Dear friends,

I am very pleased to communicate with you again through Structure, the newsletter of MIT’s Department of Materials Science and Engineering (DMSE). This issue brings news of recent developments in DMSE and of the accomplishments of our faculty, staff, and students. As the Head of DMSE, I have had the satisfaction of interacting with many of you as we have reshaped the intellectual and physical landscape of the Department over the past six years. With our major initiatives now coming to a successful conclusion, I feel ready to transition to the next phase with a stronger focus on some new research initiatives and exciting new global research alliances. I am pleased to note that Professor Ned Thomas will succeed me as Head of DMSE effective January 2006. Ned and I are working closely together to ensure a smooth transition to the next leadership team of the Department.

The major new initiatives we launched over the past several years are now bearing fruit. The physical infrastructure of DMSE is significantly improved with thriving new laboratories for multi-disciplinary research and for undergraduate teaching in one of the most visible locations of the Institute: the Infinite Corridor. A number of additional laboratory facilities for research into new and emerging research areas have been built in the past four years in conjunction with the recruitment of highly talented young faculty colleagues. The final phase of the major space renovation project involving a “space swap” with the Physics Department is well underway. The newly renovated DMSE Headquarters and the new Chipman Room are expected to be ready for occupation by the end of 2006.

Subra Suresh, Head of the Department of Materials Science and Engineering and Ford Professor of Engineering.
Approximately one-third of the current DMSE faculty members were recruited in the last six years, with our newest faculty colleague, Stephanie Reich, joining us a few months ago. Our faculty and students continue to excel in their educational and research activities. A detailed list of their recent accomplishments, honors, and awards can be found in later sections of this newsletter. Through the hard work, talent, and dedication of our colleagues, DMSE continues to have a major impact in materials education and research on a global scale. This strong leadership role has also been recognized by US News and World Report which, in its most recent ranking of materials science and engineering departments, placed MIT's DMSE at the very top in both undergraduate and graduate rankings.

The final phase of DMSE's new undergraduate curriculum was introduced in Fall 2005. This curriculum has strengthened and invigorated our core educational activities. The success of the new curriculum is clearly evident from the enthusiastic response of our undergraduate students to the new subjects and laboratories, and from the significant increase in our undergraduate enrollment.

Since the publication of the last issue of Structure in early 2004, DMSE has suffered several significant losses. Professor Emeritus Nick Grant passed away on May 1, 2004. Nick’s outstanding contributions in the field of physical metallurgy of high-temperature alloys were legendary. He played major leadership roles in his technical community through his membership in numerous national and international committees, and served as Director of MIT’s Center for Materials Science and Engineering from 1968 to 1977. During his many decades of service as a DMSE faculty member, he supervised the theses of 93 doctoral students, 51 Master’s students and 74 undergraduate students. Noteworthy among his many awards and honors was his election to the National Academy of Engineering.

Institute Professor Emeritus Morris Cohen, who was a key figure in reshaping DMSE and the field of materials science and engineering during much of the twentieth century, passed away in May 2005. The Department held a memorial service in November at MIT, in conjunction with the Materials Research Society Fall Meeting in Boston, to recognize Morris’s numerous accomplishments. An obituary and a write-up on this memorial service can be found in this newsletter. Plans are underway to launch a campaign to establish a graduate fellowship in Morris’ name.

DMSE was saddened by the death of Fred Wilson, a longtime employee until his retirement in 2002, and we also mourned the untimely deaths of two recent alumni, Benoit Bellier, S.M. 2001, and Lalit Varma, M.Eng., 2003. More details can be found in this newsletter.

I would like to take this opportunity to thank all my colleagues, students, alumni, and friends, within and outside MIT, who have helped and supported me during my tenure as the Head of DMSE over the past six years. A particular note of gratitude goes to Professor Sam Allen for his extraordinary service as Executive Officer of DMSE, to Robin Elices for her outstanding leadership role as Administrative Officer, and to Kenneth Greene for all his hard work as my administrative assistant in DMSE headquarters. It has been an enormous privilege to lead this truly outstanding department. I look forward to continued interactions with you in the years to come, and I wish Ned all the best in his new position.

With warmest wishes,

Subra Suresh

With warmest wishes,

Subra Suresh

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NEW DEPARTMENT HEAD
Edwin L. “Ned” Thomas, the Morris Cohen Professor of Materials Science and Engineering, has been appointed head of the Department, effective January 16, 2006.

“Ned is a noted materials scientist and engineer, with specific expertise in polymer physics and engineering, phase transformations and microstructure, and electron microscopy and X-ray scattering,” said Thomas L. Magnanti, dean of the School of Engineering, who announced the appointment.

Thomas “has made important contributions to understanding the structure and properties of block copolymers and to developing quantitative methods for characterizing the microstructure of polymeric materials,” and has also “developed both new experimental methods and theoretical models to guide valid interpretation of the vast range of microstructures in crystalline, liquid crystalline, and non-crystalline polymers,” Magnanti said.

Thomas has held several administrative positions at MIT. He is the founding director of the Institute for Soldier Nanotechnologies (ISN) and previously served as associate head for DMSE and as director of the Program in Polymer Science and Technology. He came to MIT from the University of Massachusetts, where he founded and served as co-director of the Institute for Interface Science and was head of the Department of Polymer Science and Engineering.

Thomas received the B.S. from the University of Massachusetts in 1969 and the Ph.D. from Cornell University in 1974.

NEW FACULTY
Stephanie Reich joined DMSE in October, 2005, as the Thomas B. King Assistant Professor of Materials Science and Engineering. She received the B.S. (1993), the M.S. (1998), and the Ph.D. (2001) from Technische Universität in Berlin, all in Physics. She was a post-doc at the Institute de Ciencia de Materials de Barcelona, a research fellow at Newnham College in Cambridge, UK, and, most recently, an Oppenheimer Fellow at the University of Cambridge. Her work on carbon nanotubes and carbon-based materials is recognized internationally, as is her book, Carbon Nanotubes: Basic Concepts and Physical Properties.

Professor Reich’s research interests are in nanoscience and nanotechnology. She aims at understanding how materials change when making them smaller and smaller and how to use this for tailoring materials to our needs. To achieve this goal she uses optical spectroscopy such as photoluminescence and Raman scattering and first-principles calculations. Optical spectroscopy allows not only to study the optical properties of nanomaterials, but also to measure vibrations and hardness and to investigate how electrical currents and heat flow in nanostructures. The experimental work is complemented by modeling and predicting materials behavior with computer simulations. Current projects concentrate on carbon and other nanotubes as well as semiconductor nanowires. These one-dimensional nanosystems can be used, for example, in nanoelectronics and as linear and nonlinear optoical devices such as color-sensitive single-photon detectors.

FACULTY PROMOTIONS
In July 2004, Caroline Ross was promoted to full professor and Christine Ortiz was promoted to associate professor without tenure. Angela Belcher was awarded tenure in 2004 and was promoted to full professor in July 2005.

In July 2005, Yoel Fink, Nicola Marzari and Chris Schuh were promoted to associate professor without tenure.

RECENT APPOINTMENTS
Angela Belcher was named the Germeshausen Professor of Materials Science and Engineering and Biological Engineering.

Chris Schuh was appointed to the Danae and Vasilios Salapatas Assistant Professor of Metallurgy, for a period of three years, beginning July, 2005. The chair is named after Vasilios Salapatas (Ph.D. 1966) and his wife Danae. Salapatas is a member of the DMSE Visiting Committee.

Krystyn Van Vliet will hold the position of Lord Foundation Assistant Professor of Materials Science and Engineering for a period of three years.
We are honored this year that one of our senior faculty, Prof. Lorna J. Gibson, is the chair of the Institute faculty. Along with her well known book, Cellular Solids: Structure and Properties, which now has a second edition, and her active research on the biomechanics of cellular solids, Prof. Gibson has been an energetic voice in the Institute and an advocate for diversity.

RECOGNITION
In May 2005, Infinite Mile Awards were presented to Esther Greaves Estwick, Personnel Officer in the Administrative Services Office (ASO), and to Peter Houk, Director of the Glass Lab. Through the Infinite Mile Awards, the School of Engineering publicly recognizes meritorious performance. Awardees are nominated by co-workers and selected by a committee comprised, in part, of past winners.

Kenneth E. Greene, Jr., of DMSE Headquarters, and Emminia Piccinonno, formerly of ASO, both received Infinite Mile Awards in 2004.

The MIT Rewards and Recognition Program selected Mindy Baughman, former DMSE employee, as a recipient of a 2004/2005 MIT Excellence Award for her participation on the Artists Behind the Desk Committee.

Carol A. Roberts, Administrative Assistant in the Center for Materials Research in Archaeology and Ethnology, joined MIT’s Quarter Century Club in 2004.

GEM 4 LAUNCHED
The Global Enterprise for Micro-Mechanics and Molecular Medicine (GEM 4) was launched on Oct. 12 at a ceremony at MIT. This innovative collaboration fosters research and global alliances at the intersections of engineering, science, and nanotechnology to medical and public health issues. Prof. Subra Suresh is the GEM 4 director; participants include scientists from MIT, Harvard University, the National University of Singapore, Institut Pasteur in Paris, the Max-Planck Institute, the University of Illinois, Georgia Institute of Technology, Caltech, Johns Hopkins University and Chulabhorn Research Institute in Thailand.

GEM 4 brings together researchers and professionals in major institutions across the globe with distinctly different, but complementary, expertise and facilities to address significant problems at the intersections of select topics of engineering, life sciences, medicine, and public health.

In addition, GEM 4 creates new models for interactions across scientific disciplinary boundaries whereby problems spanning the range of fundamental science to clinical studies and public health can be addressed on a global scale through strategic international partnerships.

Through initial focus areas in cell and molecular biomechanics, and environmental health, in the context of select human diseases, GEM 4 will create a global forum for the definition and exploration of grand challenges and scientific studies, for the cross-fertilization of ideas among engineers, life scientists and medical professionals, and for the development of novel educational tools.

GEM 4 is sponsoring a summer school on “Cell and Molecular Mechanics in Biomedicine” to be held at MIT, August 7–18, 2006. The summer school will have a special focus on infectious diseases.

NEW PUBLICATIONS
Several members of the DMSE community have recently authored books. Prof. Suresh’s Thin Film Materials: Stress, Defect Formation and Surface Evolution, co-authored with L.B. Freund of Brown University, deals with the theory and applications of thin films. The book will also be released in a Chinese translation in 2006, under the sponsorship of the Chinese Academy of Sciences, Shenyang.

Kinetics of Materials, by Robert W. Balluffi, Samuel M. Allen, and W. Craig Carter, grew out of classroom notes for 3.21, Kinetic Processes of Materials. In draft form, this text has been used by hundreds of Course III graduate students.

A Very Dangerous Woman, by Jim Livingston and his wife Sherry Penney of U.Mass. Boston, is a biography of his great-grandmother, Martha Coffin Wright. The book’s title is derived from a neighbor’s description of this suffragist and abolitionist.
On the Monday following Commencement 2005, the final stage of a long series of renovations began.

The “Physics Space Swap” has been discussed and anticipated for several years—ultimately, DMSE Headquarters, the Academic Office, and the Chipman Room will be relocated to the first floor of Building 6 along the Eastman Court.

To make space for the renovations and new construction, all floors on the north end Building 6 and all of Buildings 4A and 6A will be demolished. A new building constructed inside the court yard will be used by the Physics Department and will be surrounded by an atrium.

DMSE renovations that have already been completed and put into use include the NanoLab and the Undergraduate Teaching Lab on the first floor of the Infinite Corridor and laboratory spaces used by the Van Vliet, Irvine, and Schuh groups.

All work will be completed by January 2007. During construction, every attempt will be made to minimize disruption to permit research and everyday work to continue. DMSE headquarters and some offices have been temporarily relocated to Building 35.

Floor plans of renovations. Infinite Corridor in Building 8 at left, New DMSE headquarters and other spaces are marked in blue on Floor 1.
Academic Initiatives

UNDERGRADUATE CURRICULUM UPDATE

Now in its third year, the revised Course III undergraduate curriculum is garnering praise from students, faculty, and the MIT administration. It was also recognized by US News and World Report, which ranked the program first in the nation. DMSE undergraduate enrollment is now at its highest point in the department's history and Prof. Caroline Ross was presented with the Irwin Sizer Award in recognition of her efforts to survey student needs and to create an academic program that addresses and meets the changing field of materials science.

The junior year curriculum was initiated in Fall 2004 and its subjects include 3.032, Mechanical Properties of Materials; 3.034, Organic and Biomaterials Chemistry; 3.042, Materials Project Laboratory; and 3.044 Materials Processing. Many subjects are taught in the Undergraduate Teaching Laboratory on the first floor of the Infinite Corridor in Building 8.

Students setting up solar cells in Killian Court as part of an assignment in 3.042, Materials Project Laboratory.

ECUADORIAN-STYLE RAFT SAILS THE CHARLES

Four MIT students found their inner Huckleberry Finns during the summer of 2004, inspired by a comment in a lecture on how metallurgy was introduced to Mexico 1,300 years ago. In the lecture, Dorothy Hosler, professor of archeology and ancient technology, noted that early efforts at making a raft to travel from Ecuador to Mexico had failed. Taking this nugget of history as a 21st century engineering challenge, four students—Leslie Dewan, a junior in nuclear engineering; Daniel Cohen, a junior in physics; Danny Shen, a senior in electrical engineering and computer science, and Ryan Bavetta, a sophomore in mechanical engineering—built their own raft. For guidance in their month-long project, the students used documents written by 15th and 16th century Italian and Spanish explorers as well as 20th century sources including Thor Heyerdahl, author of Kon Tiki, and Jenny Estrada, author of La Balsa, about early Ecuadorian navigation. The boat made its maiden voyage August 2, 2004, on the Charles River, with Hosler as guest of honor. With its three moveable centerboards, four energetic paddlers and one owl-faced sail, the raft handled the river’s shifting currents easily. The four students hope to build a second raft, using authentic materials of balsa and cocobolo wood, and start a trip in Ecuador.

The story was covered in Tech Talk, the Boston Globe, and Science magazine.

RAF at sail on the Charles.

GRADUATE CURRICULUM UPDATE

Our graduate program continues to lead the field. Again, US News and World Report named it the top materials program in the country. Our enrollment is strong and we are committed to maintaining our excellent academic and research experience so that we deserve the national and international reputation we currently hold.
The Graduate Materials Council (GMC) presented the 2004 Excellence in Graduate Advising Award to Prof. Sam Allen and Dr. Bob O’Handley. The 2004 GMC Excellence in Teaching Award was presented to Prof. Francesco Stellacci. In 2005, Prof. Chris Schuh received the Excellence in Graduate Advising Award and Sam Allen the Excellence in Teaching Award.

With his co-authors, Prof. Allen received the award for the best oral presentation at the 2005 Solid Freeform Fabrication Symposium for their paper, “Improving Accuracy of Powder Sintering-based SFF Processes by Metal Deposition from Nanoparticle Dispersion.”

One of the 2004 MacArthur Fellowship recipients was Prof. Angela Belcher. The five-year award for $500,000 is commonly known as a “genius grant.” Prof. Belcher is recognized for her pioneering work in “developing new techniques for manipulating systems that straddle the boundary of organic and inorganic chemistry at the molecular scale.” The MacArthur Foundation has awarded 682 Fellowships since 1981.

Prof. Belcher received a four-star recognition award for “significant contributions to Army Transformation.” She was also named one of the Nanotech Power Elite by Forbes/Wolfe Nanotech Report.

The Mass High Tech newsletter recognized Prof. Belcher as one of the “Women to Watch.” This annual list spotlights innovators who will “shape the future” and serve as role models for girls interested in science and engineering.

Fortune magazine named Prof. Belcher to their 2005 list of “10 People to Watch.” This list recognizes innovators who will have a direct impact on our lives.

At the 2005 Annual Meeting of the American Ceramic Society (ACerS), Prof. Craig Carter received the Richard M. Fulrath Award. The Fulrath Award recognizes outstanding academic and industrial ceramic engineers/scientists and the awardees participate in the Fulrath Symposium at the Annual Meeting and then present a paper at the Annual Meeting of the Ceramic Society of Japan.

The Electrochemical Society named Prof. Gerd Ceder one of the 2004 Battery Division Research Award Recipients. The award for “outstanding contributions to the science and technology of primary and secondary cells and batteries and fuel cells” was presented at the Society’s Fall Meeting.

Prof. Tom Eagar and his former student Patricio Mendez were awarded the Charles H. Jennings Memorial Medal by the American Welding Society.

Prof. Yoel Fink received the NASA Award for Initiatives in Research, a $15,000 prize awarded annually in a field supporting information technology (condensed matter/materials science in 2004) to recognize innovative young scientists and to encourage research likely to lead toward new capabilities for human benefit. He was chosen “for his pioneering contributions and ingenuity in the creative design and development of photonic materials and devices.”

Prof. Mert Flemings received an honorary doctorate at the Swiss Federal Institute of Technology in Lausanne in recognition of his role as a pioneer and his exceptional scientific contributions in the field of solidification and foundry.

The American Society of Materials International (ASM International) presented Prof. Flemings with the Albert Easton White Distinguished Teacher Award. The award, established in 1960, recognizes unusually long and devoted service in teaching as well as significant accomplishments in materials science and engineering, and an unusual ability to inspire and impart enthusiasm to students.

Prof. Flemings received the Gold Medal of the Japan Institute of Metals in 2005. This award recognizes outstanding achievements in advancing science and technology of metallurgy and materials science.
At the March 2006 TMS Meeting, Prof. Flemings will be appointed an Honorary Member of The American Institute of Mining, Metallurgical, and Petroleum Engineers (AIME).

Prof. Darrell Irvine was one of Technology Review’s TR100 for 2004; the TR100 recognizes the top young innovators in technology in a given year. Prof. Irvine studies immunology and addresses drug delivery techniques through development of an artificial tissue structure that can act as a scaffold environment similar to the lymph node.

Prof. Jim Livingston was recognized as an Outstanding Freshman Advisor; he has led a Freshman Advising Seminar on “Attraction and Repulsion: The Magic of Magnets” for twelve years.

In 2004, Prof. Caroline Ross received the Irwin Sizer Award for the Most Significant Improvement in MIT Education. As Chair of the Department’s Undergraduate Committee, Prof. Ross has had a key role in refining the Course 3 curriculum.

Prof. Ross was elected fellow of the American Physical Society (APS) for her “innovative research into the magnetic properties of thin film and nanoscale structures, and for the development of novel lithographic and self-assembly methods for nanostructure fabrication.”

In 2004, Prof. Don Sadoway received the Everett More Baker Memorial Award for Excellence in Undergraduate Teaching in recognition of his exceptional interest and ability in the instruction of undergraduates. As the instructor for 3.091, Introduction to Solid State Chemistry, he is known as one of the most dynamic instructors at MIT and counts over half of the first-year class as his students each year.

Prof. Chris Schuh received a 2004 Office of Naval Research Young Investigators Award.

Prof. Schuh also received the Presidential Early Career Award in Science and Engineering (PECASE) at a ceremony at the White House in fall 2004. He was nominated by the Department of Defense.

Prof. Francesco Stellacci was one of the 2005 TR35, Technology Review’s list of 35 top technology innovators under 35 (until 2005, the list was called the TR100).

Prof. Stellacci has received one of the 2005 Packard Fellowships for Science and Engineering. The David and Lucile Packard Foundation established these awards in 1988 to allow promising professors to pursue science and engineering research early in their careers with few funding restrictions and limited paperwork requirements.

Prof. Subra Suresh was elected to the American Academy of Arts and Sciences (AAAS) in 2004. AAAS Fellows and Foreign Honorary Members are world-renowned leaders in science, engineering, medicine, business, the arts, and public affairs.

Prof. Suresh will receive the Acta Materialia Gold Medal at the MRS 2006 Fall Meeting in Boston. He was nominated by two different international materials societies for his “pioneering contributions to metallurgy, materials science and engineering, engineering mechanics, fracture mechanics, fatigue of materials, thin films, and cell and molecular biomechanics.”

At the ASM International annual meeting, Prof. Suresh was awarded the 2004 Albert Sauveur Achievement Award. The award recognizes his “outstanding contributions to the understanding of deformation behavior at different length scales and mechanics of materials and demonstrated leadership in materials education.” The Sauveur Award is named for an early alumnus of our department.

Prof. Suresh received a Humboldt Research Award, conferred by the Alexander von Humboldt Foundation in recognition of lifetime achievements in science. Awardees are invited to carry out research projects of their own choice with colleagues in Germany.

In Dec. 2004, Prof. Suresh was elected to the Third World Academy of Sciences. He was recognized for his “broad, innovative and pioneering contributions to the area of mechanical properties of materials” which “has led to the understanding of these properties from the atomistic to the continuum levels.” He was also recently elected an Honorary Fellow of the Indian Academy of Sciences.

Prof. Harry Tuller received an honorary doctorate (Docteur Honoris Causa) in May 2004 from the Universite de Provence, Marseille, France for life-long achievements in the field of Electroceramics. Prof. Tuller, at his investiture attended by members of the humanities and the sciences, presented a lecture entitled “Materials Science and the Environment: A Career Theme.”


**UNDERGRADUATE STUDENT AWARDS**

**Anna Bershteyn’s Solar Water Disinfectant Device team** were winners in the 2005 IDEAS competition. **Julie Goss** was recognized with the Star Volunteer Award for her three years of working on the IDEAS competition.

**Catarina Bjelkengren**, a DMSE senior, was one of the participants and organizers of the 8th annual MIT $50K GSW Conference held in Abu Dhabi, UAE last year. As a result of good established connections with the Higher Colleges of Technology (HCT) in Abu Dhabi, she was invited by Dr. Tayeb A. Kamali, CEO and Managing Director of the HCT, to introduce the theme of thinking at the opening ceremony of the Festival of Thinkers—a conference highlighting technological developments facing society today, attended by Nobel Prize Laureates and world leaders, and by 300 professors and students from the region.

**Kasetta Coleman** received the 2004 Ronald E. McNair Scholarship Award for her combination of strong academic performance and considerable contribution to the minority community. **Nduka Enemchukwu** received the 2005 Ronald E. McNair Scholarship.

**Lesley Frame** received the 2004 DMSE Outstanding Senior Thesis Award for “Investigations at Tal-I Iblis: Evidence for Copper Smelting During the Chalcolithic Period.” Her thesis advisor was Prof. Heather Lechtman. **Yuki Hori** received the 2004 Best Internship Report Award for “Contamination-Resistant Coatings in the Paper Machine Industry.” Her internship advisor was Prof. Ned Thomas.

**Christopher Ng** received the 2005 Outstanding Senior Thesis award for “Determination of Special Boundary Coordination at Quadruple Nodes using EBSD.” His thesis advisor was Christopher Schuh. The 2005 award for Best Internship Report was presented to **Julie Goss** for “Measuring the Wettability of ePTFE Tubing using Dynamic Contact Angle Analysis (DCA).” Her internship advisor was Adam Powell.

**Yuki Horı, Ana Ramos** and **Michelle Seitz** were named Outstanding Students in DMSE Class of 2004. **Elizabeth Hager** was named Outstanding Student: DMSE Class of 2005. **Joanna Natsios** and **David Schoen** were named Outstanding Juniors in 2004. **Anna Bershteyn** was named the 2005 Outstanding Junior. **David Gray** was named Outstanding Sophomore in 2004.

In 2004, **Yuki Horı** and **Michelle Seitz** received certificates recognizing their perfect 5.0 cumulative undergraduate grade-point average. In 2005, certificates were presented to **Elizabeth Hager**, **Joanna Natsios**, and **Peter Stone**.

In Feb. 2004, the “Surreptiles,” a team including **Byron Hsu**, **Forrest Liau**, **David Lin**, and **Han Xu**, were second-place winners of an ISN-sponsored competition for students to design technology to benefit soldiers; they developed a glove that translates hand signals into voice commands by using sensors and radios.

**Jina Kim** received a 2004 Service Award for renewing the MIT chapter of Best Buddies.

**Tanya Cheng** received Honorable Mention for the S. Klein Prize for Scientific and Technical Writing in 2004. **Jiji Gu** received honorable mention in the 2005 Boit Manuscript Prize—essay. **Anita Kris** received the 2004 Robert A. Boit Writing Prize—Short Story, First Prize. In 2005, she received honorable mention in the same category. **Elizabeth Zellner** was awarded second place in the 2005 Writing Science Fiction Prize.

**Joanna Natsios** and **David Schoen** were named Outstanding Juniors in 2004. **Anna Bershteyn** was named the 2005 Outstanding Junior. **David Gray** was named Outstanding Sophomore in 2004. The 2005 Outstanding Sophomore was **Irene Tobias**.

In both 2004 and 2005, **Kevin McComber** was recognized with the Award for Outstanding Service to the DMSE Community for his active and innovative role as president of SUMS (Society of Undergraduate Materials Scientists).
Ana Ramos was granted a Fulbright U.S. Advanced Student award to spend 2004–05 in France. She completed a “Master of Science and Technology” program in Materials Science and Nano-objects.

Michelle Seitz received the 2004 Henry Ford II Award. This award is made to a senior engineering student with a cumulative average of 5.0 at the end of the 7th term and exceptional potential for leadership in engineering and society.

Grady Snyder and other members of the MIT Swim Team qualified to compete in the NCAA Division III Swimming and Diving Championships held in Holland, MI in March 2005. The MIT team was ranked tenth in the nation.

G R A D U A T E  S T U D E N T  A W A R D S

Among the medal recipients at the 2005 Fall MRS Meeting in Boston were four MIT graduate students: Shin Chou of Chemistry (silver medal), Alicia Jackson of DMSE (silver medal), Kisuk Kang of DMSE (gold medal), and John Mills of DMSE (gold medal). Jennifer Vandiver received a Poster Award. Nominated for Poster Awards were Lin Han and Benjamin Bruet.

Four MIT graduate students were recognized as medal winners at the 2004 MRS Fall Meeting in Boston: Ion Bita (silver medal) of DMSE, Delphine Dean of EECS (gold medal), Jifeng Liu of DMSE (gold medal), and Daniel Solis of Chemistry (silver medal). John Mills and his co-authors received a “Ribbon Award” for their paper, “Continuous Force-displacement Relationships for the Human Red Blood Cell at Different Erythrocytic Developmental Stages of Plasmodium falciparum Malaria Parasite,” presented at the Dec. 2004 MRS meeting.

Ming Tang received the Diamond Award for ACerS Graduate Excellence in Materials Science (GEMS). Established by the Basic Science Division, this award recognizes students for their academic and scientific accomplishments, and for research they present at the conference.

Manish Deopura’s work on the “perfect mirror” was exhibited in the Talente 2004 competition. This project was carried out under the guidance of Prof. Yoel Fink and Prof. Chris Schuh.

Kristin Brodie Domike, 2003, M.Eng. 2004, and her TulipMed team were finalists in the 2004 Venture Bowl, sponsored by the National Institute for Entrepreneurship. The finalists competed for funding for their proposed business and the title of Forbes Magazine’s Future Capitalist. TulipMed’s product is a novel endotracheal tube (named because the product looks like one tulip inverted on another). Ms. Domike is now a Ph.D. candidate in Physics at the University of Cambridge.

Lara Abbaschian and George Whitfield received the 2004 John Wulff Award for Excellence in Teaching. The 2005 Wulff Award was presented to Wanida Pongsaksawad.

The 2005 Elsevier Outstanding Graduate Student Prize was awarded to Kathleen Huffman.

Karlene Maskaly and Agnieska Stachowiak were selected to attend GE’s Technology and Innovation Day in July 2004; this event is a networking event for top female Ph.D. students in the northeastern United States.

Aaron Raphel won the 2004 Charles “Harrison” Smith Award from the Engineering Systems Division.

Catherine Tweedie received the 2004 Pewter Bowl Award, presented to the female senior student who has shown the highest qualities of inspiration and leadership in contributing to women’s athletics.

Ms. Tweedie also received the Betsy Schumacker Award for excellence in athletic competition and placed 8th in the nation at the NCAA track and field championships. She is a recipient of NDSEG and NSF graduate fellowships.
ALUMNI NEWS


In 2004, Richard P. Simmons ’53 was awarded MIT's Bronze Beaver, the Alumni Association's highest award, given to volunteers for outstanding service to the Institute.

“The Hillert Symposium—Thermodynamics and Kinetics of Migrating Interfaces in Steels and Complex Alloys” was held in Stockholm in Dec. 2004, to celebrate the 80th birthday of Mats Hillert, Sc.D. 1956, professor emeritus at the Royal Institute of Technology. Among those contributing to the publication commemorating this event was Dr. John Cahn, a former DMSE faculty member who is now a Senior Fellow at NIST. Dr. Hillert's thesis advisor was Prof. Morris Cohen.

Karl Reid, ’84, M.S. ’85, was honored by the National Society of Black Engineers who named him the Minority Engineering Programs Director of the Year. Reid, assistant to the chancellor and associate dean for undergraduate education, was a recipient of a MIT Excellence Award this year in recognition of his work with minority outreach.

Miguel Marioni, Ph.D. 2003, was invited to present at the 2004 Deshpande Innovation while he was a post-doc in Dr. O'Handley's group. Dr. Marioni is now employed by the Swiss Federal Research Lab.

Mireille Treuil Clapp, Ph.D. ’79, donated a piece of her artwork to the department. “Sand Casts of Time” were installed in the Chipman Room in March 2005. The pieces are welded and made of steel, stainless steel, and velvet. Dr. Clapp has worked as a sculptor for ten years and has used this process for the past three years. Her artwork has been exhibited in sculpture shows at many museums and galleries, and is held in private collections in the US and in Europe.

OBITUARIES

Morris Cohen, Institute Professor Emeritus, passed away May 27 at his home in Swampscott, Mass. Born in Chelsea, Mass., Morris' long association with MIT began as a freshman in the fall of 1929. He earned the S.B. in Metallurgy in 1933 and the Sc.D. in Metallurgy in 1936 and was appointed an Instructor in the Department of Metallurgy that year. He became full professor in 1946, was named Ford Professor of Metallurgy in 1962, and was recognized across MIT by promotion to Institute Professor in 1975.

Morris' doctoral thesis on “Aging Phenomena in Silver-Copper Alloys” was carried out under the noted metal physicist, Prof. John T. Norton. His early work focused on improving the strength and toughness of metals and was soon connected to the war effort. During World War II, as Associate Director of the Manhattan Project at MIT, Morris helped develop processes to convert uranium powder into solid pieces of uranium metal. These castings were used for the famous “pile” built in Chicago. Cohen’s work on forging and rolling of this newly investigated metal contributed to the programs at the Los Alamos National Laboratory, the Oak Ridge facilities in Tennessee, and the Hanford site in Washington. During the war, Morris also helped develop non-magnetic steel that could be used as armor plate on the bridge of ships and in locations near compasses in other military transport craft. Related to his war work was an investigation to understand the dimensional stability of metals after manufacture, as a function of storage time and temperature, of significant importance to the interchangeability and close tolerances required of ordnance equipment.

After the war, Morris worked with his students to understand how heat treatment hardens and toughens tool and structural steels. He focused on investigating the fundamentals of the Martensitic transformation in steel and how this phase transformation improves steel's mechanical properties. Self diffusion and interdiffusion studies led to studies of
microstructural changes during tempering of iron alloys. From the 1950s to the 1970s, this work created a much more basic knowledge of how to strengthen steel and made practical today’s ultra-high-strength steels. Morris’ many contributions to the mechanisms and kinetics of the martensite transformation, tempering phenomena, strengthening mechanisms, age hardening of alloys, strain induced transformations, and rapid solidification of alloys were major milestones in the emerging field of materials science.

Cohen served as ASM President and was awarded ASM’s Howe Medal in 1945 and 1949. In addition to his leadership in metals research, Morris acted as a major leader in the new field of materials science and engineering, serving as the co-chair of the National Academy COSMAT Study (Committee on the Survey of Materials Science and Engineering), “Materials and Man’s Needs.” This report, known as the “Cohen Report,” influenced national policy on materials education and research.

Morris’ extensive national service included advisory roles to the National Academy of Sciences, National Science Foundation, NASA, and the National Academy of Engineering. He published some 300 research papers and supervised more than 150 graduate and postdoctoral students. In recognition of his fundamental work on metals and their industrial applications, Morris received the National Medal of Science from President Carter in 1977 and, in 1987, Morris won the Kyoto Prize in Advanced Technology.

Morris’ scientific vision and dedication to the field of materials science and engineering, along with his warm and gracious nature, will be deeply missed. He is survived by his son Joel, many grandchildren, great-grandchildren, and a large extended family.

In November, over 150 friends, students, colleagues, and members of the Cohen family gathered to celebrate the life and contributions of this remarkable man. Prof. Ned Thomas hosted the event, which included Joel Cohen’s reminiscences of family life in and around MIT. Rabbi Jonas Goldberg of Temple Sinai in Marblehead spoke of Prof. Cohen’s deep commitment to his religious community. Other tributes were provided by Prof. Mert Flemings, Andrew Kulin, and Greg Olson (through a letter read by his daughter Elise). It was especially touching that Marge Meyer, Prof. Cohen’s assistant for more than four decades, flew in from Florida that morning and spoke of the dedication he felt to his students, so many of whom were in attendance.

Frederick D. Wilson. We were also saddened by the death on September 9, 2005, of Fred Wilson, a DMSE employee from 1959 until his retirement in 2002. Fred joined MIT as a technician and became Project Machinist in the Ceramics Processing Laboratory in 1971. In 1987, he was promoted to a sponsored research staff position as Laboratory Supervisor of the Ceramics and Glass Laboratories. Fred also assisted DMSE in space management and in implementation of department safety examinations in the years preceding his retirement.

Benoit Bellier, S.M. 2001, died on November 21, 2004. Benoit was a Plant Manager at Ibiden DPF France SAS in Courtenay, France. His father writes, “Benoit was the eldest of our four children, and our family will never forget his courage, human qualities and cleverness. To face this terrible event, we have been lucky to be supported by many friends, including Benoit’s friends who met him at Ecole Polytechnique in Paris or at MIT. Benoit enjoyed very much his stay in Boston in your institute, and my wife, myself and our youngest daughter Sophie will never forget the wonderful days we had in Boston attending the graduate ceremony. Please accept our thanks for what you have done for Benoit during this period.”

Lalit Varma, M.Eng. 2003, drowned in July 2004 while traveling in Malaysia. Lalit wrote his M.Eng. thesis, “Controlled Release Microchip,” with Prof. Michael Cima and was an active member of the DMSE community and of Ashdown
House during his MIT education. He held a B.Tech. in Metallurgical Engineering from the Indian Institute of Technology (1998) and an M.Eng. in Mechanical Engineering from Nanyang Technological University (2001). At the time of his death, Lalit was employed in Singapore.

RETIREMENT

John B. VanderSande, Cecil and Ida Green Distinguished Professor, retired in June 2005 after a thirty-year career at the Institute.

John received the B.S. in mechanical engineering from Stevens Institute of Technology in 1966, and the Ph.D. in materials science from Northwestern University in 1970. He was a post-doctoral Fulbright Scholar with P.B. Hirsch at the University of Oxford, Department of Metallurgy.

John’s scholarly activities have focused on the observation of the structure of materials, particularly metals and ceramics, by various forms of electron microscopy, as well as on the relationship between the processing of a material and its performance. As an example of the latter, modifying microstructure through rapid solidification processing has been a favorite topic of John’s. Following the discovery of so-called high-temperature superconducting oxides, John directed some of his attention to the study of these fascinating materials. Out of this branch of his research came inventions that helped establish the basis for technology around which American Superconductor Corporation was founded. In the area of the environment, safety, and health John has studied carbonaceous material produced by combustion processes in an effort to correlate particle structure and composition with the particle source.

In addition to his fine teaching, research, and committee work in DMSE, John made major contributions to the Institute. From June 1992 to January 1999, John served as Associate Dean of the School of Engineering, during which time on two occasions he became Acting Dean. He played a seminal role in the formation of the Singapore-MIT Alliance, MIT’s distance education collaboration with the National University of Singapore, the Nanyang Technological University, and the government in Singapore. He was the first Executive Director of the Cambridge-MIT Institute (CMI), a major alliance between the University of Cambridge and MIT funded by the British government and industry for the purpose of improving productivity and entrepreneurship in the UK.

Among his awards and honors is the 1994 Columbus Quincentennial Award from the Commonwealth of Massachusetts for his co-founding of American Superconductor which earned him recognition for his “spirit of discovery” and for his “breakthrough work in developing high-temperature superconductors.” Emblematic of John’s love of MIT and its students, he and co-recipient Dr. Gregory Yurek gave the $5,000 prize along with $5,000 in American Superconductor stock to the Undergraduate Research Opportunities Program (UROP) to promote the development of innovative applications of high-temperature superconductor wires. For his work as the first Executive Director of CMI he was named Extraordinary Fellow, Churchill College, University of Cambridge (2000).

In retirement John can look forward to having the time to enjoy his many off-campus interests which include swimming, cycling, classical music, numismatics, antique American furniture, and Colonial New England architecture.
MIT and DMSE thank our generous alumni/ae for their support of MIT and its programs during the fiscal years ending in June 2004 and 2005.
formally established. We are grateful for Hanyang’s support and the Undergraduate Teaching Laboratory, was dedicated and the faculty. During the visit, the Hanyang University–MIT Department of Materials Science and Engineering Educational and Outreach Program was established. We are grateful for Hanyang’s support and look forward to many years of friendship and research interactions.

**HANYANG UNIVERSITY**

On March 16, 2004, Dr. Chong Yang Kim, President of Hanyang University, visited MIT and the Department of Materials Science and Engineering. Dr. Kim was accompanied by five members of the Hanyang University administration and faculty. During the visit, the Hanyang Undergraduate Teaching Laboratory, located in the DMSE Undergraduate Teaching Laboratory, was dedicated and the Hanyang University–MIT Department of Materials Science and Engineering Educational and Outreach Program was formally established. We are grateful for Hanyang’s support and look forward to many years of friendship and research interactions.

**Sharon M. Gardner ’79**
**Terry J. Garino G ’87**
**Linda M. Garverick G ’87**
**Stefan J. Garvin G ’50**
**Charles J. Gasdaska G ’86**
**Lisa S. Gassaway ’88**
**John J. Gassner, Jr. G ’85**
**Robert M. Gates G ’89**
**Frank W. Gayle ’85**
**Whitney B. Gaynor 2004**
**H. Lee Gearhart ’76**
**Dale R. Geiger G ’72**
**Lewis Gelbert ’36**
**Stanley H. Gelles G ’57**
**Richard L. Gentilman G ’73**
**Jean C. Chang ’82**
**David M. Gibbons 2001**
**Thomas W. Gibbs G ’64**
**Brett S. Giles G ’88**
**Martin J. Gilkes ’97**
**Ralph G. Gilliland G ’68**
**Emilio Giraldez Paredes G ’86**
**Dannellia B. Gladden G ’91**
**Emilio Giraldez Paredes G ’86**
**Mark J. Dudziak ’88**
**Elizabeth J. D’Alto ’53**
**Stephen J. D’Alto ’53**
**Robert J. Dulsky ’61**
**Barbara Dapalla ’58**
**Robert D. Dapalla ’58**
**Nancy J. Dapalla ’58**
**Alfred C. Dapalla G ’61**
**Thomas D. Dapalla G ’61**
**James D. Dapalla G ’61**
**Julia D. Dapalla G ’61**
**Gregory D. Dapalla G ’61**
**Mary D. Dapalla G ’61**
**Walter D. Dapalla G ’61**
**William D. Dapalla G ’61**
**Donald D. Dapalla G ’61**
**Ralph M. Dapalla G ’61**
**Joseph D. Dapalla G ’61**
**David D. Dapalla G ’61**
**Richard D. Dapalla G ’61**

The year of graduation refers to the date the most recent Course 3 degree was conferred. Graduate degrees are indicated with a "G."
The Electrochemical Society (ECS) has begun a campaign to endow an ECS Summer Fellowship in honor of Herbert H. Uhlig. This fellowship will provide $5,000 of support to an exceptional graduate student during the summer months in the pursuit of work in a field of interest to ECS. ECS has awarded over 250 summer fellowships since 1930.

Herbert H. Uhlig was tenacious and was always willing to help others. Over the years, Professor Uhlig taught, inspired, and graduated more than 100 M.S. students, over 20 Ph.D. students, and an equal number of post-graduate fellows. He and his students published 175 papers.

Spearheading the Fellowship campaign are Aziz Asphahani, Ronald Latanision (emeritus, HM 2002), Florian Manisfeld, and Winston Revie ’72 Ph.D., and his wife Greta. ECS hopes to award the first Fellowship in Spring 2006.

Please contact Troy Miller at troy.miller@electrochem.org with questions about this campaign or to make a donation.

Martin L. Green ’78
Robert M. Green ’53
Susan Gertzis Greenberg ’86
Barry N. Greene ’66
Richard B. Greenwalt ’51
Abbie Sue C. Gregg ’74
Karen K. Greig ’96
M anohar S. Grewal G ’72
William A. Griffith G ’50
Vernon Griffiths G ’55
Michael R. Groleau ’90
Allen W. Grove ’90
Jacob D. Gubbay ’56
John J. Gullotti ’78
Cynthia G. Gumbert ’91
M ehmet N. Gungor G ’86
Honglin Guo G ’98
Amita Gupta ’91
Julie Gupta G ’92
Monica L. Gupta ’94
Joseph Gurland G ’51
Elizabeth A. Hager 2005
John R. Hager G ’69
John S. Haggerty G ’66
Henry Hahn ’51
Ernest L. Hall G ’77
Mary E. Hamilton G ’97
Thomas A. Hamilton G ’56
Evan J. Hammerman ’80
Helen N. Han G ’94
Young C. Han G ’88
Erika Hanley-Onken ’95
William S. Hannan, Jr. G ’47
Rodney E. Hanneman G ’64
Steven S. Hansen G ’78
Marvin B. Hopp G ’56
Robert A. Hard G ’57
Anne B. Hardy G ’88
Diane L. Harper G ’82
James M. Harris G ’69
M. Lance Harris ’85
Ronald F. Harris ’53
Susan E. Hartfield-Wunsch G ’88
Hans S. Hartmann G ’64
William L. Hartrick ’54
Glen M. Hartzler G ’66
Owen G. Haselton ’59
Frank R. Hatch ’35
Christine S. Hau-Riege G 2000
Stefan Peter Hau-Riege G 2000
Roy D. Haworth ’39
Any K. Hawrylchak ’98
George T. Haymaker, Jr. ’59
Francois B. Haymann G ’68
Andy Hegedus ’79
Herman R. Heideklang G ’89
Adam S. Helfant ’85
Benjamin Hellweg G 2000
Robert A.A. Hentschel G ’36
Michael V. Herasimchuk ’39
Francis B. Herlihy ’42
Edward Hernandez ’95
Hamlet Hering III G ’83
Laurence C. Hicks G ’33
Nelson C. Hicks ’60
Richard J. Higgins ’60
Lloyd H. Hihara G ’89
Gregory J. Hildeman G ’78
David C. Hill G ’70
Joseph T. Hillman ’82
Charles D. Himmelblau G ’75
Ann S. Hirahara G ’95
Donald R. Hixson G ’74
Kay C. Ho ’87
Lan H. Huong G ’96
Diane Hodges Popp G ’95
Harald Hoegh G 2001
Walton W. Hofmann ’34
Alfred F. Hofstatter ’52
Ronald M. Hollander ’74
Kenneth D. Holmes ’55
Roger P. Holstrom G ’80
Yuki Horii 2004
William F. Horsford, Jr. G ’59
Isako Hoshino G ’97
Nicole F. Hou 2004
Charles R. Houska G ’57
Simone Peterson Hruda G ’92
John I. Hsia ’53
Amy Chuan-Yi Hsiao ’96
Peter Yaw-Ming Hsieh G ’99
Chwannah Hsiung 2004
Hao Hu 2004
Helen J. Huang 2001
Terry N. Huang 2003
Edward E. Hucker G ’54
Nancy M. Huelsmann ’82
Gordon Hunter G ’84
George F. Hurley G ’65
J. Rowland Huss G ’90
John R. Hutchins III G ’59
Margaret B. Hvatum G ’78
Julia J. Hwang ’94
Jennifer A. Hyman ’87
Jeri A. Ikeda G ’92
Tadashi Imada G ’97
Henry Inouye G ’52
Emi Ishida ’88
F. Sam Jabara ’66
Ann Jacob ’89
Jeffrey E. Jacob G ’87
Scott K. Jacobsmeyer ’92
Paul D. Jacobson ’60
Donald Jaffe G ’83
Arun Jain G ’81
Bor Z. Jang G ’82
John A. Jensen, Jr. G ’71
Mark A. Jhon 2001
Jimmy Y. Jia G 2004
Eva Jiran G ’90
Carl J. Johns G ’85
Eric C. Johnson G ’87
Francis Johnson G ’99
Stanley T. Johnson ’36
Timothy V. Johnson G ’87
Walter E. Johnson G ’51
William R. Johnson ’42
Douglas C. Johnston G ’84
Tamala R. Jonas G ’93
Christine K. Jones ’95
Eric M. Jones G ’87
Francis Johnson G ’99
Sandra K. Joung G ’96
Bertrand G. Journel G ’86
Kenneth G. Jow G 2003
Janet L. Jozwiak ’82
Andreas J. Judas ’89
Debra R. Judelson ’73
Soyoung Jung 2000
Debra L. Kaiser G ’85
Sumner H. Kalin ’38
Karsten August Kallevig ’99

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Professor Uhlig had great wisdom and knowledge and was always willing to share this with students and his colleagues in industry, government and academia. He was a man of integrity who worked hard, was tenacious and was always willing to help others.

— Robert Baboian
In memory of our dear friend Morris Cohen, DMSE will launch a campaign to establish a graduate student fellowship. Such fellowships allow students to concentrate on education and to broaden their research horizons, thus enabling them to make a more informed choice about their thesis topic. The Department guarantees support for all first-year graduate students, though that support must take the form of Teaching or Research Assistantships in some cases. More information about the Cohen Fellowship will be available in the coming year.
On Friday and Saturday, April 21 and 22, 2006, the MIT Alumni Association will host a Graduate Alumni Convocation and Reunion on the MIT campus. The event will reach out to all MIT graduate alumni (those who went to grad school at MIT) worldwide. Well over 300 attendees are expected at this important weekend event, which will bring together graduate alumni and members of the MIT community for a celebration and exploration of the many ways in which MIT and its alumni impact the world as leaders and innovators.

The Convocation and Reunion will begin on Friday with events in the academic departments, centers, and activity areas and a special student/alumni reception. On Saturday, President Susan Hockfield and Dean for Graduate Students, Isaac Colbert, will make remarks, followed by a panel of professors and students discussing their interdisciplinary research. The keynote address will take place during lunch, the afternoon breakout sessions will explore alumni leadership in a variety of sectors, and the weekend will conclude with a closing reception. For additional details, please visit the web site for the event at: http://alum.mit.edu/gacr.

All alumni attending reunions or commencement exercises are invited to join us at the annual DMSE commencement luncheon. This event has traditionally been a wonderful time for graduating students and their families to celebrate with DMSE faculty, staff, and current students. In recent years, alumni attending their reunions have stopped by to catch up with old friends and meet the latest members of the materials science community. More details will be available later.