Winter 2009

Materials Science & Engineering

Roberts Hall Review

UNIVERSITY OF WASHINGTON
COLLEGE of ENGINEERING
A Community of Innovators

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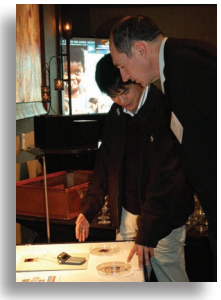

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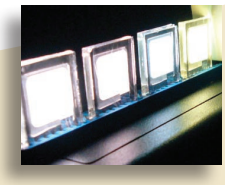

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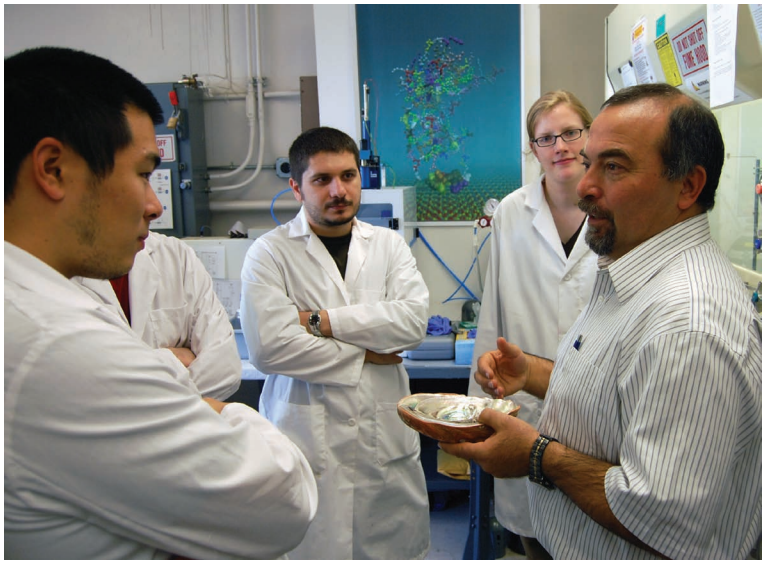
From mother of pearl to mother of invention



Professor Mehmet Sarikaya (right), explains how a red abalone mollusk produces mother of pearl, one of the strongest laminated materials in nature and an inspiration to engineers in the emerging field of molecular biomimetics.

A sea shell on a roadside vendor's table caught Mehmet Sarikaya's eye during a family trip through the Olympic Peninsula more than 20 years ago.

The former home of a red abalone mollusk from the California coast, the shell was an unusual find near Washington waters. Here, abalone shells tend to be green. Sarikaya bought his roadside find for $20 and took it home for a closer look.

Sarikaya knew preparing a sample of the shell would not be easy. The high protein content and water trapped inside made the shell sensitive to the radiation that electron microscopes generate to capture detailed imagery.

See BIOMIMETICS, page 5

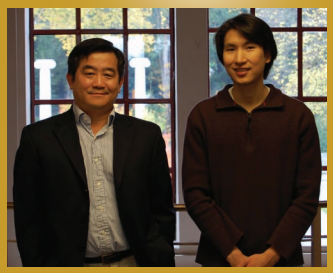
Intel and MSE collaborate on organic photovoltaics project

Intel Research Seattle and three MSE professors are collaborating on a project to improve the efficiency and stability of organic photovoltaics (OPVs), a promising technology that may one day help meet the world's growing demand for energy.

Professors Alex Jen, Guozhong Cao and Christine Luscombe are contributing their expertise in materials design and fabrication. Other partners include the University of California, Los Angeles and Zheijiang University in China.

The goal of the project is to develop hybrid organic/inorganic solar cells that convert 10 percent of the sunlight they receive into electricity and last for seven years.

Jen said reaching these targets would help make it more cost-effective for manufacturers to produce OPVs at larger scales. "If we can make OPV technology more efficient and stable, the technology will become marketable," he said.



Alex Jen (left), MSE chair, and Benjie Limketkai, Intel's principal investigator, are on a team trying to improve the efficiency and stability of organic photovoltaics.

While silicon solar cells can convert more than 20 percent of the sunlight they receive into electricity, they are expensive to produce. OPVs would be less expensive to produce, but have only recently reached efficiency levels of 6 percent.

See OPVs, page 4

Alex Jen

Message from the Chair

MSE had the highest median research funding in the College of Engineering in 2007-2008.

Welcome to the Winter 2009 issue of *Roberts Hall Review*. As the department looks forward to another successful year of research, I'm pleased to let you know that our faculty members achieved the highest median research funding among all departments in the College of Engineering in 2007–2008. This funding enables us to develop next-generation technology in a variety of fields, from Miqin Zhang's research on nanoscience in medicine to Mehmet Sarikaya's research on molecular biomimetics to Lucien Brush's exploration of metallic foams. Guozhong Cao, Christine Luscombe and I are collaborating with Intel Research Seattle on an organic photovoltaics project. The department looks forward to another productive year of research discoveries and sharing our findings in the classroom.

The world's growing demand for clean, renewable energy will drive many of our future efforts. The proposed Center for Low-cost Energy from Advanced Materials (CLEAN) is gaining support and MSE will be a key player. UW President Mark Emmert, Provost Phyllis M. Wise and the deans of the College of Engineering and College of Arts and Sciences have endorsed the center. MSE looks forward to seeing the Pacific Northwest become a major hub of research on clean energy solutions.

Our advisory board recently met to discuss the state of the department and our future needs. A subcommittee led by Jim Williams, Tom Delimitros and Tom Stoebe has formed to address one of the department's most pressing needs, upgrading our undergraduate laboratory facilities. We are fortunate to have input from leaders in many sectors of the economy and their insight is a valuable resource as we look ahead.

Center for Low-cost Energy from Advanced Nanomaterials (CLEAN) gains support

Following the community's enthusiastic response to the "Nanophotonics for Breakfast" series earlier this year, the steering committee that organized the series has launched a major regional energy initiative based on the UW's considerable strengths in organic and hybrid photonics and nanomaterials.

More than two dozen faculty members from several UW departments, including MSE, are involved in the proposed Center for Low-cost Energy from Advanced Nanomaterials (CLEAN).

The center will focus on clean energy technologies such as organic solar cells, organic solid state lighting, photocatalysis to use solar energy to split water to create hydrogen fuels, improved battery technologies, and novel organic-silicon hybrid electro-optic devices to reduce energy usage in computers and telecommunications.

UW President Mark Emmert, Provost Phyllis M. Wise and the deans of the College of Engineering and College of Arts and Sciences have endorsed the proposed center.

"Clean energy solutions will have a profound impact on nearly every aspect of our lives, including global health, transportation, communication, computing, lighting, national security, and our economy," said Rad Roberts, an intellectual property manager for the College of Arts and Sciences who is on the steering committee. "Meeting the world's energy needs in a clean and cost-effective manner may be the greatest challenge of our generation."

Angus Yip (center), MSE doctoral student, demonstrates a calculator powered by an organic solar cell at the Oct. 22 CLEAN forum.

Breakthrough technologies that address this challenge are emerging in Washington, including several at the UW in nanomaterials and photonics.

Roberts said the main goal of the steering committee is to help position the Pacific Northwest as a leading energy research center and create an industry cluster focused on energy technologies.

The broad outline of the CLEAN initiative was presented in a forum at the annual Greater Seattle Chamber of Commerce Leadership Conference in October.

Fifty members of the Chamber attended the CLEAN forum and participated in a lively discussion about the project. Many of the remaining 250 Chamber members were able to talk with UW CLEAN representatives and see working demonstrations of early-stage solar cell and telecommunications devices.

The next step in the CLEAN initiative is to expand the effort to include representatives from the Pacific Northwest National Laboratories, local companies, and other institutions.

The expanded team will work on building a roadmap for the initiative and rallying endorsements and financial support. They also will continue to strengthen and coordinate research efforts within the UW and across institutional boundaries, streamline the pathway for commercialization, and work to develop ways to help start-up companies identify the capital, financial and technical resources necessary to succeed.

"With a little luck and a lot of hard work, the CLEAN initiative will speed the delivery of compelling renewable energy solutions to the public and spur economic activity in the Pacific Northwest around development and commercialization of these technologies," Roberts said.

Bull's eye on clean, renewable energy for developing world

Tricia Bull wanted to get into something new called "nanotechnology" during her senior year of high school in Ohio in 2000, but she didn't know where to start.

So Bull started at the top; she e-mailed Richard Smalley, winner of the 1996 Nobel Prize for Chemistry for discovering fullerenes, and asked him what to do.

"He said study materials science and I blindly obliged," Bull said. "I had no idea what I'd be getting into."

Now an MSE doctoral student, Bull has her eye on bringing cheap, renewable energy to the developing world. The late Smalley's nanometer-sized fullerenes are a key component in her research on organic photovoltaics (OPVs).

Bull, fellow MSE doctoral student Brad Macleod and eight students from other U.S. universities visited Kanpur, India in December to study OPVs in an intensive two-week program called the International Winter School for Graduate Students (iWSG). The iWSG progam is organized by the National Nanotechnology Infrastructure Network (NNIN) and IIT Kanpur, a premier research and teaching institution in India.

After Bull absorbed a full semester of courses in one week, she went on a five-day field trip to participate in a hands-on project related to energy. Visit the MSE Web site at http://depts.washington.edu/mse for an update on her field project.

"Solar energy has been plagued by its high cost. If we can lower the financial barriers, there will be more incentive to expand solar projects."

~ Tricia Bull, MSE doctoral student

Bull believes OPVs have the potential to lower the social, economic and political barriers to establishing clean, renewable energy in places like India. OPVs are cheaper to produce than traditional, silicon-based solar cells, but still far less efficient. Bull aims to change that.

Bull's doctoral work under Christine Luscombe, an MSE assistant professor, is focused on designing more efficient, affordable organic solar cells.

"Solar energy has been plagued by its high cost," Bull said. "Legislation to help U.S. consumers afford solar panels has been very short-term and unreliable, so investment is difficult. If we can lower the financial barriers, there will be more incentive to expand solar projects."

Bull, who earned her bachelor's degree in materials science and engineering from The Ohio State University in 2004, heard about the iWSG program when an unexpected e-mail landed in her inbox in the fall.

"I gasped because the program is exactly what I've been dreaming of," Bull said. "It was also an opportunity to travel to a truly amazing country in the midst of global economic expansion. And I've never had a chance to install the very technology I work on."

Luscombe *(see the article on page 6)*, who was invited to India to teach at iWSG, wrote a letter of recommendation that helped Bull get into the competitive international program.

"It isn't often that you meet a student who has the intelligence, vision and passion to bring her research out of the laboratory," Luscombe said.

Congratulations to students and faculty who won department awards in 2008

- Conor Keenan and Adrian Tayne won William E. Quist awards for outstanding performance as seniors.
- Brent Apgar won the Richard L. Norris Award for outstanding performance as a senior.
- Andre Gillian and Michael Rossol won James I. Mueller Scholarship Awards for outstanding leadership and academic performance as juniors.
- Sam Schleh won the Stephen P. Harris Memorial Award for most improved academic achievement as a senior based on improved grade point average over five quarters.
- Dirk DeGroot and Nik Hrabe won ASM International Scholarship Awards for outstanding leadership and academic performance by a junior (DeGroot) and graduate student (Hrabe).
- Richard Schofield and Shane Boyd are co-winners of the Graduate Mentor of the Year Award. Undergraduates selected Schofield and Boyd for their education and guidance outside the classroom.
- Schofield won the Teaching Assistant of the Year Award as voted on by juniors.
- Jack Aubin won the Teaching Assistant of the Year Award as voted on by seniors.
- Lucien Brush won the Teaching Faculty of the Year Award as voted on by juniors.
- Brian Flinn won the Teaching Faculty of the Year Award as voted on by seniors.

Brush, partner receive NSF grant to study metallic foams

Lucien Brush, MSE associate professor, is a principal investigator on a collaborative research project funded by the National Science Foundation (NSF) to understand the behavior of metallic foams.

The project is titled "Dynamics and Stability of Metallic Foams: Network Modeling." Stephen H. Davis, the Walter P. Murphy Professor of Applied Mathematics at Northwestern University, is Brush's partner on the project.

Foams consist of a large volume of isolated gas bubbles surrounded by interconnected strands of flowing liquid, and they are continuously evolving. A major goal of the research is to build a macroscale network model from the details of microscale and mesoscale flow and interface dynamics, and to be able to describe the evolution of a foam consisting of many crowded bubbles, and in the future, the solidification of a foam. The research serves as a prelude to the study of the freezing of foams resulting in engineered structures.

Brush and Davis will focus on metallic foams, which are promising in applications that require strong, lightweight materials.

However, metallic foams are often difficult to process by freezing. Through their modeling, Brush and Davis believe they will be able to address this and other issues.

Metallic foams are promising materials for a variety of applications. They could be used in aircraft, ships and other vehicles where weight considerations are directly related to fuel consumption. Solid foams absorb substantial energy upon stressing and their large surface areas are useful in catalysis. Closed-cell solid foams possess unusually high buoyancy, making them desirable at sea.

The project duration is from August 2008 through August 2011. The NSF has awarded Brush $235,000 of the total $600,000 award.

Bordia elected to American Ceramics Society's Board of Directors

Raj Bordia, MSE professor, has been elected to the American Ceramic Society's (ACerS) Board of Directors. Bordia began his two-year term in October.

"I am honored to be selected to this important position by my peers," Bordia said. "ACerS has been my primary professional association since I was a graduate student. I look forward to serving the society, particularly in the areas of international collaborations and programming in emerging scientific topics."

Bordia's internationally recognized research is at the intersection of materials science and mechanics and is focused on fundamental and applied studies in the processing and properties of complex material systems. He was elected an ACerS fellow in 2002.

Krishnan named Distinguished Lecturer by IEEE Magnetics Society

Kannan M. Krishnan, MSE professor, has been named the Distinguished Lecturer for 2009 by the Institute of Electrical and Electronics Engineers (IEEE) Magnetics Society. Lecturers are selected for their outstanding achievements in magnetics research and excellent communication skills. Krishnan will lecture on the topic of biomedical nanomagnetics at Magnetics Society chapters for audiences of professional scientists and engineers, students and the general public at locations in the United States, Europe and Asia.

"It is an honor to be part of a select list of highly accomplished scientists and engineers who have been chosen as distinguished lecturers by the society over the years," Krishnan said. "It is not only worldwide recognition of our leadership in magnetics but also a testament to the high quality of our research program, much of which would not have been possible without the dedication, creativity and hard work of my students."

OPVs *Continued from page 1*

Jen said the main advantage of OPVs is their potential for high-speed manufacturing in roll-to-roll coating and printing production. OPVs are also lightweight, thin and flexible, enabling them to be placed virtually anywhere.

Founded in 2001, Intel Research Seattle is an exploratory research lab near the UW that aims to take computing beyond the desktop and into everyday life.

"As devices get smaller, battery life becomes the limiting factor," said Benjie Limketkai, a researcher at Intel who is the principal investigator for the project. "Since OPVs are lightweight, integrate well with existing technology and are flexible, OPV technology can become more pervasive than traditional solar cells." He said objects such as cell phones, laptops, backpacks and even windows could be fitted with OPVs.

"OPVs are a maturing technology," Limketkai said. "They may not replace traditional batteries, but could be used to trickle-charge devices to improve their energy performance."

Cao's group will create inorganic nanostructures during device fabrication. Luscombe's group will use a new polymerization method to grow organic polymers on these inorganic nanostructures, resulting in hybrid solar cells.

"The idea behind the hybrid devices is that the we get the best of both worlds in terms of cheapness from the organic components, and more efficient and stable devices from the inorganic components," Luscombe said.

Limketkai said that working with UW faculty members has been a positive experience. "The MSE faculty members have been really open and willing to collaborate," Limketkai said. "The atmosphere here has been welcoming."

Tamerler-Behar to stay with MSE for two years

Candan Tamerler-Behar, a visiting faculty member in MSE, will stay with the department for two more years. Tamerler-Behar works with Mehmet Sarikaya *(see the story on page 1)*, an MSE professor who directs the Genetically Engineered Materials Science and Engineering Center (GEMSEC). Like Sarikaya, her focus is molecular biomimetics.

In the summer of 2002, Sarikaya invited Tamerler-Behar to the UW to participate on a project to genetically engineer peptides for nanoinorganics. "As a molecular biologist, I saw enormous openings from a biotechnological perspective in terms of what could be done if I could bring my experience in protein biotechnology to this emerging area," she said. She came back in early 2003 and has been a visiting faculty member ever since.

"I sincerely believe in the future of genetically engineered materials and systems," Tamerler-Behar said. "It is my major interest to be involved in the progress of this area, to understand the mechanisms of peptide recognition on solid surfaces, and to demonstrate applications that will solidly bridge materials science to fields such as biotechnology and medicine."

Tamerler-Behar said that working with Sarikaya has been the turning point of her academic career. "Clearly he is an inspiration to many scientists around the world who are working in the field of biomimetics. He has revolutionary ideas, gets very excited when it comes to science, focuses on the big picture, and never focuses on problems, but solutions."

Tamerler-Behar also serves as the chair of the Department of Molecular Biology and Genetics at Istanbul Technical University (ITU) in Turkey and directs ITU's Research Center for Molecular Biology and Biotechnology.

BIOMIMETICS

Continued from page 1

Sarikaya had practice preparing samples of similarly sensitive materials such as ceramic superconductors, so he put his experience to work.

"This was the only way I could get a detailed view of the layered structure of calcium carbonate and the protein matter in-between," Sarikaya said. "No one had ever prepared or even thought of preparing a transmission electron microscope sample from mother of pearl, which I realized later on."

Sarikaya's resulting study was a groundbreaking effort in the developing field of molecular biomimetics, which draws inspiration from nature to create materials with applications in engineering, medicine and more.

An abalone's shell is made of tiny calcium carbonate tiles stacked like bricks. Between the layers of shell is an iridescent protein material called nacre, or mother of pearl.

When the shell is struck, the tiles slide instead of shattering and the mother of pearl flexes to absorb the blow. "Mother of pearl is one of the strongest laminated materials ever produced," Sarikaya said.

The proteins in mother of pearl and other biological materials such as bone and antler are formed out of peptides, which are short polymer chains of amino acids. "Nature uses proteins to make all conceivable molecules and tissues in an organism," Sarikaya said. "Every molecule inside of you is made from peptides or proteins."

Using biology as a guide, molecular biomimeticists aim to control interactions between these peptides and other materials. Ultimately, they seek to use

peptides as building blocks in the programmed formation of materials with medical and technological applications.

"Our approach is to learn and adapt biology's ways to use peptides as molecular agents in synthesizing, assembling and forming complex materials and functional systems for technology and medicine," Sarikaya said.

Sarikaya joined the MSE faculty in 1984. Early on, he and colleagues focused on how to create materials that mimicked the layered, nanocomposite architecture of materials such as abalone shell. In the mid-1990s, his focus shifted away from creating the materials in labs and toward discovering how organisms do it in nature.

"Under genetic control, proteins both collect and transport raw materials, and consistently and uniformly self- and co-assemble subunits into tissues and organs," Sarikaya said. "Whether in controlling tissue formation, biological functions or physical performance, proteins are an indispensable part of biological structures and systems."

Sarikaya directs the Genetically Engineered Materials Science and Engineering Center (GEMSEC). GEMSEC is an interdisciplinary team of scientists and engineers working together to marry biology, computational science, and materials science and engineering at the fundamental level. The center was established at UW in 2005 with a $7.7 million grant from the National Science Foundation.

In a department that began more than 100 years ago as the UW's School of Mining, where does a field so heavily influenced by biology fit in?

"Mining is getting minerals out of the ground, and using enrichment processes to separate useful minerals from the rest of the dirt," Sarikaya said. "It turns out, this is exactly how organisms make materials using the raw ingredients in the dirt."

Christine Luscombe uses peer review process to teach writing

The only writing assignment Christine Luscombe had to complete as a chemistry major at the University of Cambridge was the 30-page report she wrote for her senior project.

"Although I successfully completed this task and was awarded a prize, it was still daunting," Luscombe said. "I had never been exposed to such a situation."

Now an assistant professor in MSE, Luscombe is poised to help undergraduates at the UW who face the same challenge.

Luscombe is using part of the $495,000 CAREER Award she received from the National Science Foundation in early 2008 to develop a writing program for seniors in her "Introduction to Polymer Science and Engineering" class.

"The motivation to develop such a system is driven from my own personal experience," Luscombe said. "As an undergraduate student, I was never taught how to write a scientific report, a paper for publication, nor a proposal."

Luscombe discovered that seniors in her fall 2006 "Introduction to Polymer Science and Engineering" were in the same boat when she asked them to write a report on the polymer of their choice. Many of the students were unable to write a succinct report, and some even copied straight from Wikipedia, a encyclopedia Web site where the general public can submit articles and details often go unchecked.

"We, as faculty members, often mistakenly assume that our students already possess the necessary writing skills needed to produce a scientific report," Luscombe said.

Luscombe recalled how she felt when she joined the UW's faculty in 2006 and had to write research proposals for the first time. "In general, I have acquired writing skills only when needed, and because of this, it still remains an unpleasant task," she said.

"Most of us are never given any formal training for writing papers, proposals, and reports, but are expected to be able to do so."

~ Christine Luscombe

In this regard, students and professors have something in common. "Most of us are never given any formal training for writing papers, proposals, and reports, but are expected to be able to do so," Luscombe said.

Luscombe's program, which she tested on graduate students in her spring 2008 "Organic Eelectronic and Photonic Materials" course, is modeled after the peer review process that professors are subject to after submitting papers for academic publications.

Christine Luscombe (left) is developing a writing program for MSE undergraduates based on the peer review process used in academia.

Luscombe will test her new program again on graduate students in spring 2009. Then, in fall 2009, she will roll it out for undergraduates for the first time in her "Introduction to Polymer Science and Engineering" course.

During the first two weeks, Luscombe will ask her students to identify a polymer to investigate. Then, she will ensure that the polymers are appropriate to write about and that no two students have chosen the same topic. She'll also introduce students to the American Chemical Society's guidelines for authors, the same set of rules that her peers use in academia.

Students will have four weeks to write a first draft. Luscombe will assign the students weekly tasks to break the writing process into smaller chunks so they don't leave completing their papers until the last minute.

Once the students submit their drafts, Luscombe will distribute each paper to two other members of the class who will act as anonymous reviewers.

"The students will be encouraged to write thoughtful reviews, stating at least one positive comment about the paper as well as comments about how the paper can be improved," Luscombe said. "They will also be advised not to write personal comments to maintain the anonymity of the process."

Luscombe said students often become scientists and engineers because they don't enjoy writing. They are in for a surprise when they join the workforce, she said, since "it has been estimated that a typical scientist will spend as much as one-third of their day writing."

The new program was developed with assistance from the UW's Engineering Writing Center and Center for Engineering Learning and Teaching. To prepare herself to teach writing, Luscombe also attended a workshop entitled "Doing Writing Differently: How the Right Kinds of Writing Assignments Can Create More Active, Engaged, and Happy Students."

"Although this educational program focuses on undergraduate education, it will have an effect beyond the UW setting," Luscombe said. "It will prepare students for their future careers in industry or academia."

Alumnus creates fellowship to draw top students to UW

Tom H. and A. Jeannette Delimitros

Tom (right) and Jeannette (left) Delimitros

"Engineering used to be described as a calling, to be undertaken with passion and intensity," said Tom Delimitros, who applied that philosophy to his own career in industry and as a venture capitalist investing in high-tech companies.

"Engineers are at the forefront in creating value in our society. I want to see many more young people thinking about an engineering career," Delimitros said. "We need more scholarships and fellowships to attract the brightest students."

To that end, Tom and his wife, Jeannette, established an endowed fellowship in Materials Science & Engineering that supports its first student this year (see sidebar).

Raised in Seattle, Delimitros was both a "gadget-happy kid" and a talented violinist/concert master of the Lincoln High School orchestra. Unsure whether to study engineering or music, he enlisted in the Army Chemical Corps to get away and figure out what he wanted to do.

"I realized I wasn't good enough for a career as a violinist, and I liked science, so gadgets won and I enrolled at UW to study engineering," he said. A talk by Professor Jim Mueller convinced him that ceramics was an up-and-coming field, so he gravitated to materials science and earned his BS in 1963 and MS in 1966.

At Boeing he helped develop rain erosion coatings for the SST. His career took off when a friend in New York offered him a position at a company developing electronic ceramics. More doors opened and he gained experience with companies producing specialty chemicals for oil field operations and water treatment plants. During his 14-year sojourn back East, Delimitros added to his skill set, earning an MBA at Harvard.

By 1979 he was president and CEO of Magma Corporation, a Houston-based producer of specialty and oil field chemicals, which he grew to a $100-million company. Then came a move to Dallas as a general partner in a venture capital firm. By 1987 he was a founding general partner of AMT (Advanced Materials Technology) and an investor in high-tech companies. He is now largely retired, though serves on several corporate boards.

Delimitros never let geographic distance get in the way of engagement with his alma mater. He chairs MSE's advisory board and helped raise funds to build Mueller Hall. Each year he speaks to an MSE class on ethics in engineering work. He served on the Campaign for Washington volunteer committee in the late 1980s, on Engineering's executive committee for Campaign UW, and for the past three years chaired the selection committee for the college's annual Diamond Awards program recognizing outstanding alumni.

"Engineering offers a great skill set for self-expression that can take you in many directions," Delimitros affirmed. "I see our fellowship as a vehicle for that. You can make things happen if you have passion, enthusiasm, and commitment." In that regard, he says, "being an engineer can be just as good as being a musician."

Delimitros now will apply his passion and enthusiasm to help keep the beat going on the University level as a new board member of the UW Foundation.

Brent Apgar

"I am thankful for the freedom the Delimitros fellowship gives me to pursue my research and educational goals. I would like to work to improve our national electrical, transportation, and energy infrastructure and promote sustainable global growth."

Brent Apgar, the first recipient of the Delimitros Fellowship, is beginning MS work in Professor Raj Bordia's research group. Apgar spent eight years in the Navy and was introduced to materials engineering in Nuclear Power School. He served for four years on a nuclear-powered aircraft carrier. Apgar believes materials scientists can help solve "some of the greatest problems we have ever seen."

For details on how to give to MSE, contact Mahnaz Sherzoi, associate director of advancement, at (206) 685-1927 or mahnaz.sherzoi@u.washington.edu.

MSE's advisory board met in the fall to discuss the state of the department and future needs. A subcommittee led by James Williams, Tom Delimitros and Tom Stoebe met later to discuss one of the department's most pressing needs, upgrading MSE's undergraduate laboratory facilities. Look for updates in future issues of the Roberts Hall Review.

MSE undergrads win ceramics competitions

MSE undergraduates from the UW's chapter of Keramos took top honors in national ceramic mug drop and putter competitions at the annual Materials Science & Technology Conference on Oct. 7 in Pittsburgh, Penn. In the mug drop competition, one of the team's three mugs survived a drop from a height of four meters. In the putter competition, UW undergraduates Laura Anderson and Tyson de Los Santos won first-place prizes.

Alex Jen named Fellow of ACS's PMSE Division

Alex Jen, MSE chair, was named a Fellow of the American Chemical Society's Polymeric Materials Science and Engineering (PMSE) Division in November.

Fellows of PMSE are selected based on their significant contributions to the science and engineering of polymeric materials.

"To be recognized specifically for my work on polymers has special meaning to me, since my research in materials science and engineering spans many areas," Jen said. "Being named a PMSE Fellow puts me in some very good company and I am very honored to be mentioned with those who have made the study of polymers their lifetime work."

Jen and four others will be inducted into PMSE's ninth class of Fellows at an an awards luncheon on Monday, March 23, 2009 during the American Chemical Society's annual meeting in Salt Lake City. For a list of all five Fellows, visit PMSE's Web site.

Jen has made pioneering contributions in the fields of molecular engineering of organic photonics and electronics. He joined the UW faculty in 1999 and has chaired MSE since September 2005. He has co-authored more than 400 papers and holds 50 patents and invention disclosures.

Jen also co-authored the featured article in the Oct. 14 issue of the Journal of Materials Chemistry. The article is titled "Crosslinkable hole-transporting materials for solution processed polymer light-emitting diodes."

Roberts Hall Review

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