free print issues of *Acta Biomaterialia*, simply visit www.elsevier.com/locate/actabiomat.

ENGELHARD CORPORATION
info@engelhard.com
www.engelhard.com

BOOTH 807

Key Products: Pyrometer; Optical; Temperature Sensors

Engelhard Temperature Sensing is exhibiting breakthrough optical thermometer technology, which has broader dynamic range and greater sensitivity than any known pyrometer. This allows the user to measure low temperatures with unheard of accuracy. Engelhard Corporation is a surface and materials science company that develops technologies to improve customers' products and processes. Engelhard is a world-leading provider of technologies for environmental, process, appearance and performance applications.

2005 MRS FALL EXHIBITORS

EPICHEM GROUP
info@epichem.co.uk
www.epichem.com

Key Products: Metalorganics; Specialty Gases; Oxides and Nitrides

Founded in 1983, Epichem manufactures a wide range of high purity precursors used across the semiconductor, electronic and optoelectronic industries. With manufacturing and distribution facilities on three continents, Epichem has a global supply network to service all markets from local sites. Epichem's strong R&D background ensures that the product ranges available include chemicals to meet both current and future customer demands. Working with world leading groups, novel materials systems continue to be developed to meet industry roadmaps. Coupled with our innovative precursor delivery and monitoring systems Epichem is acknowledged as being at the forefront of precursor technology and a leading provider of comprehensive product supply packages.

EVANS ANALYTICAL GROUP
marketing@eaglabs.com
www.eaglabs.com

Key Products: Analytical Services

The Evans Analytical Group (EAG) is a worldwide network of laboratories specializing in materials characterization, failure analysis, and contamination identification. Our services include Dynamic SIMS, TOF-SIMS, XPS, Auger, FTIR, SEM/EDS, FIB, TXRF, AFM/SPM, RBS, HFS, NRA, PIXE, Raman, GC/MS, and XRF. EAG laboratories are located in California, Minnesota, Texas, New Jersey, Massachusetts, and Taiwan. In addition to the network of laboratories, EAG has sales representation in Japan, Singapore, and Korea.

EVIDENT TECHNOLOGIES, INC.
info@evidenttech.com
www.evidenttech.com

Key Products: Quantum Dots; Nanomaterials; Reagents

Evident Technologies, Inc. is a world-leader in manufacturing tunable band-gap semiconductor nanocrystals (i.e., quantum dots). We produce uniform, high quality, semiconductor nanocrystals that are available in production quantities and with unprecedented flexibility for use as an enabling technology. We apply nanotechnology to biotechnology applications with state-of-the-art materials and in leading the way for expanded applications in telecommunications, optical computing, and lighting applications. We enable other companies to explore a plethora of applications and innovations by joining our Nanotechnology Web™.

EXPERT SYSTEM SOLUTIONS S.R.L.
info@expertsystemsolutions.com
www.expertsystemsolutions.com

Key Products: Heating Microscope; Optical Dilatometer; Optical Fleximeter

Expert System Solutions designs advanced laboratory equipment, including: a Heating Microscope to automatically detect the specimen typical temperatures, such as sintering, softening, sphere, half-sphere and melting; the Dilatometer (optical) to analyse the thermal expansion variations and the coefficient of expansion, and also to identify the temperatures of glass transition and dilatometric softening of the single materials; and the Fleximeter (optical) to study the pyroplastic deformation occurring in the material and the bending caused by the difference in thermal expansion or sintering between different materials.

BOOTH 604



FEI COMPANY
sales@feico.com
www.feicompany.com

Key Products: SEM; DualBeam; TEM

New Titan™ S/TEM breaks the Ångström barrier, enabling the highest resolution characterization of nanostructures and functional materials. Nova NanoSEM™ dedicated field emission, high resolution, low vacuum SEM is ideal for ultra-high resolution characterization of charging or contaminating samples such as organic materials, glass substrates, porous materials, plastics and polymers. Nova NanoLab™ and Quanta 3D™ both offer high resolution SEM imaging and FIB cross-sectioning for the most comprehensive characterization of materials, while Tecnai TEMs delivers atomic scale resolution for advanced materials research.

BOOTH 314



FERRO-CERAMIC GRINDING, INC.
sales@ferroc ceramic.com
www.ferroc ceramic.com

Key Products: Precision Machining; Advanced Ceramics; Ceramic Composites

Ferro-Ceramic Grinding, Inc. is an ISO9001:2002 registered precision machining and technical ceramic component supplier. We specialize in alumina, zirconia, quartz and all other related ceramic materials. Our capabilities include in-house CAD/CAM, ultrasonic milling/drilling as well as a wide range of CNC machining. Using an integrated bar scanning production system, this enables real-time job status and helps Ferro be more efficient to work on scheduling and price structures. Visit our Web site at <http://www.ferroc ceramic.com>.

BOOTH 628

FISCHIONE INSTRUMENTS
info@fischione.com
www.fischione.com

Key Products: Electron Microscope Accessories; Plasma Cleaner; Ion Mill

Fischione Instruments features a full line of Electron Microscopy Instrumentation. TEM Specimen Preparation Instruments include the Twin-Jet Electropolisher, Dimpling Grinder, Ultrasonic Disk Cutter, Ion Mill, and the Plasma Cleaner which eliminates contamination in TEM and SEM applications. The new NanoMill combines ultra-low ion energies and a focused beam for artifact-free preparation. The Automated Sample Prep (ASaP) System (Patent Pending) significantly enhances the image quality and analytical data derived from SEM specimens. Imaging Instruments include the high angle Annular Dark Field (ADF) detector for high resolution STEM imaging. TEM Specimen Holder Technology includes the Advanced Tomography Holder (Patent Pending), affording high tilt and extended fields of view in high resolution TEMs.

BOOTH 411



GATAN, INC.
info@gatan.com
www.gatan.com

Key Products: TEM Instruments; SEM Instruments

Gatan, Inc. is the world's leading manufacturer of instrumentation and software used to enhance and extend the operation and performance of electron microscopes. The Gatan name is recognized and respected throughout the worldwide scientific community and has been synonymous with high quality products and the industry's leading technology. Gatan designs and manufactures state-of-the-art TEM and SEM products for: Specimen Preparation, Specimen Holders, Imaging, Analysis and Software.

BOOTH 424

See ad in this issue

2005 MRS FALL EXHIBITORS

GELEST INC.
info@gelest.com
www.gelest.com

Key Products: Silanes; Silicones; Molecular Materials

Gelest is a manufacturer of silanes, modified and reactive silicones as well as metal organics including germanium and tin compounds. Gelest also manufactures a broad range of metal alkoxides and metal diketonates. Gelest provides materials at both R&D and commercial quantities. Products are used in microelectronic and optical coatings, sol-gel ceramics, composites and polymer synthesis.

GOODFELLOW CORPORATION
info@goodfellow.com
www.goodfellow.com

Key Products: Materials for R&D; Precious Metals

Goodfellow supplies small quantities of metals, alloys, ceramics and polymers for research, development and prototyping applications. Our CD-ROM and Web Catalogs list a comprehensive range of materials in many forms including rods, wires, tubes and foils. There is no minimum order quantity and items are in stock ready for immediate shipment worldwide with no extra shipping charge. Custom-made items are available to special order.

GOWLING LAFLEUR HENDERSON LLP
info@gowlings.com
www.gowlings.com

Key Products: Legal Services, including materials science and technology

With a history dating back more than 100 years, Gowlings is a leading Canadian business law firm with close to 700 professionals across offices in Montréal, Ottawa, Toronto, Hamilton, Waterloo Region, Calgary, Vancouver and Moscow. Characterized by national strength and regional focus, the Firm is a recognized leader in business law, advocacy and intellectual property law, offering expertise across a broad range of industries and in virtually every area of law. Gowlings provides end-to-end legal and consulting services to clients in Canada and around the world. Visit us at www.gowlings.com to learn more about Gowlings.

HAMAMATSU CORPORATION
usa@hamamatsu.com
www.usa.hamamatsu.com

Key Products: PMT

Hamamatsu Corporation is one of the world leaders in photo detector and light source manufacturing. Hamamatsu Corporation is introducing a new advanced detector for the near infrared region. The R3809U-68/69 has a response range to 1.4 μm or 1.7 μm . These detectors feature extremely fast response time such as 100 picoseconds as well as single photon counting performance allowing weak light detection in the near infrared region. Hamamatsu Corporation will also feature the NIR PMT module.

HEATWAVE LABS INC.
techsales@cathode.com
www.cathode.com

Key Products: Substrate Heaters; Cathodes; Ion Pumps

HeatWave Labs is an engineering, design and manufacturing company that specializes in components and assemblies for the vacuum tube and vacuum equipment industries. Our expertise lies in the areas of thermionic electron and ion emitters and guns, ion sources and ionizers, ion pumps and controllers, vacuum tube design, processing and rebuilding, specialized high purity and refractory materials, UHV sample heating and filament products, temperature controllers and power supplies, ceramics and vacuum envelope assemblies and other related products.

BOOTH 321



HIELSCHER USA, INC.
usa@hielscher.com
www.hielscher.com

Key Products: Ultrasonic Products

Ultrasonic devices made by Hielscher are used worldwide for the deagglomeration and primary particle size reduction of powders in liquids. This includes the processing of catalysts, coatings, conductive pastes, cosmetics, ceramic composites, magnetic storage media, phosphors, inks and pigments, polishing media, and toners. In the production of micron-size and nano-size particles, ultrasound has proven to be more effective than many other technologies on lab, bench-top and production level. Equipment for feasibility studies and process optimization is available on good terms.

BOOTH 1201

BOOTH 325
See ad in this issue



HIGH VOLTAGE ENGINEERING EUROPA B.V.
info@highvolteng.com
www.highvolteng.com

Key Products: Accelerators

High Voltage Engineering, an engineering-oriented company, designs, manufactures, sells and markets custom-made, high-tech capital equipment for the world market. Specializing in the development and manufacture of ion beam technology-based equipment, High Voltage Engineering is the largest and most diverse manufacturer of particle accelerator systems for the scientific, educational and industrial research communities. Major product lines include: ion accelerator systems, research ion implanters, systems for ion beam analysis and systems for accelerator mass spectrometry. Recent developments include extension of the terminal voltage range from 5.0 MV to 6.0 MV and increase of the output power from 10 kW to 50 kW for the range of Tandetron (tandem) and Singletron (single-ended) accelerators.

BOOTH 1012
See ad in this issue

HITACHI HIGH TECHNOLOGIES AMERICA, INC.
emdsales@hitachi-hita.com
www.hitachi-hita.com

Key Products: Electron Microscopes

Hitachi High Technologies America, a global leader serving the needs for material science and nanotechnology development, provides a wide array of advanced electron microscopes. Our product line-up includes Scanning Electron Microscopes (SEM), Transmission Electron Microscopes (TEM), Variable Pressure SEM (VP SEM), Field Emission SEM (FE SEM) and Focused Ion Beam Systems (FIB). Our customers can expect more experience, reliability and customer support when choosing Hitachi electron microscopes.

BOOTH 419

HORIBA JOBIN YVON, INC.
Raman Spectroscopy and EDXRF Division
and Thin Films Division
www.jobinyvon.com

Key Products: Raman Spectrometers; X-ray Fluorescence/EDXRF Systems; Ellipsometers, End Point Detectors

HORIBA Jobin Yvon is the world leader in optical spectroscopy instrumentation. We manufacture spectroscopic and laser ellipsometers, *in situ* end point detectors, Raman systems, EDXRF microscopes, glow discharge, ICP systems, detectors, spectrometers and gratings. As the largest manufacturer of Raman instrumentation in the world, we provide Raman solutions for all applications including single, double and triple spectrometers, with microscope, macro and fiber based sampling. Our EDXRF microscope provides a 10 micron analysis area and rapid elemental imaging. Our ellipsometers determine multi-layer thickness, optical constants, growth and etch rates, composition and more. *In situ* end point detectors such as optical emission spectroscopy or laser imaging interferometry are widely used for real-time plasma monitoring, shallow and deep trench monitoring.

BOOTH 501

2005 MRS FALL EXHIBITORS

HUNTINGTON MECHANICAL LABORATORIES, INC.

vacman@huntvac.com
www.huntvac.com

BOOTH 1001

See ad in this issue

Key Products: Combinatorial PLD Systems; Positioning Devices; Manipulators; Valves; Feedthroughs

The industry's largest selection of vacuum valves, flanges, fittings, and feedthroughs is available when you need it at Huntington. Also available are a wide assortment of roughing components including flexible hoses, traps, thermocouple and ionization gauge tubes, sorption and jet roughing pumps. Standard, custom, or modified UHV positioning and motion devices can be provided to meet your special needs. Stainless steel custom chambers, tees, and crosses are supported by 35 years of experience in vacuum chamber design and fabrication. Our electrical feedthrough product line has been dramatically increased. We also now offer a Pulse Laser Deposition System! See all of our products on our website at www.huntvac.com.

HYSITRON, INC.

info@hysitron.com
www.hysitron.com

BOOTH 415

Key Products: TriboIndenter; TriboScope; Ubi 1 and 3D OmniProbe

Hysitron is the world leader in the development of quantitative nanomechanical testing instruments. All Hysitron systems provide multiple analysis techniques for customized materials testing solutions of bulk materials, thin films and nanostructures (MEMS); from tribological films to biological materials. Come visit us and learn about our new products, such as nanoDMA II[®] and the Ubi II[®]. Call Hysitron to discuss nanomechanical testing solutions for your applications.

IMAGE METROLOGY A/S

sales@imagemet.com
www.imagemet.com

BOOTH 622

Key Products: Image Processing Software

Image Metrology provides the Scanning Probe Image Processor, SPIP, software package. SPIP is an image processing and data processing program with specialized utilities for microscopy, metrology, visualization and automation. The main purpose of the program is to provide tools that can correct for random and systematic errors and achieve the most correct measurements automatically.

IMAGO SCIENTIFIC INSTRUMENTS CORPORATION

info@imago.com
www.imago.com

BOOTH 810

Imago Scientific Instruments provides solutions for 3D, atomic resolution, compositional imaging, and analysis. Materials are examined by removing and analyzing individual atoms. Material systems studied using Imago's technology include metal precipitates, Nanomagnetic interfaces, High-*k* dielectric/Si interfaces, and the 3D distribution of dopants in semiconductors.

INEL, INC.

inelinc@aol.com
www.inel.fr

BOOTH 423

Key Products: Powder Diffractometer; Position Sensitive Detector; X-ray Generator; Small Angle Scattering; X-ray Diffractometer; Scintag Upgrades; Diffractometer Upgrades

Serving the x-ray diffraction community for over 30 years, Inel is one of the world's leading suppliers of quality x-ray diffractometer systems incorporating curved or linear position sensitive detectors. Applications include powders,

texture analysis, thin films, combinatorial, chemistry and materials analysis, reflectometry, microdiffraction, polymers, capillaries, *in situ*, on-line, transmission and reflection, small angle scattering, and variable temperature dynamic studies. We offer new systems and also hardware and software upgrades to existing instruments.

INFINITESIMA LIMITED

info@infinitesima.com
www.infinitesima.com

BOOTH 1208

Key Products: Video AFM

The VideoAFM™ delivers real-time atomic-level images at video frame rates. With scan-rates up to 1000 times faster than conventional AFMs, the VideoAFM™ allows users to view and interact with molecular processes in real time. The VideoAFM™ works in conjunction with existing AFMs, allowing large surface areas (i.e., 1000 μm x 1000 μm) to be scanned and explored before selecting features of interest for a more detailed investigation. Installation is simple but its operation is powerful allowing the AFMs to act like optical microscopes for the first time.

INNOCENTIVE, INC.

info@innocentive.com
www.innocentive.com

BOOTH 719

Key Products: R&D; Online R&D

InnoCentive is an exciting web-based community matching top scientists to relevant R&D challenges facing leading companies from around the globe. We are the first online forum that allows world-class scientists and science-based companies to collaborate in a global scientific community to achieve innovative solutions to complex challenges. InnoCentive is an e-business company of Eli Lilly and Company, a leading innovation-driven pharmaceutical company. To learn more and to register as an InnoCentive Solver, visit the InnoCentive Website at www.innocentive.com.

INNOVATIVE COATINGS LLC

innovativellc@att.net
www.innovativecoatingsllc.com

BOOTH 1206

Key Products: Sputtered Coatings; Thin Films; Coating Services

Innovative Coatings provides sputter coating services for coating powders and other substrate forms. A wide variety of coating materials can be provided, either elemental or compound, by DC, PDC or reactive deposition. Development and research projects are welcomed. Innovative provides process and equipment development, including equipment building for research, prototype and production applications. Visit our Web site at www.innovativecoatingsllc.com.

INTEC INC.

sales@instec.com
www.instec.com

BOOTH 908

Key Products: Thermal Stage Microscope; Thermal Chuck Microscope

Instec designs, manufactures and sells optical polarizing microscopes with long working distance polarizing condenser and long working distance objectives, precision (up to 0.001°C) temperature controllers, microscope hot and cold stages (from -190°C to 700°C), C-mount microscope digital cameras with sample temperature overlay, hot and cold chucks (-190°C to 600°C) with low leakage current and low electrical noise, high voltage (±100 V) and high frequency (up to 5 Mhz) function generators, high voltage (up to 800 V) and high current (up to 2.7 A) amplifiers.

2005 MRS FALL EXHIBITORS

INTERNATIONAL CENTRE FOR DIFFRACTION DATA (ICDD)

info@icdd.com
www.icdd.com

BOOTH 524



ICDD maintains and distributes the Powder Diffraction File™ for use in materials characterization via X-ray analysis. Release 2005 boasts over 478,000 entries (materials data sets). The File is available in PDF-2, Release 2005 (174,699 entries), PDF-4+ 2005 (240,050 entries), PDF-4/Minerals 2005 (17,826 entries) and PDF-4/Organics 2005 (265,208 entries).

INTERNATIONAL CRYOGENICS, INC.

ic@intlcryo.com
www.intlcryo.com

BOOTH 826

Key Products: LHe Containers; Controlled Temperature Cryostats; MRI Equipment

International Cryogenics, Inc. offers custom design and fabrication of high quality cryogenic equipment and related products. Products included but not limited to: Infrared detector Dewars, Controlled Temperature Cryostats, LN₂/LHe Cryostats/Dewars, LHe Transfer Lines, Liquid Nitrogen Transfer Lines, Liquid Helium Storage/Transport Containers, and LN₂ Laboratory Dewars, racking systems and dry shippers. International Cryogenics also offers leak checking, welding and repair services.

ION-TOF USA, INC.

sales@iontofusa.com
www.iontofusa.com

BOOTH 507

Key Products: TOF-SIMS; Surface Analysis

ION-TOF GmbH is the leading European manufacturer of TOF-SIMS (time-of-flight secondary ion mass spectrometry) instruments used for surface analysis. The company was founded in 1989 to commercialize the original TOF-SIMS research started in the early 1980s and carried out by the research group of Professor Alfred Benninghoven at the University of Muenster in Germany. ION-TOF USA imports and distributes this sophisticated equipment from the home factory in Germany, and provides after-sales support throughout the USA and Canada.

IOP PUBLISHING

info@ioppubusa.com
www.iop.org

BOOTH 222

Key Products: Journals

Institute of Physics Publishing, a not-for-profit scientific publisher, produces leading journals, electronic products, and magazines. At the 2005 MRS Fall Exhibit, IOP features *Journal of Physics: Condensed Matter*, *Journal of Physics D: Applied Physics*, *Nanotechnology*, *Modelling & Simulation in Materials Science & Engineering*, *Smart Materials and Structures*, *Journal of Radiological Protection*, *Reports on Progress in Physics*, and *Superconductor Science and Technology*. Stop by for a free sample copy of these or other IOP journals. Visit IOP at www.iop.org.

iXRF SYSTEMS, INC.

info@ixrfsystems.com
www.ixrfsystems.com

BOOTH 806

Key Products: Microanalysis Systems; XRF SEM Tube, FX Tube and X Beam

iXRF's integrated EDS systems combine the SEM and iXRF EDS user interfaces into a single application. The EDS Toolbar is accessed directly from the SEM user interface allowing advanced microanalysis features to be performed directly on the live SEM image. Spectra, x-ray maps, and line scans can be directly acquired from the selected regions of the SEM image with a single click on the EDS toolbar. The EDS and SEM user interfaces combine to provide the only seamless, integrated, microanalysis tool, including a fully automated particle analysis package. iXRF also introduced the first commercially available Micro-XRF tube adapted to

the scanning electron microscope. By the addition of XRF to the microanalysis industry, customers can now take advantage of their existing EDS detector and use their SEM as a small-spot or bulk XRF analyzer. iXRF fully integrated the XRF quantitative software into the EDS2000 software allowing for trace analysis for all non-conductive samples as well as thickness coating measurements for the semiconductor industry.

JANIS RESEARCH COMPANY, INC.

sales@janis.com
www.janis.com

BOOTH 406

See ad in this issue

Key Products: Continuous Flow and Reservoir Cryostats; 10 K and 4 K Cryocoolers; He-3 Systems

Janis combines over 40 years of manufacturing experience with extensive engineering capabilities to provide cryogenic systems for all research applications. Application-specific products include cryostats for optical microscopy, FTIR, and Mössbauer spectroscopy, continuous flow and Helium-3 cryostats, 4 K and 10 K closed-cycle refrigerators, dilution refrigerators, superconducting magnet systems, and micromanipulated probe stations.

JEOL USA, INC.

eod@jeol.com
www.jeol.com

BOOTH 425

See ad in this issue



Key Products: SEM; TEM; SPM

JEOL is a global leader of electron optical instrumentation used for high-end scientific research and industrial applications. JEOL's business mission is to provide innovative technologies, products and services to promote advancements in the core markets we serve including materials science, nanotechnology, biotechnology, life science, forensics, and biology. Please stop by the booth to obtain information on our full line of TEMs, SEMs, FIBs, and AFMs. JEOL also sells Mass Spectrometers and NMR Spectrometers.

JOHNSEN ULTRAVAC INC.

juvinfo@ultrahivac.com
www.ultrahivac.com

BOOTH 1010



Key Products: Helium-Cooled Manipulators; STM Chambers; Nanotechnology Systems; Custom Designs

Johnsen Ultravac manufactures a complete line of vacuum products for R&D, production and light sources including: six axis manipulators featuring maximum ±4.00 inch XY motion; heating/cooling stages with 10 K to 1500 K temperature range; ultra-long stroke linear motion translators; UHV XYZ translators with 500 lbs. payload capacity; XYZ stages for *in situ* analysis; 5x10⁻¹¹ Torr UHV chambers; beam line components; monochromators; and a wide range of vacuum systems for surface analysis, semiconductor, optoelectronics and coating. We specialize in unique, one-of-a-kind projects.

k-SPACE ASSOCIATES, INC.

requestinfo@k-space.com
www.k-space.com

BOOTH 511

Key Products: Thin-Film Stress Measurement; Analytical RHEED; Semiconductor Wafer Temperature; Real-Time Thin Film Deposition Monitors

Since 1992, k-Space Associates has been a leading supplier of advanced instrumentation and software for the surface science and thin-film technology industry. k-Space sets the standard for analytical RHEED with the kSA400. kSA MOS yields *in situ* curvature, stress, and strain while the new kSA MOS Ultra Scan provides full two dimensional stress mapping of samples up to 200 mm. kSA RateRat monitors real-time deposition rate and optical constants. And, our kSA BandIT for monitoring semiconductor substrate wafer temperature during epitaxial growth now also works for GaN!

2005 MRS FALL EXHIBITORS

KAMMRATH & WEISS GMBH
mail@kammrath-weiss.de
www.kammrath-weiss.com

BOOTH 1020

Key Products: *In situ* Materials Testing; Sample Stages; Cryostat Devices

Special developments for all fields of microscopy with 30 years experience. High precision micro systems, carefully designed in great detail. These are the ingredients that put all of our developments to life. Accent on tomorrow's needs, modular design in state-of-the-art technology—these are the leading thoughts that allow our research tools to grow together with your increasing needs. Many a device and instrument exists already, just waiting to be discovered by you.

KEITHLEY INSTRUMENTS, INC.
info@keithley.com
www.keithley.com

BOOTH 716

Key Products: Test Equipment; Measurement Equipment

Keithley experts will be on hand to discuss users' measurement challenges and demonstrate the company's solutions for materials research in nanotechnology, superconductivity, ferroelectrics, and ceramics. These solutions include Keithley's award-winning Model 6221 AC and DC Current Source, which offers capabilities never previously available, such as pulsed and arbitrary waveform current sourcing. When coupled with Keithley's new Model 2182A Nanovoltmeter, this source simplifies differential conductance, resistance, and pulsed I-V measurements dramatically. Keithley will also showcase the new Model 2602 System SourceMeter® Multi-channel I-V Test Solution, which employs the revolutionary TSP scripting language, allowing users to create custom commands and tightly coordinate measurements between multiple instruments. Keithley will also unveil the Model 4200-PIV, which combines pulsed I-V and DC characterization into a single benchtop device characterization instrument.

KIMBALL PHYSICS, INC.
info@kimphys.com
www.kimballphysics.com

BOOTH 517

UHV Electron and Ion Sources/Systems: Beam energies 5 eV to 100 keV; cathodes, cathode cartridges; Faraday cups, phosphor screens. System options: Energy sweeping, rastering, fast pulsing, emission current control. UHV components: Multi-CF Fittings™, vacuum chambers, eV Parts®. Applications: Surface physics, vacuum physics, charge neutralization, cathodoluminescence, phosphor testing, semiconductor processing, RHEED, ESD, custom designs.

KLA-TENCOR CORPORATION
nanopics@kla-tencor.com
www.ktnanopics.com

BOOTH 602

Key Products: Nanopics Atomic Force Profilometer; Alpha Step IQ; P-15 Profiler

KLA-Tencor's Nanopics 2100™ combines the ease of use and speed of a surface profiler with the nanometer-scale 3D surface imaging capabilities of an atomic force microscope, meeting the needs of the emerging fields of nanoscience and nanotechnology for dependable, easy-to-use atomic force profilometers. This clean, practical system can quickly generate an 800 micron image of an entire microfabricated device—followed by a 0.5 micron close-up of any one of its surfaces. There's no need for an extra optical metrology system to keep the scanner on track. No need for an additional deflection-measurement system requiring time-consuming alignment. And no costly, space-consuming vibration table. Just set the sample on the stage, insert the cantilever, and go. After the image is complete, image processing and data analysis packages provide comprehensive step-height, microroughness and grain-size results.

KRATOS ANALYTICAL, INC.
info@kratos.com
www.kratos.com

BOOTH 505

Key Products: Surface Analysis Equipment; X-ray Analytical Equipment

Kratos Analytical, Inc., a wholly owned subsidiary of the Shimadzu Corporation, is responsible for Shimadzu X-ray analytical instruments in the North American market, as well as Kratos Analytical surface analysis equipment. These products include both energy dispersive (benchtop and micro) and wavelength dispersive (simultaneous and sequential) X-ray fluorescence (XRF) systems, as well as X-ray diffraction (XRD) systems in theta-theta and theta-2theta geometries. These complement Kratos' leading line of X-ray Photoelectron Spectroscopy (XPS) systems.

KURT J. LESKER COMPANY
sales@lesker.com; international@lesker.com
www.lesker.com

BOOTH 601

Key Products: Pure Targets and Materials; Vacuum Components; Sputter Sources

Stop by our booth to discuss your materials research challenges. We offer systems and components for a wide variety of materials research related activities including: magnetron sputtering, electron beam evaporation, organic materials evaporation, MOCVD, and atomic layer deposition (ALD).

LAKE SHORE CRYOTRONICS, INC.
info@lakeshore.com
www.lakeshore.com

BOOTH 700

MRS Corporate
Affiliate

Key Products: Hall Effect Measurement Systems; Probe Stations; Temperature Sensors and Instrumentation

Manufactures cryogenic and superconducting magnet-based probe stations and Hall effect measurement systems (HMS). The probe stations can be used for DC, RF, microwave, and magneto-transport measurements on devices and wafers. Features include temperatures from 1.5 K to 475 K, 1 T vertical or horizontal field superconducting magnet pairs, up to 6 manipulated probe arms, and up to 6-inch wafer probe capabilities. The HMS feature fields to 9 T, temperatures from 2 K to 800 K, up to 6-inch wafers, or accommodation of 4 samples. Measurements including resistance, I-V curves, Hall coefficient, mobility, and carrier concentration can be made on compound semiconductors, semi-insulators, and heterostructures. Quantitative Mobility Spectrum Analysis (QMSA®) software resolves individual carrier mobilities and densities in multi-carrier devices such as quantum wells and HEMTs.

LAYTEC GMBH
info@laytec.de
www.laytec.de

BOOTH 518

Key Products: Optical Sensors; *In situ* Monitoring Tools

As a leader in the field of *in situ* epitaxy sensors, LayTec offers a wide range of real-time monitoring tools for MOCVD, MBE and other thin-film processes. LayTec's EpiRAS 2000 TT (True Temperature) is the most advanced multi-wafer *in situ* sensor available today. Our sophisticated real-time monitoring tools measure epitaxy growth properties such as growth rate, layer thickness, doping levels, ternary material composition, and wafer surface temperature with extreme precision—already during the MOCVD or MBE process. A brand new curvature sensor EpiCurve will complement our product range in September.

2005 MRS FALL EXHIBITORS

LEIGHTON ELECTRONICS, INC.

lei@leighton.com
www.leighton.com

BOOTH 727**Key Products:** Metrology Equipment

Nondestructive carrier mobility measurement has arrived! LEI's Model 1600 enables contactless measurement of mobility, carrier density and sheet resistance on PRODUCT WAFERS. Visit LEI in Booth 319 to talk about the Model 1600, the 1500 Family of contactless sheet resistance measurement tools, or our other metrology solutions, including Mercury Probes, Miller Profilers, and metrology equipment for flat panel and silicon metallization applications.

LITREX CORPORATION

sales@litrex.com
www.litrex.com

BOOTH 931**Key Products:** Precision Inkjet Printers; Industrial Inkjet Printers

Litrex is the leading precision inkjet system supplier to the worldwide materials industry. Litrex Precision Inkjet Systems are used for the printing of organic electronics, polymers, nano-materials and biomaterials. Litrex offers an extensive product line ranging from systems optimized for basic materials research to systems that are optimized for high volume manufacturing of Flat Panel Displays. Litrex is located in Pleasanton, CA where it maintains its headquarters, research and development and manufacturing facilities.

LUMILOG

info@lumilog.com
www.lumilog.com

BOOTH 1018**Key Products:** GaN Substrates; Free Standing GaN; GaN Templates

Already well renowned for the quality of its GaN epiwafers on sapphire substrates and after the introduction, early 2004, of GaN Free Standing Laser Quality, LUMILOG is also the first and unique company offering the very high quality and very cost effective GaN Free Standing LED quality. Semi Insulating GaN Free Standing is currently under development.

M.BRAUN INC.

info@mbraunusa.com
www.mbraunusa.com

BOOTH 1006**Key Products:** Gloveboxes; Analyzers; Solvent Purification Systems

M.Braun offers a full line of standard and custom glove box and solvent purification systems including the Automatic SPS. Accessories include evaporation chambers, vacuum ovens, analyzers, freezers, minis, etc. With over 30 years of experience in the design and manufacture of glove boxes and gas purification systems, M.Braun is able to supply its customers with turnkey solutions for all of their controlled environment needs. Stop by Booth 1006 to discuss your application.

MAD CITY LABS, INC.

sales@madcitylabs.com
www.madcitylabs.com

BOOTH 710**Key Products:** Nanopositioning Systems; Piezoactuators; Translation Stages

Mad City Labs, Inc. manufactures high speed, high precision nanopositioning systems with integrated position sensors and closed loop feedback control for applications that require sub-nanometer precision and repeatability. Our products include single and multi-axis systems with true parallel motion, better than 0.05% linearity, high scanning speeds, travel ranges up to 500 microns. Discover how our innovative design, superior customer service and competitive pricing can assist your R&D. Featured Products: Lowest Profile Nano-LP Series, High speed Nano-PDQ and Nano-MTA Series.

MANEY PUBLISHING

maney@maney.co.uk
www.maney.co.uk

BOOTH 225**Key Products:** Journals; Books

Maney Publishing, founded in 1900, became the official publisher to the Institute of Materials, Minerals and Mining in 2001 and has since established a leading international materials science and engineering portfolio comprising sixteen journals and over 200 books.

MANTIS DEPOSITION LTD.

sales@mantisdeposition.com
www.mantisdeposition.com

BOOTH 606**Key Products:** Nanocluster Source; E-beam Evaporator; RF Atom Source

MANTIS Deposition is dedicated to the manufacture of high-quality deposition components for cutting-edge applications such as nanotechnology, MBE, PVD and ion-beam assisted deposition. Our product offerings include: nanocluster deposition sources and systems, RF atom and RF ion sources, mini e-beam evaporators, k-cells and thermal gas crackers.

MASSCAL CORPORATION

info@masscal.com
www.masscal.com

BOOTH 1106**Key Products:** G1 Nanobalance/Calorimeter

Masscal Corporation's scientific instruments, of which the G1 is the first, plug a gap in the ability of scientists to characterize materials used in nanotechnology, thin films, catalysts, coatings, and other applications where surface reactions are critical to final product performance. The G1 continuously measures mass, heat flow, and loss compliance of films from .001 m to 10 m reacting with gases; from these measurements are derived thermodynamic and kinetic properties of the films. See www.masscal.com.

MATERIALS ANALYTICAL SERVICES, INC.

www.mastest.com

BOOTH 611**Key Products:** Analytical Services; Materials Characterization; Microscopy Services

Materials Analytical Services is a commercial analytical laboratory offering a complete range of materials and process characterization services, FIB assisted SEM and TEM microscopy services and environmental testing for the laboratory or the fab. Services include SIMS, XRD, XRR, XPS, TXRF, AES, RBS, AFM, FE-SEM, FIB, TEM and STEM. For detailed information on the services we offer, please visit our web site or call our laboratory to discuss your requirements.

MAXTEK, INC.

sales@maxtekinc.com
www.maxtekinc.com

BOOTH 809**Key Products:** Thin Film Deposition; Quartz Crystal Microbalance Research; Industrial Plating

Maxtek, Inc. is a manufacturer of quality thin film vacuum deposition controllers, monitors, sensor heads (single, dual, bakeable and 6 crystal rotary), feedthroughs, valves and oscillators. Maxtek produces an extensive line of quartz sensor crystals covering a wide array of measurement applications. Maxtek provides innovative new Quartz Crystal Microbalance systems and components for research applications that require measurement of films with changing losses and for use in liquids. Real-time, on-line plating, rate and thickness monitors for electroless and electrolytic processes.

2005 MRS FALL EXHIBITORS

McALLISTER TECHNICAL SERVICES

solutions@mcallister.com
www.mcallister.com

BOOTH 607

Key Products: Kelvin Probes; Linear Translators; Mag Intros

McAllister Technical Services will exhibit the UHV Kelvin Probe for contact potential measurements. Also on display will be their full range of custom UHV devices such as bellows-sealed positioners, XYZ manipulators, quick-entry load-lock system, magnetic linear motion feedthrough and differentially-pumped rotary motion platforms.

**MDC VACUUM PRODUCTS CORPORATION/
INSULATOR SEAL, A Division of MDC Vacuum Products**
sales@mdcvacuum.com
www.mdcvacuum.com

BOOTH 900

MDC and ISI stock thousands of off-the-shelf components and provide the widest product range of high and ultrahigh vacuum components in the industry. Both product lines are detailed in our catalogs and on our technically based websites. MDC products consist of flanges, fittings, valves, roughing hardware, vacuum gauge tubes, motion and manipulation instruments, thin film electron-beam evaporation systems, and surface science chambers. ISI products include Multi-pin, Low/high current power, Coaxial, liquid, Thermocouple and RF Feedthroughs, Optical viewports and Vacuum breaks and envelopes. MDC and ISI are ISO 9001:2000 registered companies.

MICRO PHOTONICS INC.
info@microphotonics.com
www.microphotonics.com

BOOTH 1013

Key Products: Nano-hardness/Nano-scratch Testers; X-ray Microtomographs; Surface Profilers

Micro Photonics offers instruments and testing services for nano- and micro-hardness testing, nano- and micro-scratch adhesion testing, wear resistance measurements; thin-film measurements utilizing ellipsometry and pyrometry/reflectance; non-contact surface roughness and surface profiling measurements; x-ray microtomography for imaging and analyzing internal microstructure; and x-ray diffraction for studying structure of powders, bulk materials and thin films.

MICROFAB TECHNOLOGIES, INC.
microinfo@microfab.com
www.microfab.com

BOOTH 925

MicroFab Technologies is the pioneer and the leader in providing liquid micro-dispensing solutions and tools based on piezoelectric inkjet technology to research and development labs in biomedical, micro- and nano-electronics, photonics, and alternative energy institutions since 1984. MicroFab's Jetlab®-II, a tabletop-printing platform is ideal for material and process development. The jetting devices, used in conjunction with Jetlab®-II, are capable of dispensing a wide range of materials with high precision and throughput in sizes ranging from as small as 5 picoliter to a nanoliter.

MIKROMASCH USA
www.spmtips.com

BOOTH 1209

Key Products: SPM Probes; Calibration Standards; MEMS Products

At MikroMasch, we strive to provide complete micromachining solutions for your research. MikroMasch offers one-stop shopping for all SPM accessories and MEMS customization service upon request. Our continuous efforts in improving and developing our probes resulted in a new probe, called Hi'RES, with its tip curvature radius of 1 nm. This new product will contribute to your fine research leading to an even more advanced level. Please visit our web site at www.spmtips.com to review our product lines.

MIRWEC FILM, INC.
sales@mirwecfilm.com
www.mirwecfilm.com

BOOTH 924

Key Products: Test R/D Coaters; Contract Coating; Thin Layer Coating

MIRWEC Film's Coating Division introduces the best coating system for ultra-thin liquid coating. The "Micro-Gravure" method, patented by Yasui Seiki Company, Japan, uses a uniquely small diameter of gravure rolls and provides excellent, really uniform thin coated layers. Continuous, uniform and thin layers from 0.008 micron (8 nm) dry or 0.8 micron wet to 40 micron wet are made with Micro-Gravure every day. We also welcome Contract Coatings.

MMR TECHNOLOGIES, INC.
mmr@mmr.com
www.mmr.com

BOOTH 1003
See ad in this issue



Key Products: Variable Temperature Materials Characterization Systems

MMR Technologies manufactures temperature controlled systems—cryogenic cooling systems and wide temperature range thermal stages—which find application in materials research in chemistry, biology, electrical engineering, and physics. These systems operate over the temperature range of 10 K to 730 K. They are used for electrical resistivity, Hall effect, Seebeck effect, DLTS, MEMS, magnetoresistivity, and luminescence studies. They are also used in medical applications and the cooling and characterization of computer chips, electronic devices, laser diodes and thermal imaging devices as a function of temperature.

MOLECULAR IMAGING
info@molec.com
www.molec.com

BOOTH 902



Key Products: Scanning Probe Microscopes; Nano Mechanical Tester; Nanolithography

Molecular Imaging manufactures AFMs for nanoscale quantitative force measurements and high resolution imaging with special emphasis on controlled conditions including operation in solvents, acids, specialty gases and temperatures from -30 to +250C. Nanoscale mechanical properties are imaged in real time or quantitatively measured via nanoindentation. AFM platforms available for atomic scale to 6-in. wafer to inverted Light Microscope interfaces. A nanolithography package is also available.

MTI CORPORATION
info@mticrystal.com
www.mticrystal.com

BOOTH 320

Key Products: Single Crystal Substrate; Nanopowders; Processing Machine

Our primary products are high quality single crystals of oxides, compound semiconductors and advanced optical materials as well as nanopowders that are produced by an innovative process of laser decomposition. We also manufacture crystal cutting and polishing equipments as well as consumable tools such as vacuum pens, crystal packing boxes, etc. Tailoring to customers' special requirements and very competitive pricing are our strengths.

MTS SYSTEMS CORPORATION
Nano Instruments Innovation Center
nano@mts.com
www.mtsnano.com

BOOTH 401



Key Products: Nano Indenter XP; Nano Indenter SA2; Nano UTM

MTS Nano Instruments designs, engineers and manufactures instrumentation and software used to determine mechanical behavior of nano-scale materials and structures. Our Nano Indenter® systems, as well as our Nano UTM™ and Nano Bionix® universal testing systems, offer the most accurate and robust means of characterizing nanomechanical behavior. Stop by our booth to experience a

demonstration of our Nano Vision™ nanomechanical microscopy option—for truly quantitative imaging. Ask about our Virtual Indenter finite element modeling software and how it simplifies the process of simulating indentation experiments. Whether your materials research needs call for physical experiments or simulations, MTS is your trusted solutions provider. Visit our booth for more information on how nanomechanical testing solutions from MTS can support your materials research initiatives.

NANO-MASTER, INC.
info@nanomaster.com
www.nanomaster.com

BOOTH 811

NANO-MASTER SWC-2000 and 3000 Megasonic Single Wafer and Mask Cleaners; SWC-4000 Pelliculized Reticle Cleaner; NSC-2000, 3000 and 4000 Sputter Coaters; NPE-3000 and 4000 PECVD Systems with Planar Hollow Cathode High Density Plasma Sources; NRE-3000 and 4000 Reactive Ion Etching Systems; ANELVA Cryopumps, Vacuum Gauges, Helium Leak Detectors, RGAs; Shen Chang Pulsed DC Power Supplies; PLASMA CONSULT Plasma Sources; Langmuir Probe.

NANOINK, INC.
info@nanoink.net
www.nanoink.net

BOOTH 717



Key Products: NSCRIPTOR™ DPN™ System; Active™ Pen Arrays; DPN™ Probe Arrays

NanoInk's mission is to become the world leader in nanometer-scale manufacturing and applications development. NanoInk provides numerous industries access to the nanoworld by leveraging the power and versatility of its patented technology, Dip Pen Nanolithography™ (DPN™). Because of its unmatched flexibility, high resolution, accuracy, scalability and low cost, DPN allows the development of new or improved products that would have otherwise been impossible or cost-prohibitive to create.

NANONICS IMAGING LTD.
info@nanonics.co.il
www.nanonics.co.il

BOOTH 916



Key Products: NSOM; AFM; SPM

Ultimate resolution AFM/NSOM/SPM systems including the first two-probe SPM system. Hallmarked by transparent optical and electron/ion beam integration including microRaman, confocal, SEMs, TEMs, FIBs, 10°K operation. Optically transparent AFM probes surpassing nanotube profiling/deep trench capabilities, multiwire electrical, Nanoheater™ thermal conductivity, electrochemical, AFM-controlled gas and liquid nanochemical deposition.

NANOSCALE MATERIALS, INC.
www.nanomatinc.com

BOOTH 822

Key Products: NanoActive® Materials; FAST-ACT®; Development Materials

NanoScale Materials is a dynamic and innovative technology company founded to develop and commercialize our proprietary NanoActive™ materials and technologies. NanoScale has combined advanced chemistry and engineering to produce a line of high performance nanocrystalline metal oxides and related products. These highly porous materials have unmatched surface areas and unique morphologies that result in enhanced chemical reactivity and high sorption capabilities. These materials are available in powder, granule and suspension forms for utility in a broad range of commercial, military and research applications.

NANOSCIENCE INSTRUMENTS, INC.
info@nanoscience.com
www.nanoscience.com

BOOTH 619

Key Products: AF Microscopes; Accessories

Nanoscience Instruments provides a wide range of scanning probe microscope products for research, industry, and education. We will be introducing the new Nanosurf easyScan 2 AFM and STM system. Stop by our booth to witness its unparalleled ease of use, modularity, and capabilities. We will also be featuring the Nanosurf Mobile S AFM system. We offer various AFM add-on products such as the Nanoanalytics Q-control, SPIP post processing software, and low-cost vibration isolation solutions. Our huge range of AFM probes include Nanosensors, Nanoworld, Team Nanotec, Budgetsensors, and a wide variety of carbon nanotube tips.

NANOSENSORS
info@nanoworld.com
www.nanoworld.com

BOOTH 617

Key Products: AFM Probes

NANOSENSORS™ is specializing in the development and production of innovative high quality probes for scanning probe microscopy (SPM) and atomic force microscopy (AFM). The new PointProbe® Plus combines the well-known features of the proven PointProbe® Series such as high application versatility and compatibility with most commercial AFMs with a further reduced and more reproducible tip radius as well as a more defined tip shape. In December, NANOSENSORS™ will introduce its new self-sensing and self-actuating probes.

NANOSURF AG
info@nanosurf.com
www.nanosurf.com

BOOTH 623

Key Products: Atomic Force Microscope; Scanning Tunneling Microscope

Founded in 1997 as an answer to a teacher's request for an inexpensive scanning tunneling microscope, Nanosurf AG has since also developed several affordable, portable, easy-to-use atomic force microscopes, from the educational E-Line to the new all-in-one Mobile S. At the 2005 MRS Fall Meeting, Nanosurf proudly presents the latest addition to its series of Swiss quality products, the Nanite, our answer to customer requests for AFM integration and combination with other machines and instruments.

NANOTECH AMERICA/NT-MDT
info@nt-america.com
www.nanotech-america.com

BOOTH 711



Key Products: SPMs and AFMs, Cantilevers, SPM/AFM Accessories

The Solver line of scanning probe microscopes are leading edge instruments combining the highest quality construction (titanium frames, sapphire bearings) with easy scanner interchangeability and innovative technology (closed-loop equivalent) to provide extremely powerful yet flexible systems: Solver LS accepts samples up to 250 mm in diameter and can be automated for combinatorial investigations. In addition to conventional AFM and magnetic force microscopy, the new Solver PRO has scanners for atomic force acoustical microscopy (AFAM) to image amorphous vs. structured domains in polymer and direct measurement of local Young's modulus. Ask about our calibration gratings, HOPG, and probe tips that fit most AFM/SPMs. For a preview of this new line, visit www.nanotech-america.com.

2005 MRS FALL EXHIBITORS

NANOWORLD AG
info@nanoworld.com
www.nanoworld.com

Key Products: AFM Probes

NanoWorld AG is the leading manufacturer of high quality tips for Scanning Probe Microscopy (SPM). NanoWorld™ offers four product lines. The Pointprobe® series comprises AFM tips with various coatings and shapes for a wide range of applications. The unique shape of the Arrow™ series allows easy positioning of the tip on the area of interest. Tipless cantilevers and arrays based on the Arrow series and the Hybrid-Nitride series made of silicon nitride were recently introduced.

BOOTH 624



NETZSCH INSTRUMENTS INC.
at@nib.netzsch.us
www.e-thermal.com

Key Products: Thermal Analysis; Thermal Conductivity; Contract Testing

Thermal analysis, thermal properties measurement, conductivity, *in situ* dielectric analysis, and contract testing services; DSC, TGA, DTA, simultaneous TGA-DSC/DTA, TMA, DMA, DEA-Micromet-series cure monitoring by dielectric analysis in-process and lab-scale, evolved gas analysis coupling thermal analyzers to FTIR and MS, dilatometers, thermal conductivity and laser flash diffusivity.

BOOTH 805

NATIONAL INSTITUTE FOR MATERIALS SCIENCE
stam_office@nims.go.jp

Key Products: Peer-Reviewed Journal

National Institute for Materials Science (NIMS: <http://www.nims.go.jp>) has published a peer-reviewed journal, *Science and Technology of Advanced Materials (STAM)*, since April 2005. STAM was founded by the Japan Federation of Materials in 2000, and they have forwarded all publishing operations to NIMS. STAM offers an international forum presenting refereed original contributions at the forefront of materials science research, and occasionally includes reviews of articles in rapidly growing fields, such as nano-, bio- and eco-materials.

BOOTH 229



ngIMAT CO.
customer@ngimat.com
www.ngimat.com

Key Products: Nanopowders; Phase Shifters and Filters; Photonic Sensors

ngimat offers commercializable nanoEngineered Material™ products including metal and metal oxide nanopowders for electronic, SOFC, pigment, cosmetic, CMP, catalytic, ferroelectric and medical implant applications; phase shifters and other tunable RF devices; barrier layers; as well as photonics sensors for drug and virus sensing applications. Our proprietary NanoSpray and CCVD technologies can enable a world of compositions, thin film coatings, nanotextured coatings and nanopowder products for a variety of applications at a cost that enables profitable commercialization. Come visit us at www.ngimat.com and let us give you practical solutions to solve your practical nanotechnology needs!

BOOTH 927

NATIONAL TECHNOLOGY TRANSFER CENTER
For the Missile Defense Agency Technology Applications Program
Washington Operations
www.mdatechnology.net

Key Products: Fuel Cells; Batteries; Supercapacitors; Energetic Materials;
Wide-Bandgap Semiconductors; Nanomaterials; GaN; AlN; InN

Advanced materials are a key element of the Missile Defense Agency's (MDA's) mission of ballistic missile defense. The MDA Technology Applications program's goal is to transfer MDA-funded technology into the commercial market where commercial development, testing, and product usage result in materials that are mature, reliable, and ready for insertion into future missile defense systems.

BOOTH 720

NATURE PUBLISHING GROUP
nature@nature.com
www.nature.com
www.nature.com/nmat

Key Products: Journals; Magazines

NPG publishes quality, peer-reviewed research; review and reference material; timely news; and essential career and recruitment information in print and online. The NPG portfolio combines the excellence of *Nature*, the recently launched primary research journal *Nature Materials*, with over 30 leading international scientific and medical journals and reference titles. *Nature Materials* is the number one research journal in materials science with a 2003 impact factor of 10.778, according to the ISI *Journal Citation Reports*.

BOOTH 125

NEOCERA, INC.
sales@neocera.com
www.neocera.com

Key Products: Pulsed-Laser Deposition; Pulsed Electron Deposition

Neocera creates, develops, and promotes advanced thin film materials and deposition techniques. Founded in 1989 to commercialize technical expertise in cutting-edge materials, Neocera is now a world leader in the manufacture, application, and support of Pulsed Laser Deposition (PLD) and Pulsed Electron Deposition (PED) systems for research and production applications. Neocera also offers complex oxide thin films on a foundry basis.

BOOTH 901



NOR-CAL PRODUCTS, INC.
ncsales@n-c.com
www.n-c.com

Key Products: Vacuum Components; Custom Chambers; Valves

Since 1962, Nor-Cal Products, Inc. has manufactured high and ultra-high vacuum components for many applications. Nor-Cal has earned a reputation worldwide for quality components, competitive prices and excellent customer service. Standard products include: flanges; fittings, viewports, feedthroughs and flexible hoses; crystal monitors, manual and pneumatic valves; pressure control valves and controllers; heater jackets; foreline traps; and manipulators. Custom chambers, manifolds, feedthrough collars and baseplates can be manufactured from customer specifications, sketches or drawings. Entire systems can be supplied. Extensive 3D Model Library is now available on-line. Visit our website at www.n-c.com for more information.

BOOTH 422

nPOINT, INC.
info@npoint.com
www.npoint.com

Key Products: Nanopositioning Systems; AFM Scanners; Motion-control Components

nPoint, Inc. manufactures ultra-precision motion and control devices for nano-scale research and manufacturing. Our products include a series of nanopositioning systems that consist of stages and control electronics. The positioning products enable rapid, precise, and repeatable motion and are used in applications ranging from life science to semiconductor industry.

BOOTH 625



OCEAN OPTICS INC.
info@oceanoptics.com
www.oceanoptics.com

Key Products: LIBS

Ocean Optics is creator of the world's first miniature fiber optic spectrometer and a leading supplier of optical-sensing systems for materials analysis and characterization of metals, ceramics, semiconductors and polymers. Among our latest innovations is a Laser-induced Breakdown Spectrometer, a broadband (200-980 nm)

BOOTH 825

2005 MRS FALL EXHIBITORS

system for instant elemental analysis of trace elements in solids, solutions and gases. We also offer a line of high-precision metrology tools for thin film measurement, plasma analysis and optics characterization.

OLYMPUS INDUSTRIAL AMERICA INC. **BOOTH 1004**
info@olympusindustrial.com
www.olympusmicroimaging.com

Key Products: Inverted Metallographs; Upright Microscopes; Stereo Microscopes

Olympus Industrial America's Micro-Imaging division, based in Orangeburg, New York, is responsible for sales and service of the complete range of Olympus microscopy products for use in industrial applications from production and inspection to research and quality control. Complimenting our line of materials analysis microscopes will be a range of digital cameras and Discover Series modular software packages. You will be impressed with the speed and accuracy of our software and cameras when archiving images, taking measurements/particle sizing or generating reports. Feel free to bring a sample to our booth to see the quality of Olympus Micro-Imaging products.

OMICRON NANOTECHNOLOGY USA **BOOTH 315**
info@omicronus.com
www.omicron-instruments.com



Key Products: UHV SPM; Surface Science Instrumentation; MBE

Omicron NanoTechnology is the premier supplier of UHV systems and instruments for surface analytical and nanoscience-related research. From our award-winning variable temperature AFM/STM instruments to our family of multiprobe UHV systems for multi-technique surface science research, Omicron is continuously striving to develop new tools with increased performance for UHV microscopy and spectroscopy research. At this year's meeting we will be providing live demonstrations of the newest addition to our award-winning line of scanning probe microscopes—the MATRIX control system. Comprised of an all digital electronics package and new data collection and analysis software, the MATRIX system is the cumulative result of several man years of development from the team at Omicron.

ORIGINLAB CORPORATION **BOOTH 323**
sales@originlab.com
www.originlab.com

Key Products: Origin Software

Origin is a software application that combines point-and-click interfaces for scientific graphing and analysis with a powerful programming environment. Over 60 built-in plot types allow you to quickly create 2D, 3D, contour, and image graphs. Advanced data analysis tools include statistics, signal processing, curve fitting and peak analysis. The C programming capability combined with the numerical computation and graphing power make Origin a robust platform for routine data processing, analysis, and algorithm development.

OXFORD APPLIED RESEARCH **BOOTH 522**
sales@oaresearch.co.uk
www.oaresearch.co.uk

Key Products: Ion Sources; Atom Sources; Thin Film Deposition/Evaporators; Valved Organic Source

Manufacturer of growth and processing equipment for semiconductor or thin film research. Core instruments include RF atom sources for high-quality oxide/nitride growth, e-beam evaporators, atomic hydrogen sources, nanocluster deposition sources for size-selected nanoparticle deposition, broad-beam RF and DC ion sources for sputter deposition or ion beam assisted deposition (IBAD), and a family of ion and electron guns for thin film analysis. Come and see us for more information on our new valved organic source.

OXFORD INSTRUMENTS AMERICA, INC. **BOOTH 801**
info@ma.oxinst.com
www.oxford-instruments.com

Key Products: Microanalysis; X-ray; Optical Spectroscopy

Oxford Instruments is the world leader in research instrumentation and analytical products, with over 40 years of experience in cryogenics, superconductivity, vacuum, x-ray and microanalysis techniques. Visit our booth to see the latest in superconducting magnet, cryogenic/variable temperature control technologies and microanalysis systems for SEMs and TEMs. On display will be a range of laboratory optical spectroscopy systems for sample temperature control. The premier manufacturer of cryogenic spectroscopy, EDX, WDX and EBSD systems, Oxford Instruments has a global distribution and support organization.

OXFORD UNIVERSITY PRESS **BOOTH 123**
custserv.us@oup.com
www.oup.com/us

Oxford University Press is an international publishing house known throughout the world for its dictionaries, reference books, texts, monographs and journals. New and forthcoming titles include *High-Resolution Electron Microscopy* (March 2003), *Polymer Physics* (July 2003), and *Engineering Mechanics of Composite Materials, 2E* (December 2003). Stop by the Oxford booth and save 20% on all titles and journals on display.

PACIFIC NANOTECHNOLOGY, INC. **BOOTH 912**
www.pacificnano.com

Key Products: Nano-R AFM; Nano-I AFM; Crystal SPM

Pacific Nanotechnology offers Atomic Force Microscopes (AFM) for research, product development, and process control applications. Each of the Pacific Nanotechnology AFM products offers high performance, is easy-to-use and is versatile. The latest product added to the product line, the NanoR™ Crystal, sets a new standard in AFM instrumentation.

PANALYTICAL INC. **BOOTH 1000**
info@panalytical.com
www.panalytical.com

Key Products: X-ray Diffraction; X-ray Fluorescence

PANalytical Inc. is the leading world supplier of analytical X-ray instrumentation and software for elemental analysis, phase characterization and small angle scattering. PANalytical has been providing X-ray instrumentation for over 50 years to nanomaterial, pharmaceutical, and materials research and process control applications. Our X-ray diffraction products are designed and engineered to supply our customers with solutions to solve complex problems such as thin film characterization; e.g., epitaxial, reflectivity and diffuse scattering, and determination of bulk material properties using the most advanced software algorithms for data collection, phase and structure determination. Additionally, our X-ray spectrometry systems provide elemental analysis for semiconductor and process control applications. Finally, our commitment to providing a customer based solution is exemplified by the largest and most dedicated customer support group in the X-ray business.

PE EUROPE GMBH **BOOTH 929**
info@pe-europe.com
www.pe-consulting-group.com

PE Consulting Group provides software solutions and consultancy services for all environmental activities related to products and production and process optimization (GaBi software family including GaBi 4, GaBi lite and GaBi DfX), and for corporate sustainability reporting (web-based SoFi software). The group was founded in 1991 and at present consists of the companies PE Europe, PE Asia and PE Americas. Our services comprise (amongst others): Life Cycle Assessment,

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Material Flow Analyses, Eco-efficiency Studies, Environmental Risk Management, Design for Recycling, Energy-Efficiency Analyses, Greenhouse Gas Accounting, Sustainability Management and Reporting.

TED PELLA, INC. **BOOTH 523**
sales@tedpella.com
www.tedpella.com

Key Products: Vacuum Coaters; Calibration; Sample Preparation Supplies/Accessories

Vacuum Coaters for evaporation or sputtering modes will be shown. The bench-top turbo 12" (30 cm) 308R vacuum coater is suitable for standard carbon and metal coatings and incorporates thickness monitoring (measurements down to 0.1 nm) and sputtering. Unique and efficient rotational, tilting and planetary movements of samples are possible for uniform coating. Other turbo-mounted coaters are available for specialized purposes. 208HR is used for hi-res metal coating and our turbo carbon evaporation is possible with model 208C. A number of specimen preparation products will be on our stand such as adhesives, tweezers and abrasives. Jack Vermeulen will be present for the first time in our MRS booth. Jack is now our Director of Sales and Marketing. Jack's extensive background in materials and electron microscopy will be most helpful to our customers.

PERKINELMER LIFE & ANALYTICAL SCIENCES, INC. **BOOTH 1007**
productinfo@perkinelmer.com
las.perkinelmer.com

Key Products: Spectrophotometers; UV/Vis/NIR

PerkinElmer serves a number of growing industries and markets including the environmental, pharmaceutical, chemical, petrochemical, semiconductor, academic research, biotechnology, and clinical screening segments. Our instruments and related software applications measure a range of substances from biomolecular matter to organic and inorganic materials. Our total application-driven laboratory solutions help our customers speed drug discovery, enhance research productivity, meet strict regulatory requirements, improve time-to-market, and increase manufacturing efficiencies.

PHYSICAL ELECTRONICS USA, INC. **BOOTH 707**
marketing@phi.com
www.phi.com

Key Products: Scanning Auger; SIMS; XPS

Since 1969, Physical Electronics (PHI) has been the innovative technology leader and the only supplier to offer the full range of high performance surface analysis instrumentation. To meet the diverse needs of our customers, PHI supplies an array of surface analysis instruments, including: Scanning Auger Nanoprobes (AES), Scanning ESCA Microprobes (ESCA/XPS), Time-of-flight Secondary Ion Mass Spectrometers (TOF-SIMS), and Quadrupole-based dynamic SIMS.

PLASMATERIALS, INC. **BOOTH 626**
info@plasmaterials.com
www.plasmaterials.com

Key Products: Sputtering Target; Backing Plates; Evaporation Materials

Plasmaterials, Inc. provides high purity Physical Vapor Deposition (PVD) materials in nearly every element, alloy, composition and component available on the periodic table. We provide sputtering targets and other segments of the materials market including evaporation material, crucible liners and electron beam starter sources. In addition, we offer backing plates and metallic bonding services for sputtering targets if required. Our metallic bonding process utilizes a proprietary process for affixing the target directly to the backing plate using low vapor pressure materials. These bonding materials provide the necessary mechanical strength, thermal and electrical conductivity while allowing differential expansion between the target and the backing plate. Backing plates for nearly all commercial available systems are usually in stock for immediate delivery.

Customer designed backing plates can usually be provided within a few short days utilizing layers of low vapor pressure materials designed to combine mechanical strength with high thermal and electrical conductivity.

PRINCETON GAMMA-TECH INSTRUMENTS, INC. **BOOTH 420**
sales@pgt.com
www.pgt.com

Key Products: Spirit EDS System; Avalon EDS System

PGT will display the Avalon and Spirit EDS Systems for comprehensive x-ray and image analysis. The IMAGIST PC, a turnkey system for image analysis from light and electron microscopes, will be available for demonstrations with a full range of applications software. PGT's family of x-ray detectors will be highlighted including Prism Si(Li) and HPGe detectors as well as Sahara, the best non-LN detector available. Stop and discuss the detector that's best for your application.

PSIA, INC. **BOOTH 706**
info@psiainc.com
www.psiainc.com

MRS Corporate
Affiliate

Key Products: AFM; SPM; NSOM

PSIA, Inc. offers a complete AFM product line for academic, R&D, and industrial needs. The XE-Series provides unprecedented accuracy, ease-of-use, and versatility compared to other AFMs. Visit our booth and see for yourself, the XE capabilities are second to none.

PVD PRODUCTS, INC. **BOOTH 708**
sales@pvdproducts.com
www.pvdproducts.com

Key Products: Pulsed Laser Deposition Systems; PLD Tape Systems; Sputter Systems

PVD Products sells a complete line of thin film deposition systems including pulsed laser deposition, magnetron sputtering, electron beam evaporation, and CVD systems for both R&D and prototype production applications. We manufacture custom vacuum components such as magnetron sputter sources, substrate heaters, target manipulators, Intelligent Windows and optical trains. Thin film deposition services of HTS materials and related compounds as well as SEM and EDX services are also available.

Q-SENSE, INC. **BOOTH 1005**
info@q-sense.com
www.q-sense.com

Key Products: Q-Sense E4—Rapid characterization of bio-interfaces

The E4 is the new generation 4-sensor research instrument from Q-Sense, primarily designed for rapid characterization of bio-interfaces. The instrument measures in real-time the mass of molecular layers that form on its sensor surfaces. Simultaneously structural (viscoelastic) properties of such molecular layers are monitored. This gives a thorough understanding of binding events such as molecular adsorption and interaction. Samples include proteins, polymers, lipids and cells/bacteria. A large number of surfaces are available including metals, polymers, ceramics and chemically/biologically modified surfaces.

QUANTOMIX INC. **BOOTH 1024**
info@quantomix.com
www.quantomix.com

Key Products: Capsules for imaging wet/hydrated samples with SEM

Quantomix' WETSEM™ technology enables imaging of wet samples with Scanning Electron Microscopes (SEM). The QX capsules allow imaging and analysis of fully hydrated samples such as cells, tissues, food, nanoparticles and ink, in

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their native environment. EDS (energy dispersive x-ray spectroscopy) of wet samples is easily performed with the capsules. The WETSEM™ technology presents significant advancement in research and analysis, and a tangible solution for quality control processes in industrial fields.

QUANTUM DESIGN, INC.

info@qdusa.com
www.qdusa.com

BOOTH 610



Key Products: Physical Property and Magnetic Property Measurement Systems; SQUID

Quantum Design is the leading manufacturer of automated material characterization systems for the physics, chemistry, and materials science research communities. These systems provide temperatures from <0.4 to 1000 K and magnet fields up to 16 tesla. The SQUID-based Magnetic Property Measurement System (MPMS) is the industry standard for ultra-sensitive magnetic measurements. The Physical Property Measurement System (PPMS) is an innovative device designed to provide a wide range of fully automated measurements, including: magnetometry (AC, DC, Torque, and VSM), electrical transport (AC, DC, Hall effect and critical current), thermal transport (thermal conductivity, Seebeck coefficient, thermopower), and heat capacity. Both systems can be supplied with an optional cryocooled liquid helium dewar, virtually eliminating helium transfers.

QUESANT INSTRUMENT CORPORATION

qsales@quesant.com
www.quesant.com

BOOTH 702

Key Products: SPM; AFM; STM

Quesant Instrument continues to add features to our newest instrument, the Universal SPM (USPM), our AFM and STM with resolution at the atomic level. The USPM can be added to existing systems as well as being purchased as a complete turnkey system starting at \$55,000. Some of the new features have been carried over from our QScope AFM line. The sample heater, scanning in liquids, and scan modes such as MFM, EFM, conductance, etc., have been often included options on the QScopes. A metrology option for the USPM will be released in the first quarter of 2005. The closed loop scan tube assembly will have 40 μm of X and Y range and 4 μm in Z. All USPMs have been shipped ready to accept this option. The USPM will be the only small sample metrology system in the world capable of atomic level imaging. Nanolithography/nanomanipulation will be a low cost option.

RAITH USA, INC.

ebeam@raithusa.com
www.raithusa.com

BOOTH 609



Key Products: E-Beam Lithography; Laser Stages; CAD Navigation Systems

Raith offers a variety of E-Beam Lithography systems for research and development. Our EBL systems range from add-on attachments for SEMs and FIBs, to complete "Turnkey" systems with full wafer and mask handling capabilities. Raith also manufactures ultra-high precision laser stages and CAD-navigation packages for failure analysis applications.

REFINING SYSTEMS, INC.

www.refiningsystems.com

BOOTH 804

Key Products: Sputtering Targets; Evaporation Materials; Wires

Since 1986, Refining Systems, Inc. has been an industry leader in the manufacturing of metals and materials for science and industry. We manufacture custom-made sputtering targets, evaporation materials, crucibles rods, sheets, wires, foils, shots, tubing, discs and other items. Our product line has been tailored to meet the increasing needs of high-tech industries, research facilities, vacuum coating industries and other trades. Please stop by our booth to view our extensive product line.

RENISHAW INC.

usa@renishaw.com
www.renishaw.com

BOOTH 918



Get chemical/molecular information from your SEM using the power of Raman spectroscopy. Renishaw Raman Microscopes provide chemical information focally at sub-micron spatial resolution with auto-alignment, internal calibration and performance validation. Renishaw Raman spectrometers are configurable to include multiple excitation sources from the UV through NIR with automated laser switching and alignment, quick-launch fiber-optic probes, AFM/NSOM/Raman, SEM-Raman, PL, hot/cold cells, macro-sampling, global Raman imaging, near excitation analysis, 2D/3D mapping and depth-profiling.

RHK TECHNOLOGY, INC.

info@rhk-tech.com
www.rhk-tech.com

BOOTH 521



Key Products: Scanning Probe Microscopes

RHK Technology, Inc., the leading supplier for scanning probe microscopes for research, will feature our growing line of SPM products. Products featured at this meeting will include: the ultimate in terms of performance and flexibility, our newest Model SPM1000 universal scanning probe microscope controller with Windows XP software, our new line of low temperature SPM systems, and our growing line UHV AFM and STM turn-key systems.

RIGAKU

info@rigakumsc.com
www.rigakumsc.com

BOOTH 307

Key Products: X-ray Diffraction Systems; Small Angle Scattering Systems

Rigaku provides the world's most comprehensive line of X-ray Diffraction and X-Ray Fluorescence hardware and software for the analysis of advanced materials. Systems for the analysis of thin films, nano-particles, semiconductor wafers, and bulk materials are fully automated enabling high precision user friendly measurements and detailed structural interpretation. A wide range of x-ray applications including XRD, XRF, XRR, SAXS, HRXRD, and micro XRD/XRF can be routinely performed by general users.

RIGAKU/MOLECULAR METROLOGY

info@molmet.com
www.molmet.com

BOOTH 309

Rigaku/Molmet (formerly Molecular Metrology, Inc.) is an established leader in the design and manufacture of Small Angle X-ray Scattering (SAXS and Ultra-SAXS) instrumentation for nanostructure determination from 1 nm to 3 microns. We offer complete, turn-key systems with a range of Rigaku high brilliance x-ray sources and a selection of 2D area and 1D linear position sensitive detectors.

ROYAL SOCIETY OF CHEMISTRY

sales@rsc.org
www.rsc.org

BOOTH 124

Key Products: Journals; Books

The Royal Society of Chemistry is the largest European organization for advancing the chemical sciences. It is supported by a network of 45,000 members worldwide and an internationally acclaimed publishing business. Visit our booth for the latest developments in our publication collection including the only weekly journal in the field, *Journal of Materials Chemistry*, and our new interdisciplinary journal *Soft Matter!*

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RPMC LASERS INC.
rpmc@rpmclasers.com
www.rpmclasers.com

BOOTH 1205

Key Products: Picosecond Ultrafast Lasers: RAPID Laser, STACCATO Laser, UPL Lasers

RPMC Lasers delivers custom and standard lasers, including nanosecond, 100 and 500 kHz 5 and 10 W picosecond, femtosecond, and CW red/blue/green lasers for research, micromachining, spectroscopy, scientific, lidar, military and more (www.rpmclasers.com/solidstatelasers.htm). In addition, RPMC offers esoteric wavelength high power diode lasers from 622 nm through 2.5 um (www.rpmclasers.com/laserdiodes.htm). We provide collimated and fiber coupled high brightness diodes, as well as single mode lasers diodes. Contact rpmc@rpmclaser.com.

RUBICON TECHNOLOGY, INC.
sales@rubicon-es2.com
www.rubicon-es2.com

BOOTH 817

Key Products: Sapphire Substrates; Sapphire and Other Single Crystal Windows; Blanks; Tubes

Rubicon Technology is a leading material science solutions provider specializing in the production and distribution of sapphire substrates and components and other advanced technology materials. Rubicon serves the opto-electronic, compound semiconductor, and semiconductor fabrication markets. Our Chicago-based manufacturing facilities house state-of-the-art equipment and processes, including our proprietary ES2-GSA single-crystal growth technology and ES2-PSA epi-polishing technology. Rubicon's top-quality products, material expertise, and collaborative approach enable evolving science and evolving solutions for our customers throughout the world.

SEKI TECHNOTRON USA
www.sekicvdsolutions.com

BOOTH 603

Key Products: Microwave Plasma CVD Systems; Hot Filament CVD Systems

Seki Technotron is the leading manufacturer of microwave plasma CVD systems and the exclusive worldwide supplier of the sp3 Diamond Technologies' hot filament CVD systems. Our microwave plasma CVD systems are designed for high growth, high quality diamond films, carbon nanotubes and advanced material research, for deposition areas of 100 mm to 300 mm and power levels from 1.5 to 100 kW depending on required process and growth rates. The sp3 hot filament CVD system is designed for highly uniform deposition diamond of very smooth nanocrystalline and faceted diamond films over a wide area for electronics, tools, and wear part coating applications. We work closely with our customers to select the CVD system most suited for the intended R&D and production applications.

SEMICORE EQUIPMENT INC.
sales@semicore.com
www.semicore.com

BOOTH 803

Semicore has a long-established record of quality in re-manufacturing sputtering, evaporation and etching systems. New or pre-owned, standard or custom, Semicore can provide the thin film deposition tool that meets all of your process requirements. Semicore's wide range of expertise in vacuum tool manufacturing ensures a perfect fit between performance, production and price. See why leading companies are using our equipment services and support network. Please call or visit us at www.semicore.com.

SEMTECH SOLUTIONS, INC.
info@semtechsolutions.com
www.semtechsolutions.com

BOOTH 709

Key Products: Used SEM; SEM Service; SEM Digital Upgrades

SEMTECH Solutions is a seller of re-conditioned Scanning Electron Microscopes (SEMs) and a new affordable USB digital imaging solution for SEMs. SEMTECH Solutions offers customers an alternative to buying expensive new scanning electron microscopes. Our rebuilt SEMs are upgraded with our digital imaging product and include a warranty. SEMTECH Solutions is also the Northeast sales representative for Physical Electronics (Auger, ESCA, SIMS).

SETARAM INC.
sales@setaram.com
www.setaram.com

BOOTH 907

Key Products: Thermal Analyzers; Calorimeter; Humidity Generator

SETARAM is a leading supplier of high performance thermal analysis and calorimetry instruments. We have been working in the area of thermal analysis and calorimetry (DTA, DSC, TGA, TMA, simultaneous TGA-DTA/DSC, coupled TGA-EGA) for more than forty years and have built a solid reputation as experts specialized in high temperature thermal analysis and "three dimensional" Calvet-type calorimetry (3D Sensor).

SIGMA-ALDRICH
matsci@sial.com
www.sigma-aldrich.com/matsci

BOOTH 311

See ad in this issue



Key Products: Volatile Precursors; Organic Electronics; Nanomaterials; Crystal Growth Inorganic Materials

Sigma-Aldrich® is a leading high-technology company. Through our Materials Chemistry Centers of Excellence in research and manufacturing, we develop advanced, enabling materials for your micro/nanoelectronics, alternative energy, display/optoelectronics, nanotechnology and related materials science and engineering applications. Specialties include ALD precursors, electronic organics, ultra-high purity inorganic halides, fuel cell materials, electronic grade dyes, specialty monomers and cGMP grade polymers. Visit our website at www.sigma-aldrich.com/matsci or contact us at matsci@sial.com for applications data, tutorials and product listings.

SMART IMAGING TECHNOLOGIES CO.
info@smartimtech.com
www.smartimtech.com

BOOTH 1102

Key Products: Image Analysis Software; 3D Modeling Software; Materials Analysis Services

Smart Imaging Technologies Co., an international software development and scientific research firm, specializes in automated digital image analysis and 3D modeling of complex microstructures. Our SIMAGIS™ Smart Imaging Spreadsheet is the most advanced and complete image analysis solution available. SIT provides ready-to-run automated solutions for metallurgy, nanotechnology, material science, petrography, biology and customized application development. Software is simple to use; no end-user coding is required. SIMAGIS™ will quickly generate reports with consistent and reliable data.

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SMART MATERIAL CORPORATION

info@smart-material.com
www.smart-material.com

BOOTH 1207

Key Products: Macrofiber Composites; Piezoelectric Composites; High Voltage Power Supplies

Smart Material Corporation, with its affiliated company Smart Material GmbH, is manufacturing and developing advanced piezo-composite materials. Smart Material's product portfolio includes piezoceramic fibers, 1-3 fiber composites, piezoceramic actuators and sensors and test equipment for these products. Applications for our products include: ultrasonic transducers for non-destructive material testing, sonar application, active components for dynamic forming or stiffening of load bearing structures, active vibration dampening, sound attenuation, strain and pressure gauges.

SOLARTES LAB, INC.

k.terashima@solartes.com

BOOTH 1104

Solartes Lab provides cubic-type GaN epitaxial substrate on silicon (100) wafers using highly conductive buffer materials. The electric current has come to be able to flow vertically and it is easy to cleavage to obtain mirror structure of laser devices. Scintillating effect for blue LD/LED for part of white LED and solar cell application will be demonstrated. Fluoride lens for environment analysis will be exhibited for use in ICP to detect As, Al, Pb and Cl atom.

SONICS & MATERIALS, INC.

info@sonics.biz
www.sonics.biz

BOOTH 921

Key Products: Ultrasonic Liquid Processes; Cell Disruptors; Homogenizers

The Vibra-Cell™ is the most technologically advanced high intensity ultrasonic processor available to the researcher. Extremely capable and versatile, it can safely process a wide range of organic and inorganic materials—from microliters to liters. Typical applications include: sample preparation, cell lysing, desegregation, homogenization, particle size reduction, soil testing, acceleration of chemical reactions, degassing and atomization. Sonics has the widest range of multi-element probes for 96 well applications.

SOPRA INC.

sales@soprainc.com
www.sopra-sa.com

BOOTH 712

Key Products: Spectroscopic Ellipsometer; Ellipsometric Porosimeter; Excimer Laser

SOPRA is a world leading provider of high accuracy spectroscopic ellipsometers. SOPRA's variable angle spectroscopic ellipsometers cover a very wide spectral range, 190 nm to 2.0 mm. The spectral range is extendible down to 140 nm wavelength with the VUV option, or up to 20 μm wavelength with the IR option. The VUV spectral extension allows characterization of photolithography films, wide optical bandgap materials and high-k materials. The IR extension is uniquely powerful at characterizing thin epitaxial layers. SOPRA's SE5 spectroscopic ellipsometer, combined with a grazing incidence angle x-ray reflectometer, offers very precise characterization of layers and materials such as "ultra" thin gate dielectrics. SOPRA's newest system is an ellipsometric porosimeter for the characterization of porous materials, namely ultra low-k. SOPRA's high energy excimer lasers are ideally suited for annealing amorphous silicon as deposited on glass panels, or for activation of dopants.

SOUTH BAY TECHNOLOGY, INC.

info@southbaytech.com
www.southbaytech.com

BOOTH 600

Key Products: Specimen Preparation; Materials Processing; Metallography; Plasma Cleaner; Lower Energy Ion Mill

South Bay Technology, Inc. manufactures materials processing equipment for applications in electron microscopy, optical microscopy, metallography, microelectronics and single crystal processing. Products include wire saws and diamond wheel saws for precision cutting; lapping and polishing machines and fixturing for controlled surface preparation; 2- and 3-axis goniometers for orientation, cutting and polishing of single crystals; ion milling, dimpling, disc cutting and plasma cleaning systems for TEM sample preparation; ion beam sputter deposition and etching systems to prepare fine grain thin films for high resolution imaging using FESEM; plasma etching, reactive ion etching (RIE) and backside polishing systems for microelectronic processing; and high precision polishing systems for nanotechnology applications. The SampleSaver™ is a new product being introduced for the transport and storage of oxygen sensitive samples in an inert environment.

SPECS SCIENTIFIC INSTRUMENTS, INC.

support@specs.com
www.specs.com

BOOTH 905

MRS Corporate
Affiliate

Key Products: LEEM; OLED; MBE; XPS; STM; Atom Probe; SIMS; EELS; Auger

SPECS will present its new high performance UHV scientific instruments which include: VT-STM with extreme stability and fast scanning capability; LT-STM for atomic/molecular manipulation; MBE components and systems, RHEED, ECR sources; atom sources, e-beam evaporators, K-cells, effusion cells and its high resolution electron energy analyzer—PHOIBOS 100/150. SPECS, with over 15 years of experience in the field of ultra-high vacuum products, is a leading manufacturer and distributor of surface analysis and thin film deposition components and systems for STM, LT-STM, XPS, UPS, ISS, AES, SAM, SEM, LEED, EELS, ARUPS, ARXPS, PEEM, LEEM, SIMS and SNMS, MBE components, effusion cells, K-cells, RF-sources, plasma sources, accelerator components, beam lines for synchrotron radiation facilities, and monochromators for hard and soft x-rays.

SPI SUPPLIES

Division of Structure Probe, Inc.

spi3spi@2spi.com
www.2spi.com

BOOTH 1203

Key Products: Electron microscopy supplies and consumables; Sputter/carbon coaters; Plasma etchers and cleaners; Si₃N₄ membrane window grids.

SPI Supplies will be featuring its newest products including the OPC Osmium Plasma Coater for "zero grain size" coating, Plasma Prep™ X parallel plate (anisotropic) plasma etcher (for no undercutting), MACO® TEM film, and the Secador® automatically regenerating desiccant module for sample storage. Also on display will be the popular line of SPI Module™ SEM/EDS coaters and the Plasma Prep™ II plasma etcher. Visit www.2spi.com to learn more about these innovative new products or to place an order using the on-line shopping cart.

SPIRE CORPORATION

rdinfo@spirecorp.com
www.spirecorp.com

BOOTH 821

Key Products: Metal and Ceramic Coatings; Ion Beam Surface Modification Services; Nanotechnology

Spire Biomedical, Inc. is a leading provider of biotechnology surface engineering for improving the performance of implantable biomedical devices through its IonLink™ family of services. Spire Biomedical offers customized coatings and surface treatments to meet a variety of needs such as reduced friction, wear and

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abrasion, anti-microbial properties, thromboresistance, radiopacity, electrical conductivity, enhanced tissue growth, and a range of other performance characteristics. Orthopedic components, catheters, vascular grafts, and stents are examples of products being processed at Spire Biomedical. Spire Biomedical constantly strives to achieve technical advances and process innovation, and understands that customer satisfaction is the foundation of its success.

SPRINGER

orders-ny@springer-sbm.com
www.springeronline.com

BOOTH 219



Key Products: Publishing; Books; Journals

Enjoy 20% off the latest books from our numerous gold-standard series: *Materials Science; NanoScience & Technology; Solid-State Sciences; Surface Physics; Chemical Physics; Photonics, Optical Sciences, Advanced Microelectronics*, and more. Plus see: *The Springer Handbook of Condensed Matter and Materials Data*, the *Springer Handbook of Nanotechnology*, and the brand-new *Handbook of Materials Modeling*. Also take home FREE samples of renowned journals *Applied Physics A & B*, and more.

STAIB INSTRUMENTS, INC.

staib-us@staibinstruments.com
www.staibinstruments.com

BOOTH 509

Key Products: RHEED; Electron Guns; CMA Auger; PEEM; SEM; EBSD Filter

STAIB designs and manufactures innovative, high performance, reliable instruments for *in situ* material analysis and Multi-technique Surface Analysis Chambers, including: a full range of Electron Guns for analytical surface studies (flood, microfocus, general purpose, low energy, etc.); RHEED systems (new in CVD, PLD, PVD environments) to study structure and quality of thin films; CMA energy spectrometers (Auger, SAM, XPS, and UPS) for analytical surface studies; SEM using our micro-focus guns; Photo-Electron Emission Microscopes (PEEM) for dynamic studies of chemical distributions (video speeds with high time/space resolution); and X-ray Sources.

STREM CHEMICALS, INC.

info@strem.com
www.strem.com

BOOTH 519



Key Products: Chemicals; Nanomaterials; CVD Precursors

Strem Chemicals manufactures and markets a wide variety of metals, inorganics and organometallics for research and commercial scale production for the materials science community including a wide range of MOCVD precursors and nanomaterials (nanoclusters, nanocolloids, nanoparticles, nanopowders, nanomagnetic fluids). We also perform custom synthesis work and provide a variety of catalysts and ligands for organic synthesis, rare-earth and electronic grade chemicals for ultra high purity needs and ionic liquids. Ask for our catalog of over 4000 products.

SUPER CONDUCTOR MATERIALS, INC.

info@scm-inc.com
www.scm-inc.com

BOOTH 1022

Key Products: Sputtering Targets; Evaporation Materials; Crucibles; ITO; Tungsten/Titanium ZnO/Al₂O₃; Cobalt Iron; IZO

Serving the vacuum industry since the 1980s, SCM, Inc. uses inert hot pressing, vacuum hot pressing, and induction melting to produce targets. Sputtering targets and evaporation materials are available in various purities from 99.9% to 99.9999%. Ceramic materials are produced using an advanced hot pressing technique, which yields targets with densities approaching theoretical, much greater than other ordinary techniques. It also provides excellent homogeneity, which ensures repeatable use. Crucible inserts for all the major E-beam systems are available. For all your magnetic, optical, LCD, ferroelectric, and microelectronic material needs, please visit our website at www.scm-inc.com.

SURFACE

info@surface-tec.com
www.surface-tec.com

BOOTH 718

SURFACE was established in 1988 as a distributor for U.S. thin film technology products. SURFACE is divided into two divisions—nanometrology, based on advanced SPM technology and system design, and the production of materials science-related UHV systems. SURFACE was starting in 1994 with the development of its PLD technology and is now the leading company worldwide. The latest development is the PLD-Workstation, a very compact all-in-one system, including all necessary process components in one rack. This plug-n-play design is supported from the advanced SURFACE process control system. All of the SURFACE PLD systems include remote control, visual and verbal communication lines via the Internet. The vacuum chambers already include all necessary expansion flags for most common additional monitoring and process diagnostic tools. SURFACE also delivers complex PLD cluster tool systems as well as large area PLD systems.

SURFACE IMAGING SYSTEMS

info@surface-imaging.com
www.surface-imaging.com

BOOTH 733

Key Products: AFM; SPM; Inspection Tools

Surface Imaging Systems, Inc. manufactures atomic force microscopes and automated/integrated AFM inspection systems. Our unique detection principle allows us to integrate our AFM with more precise results than other manufacturers. Our ULTRAObjective is a very compact AFM/SPM that can be adapted to standard optical microscopes or other research/inspection tools. This combination allows you to first select a region of interest with your tool and then switch to our AFM/SPM head and investigate the selected region with nanometer resolution. You can choose from a wide variety of AFM/SPM modes, such as contact, non-contact, MFM, EFM, elasticity mode, friction mode, thermal conductivity, Kelvin probe microscopy, Q-control, force-distance curves, and STM. In addition, our ULTRAObjective is very convenient for use in liquids. We are exhibiting a fully functional system and will offer live measurements on your sample(s). Please contact us at info@surface-imaging.com for an appointment or product information.

SVT ASSOCIATES, INC.

svta@svta.com
www.svta.com

BOOTH 418



Key Products: Thin Film Deposition Equipment and Process Monitoring Systems

SVT Associates, Inc. offers a full range of thin film deposition equipment and process monitoring systems including MBE, CVD and PVD. Our systems are available with guaranteed material specifications for organic and compound semiconductors. We manufacture a variety of deposition components including RF plasma sources, electron beam evaporators, effusion cells, OLED sources and Ozone delivery system. We offer state-of-the-art process monitoring systems for *in situ* temperature, growth rate and flux measurements. Call for our Epi-Wafer service.

SYCON INSTRUMENTS, INC.

info@sycon.com
www.sycon.com

BOOTH 421

Key Products: Vacuum Process Control

Sycon Instruments, Inc. is a manufacturer of thin film deposition monitors and controllers utilizing the quartz crystal sensing techniques. These products include the STC-2002 deposition controller which can be expanded to 8 channels; the STM-100/MF Thickness Rate Monitor, and the STC-2000A deposition controller for the budget minded. The EBS-530 E-Beam Sweep Control for electron beam sweep control. The STM-1 monitor with integrated oscillator for use with Lab View on your PC. The SRT-422 E-Beam Source Indexer. The T-3000 Deposition Power Supply. The VSO-100 In-Vacuum sensor oscillator and a complete line of sensors, crystals and feedthroughs. All products available for quick delivery all over the world.

2005 MRS FALL EXHIBITORS

TAYLOR & FRANCIS GROUP LLC/CRC PRESS

orders@taylorandfrancis.com
www.taylorandfrancis.com

BOOTH 119

Key Products: Journals; Books; CD-ROM Products

Taylor & Francis is a premier publisher of technical references in the field of Materials Science, Polymers, Nanomaterials and Technology. This year we are pleased to launch thirty new professional and textbook publications including: *Physical Metallurgy*; *Advanced Mechanics of Materials and Elasticity*; *Handbook of Porous Media*; *Modern Ceramic Engineering*; *Selection of Engineering Materials and Adhesives* and the *Nano Materials Handbook*. Stop by our booth to view these titles, book discounts and free journal sample copies.

TCI AMERICA

sales@tciamerica.com
www.tciamerica.com

BOOTH 923

Key Products: Specialty Organic Chemicals; Glyco-Chemistry and Biology Compounds; Custom Synthesis

TCI America provides custom synthesis and contract research services for the pharmaceutical, cosmetic, electronic, hi-tech and biotechnology researcher. TCI announces its New Glyco-Chemistry & Biology Reagent line. Current catalog lists more than 18,000 high purity specialty organic chemicals in convenient packaging. Manufacturing facilities offer kilo to ton lot production utilizing many reaction capabilities. Modern facilities can provide cGMP manufacturing and are registered with the FDA. Visit our website and on-line catalog for information or ordering.

TECHNOLOGIES & DEVICES INTERNATIONAL, INC.

welcome@tdii.com
www.tdii.com

BOOTH 627

Key Products: GaN Substrates; AlN Substrates; AlGaIn Substrates

Technologies & Devices International, Inc. (TDI) is developing, fabricating and selling GaN, AlN and AlGaIn materials for advanced semiconductor devices. Available products include 2- and 4-inch low defect GaN/sapphire template substrates for blue LEDs, AlGaIn/sapphire substrates for UV LEDs, and 3-inch AlN/SiC semi insulating substrates for high power GaN-based HEMTs. 6-inch product prototypes and novel 2-inch diameter InN-on-sapphire templates have been demonstrated. These novel materials are fabricated by proprietary patented hydride vapor phase epitaxial (HVPE) technology.

TELEMARK

sales@tfi-telemark.com
www.tfi-telemark.com

BOOTH 605

Telemark manufactures evaporation components, including electron beam sources, e-beam power supplies, optical monitors, plasma chemistry monitors, water vapor cryotrap, and related accessories. Telemark also offers quartz crystal deposition controllers, spare parts, refrigerant gas charges, and field service for a wide range of vacuum equipment. An affiliated company, APT, offers automated wet chemical processing tools and wafer mapping systems.

THE ROYAL SOCIETY

www.pubs.royalsoc.ac.uk

BOOTH 126

Key Products: Scientific Journals

The Royal Society is the UK's national academy of science and is at the cutting edge of scientific progress. It supports many of the UK's top young scientists, engineers and technologists, influences science policy, and debates scientific issues. We publish seven international journals including three that will particularly appeal to materials scientists—*Proceedings A*, *Philosophical Transactions A*, and *Interface*. See our website at www.journals.royalsoc.ac.uk.

THERMIONICS VACUUM PRODUCTS

sales@thermionicscorp.com
www.thermionics.com

BOOTH 414

Key Products: Sample Handling; Thin Film Deposition Equipment; Valves

Manufactures vacuum components, systems and accessories for production and research applications including: our new line of compact manipulators; our new programmable sweep controller with DeviceNet; our HMS specialized leak detector; our RC series of 3kW e-Guns™; HC series e-Guns™ with dual filament capability for demanding production coating applications; PyraFlat™ rectangular flanges and waveguides; TriBond™ bi-metallic flanges and fittings; gate and poppet valves; sample handling and transfer systems; ion pumps; maTched™ thermocouple gauges; mechanical, electrical and fluid feedthroughs; and materials and surface science systems.

THERMO ELECTRON CORPORATION

analyze@thermo.com
www.thermo.com

BOOTH 514

Key Products: FTIR; Raman; X-ray Microanalysis

A world leader in high-tech instruments, Thermo Electron Corporation helps life science, laboratory, and industrial customers advance scientific knowledge, enable drug discovery, improve manufacturing processes, and protect people and the environment with instruments, scientific equipment and integrated software solutions. Products include sample preparation equipment, liquid handling and automation systems and analytical instruments for chromatography, mass spectrometry, molecular and elemental spectroscopy and microanalysis. These are integrated with informatics solutions and supported by professional and financial services.

THOMAS SWAN SCIENTIFIC EQUIPMENT LTD.

service@thomasswan.co.uk
www.thomasswan.co.uk

BOOTH 722

Thomas Swan Scientific Equipment (TSSE) is a leading manufacturer of vertical MOCVD equipment. The unique Close Coupled Showerhead (CCS) MOCVD reactors are available in 3, 6 and 19 x 2 in. wafer configurations for the manufacture of GaN, GaAs, InP and related materials. Suitable either for manufacturing use or research applications, our patented CCS technology offers ease of use, ease of control, cost effectiveness and is a process proven technology—growth demonstrations and guarantees are available.

TREK, INC.

sales@trekinc.com
www.trekinc.com

BOOTH 820

Key Products: High-Voltage Amplifiers; Electrostatic Voltmeters; Charge Decay Measurements

Trek, Inc. offers a wide range of High-Voltage Amplifiers and Electrostatic Voltmeters for materials research. High slew rates, accuracy and full four quadrant operation make Trek amplifiers ideal for research in microfluidics, piezoelectric driving and control, vibration damping, laser modulation, MEMS, material poling, electrorheological fluids, electroactive polymers, electrophoresis, and electrospinning. Our new InfiniTron™ Ultra-High Impedance Voltmeter allows contacting voltage measurement with virtually no charge transfer.

TRION TECHNOLOGY

trion@triontech.com
www.triontech.com

BOOTH 906

Key Products: Plasma Etch Tool; Plasma Deposition Tool; Asher/Stripper

Trion Technology manufactures reactive ion etch (RIE), inductively coupled plasma (ICP) etch, plasma enhanced chemical vapor deposition (PECVD), and physical vapor deposition (PVD) systems. These tools process up to 300 mm wafers,

wafer segments, packaged devices and small electronic parts. All systems incorporate cutting-edge technology and yet remain surprisingly affordable. Modular systems are designed for optimum reliability and flexibility, addressing a wide variety of processes for materials such as: silicon, quartz, GaAs, InP and GaN with proven applications for the MEMS (including DRIE), Photonic and Semiconductor industries. Complete process support, including recipes. In addition, Trion also offers foundry services for all the aforementioned industries.

TSL

A Subsidiary of EDAX Inc.

(See EDAX Inc.)

ULVAC TECHNOLOGIES, INC.

sales@ulvac.com

www.ulvac.com

BOOTH 324

See ad in this issue



Key Products: Thermoelectric Measuring Equipment; IR Furnaces; Vacuum Equipment

The ULVAC-RIKO division specializes in thermo-physical property measurement systems. Products include high temperature infrared gold image furnaces, a furnace hot-stage optical microscope, a programmable mini tabletop RTP furnace, thermal constants measuring equipment for evaluation of thermal conductivity, Seebeck coefficient and electrical resistance, thermocouple wire welders, and a photocatalysis evaluation checker. ULVAC-RIKO is a division of ULVAC, an international corporation that provides systems and components used in manufacturing and research applications requiring vacuum technology.

VARIAN, INC.

vtl.customer.service@varianinc.com

www.varianinc.com

BOOTH 304



Key Products: Vacuum Pumps; Vacuum Systems; Vacuum Components

Varian, Inc. Vacuum Technologies (VVT) is a world leader in providing total vacuum solutions. Product offerings include primary, high and ultra-high vacuum pumps, leak detectors, vacuum valves and gauging for all applications. VVT offers unique expertise in applications, support and system design to integrate these superior components into optimized vacuum solutions.

VAT, INC.

usa@vatvalve.com

www.vatvalve.com

BOOTH 613



Key Products: Vacuum Valves; Control Valves; Gate Valves

VAT is the worldwide leader in vacuum valve technology. VAT will have on display the following valves: gate, pendulum, isolation, butterfly, control, angle, all-metal. VAT sales engineers are available to assist you with your vacuum valve requirements in applications such as: CVD, coating, pump isolation, laser, high energy physics, semiconductor, load locks, beam lines, and many more.

VEECO INSTRUMENTS INC.

info@veeco.com

www.veeco.com

BOOTH 301



Key Products: Atomic Force Microscopy; Optical Surface Profiler; Stylus Profiler

Veeco is advancing nanoscience through the world's most accurate and repeatable metrology technologies. With proprietary expertise atomic force microscopy, our instruments have the world's largest install base and proven reliability. See our latest innovations, including new vacuum imaging capabilities, revolutionary new imaging modes, cantilever sensor arrays, and exclusive nanomanipulation software and systems. In addition, Veeco, the world's leading supplier of MBE equipment, will display its Group V sources and its MBE systems for materials research.

VIRGINIA SEMICONDUCTOR, INC.

sales@virginiasemi.com

www.virginiasemi.com

BOOTH 703

Key Products: Silicon Wafers; Silicon Ingots; SOI Wafers

Virginia Semiconductor, Inc. is a leading manufacturer of prime single crystal silicon substrates. Offering production quantities of 2- to 6-in. diameter silicon and small quantities of 1- to 6-in. diameter customer silicon substrates. We also offer custom 2- to 6-in. SOI substrates.

VTI CORPORATION

vtisales@vticorp.com

www.vticorp.com

BOOTH 920

Key Products: Dynamic Vapor Sorption Analyzers; Permeation Analyzers

VTI Corporation is committed to the development, design, and manufacture of innovative, quality instruments in the field of adsorption studies. Their name has been synonymous with cutting edge sorption technology since the 1980's, when they introduced the first dynamic or continuous adsorption instrumentation. Today their instrumentation is used by commercial, institutional and government research facilities around the world. VTI maintains a contract laboratory performing adsorption studies for pharmaceutical, petrochemical, industrial gas and other research clients.

WAFER WORLD INC.

sales@waferworld.com

www.waferworld.com

BOOTH 1021



Manufacturer of semiconductor materials in Silicon (Fz, Cz, Low TTV, Thick Slabs, Oxide, MEMS Thin, EPI, SOI); Germanium; III-V Compounds (GaAs, InP, GaP, GaSb, GaN, InSb, InAs) in reclaim, test, prime and two-sided polished surfaces; Optical Materials (Quartz, Ge, ZnSe, ZnS, Sapphire); Fiber Optical Materials (LiNbO₃, LiTaO₃, CaCO₃, TiO₂, YVO₄, YAG, Gd₃Ga₅O₁₂); and Superconductor Materials (MgO, LSAT, LaAlO₃, SrTiO₃, SrLaAlO₄, KTaO₃, MgAl₂O₄). Many stock and custom wafers available. Clean room packaging, equipment, consulting available. On Line Shopping Cart 24-hours a day!

WATERVLIT INNOVATION CENTER

(part of the NY♥ Nanotech Pavilion)

www.ceg.org/wic

BOOTH 1029

The Watervliet Innovation Center is a state-of-the-art business incubation program focused on accelerating the growth of emerging homeland defense and security technology companies. A new, focused program of the Center for Economic Growth, the WIC is located in a modern facility at the Watervliet Arsenal near Albany, New York. The Watervliet Innovation Center supports existing and start-up technology companies developing advanced materials, nanotechnology, and information technology for cutting edge homeland defense and security applications.

R.D. WEBB COMPANY

rdwebb@alum.mit.edu

www.rdwebb.com

BOOTH 506

Manufacturer of the world's only air cooled 2200°C vacuum furnace—the RED DEVIL. Now also offering turbomolecular pumped high vacuum furnaces RED TURBO and RED MINI for vacuum brazing and annealing applications, including active metal brazing of diamonds and ceramics. The inexpensive RED DEVIL family of furnaces are used worldwide at leading materials research laboratories as well as being suitable for production of small components such as diamond cutting tools, electronic components, and medical devices.

2005 MRS FALL EXHIBITORS

JOHN WILEY & SONS, INC.
custserv@wiley.com
www.wiley.com

Key Products: Publications; Books; Journals

Wiley-VCH publishes for the scientific community, scientific societies and students worldwide. New books include *The Handbook of Advanced Materials: Enabling New Designs*, *Dictionary of Engineering Materials*, and the *Fundamentals of Materials Science and Engineering: An Integrated Approach, 2nd Edition*. Wiley is also the publisher of the journal, *Advanced Materials* and is excited to introduce the latest journal on nanotechnology, *Small*.

WITEC INSTRUMENTS CORP.
info@witec-instruments.com
www.witec-instruments.com

Key Products: CRM 200; Alpha SNOM; Mercury 100 AFM

Manufacturer of modular designed, high resolution optical and scanning probe microscopy solutions for scientific and industrial applications (Scanning Near-field Optical Microscopes, Confocal Scanning Microscopes, Raman-CSM, Atomic Force Microscopes, Pulsed Force Mode AFM). WITec offers the Near-field Scanning Optical Microscope AlphaSNOM using unique cantilever technology, the Confocal Raman Microscope CRM 200 designed for highest sensitivity and resolution and the Mercury 100 AFM with the integrated Digital Pulsed Force Mode for imaging of material properties on the nanometer scale.

J.A. WOOLLAM COMPANY, INC.
sales@jawoollam.com
www.jawoollam.com

Key Products: Spectroscopic Ellipsometers; Thin Film Measurement Services

Spectroscopic ellipsometers for non-destructive materials characterization: multi-layer thickness, optical constants, growth and etch rates, composition and more. Offering the widest spectral ranges available: vacuum ultraviolet to the far infrared (142 nm to 33 microns) to meet all your metrology needs.

BOOTH 218



X-RAY OPTICAL SYSTEMS, INC.
info@xos.com
www.xos.com

Key Products: X-Ray Optics; Beam Solutions

XOS manufactures x-ray optics and beam systems. The company's design, manufacture and characterization capabilities of polycapillary, monicapillary and doubly curved crystal optics enables a range of focusing and collimating lens options. The product line of polychromatic and monochromatic X-Beams provides an optimized integration of x-ray optics and sources. Applications include texture, stress and phase ID, as well as film thickness and composition measurements. XOS optics are also used in fluorescence collection in EDS and WDS micro beam analysis.

BOOTH 926

BOOTH 616



XEI SCIENTIFIC, INC.
info@evactron.com
www.evactron.com

Key Products: De-contaminators; Anti-contaminators; Plasma Cleaners

XEI was founded in 1991 to make and sell anticontamination systems for the Electron Microscope community. The EVACTRON Anticontaminator, an RF plasma activated cleaning system, was introduced in 1999 to provide a faster and more complete cleaning process. XEI Scientific solves hydrocarbon contamination problems in Electron Microscopes and other high vacuum systems by RF plasma (glow discharge) cleaning with EVACTRON® plasma activated oxidation using air as the oxygen source. The Evactron® anticontamination system produces oxygen radicals for a fast, chemically reactive, oil and hydrocarbon removal process that is safe for most surfaces. Over 200 Evactron Anticontaminators have been installed worldwide.

BOOTH 1202

ZYGO CORPORATION
inquire@zygo.com
www.zygo.com

Zygo Corporation is a worldwide developer and supplier of high-performance metrology instruments and systems, high-precision optics, optical assemblies, and automation for the semiconductor and industrial markets providing productivity and yield improvement solutions for manufacturers of precision components.

BOOTH 322

2005
Boston, MA
FALL MEETING
MRS

EXHIBIT OPPORTUNITIES FOR START-UP COMPANIES

2005 MRS Fall Exhibit

November 29-December 1, 2005
Hynes Convention Center
Boston, MA

The MRS Entrepreneur Program will afford you an excellent opportunity to introduce new products or technologies to materials science/engineering professionals who walk the exhibit floor seeking technical solutions to their challenges. A perfect way for start-up companies on a tight budget to gain visibility, this program offers reduced booth rental costs to companies who meet the following criteria:

- Less than 3 years old
- Annual sales less than \$1M
- Fewer than 10 employees

To take advantage of the Entrepreneur Program or for more information on how MRS can market your company in the world of materials science, contact Mary E. Kaufold at 724-779-8312 or kaufold@mrs.org.

www.mrs.org/mo/

MRS **2005 FALL**
Career Center

Need a Job... Need Someone to Fill a Job?

Discover the many valuable services available to you at the 2005 MRS Fall Meeting Career Center. Whether you are conducting a job search or recruiting potential employees, the Career Center is the place to be.

Location & Hours
Hynes Convention Center • Exhibit Hall (Level 2)

Monday, November 28 1:00 pm – 4:00 pm
(Registration only)

Tuesday, November 29 12:00 noon – 6:00 pm

Wednesday, November 30 10:00 am – 6:00 pm

Thursday, December 1 10:00 am – 1:30 pm

For additional information, contact Lorri Smiley at 724-779-3004, ext. 543 or smiley@mrs.org.

MRS Launches the Entrepreneurship Challenge

www.mrs.org/entrepreneur

On September 1, 2005, the Materials Research Society launched the Entrepreneurship Challenge—a competition designed to help MRS members develop the entrepreneurial skills that get ideas out of the laboratory and directly into the marketplace.

Through the Entrepreneurship Challenge, scientists and business students will form “virtual teams” to develop a 12-slide PowerPoint presentation that will present a start-up technology to a panel of venture capitalist judges. The grand prize is \$3,000—and the top three teams will additionally receive meeting registration plus travel funding of up to \$3,000 each to present their entries at the 2006 MRS Spring

Meeting in San Francisco.

The competition is virtual, in that team members can be located anywhere in the world and are expected to collaborate by telephone and the Internet. The final presentations are mailed on CD-ROM to MRS headquarters, where they are loaded onto a Web site for viewing by judges, who are also geographically dispersed. This approach allows networking across and between schools, laboratories, even continents.


The judges for this competition are experienced venture capitalists, members of the National Venture Capital Association, and come from firms having at least \$50 million under active management. They will score the submitted pre-

sentations according to fairly typical venture capitalist investment criteria.

To learn more about how to enter the competition, visit www.mrs.org and go to the MRS Entrepreneurship Challenge link.

The deadline for team registration is **November 1, 2005**.

All entries must be postmarked by **January 23, 2006**.

The Entrepreneurship Challenge is sponsored by Adams Capital Management; The Dow Chemical Company, Corporate Venture Capital; CMEA Ventures; Materials Research Institute, The Pennsylvania State University; and Tessera. To become a sponsor, contact MRS at entrepreneurs@mrs.org. 


MRS Launches Improved Web Site to Better Serve Members

www.mrs.org

With the launch of a new Web site in October, the Materials Research Society is giving members a new online experience. The new site at www.mrs.org offers improved search and navigation tools with an enhanced design and new features.

The fresh new look and interface are designed to increase members' productivity, as MRS members now have quick and accurate access to the information they need, when they need it. With the new site, users can shop quickly and easily for MRS

products through improved e-commerce functionality, and they can register easily for meetings and workshops as well. They can “personalize” their access to Web content in order to retrieve the information that is most useful to them. Searches by full text or keywords can be accomplished across the site or within a focused area (e.g., *Journal of Materials Research*). And members have access to new areas focusing on career services (e.g., research funding and jobs).

At the same time, the MRS Web site continues to serve as a direct portal to the materials world. Members can turn to the Web site for the latest news in materials research, upcoming conferences, and resources, including access to the materials Web site databases. The database contains links to materials companies and industries, corporate and private research laboratories, educational resources, publications, and more. 



Coming in October...

a new online experience from the Materials Research Society at

► **Improved search and navigation**

quick and accurate access to the information you need, when you need it

► **Enhanced design**

fresh new look and interface increases your productivity

► **NEW Features**

- *dynamic new online store makes your shopping experience quick and easy*
- *personalization—receive, save and store content most useful to you*
- *exciting new advertising opportunities*

► **Materials Gateway**

your direct portal to the materials world

www.mrs.org

*a community of
scientific possibility*