UNIVERSITY OF WASHINGTON
COLLEGE of ENGINEERING
A Community of Innovators

the Trend in engineering

Autumn 2008: Volume 58, Issue 2

Research Stars Light the Path *page 5*

In contrast to gloomy news on the national and global fronts, we have good news from UW Engineering. Foremost is the huge success of Campaign UW: Creating Futures. More than 10,000 friends helped us raise $267 million, seven percent more than our $250 million goal. New student and faculty endowments created during the campaign will transform the college's research and educational programs. A section of this issue celebrates your generous support and the future it creates.

The feature story highlights the value of undergraduate research, with a focus on our efforts to create more opportunities for women engineering students.

When I was in college in the early 1970s, women were actively discouraged from studying engineering. The emerging women's movement helped dissipate that bias in the 1980s, and the percentage of women students rapidly shot up from the single digits to a little over 20 percent. However, the percentage has remained flat for the past two decades, probably because many young women still don't resonate with the image of the geek.

A number of studies have shown that women are much more drawn to fields that clearly benefit humanity. In recent years the profession has presented itself not just as an economic engine, but also a way to change lives. This vision has been especially true for disciplines working at the interface of biology and engineering — bioengineering, chemical engineering, and materials science have attracted the highest percentage of females into engineering.

When Professor Mary Lidstrom was our associate dean for new initiatives, she created a "biology for engineers" course that had great success demonstrating that bridge. We are committed to opening more pathways into engineering for young women and to recruiting more women faculty. As you will read in this issue, women engineers at the UW are doing exceptional research and are outstanding role models.

On another front, I'm excited about two new federal grants highlighted on pages 3–4. A grant from the Department of Energy establishes a collaboration between UW and Oregon State University on marine renewable energy. Additionally, UW and Caltech will partner on a National Science Foundation grant that will build a research focus on molecular programming.

Molecular engineering is becoming a major new thrust for us. This field parallels the great advances at the end of the last century in design tools for mechanical and electrical systems that can address many of the great challenges of our time, such as health, energy, and the environment. Two stories in the Innovator section report some recent faculty work in molecular engineering.

Another new focus area bridges engineering and global health, the latter a growing strength at the UW. Bioengineering and Industrial Engineering have new global health grants, and you'll hear a lot more about these new initiatives in future issues.

Matthew O'Donnell
Frank and Julie Jungers Dean
of Engineering

Taking Charge

Thomas Calhoun

Craig Benson

Thomas Calhoun is the new assistant dean for the Engineering Advising and Diversity Center. Previously he was executive director of GEAR UP, a statewide precollege program based at the UW. He has a long career in education on the East Coast and in Chicago. He recently earned his PhD in educational leadership at the UW.

Craig Benson became chair of Civil & Environmental Engineering on July 1. An expert in geotechnical engineering, he comes to the UW from the University of Wisconsin–Madison, where he chaired the geological engineering program. Benson received his MS and PhD degrees in civil engineering from the University of Texas–Austin.

Jan Spyridakis

Technical Communication did not need to look far for its new chair. Longtime faculty member **Jan Spyridakis** moved into the leadership role on August 1. She has won numerous awards for her research on document design, usability, and online learning, and has been honored with the UW Distinguished Teaching Award. She earned her BA through PhD degrees at the UW.

In Rarified Company

Buddy Ratner, professor of bioengineering and chemical engineering, will be honored as one of the "One Hundred Chemical Engineers of the Modern Era" by the American Institute of Chemical Engineers as part of its centennial celebration. These 100 "guided the profession into the new century" after World War II. Ratner was selected in the New Frontiers category for work in engineered biomaterial surfaces to control surface interaction and synthesized biostable radio-frequency films and polymer scaffolds. The 100 were selected from nearly 1000 nominations.

Caltech and UW Partner on $10 Million NSF Grant at the Frontiers of Computing and Molecular Design

The National Science Foundation's Expeditions in Computing program has awarded $10 million to researchers at the California Institute of Technology and the University of Washington to use the principles of computer science to design complex molecular and chemical systems. They will pursue far-reaching research agendas that promise great benefit to society. Eric Klavins, assistant professor of electrical engineering, will lead the UW research team.

The main goals of the Molecular Programming Project (MPP) are to build computational devices out of biochemical molecules such as DNA or protein and create programming languages and compilers for these systems. Such tools would allow unprecedented control of biological systems, including embedding new molecular systems inside living cells. For example, MPP researchers hope to build, from scratch, an artificial immune system for a bacterium that allows it to detect and disrupt bacteriophage infections.

Klavins has been building a research thrust in molecular programming that unites biochemistry and molecular biology with theoretical work in control systems. "I believe we can design molecular systems in the same way that we build electrical circuits or computer control systems," Klavins said. "This incredibly complex and potentially powerful technology will be among the main tools required to bring artificial molecular systems 'to life'."

New Electron Beam Lithography System Will Be a Magnet for Nanotechnology Researchers

Next summer, the most expensive piece of equipment ever purchased by UW Engineering will be installed in the Washington Technology Center in Fluke Hall. The electron beam lithography system, manufactured by JEOL, will be the only one in the Northwest and one of just a few of its caliber in the nation.

"It prototypes nanostructures down to about 6 nm and gives better results at about 100 times the speed of current equipment," said Michael Hochberg, a nanophotonics researcher and assistant professor of electrical engineering. "More than 30 faculty from multiple UW departments will use it, and it will be a big draw for recruiting new faculty and graduate students."

Hochberg led the effort to fund the system, valued at $4.5 million. The Washington Research Foundation made the lead gift, its largest ever to the UW. Significant support also came from the Washington State Research Stars Program, the College of Engineering, the Department of Electrical Engineering, the College of Arts and Sciences, the Washington Technology Center, and the center's NanoTech User Facility.

High-resolution image of the UW seal created by electron beam lithography. Several hundred would fit on the end of a human hair.

Professor Keith Holsapple

Up in the Sky! It's Venus, Mars, Holsapple, and Jupiter ...

Okay, you can't see the asteroid *20360 Holsapple* with your naked eye, but the rock does orbit the Sun between Mars and Jupiter, and you could walk over to Guggenheim Hall to see Keith Holsapple, professor of aeronautics and astronautics.

The International Astronomical Union in July named the asteroid in his honor to recognize his work in modeling the response of planetary and asteroidal material to stress and shock. His namesake asteroid was first sighted by Arizona's Lowell Observatory on May 1, 1998.

"It's fun to have your name on something that could be around the universe for another 100 million years," Holsapple said.

He has developed software to calculate the effects of high-speed asteroid impacts and speaks at professional conferences on potential methods to deflect a major threat to the Earth. The History Channel recently filmed him for an episode of "Stopping Armageddon," to air later this year. He explains what would happen if a "big one" hit Los Angeles.

CoE Launches New Website

We invite you to visit **www.engr.washington.edu** and learn more about the opportunities to connect with UW Engineering. The new CoE website includes an alumni and community section specially designed for you. Learn about upcoming events, continuing education, and ways to stay connected. The site is designed to be a valuable resource to our alumni, students, and partners.

Please visit the site and let us know what you think. Send comments or suggestions to: webmaster@engr.washington.edu

News Spotlight continued on page 4

Free-flowing turbine, courtesy of Verdant Power, Inc.

Tidal Energy Research Gets Boost From Department of Energy

In the Pacific Northwest tidal and wave energy are likely to be in our renewable energy future. Leading the research effort are the University of Washington and Oregon State University. Recently the U.S. Department of Energy selected the universities to collaborate on a Northwest Marine Renewable Energy Center, one of two such DOE-funded centers in the nation. The other is in Hawaii.

The five-year, $6.5-million award will support research on wave and tidal energy, facilitate device commercialization, and help inform policymakers. OSU, the prime contractor, will focus on coastal wave energy and the UW will focus on tidal energy in estuaries and free-flow turbine applications. With support from OSU, UW, and other sources, total funding is $13.5 million.

"With renewable energy, you want to go with the source that's most appropriate for your location on the planet," said Phil Malte, professor of mechanical engineering and co-director of the UW tidal energy center. Research will calculate how much tidal energy Puget Sound could produce before turbines would begin to impact the range of tides in the sound or affect the volume of water Puget Sound exchanges with the ocean.

The UW will continue its work with the tidal energy programs of the Snohomish County Public Utility District and the Electric Power Research Institute and will begin interacting with local and national firms involved in ocean energy, including BioSonics, Verdant Power, and the Pacific Northwest Economic Region. Oceanography Professor Mitsuhiro Kawase will co-direct the interdisciplinary UW team involving ME and also the Applied Physics Lab.

Charlie Redding, The Daily (UW)

Where oh where has my laptop gone?

Psst...Ask the goddess Adeona

Hundreds of thousands of laptop thefts occur annually, which often means sensitive data is gone too. Now, a free laptop theft-protection tool acts as a virtual watchdog by reporting your laptop's location when it connects to the Internet, but without letting anybody monitor your whereabouts. It is named Adeona after the Roman goddess of safe returns. Since its public release in June, more than 70,000 people have downloaded the software under the open source license. Yoshi Kohno, assistant professor of computer science and engineering, and Gabriel Maganis (BS '08), created Adeona with collaborators at UC San Diego.

- visit http://adeona.cs.washington.edu

Student-designed Recycling Bins Now Installed on State Ferries

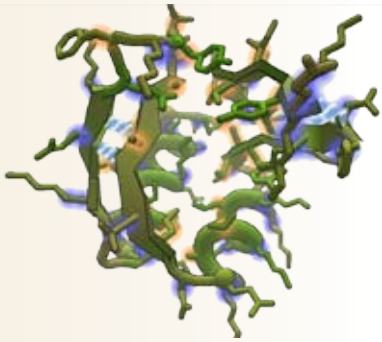
In 2006 Washington State Ferries contacted Vipin Kumar, professor of mechanical engineering, to request help in designing new trash and recycling containers with improved security and reduced risk of causing back injuries when workers remove heavy bags. Three seniors in Kumar's capstone design class took up the challenge. WSF approved the design, contracted out production, and completed installation of the bins this past summer. Check them out when you next ride a ferry.

Protein-Folding Game Turns Hard Science into Fun

Foldit, a free protein-folding game released on the Web in May, is engaging players around the world. While it may not seem quite as exciting as protecting the planet from alien invaders, it could lead to cures for diseases. Scientists don't know how the 100,000 plus proteins in the human body fold up into complex shapes with crucial biological roles. The task of calculating all possible protein shapes is a mathematical problem so huge that all the computers in the world would take centuries to solve it. Software named Rosetta@home, developed by David Baker, UW professor of biochemistry, tapped into the computer time of volunteers, but active human intervention was needed to find better answers, so Baker enlisted help from Computer Science & Engineering.

A CSE student/faculty team including doctoral student Seth Cooper and Associate Professor Zoran Popovic spent about a year developing Foldit, which taps into intuitive and 3-D problem-solving skills. Anyone can play — scientific expertise not needed. People can team up and chat with other players. Teams with names ranging from Freedom Folders, to Rule Brittania, Team China, and Carnegie Mellon vie to score the most points. Eventually, the researchers hope to challenge players to devise a protein with the right shape to lock into a virus and deactivate it, and in the process identify "protein-folding geniuses." Winning designs will be synthesized and tested in Baker's lab.

- More info and demo: **http://fold.it/portal/adobe_main**



Research Stars Light the Path

Associate Professor Yoky Matsuoka and undergraduate Carissa Conway examine the robot hand, a step toward a lifelike prosthesis.

The call came out of the blue to Yoky Matsuoka, associate professor of computer science and engineering. An official from the John D. and Catherine T. MacArthur Foundation instructed Matsuoka to sit down and put down her week-old baby. Then he revealed she had won a 2007 MacArthur Fellowship, the so-called "genius award" with a $500,000 no-strings-attached prize.

Matsuoka directs the UW Neurobotics Laboratory. She studies how our central nervous system produces signals that control movements of the limbs and then uses that information to create advanced robotic prosthetics. Her team is working on a lifelike robotic hand that could approximate natural motion, directed by a person's brain and nerve signals.

UW Engineering wants to greatly expand research opportunities for undergraduates and encourage more women to pursue careers in engineering. In these pages we introduce you to three women on our faculty who are mentoring young women. Any faculty member, male or female, can be a first-rate mentor to any student, male or female, but in a field where men predominate, an extra dash of inspiration seems to infuse woman-to-woman mentorship.

Matsuoka earned a BS degree from UC–Berkeley and a PhD from MIT, both in electrical engineering and computer science. UW CSE recruited her in 2006 from the Carnegie Mellon faculty. Winning the MacArthur has earned her worldwide media coverage, including a PBS NOVA segment in July, a story in the September 25 *Nature*, and participation in the *New Yorker's* "Stories from the Future" conference last May.

Matusoka is just one highly visible example of the extraordinary women on the Engineering faculty, all of whom value the opportunity to introduce the challenges and excitement of research to women undergrads.

She also is light years removed from the super-smart teenager who didn't want to be perceived as a math and science nerd and so pretended she never studied. The "airhead" act worked until her second year at MIT. "My advisor pulled me aside and told me to stop it," Matsuoka said. "That was a big turning point. I realized that acting airhead was not the right dual life for me."

Matsuoka also is on a mission to pave the way for young women interested in science by changing the image and ensuring them it's okay to be smart. "I'd like to be a role model. I want them to see what I'm doing and encourage them to do better than me," she said.

Carissa Conway, a computer science junior, is watching closely. This past summer she participated in the Intel Research Experience for Undergraduates. "I was ecstatic that Yoky chose me to work in her lab," Carissa said.

She contributed to the research by developing a 3D computer representation of a skeletal finger. It uses a feedback device to take data on the velocity and position of the tip of a user's index finger. "The virtual finger will execute the same motions as the user's finger," Conway said. "This allows us to test passive behaviors in a virtual environment before transferring them to the robot hand."

Not many girls at her high school in Tenino were interested in math and science, so she is happy to be at the UW. "I just love solving problems and working through the code. Debugging it and getting it to work is such a joy," Conway said. "Being part of a research team is definitely challenging and has taught me a ton."

Conway hopes to pursue a doctorate in computer science and then do research in academia or industry. "Yoky has been so supportive and it's just awesome working with her," Conway said. "It's nice to have a woman to look up to. She's an inspiration." *Cont. pg 6*

- To learn more about Matsuoka and the Neurobotics Lab: http://www.cs.washington.edu/homes/yoky/

Bioengineering Professor Valerie Daggett and junior Sara Calhoun discuss the structural aspects of binding in a protein complex Calhoun analyzed.

A shared goal to help people

As an undergraduate at Reed College in 1982, Valerie Daggett proposed a senior research project applying quantum mechanics to protein folding. Her professors told her it couldn't be done, so instead she conducted experiments on protein folding. During doctoral work in pharmaceutical chemistry at UC San Francisco she wanted to do computational work on protein unfolding because protein instability is a factor in Alzheimer's and other neurological disorders, but her ambitions still exceeded the fledgling limits of computational biology.

Single-minded and undeterred, Daggett pursued her goal during a postdoctoral fellowship at Stanford. She went on to establish one of the first labs anywhere to look at realistic atomistic simulations of protein unfolding focusing amyloid diseases. Now there are at least 50 such labs around the world.

Daggett's lab in UW Bioengineering maintains the world's largest collections of protein structures and more than 5000 folding/unfolding simulations. She created a field and also the term for it — *dynameomics* — the use of molecular dynamics simulations to characterize the native-state dynamics and folding-unfolding pathways of all known proteins.

"Now we are trying to make use of what we know to develop applications and drug design to treat disease," she said. Daggett is a world-recognized pioneer in a science subspecialty that draws few women, even to her own 20-person lab, where there are just three.

It might seem to be an intimidating place for dipping a toe into research, but that didn't deter Sara Calhoun, who has studied ballet since age three and knows where to put her toes. The soft-spoken 18-year-old is already a bioengineering junior. She entered the UW through the early admissions program for gifted young scholars and this summer participated in the Intel Research Experience for Undergraduates program, mentored by Daggett.

Her project looked at the way two proteins collide in various orientations until specific amino acid residues reach chemical stability and bind. She used molecular modeling software to model 25 protein pairs in their bound and unbound conformations to analyze structural aspects of protein binding interactions.

"A lab is like a startup company and anyone coming in must contribute. We have no time to give undergraduates busy work," Daggett said. "I think it's really important that they have a good research experience. You don't develop passion for science through a textbook or a lecture. To 'catch the bug' and stay excited about science, undergrads need to do hands-on work and see the principles in action."

Calhoun is focusing her passion for biology and cutting-edge technology into a career path that will enable her to help people, but the research experience has changed her orientation. "Originally I was thinking about going into industry, but I really enjoy working in this lab and now aiming for a PhD and going into academia seem more accessible," she said.

Having a mentor like Daggett is a definite plus. "She seems to know everything, and she asks hard questions and challenges you to bring out your best," Calhoun said. "It's a great learning opportunity."

Daggett has only accolades for Calhoun and the undergrads who have come through her lab. "The UW has such bright students — truly impressive. And the undergrads are so enthusiastic. I'm looking forward to bringing more into my lab."

• To learn more, visit: http://www.dynameomics.org and http://depts.washington.edu/bioe/people/core/daggett/daggett.html

"Talking" fish with a mission

Recently hired as a software engineer at Boeing, Jennifer Zhang helps keep track of voluminous data on construction of the 787 Dreamliner. She graduated in June with a double degree in electrical engineering and computer science. "My undergraduate research was invaluable in helping me land the job," Zhang said.

She spent three years working on the robofish team directed by Kristi Morgansen, assistant professor of aeronautics and astronautics, who is the first and still the only female faculty member in A&A. Morgansen and her students are gaining widespread attention for programming the fish so that a group of three can "talk" to each other underwater, without human intervention. Robofish emit and receive acoustic signals with data on time and location and take turns signalling so they can swim together or in different directions.

Morgansen conducted research on "bio-inspired locomotion" during her own undergraduate days at Boston University, where she earned BS and MS degrees in mechanical engineering. At Harvard she earned a masters in applied mathematics and a doctorate in engineering with an EE focus. The UW recruited her from the California Institute of Technology, where she was a senior research fellow.

Morgansen's team, a mix of about 15 graduate and undergrad students, was a perfect fit for Zhang, a Garfield High School graduate who won direct freshman admission to the EE and CSE programs. "As a kid I watched *The Jetsons*, and liked Rosie the household robot, but thought I could invent a better one. That's what got me interested in engineering," Zhang recalled.

During her first summer in the lab she developed a mathematical model of the motion of real fish by using data on spine segment positions and mapping them to the robofish. Her work earned her third authorship on a paper presented at an international symposium. She later helped develop new hardware and software that enable the robofish to communicate and swim together.

Working on a multidisciplinary team under intense deadlines and knowing when to seek help when stumped by a problem aided her transition to the larger universe of Boeing. "If you ask a question too early, others think you haven't worked hard enough to solve the problem. If you ask too late, they think you are just banging your head," Zhang said.

Assistant Prof. Kristi Morgansen and Jennifer Zhang check out a robofish.

Zhang gained valuable leadership experience when Morgansen assigned her to coordinate the work of younger undergraduates in the lab. "Jennifer is a natural at it," Morgansen said. "This is a hardcore experimental lab and it would stop functioning if we didn't have undergraduates doing theoretical work, building components, and running experiments."

Morgansen intends to develop advanced robofish able to work in lakes and the ocean. "They could be used for tasks that are dirty, dull, or dangerous. Schools of robofish might monitor pollution or undersea volcanoes and track marine life or even submarines," Morgansen said. Media from Seattle to Singapore have reported her work, and both U.S. and Canadian Discovery Channel programs have shot film for upcoming documentaries.

"Kristi has been a great mentor and role model," said Zhang, who wants to do research and development in industry, most likely in controls and robotics. In fall 2009 she returns to the UW to earn a masters in EE. "Both CSE and EE are such diverse fields with applications that can help make people's lives better. That's a big reason I've chosen to be an engineer," Zhang said.

• To learn more: http://www.aa.washington.edu/faculty/morgansen/

LEADERS • INNOVATORS • MENTORS

Mary Lidstrom, UW Vice Provost for Research, Frank Jungers Professor of Chemical Engineering, and Professor of Microbiology

"A strong undergraduate research program, with its rich learning experience, sets a major research university apart from other academic institutions. Students say they learn ten times as much at the bench as in the classroom. Undergraduates who get into the lab and work with research teams begin to vialize themselves as scientists and engineers. This experience is especially important for inspiring young women to go on to graduate school and to pursue research careers."

Eve Riskin, Associate Dean of Engineering, Professor of Electrical Engineering, and Director of the ADVANCE Center for Institutional Change

"We have a great story to tell at UW Engineering as about 18% of our faculty are women, exceeding the national average of 11–12%. We want this percentage to increase. Receiving a National Science Foundation ADVANCE Center grant in 2001 enabled us to make rapid strides by developing programs that provide a supportive environment. Our women faculty are highly productive and account for a disproportionately large share of research expenditures — and they encourage more women students to become engineers."

Mari Ostendorf, Professor of Electrical Engineering, 2008 CoE Faculty Innovator for Research, and Advisor to Society of Women Engineers UW Student Chapter

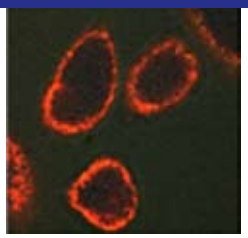
"Early in my career I was the only woman with tenure on the EE faculty at Boston University. Until I came to the UW I didn't appreciate how important it is to have more than a few token women. It makes a huge difference in creating an environment that enables us to do our best work in research and teaching. Many women students want to go into a field with clear social impact. We need to tell them how the innovative work of so many of our faculty directly benefits people."

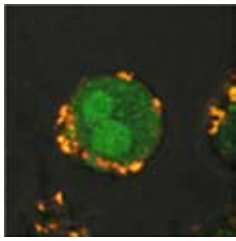
Suzie Pun, Assistant Professor of Bioengineering, 2008 CoE Junior Faculty Innovator for Research, 2008 UW Undergraduate Research Mentor Award

"Dr. Suzie Pun has an amazing understanding of the needs of an undergraduate researcher. If you need to talk to her, she will make the time. This makes me feel like I am part of the lab and not just passing through. Dr. Pun is an outstanding mentor for encouraging the growth and cultivating the talents of her undergraduate students and thereby upholding the University of Washington's reputation as an excellent research institution."
Kathy Wei, Senior, Bioengineering

Spotlight on Molecular Engineering

Quantum Dots: Silencing Genes with Nanoparticles





Above: A fluorescent image of the cell taken 30 minutes after introducing the quantum dot(red)-siRNA(green) complex shows particles in the cell membrane. Right: An image taken five hours later shows the si-RNA is distributed throughout the cellular fluid.

More than 15 years ago scientists discovered how to use short pieces of RNA to silence, or deactivate, a stretch of genetic code and disable production of a protein. The Nobel Prize-winning finding holds tantalizing promise for medical science, but so far it has been difficult to apply RNA interference (or siRNA) in living cells. Now scientists at UW Bioengineering have solved the problem by using nanotechnology known as quantum dots.

"We believe this is going to make a very important impact to the field of siRNA delivery," said Xiaohu Gao, assistant professor of bioengineering and co-author of a study published online in June in *ACS Nano*, the new journal of the American Chemical Society.

Quantum dots are fluorescent balls of semiconductor material just six nanometers across (9,000 dots lined up end to end would equal the width of a human hair). Different sized dots emit light of different colors and are being developed for cellular imaging, solar cells, and light-emitting diodes.

All jars of water contain the same substance. Suspended quantum dots absorb ultraviolet light and reemit it in a specific color that depends on the particle's size. Each quantum dot is about one ten-millionth of an inch in diameter and is composed of a few hundred to a few thousand atoms.

The siRNA's negative charge prevents it from penetrating a cell's wall. Gao and colleagues surrounded each quantum dot with a positively charged proton sponge, also known as amphipol, and attached them to the siRNA. With this chaperone, the more weakly charged siRNA complex crosses the cellular wall and accumulates in the cellular fluid, where it can disrupt protein manufacture. Researchers can adjust the chemical makeup of the amphipol coating of the quantum dots to precisely control how tightly the dots attach to the siRNA.

Quantum dots were dramatically better than existing techniques at stopping gene activity, and fluorescent quantum dots allow scientists to track the gene silencer's path. Previous siRNA trackers gave off light for less than a minute, while quantum dots, developed for imaging, emit light for hours. The new approach is also five to ten

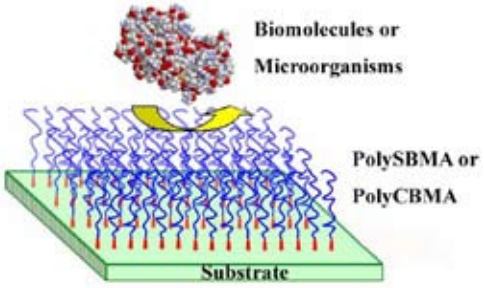
Continued on page 10

Lowly Barnacle, Big Problem: Molecular Engineering Goes to Sea

Barnacles and seaweed on ship hulls may seem more picturesque than problematic, but not if you're the U.S. Navy and those marine hitchhikers slow down your aircraft carriers and add more than $30 million to annual fuel costs. That's why the Office of Naval Research is funding work to develop new anti-fouling coatings in the labs of Shaoyi Jiang, Boeing-Roundhill Professor of Chemical Engineering and adjunct professor of bioengineering.

Current anti-fouling mechanisms in the marine industry are based on heavy metals like tin and copper, which poison anything that attaches to a ship hull. Leaching of these metals into the water causes environmental damage.

Jiang's team manipulates surface microenvironments at the molecular level to create coatings that interfere with protein binding. In these zwitterionic coatings, ions alternate perfectly between positive and negative charges to prevent naturally occurring proteins from binding to the surface.



Biomacromolecules and microorganisms repelled by poly(sulfobetaine methacrylate)(PolySBMA) or poly(carboxybetaine methacrylate)(PolyCBMA).

Jiang sees his work as a cycle, from molecular principles to product development. "We start with molecular-level understanding and design. Once we find a candidate material, we synthesize and characterize it. Then we perform biological studies, and develop products for specific applications," Jiang explained

"Applications are very important — that's the real challenge," Jiang said, "because you have to meet requirements in the real world" such as the recent ban on tin-based marine coatings and U.S. Navy requirements that replacement coatings be environmentally benign and stable for 10 to 12 years.

Jiang's team also researches health-care applications for his coatings. The body's ability to accept biomedical implants could be improved if proteins are prevented from sticking to their surfaces.

• For more information: http://depts.washington.edu/jgroup/Index.htm

Licensing Is First Step to Market for Tiny Scanner that Could Save Lives

Above: Associate Professor Eric Seibel and ME doctoral student W. Jong Yoon examine an image of the broncheal lining of a dried pig lung, taken with the scanning fiber endoscope. Right: The capsule holding the scanning device is only 16-mm long.

One of the largest technology transfer agreements in UW history could lead to more widespread screening for esophageal cancer. Although a relatively rare cancer in the United States, diagnoses have more than tripled in the last 30 years. Esophageal cancer now has the fastest growing incidence rate of any cancer in the U.S. and is the sixth leading cause of death from cancer in men.

Today's screening technology is expensive because it requires sedating the patient to enable swallowing of an endoscope — a miniature camera on a long, flexible tube about 9 mm wide, about the width of a fingernail. Most people learn they have esophageal cancer at the stage when the survival rate is less than 15 percent.

What if swallowing a pill with a tinier camera could detect the early signs of a precancerous condition of the lining of the esophagus? What if this scan is easy on the patient, does not require sedation, and is thus low cost?

Eric Seibel, research associate professor of mechanical engineering and director of the UW Human Photonics Lab, and colleagues in ME, Computer Science, and Gastroenterology have developed a fundamentally new device they call a scanning fiber endoscope (SFE).

"This could be the foundation for the future of endoscopy," Seibel said. "Any screening method that detected a treatable condition before it turned into cancer would save lives."

The SFE features a small capsule at the end of a soft, spaghetti-like tether. The capsule contains a single-mode optical fiber for illumination multiplexed to three laser diodes. An electric current causes the fiber to swing back and forth 11,000 times per second so that its lone electronic eye sees the whole scene one pixel at a time. At the same time the fiber spins and its tip projects red, green, and blue laser light. The device records video images as the capsule is retracted up the esophagus. Software processes the data to create two-dimensional color pictures at a resolution better than 100 microns, though lower than for traditional endoscopes. Visit the website noted below to see an animated illustration.

Seibel volunteered for the first human test of the device. "It felt like swallowing a regular pill and the tether didn't bother me," he said.

The UW recently granted an exclusive license for scanning fiber endoscope technologies to Pentax Life Care Division of Hoya Corporation of Japan, one of the world's leading companies in medical imaging. Pentax expects to develop and market the endoscope within the next few years. Seibel and colleagues plan to develop scanning fiber technologies to detect cancers in other organs and for laser treatment devices.

- For more information: http://www.hpl.washington.edu/research/sfep/

The research was funded by the National Cancer Institute and Pentax Corp., with early funding from the Whitaker Foundation and the Washington Technology Center.

Toxic Chemicals Found in Common Scented Household Products

Professor Anne Steinemann

Top-selling laundry products and air fresheners found in millions of homes contain dozens of different chemicals and some can be toxic. This unsettling finding emerged from a study by Anne Steinemann, professor of civil and environmental engineering and public affairs.

"People were telling me that the air fresheners in public restrooms and the scent from laundry products were making them sick," Steinemann said. "I wanted to know, 'What's in these products that is causing these effects?'"

She studied three common air fresheners and three types of laundry products, selecting a top seller in each category. She bought household items at a grocery store and asked companies for samples of industrial products. Through laboratory analyses she found chemcials such as acetone, the active ingredient in paint thinner; chloromethane, a banned refrigerant; and 1,4-dioxane and acetaldehyde, both carcinogens.

Continued on page 10

Engineering Teams Break Down Communication Barriers

Can you see me now? Sign language over cell phones

Deaf and hard-of-hearing Americans are a step closer to using sign language to communicate over a mobile phone. A UW team led by Eve Riskin, professor of electrical engineering, has developed software that enables two-way real-time video communication and has received a National Science Foundation grant for a 20-person field project to begin next year. A video of the prototype posted on YouTube has drawn many emails. "A lot of people are excited about this," Riskin said. Mobile video sign language won't be widely available until a commercial cell-phone manufacturer agrees to provide the service.

- For more information: http://mobileasl.cs.washington.edu/index.html. The video is posted at http://youtube.com/watch?v=FaE1PvJwI8E.

Online service lets blind surf the Internet from any computer, anywhere

Roughly 10 million people in the United States are blind or visually impaired. Use of a computer has required special screen-reading software typically installed only on their own machines. New software called WebAnywhere now lets blind and visually impaired people surf the Web on the go. The tool reads aloud Web text on any computer with speakers or headphone connections. Jeffrey Bigham, a Computer Science & Engineering doctoral student, developed WebAnywhere under the supervision of Professor Richard Ladner. NSF funded the research. On July 8 in Paris, Bigham won the Accessible Technology Award for Interface Design at the Imagine Cup, a worldwide student programming contest sponsored by Microsoft.

- The free program with audio and video demonstrations can be viewed at http://webanywhere.cs.washington.edu.

For your eyes only: custom interfaces make clicking faster, easier

Open any computer program and you're largely subject to a design team's ideas about button sizes, fonts, and layouts. Off-the-shelf designs are especially frustrating for people with disabilities and the elderly. A new approach for design would put each person through a brief skills test and then generate a customized version of the user interface optimized for his or her vision and motor abilities. Computer Science & Engineering doctoral student Krzysztof Gajos and Professor Dan Weld designed the system, called Supple.The first applications will likely be Web-based.

- For more information and a video demonstration: http://uwnews.org/article.asp?articleID=42817

Toxic Chemicals *(from page 9)*

"Nearly 100 volatile organic compounds were emitted from these six products. Plus, five of the six emitted one or more carcinogenic 'hazardous air pollutants,' which have no safe exposure level according to the Environmental Protection Agency," Steinemann said.

For instance, a plug-in air freshener contained more than 20 different volatile organic compounds, seven regulated as toxic or hazardous under federal laws.

Environmental Impact Assessment Review published her study online in July. Steinemann has not disclosed product brand names. A subseqent study (submitted for publication) analyzed 25 cleaners, personal care products, air fresheners, and laundry products and confirmed that all brands of fragranced products contained similar toxic chemicals — even ones called "organic"and "natural."

In earlier work, two national surveys published by Steinemann and a colleague in 2004 and 2005 found that about 20 percent of respondents reported adverse health effects from air fresheners and 10 percent reported such effects from laundry products vented to the outdoors.

While the Food and Drug Administration requires that cosmetic packaging list ingredients, no law requires the manufacturers of consumer products to list all ingredients or those in fragrances, even if toxic. "These chemicals are a concern due to the potential for involuntary exposure," Steinemann said. "I'd like to see better labeling, and I hope this study will raise public awareness and help reduce exposures to potentially hazardous chemicals."

Her study has drawn media coverage in 13 countries by more than 20 newspapers, 9 magazines, 35 radio and TV stations, and more than 100 websites — among them CBS News, *Scientific American*, and the *Hindustan Times*.

Quantum Dots *(from page 8)*

times less toxic to the cell than the chemicals now used.

Quantum dots are not yet approved for use in humans so the researchers are transferring their techniques to nontoxic iron oxide particles that have been approved by the Food and Drug Administration. "Eventually this method could be used to treat conditions ranging from cancer to deteriorating eyesight," Gao said. "Our team also is working to target cancer cells by attaching the quantum dots to specific markers on the cell's surface."

- For more information, http://faculty.washington.edu/xgao/

The research was funded by the National Institutes of Health and the National Science Foundation.

Creating Futures for Engineering

UW's Creating Futures campaign for Engineering came to a spectacular conclusion on June 30. Support from alumni and friends totaled

$267,564,979

We are excited about every dollar, but what is most important is their **impact.**

Gifts totaling $47.4 million created:

181 New Endowments

1 deanship, 5 chairs
13 professorships, 68 scholarships
58 fellowships, 36 academic support funds

State-of-the Art Facilities

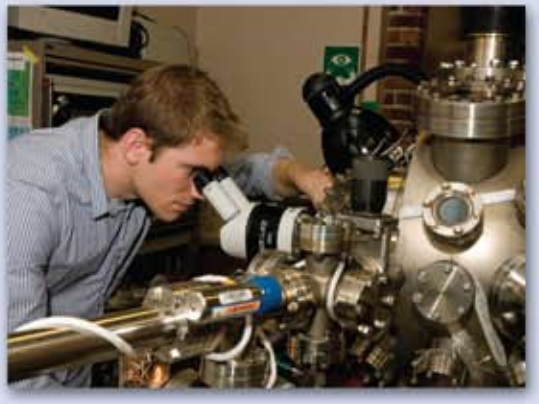
Other private support helped construct two new buildings and upgrade a campus gem:

The Paul G. Allen Center for Computer Science & Engineering

William H. Foege Genome Sciences & Bioengineering Building

Guggenheim Hall

10,000+ alumni, friends, foundations, and corporations participated in Engineering's campaign. We are grateful. In this special section of The Trend, we celebrate your generosity.



THE POWER OF NUMBERS

During the Beijing Olympics we learned the Chinese regard the number eight as auspicious, signifying prosperity. Perhaps that holds for the UW community too, as we conclude eight years of Campaign UW in 2008. Engineers know that numbers have power, at least in mathematical if not cultural expression, and our numbers are huge!

Thanks to more than 10,000 alumni, friends, and corporate partners, we surpassed our goal and raised over $267 million. We are deeply grateful for the generosity of so many whose gifts ranged from $1 to $16 million. No matter the size, each means someone cares about our students and educational mission.

Extraordinary giving is both essential and transformative. Private support is now the third largest source of funding for engineering education and research. With state dollars primarily earmarked for faculty salaries, the college must rely on private giving to create scholarships and fellowships that provide access for students, establish professorships to recruit and retain outstanding teaching and research faculty, and provide unrestricted support for student programs and projects.

Central to our success was an active and engaged campaign committee under the leadership of recently retired Weyerhaeuser CEO Steve Rogel. These volunteers advised on college priorities, assisted with outreach to alumni and friends locally and across the U.S., and gave generously of their time and resources. "Thank you" can only begin to express our appreciation.

Our Campaign UW numbers are already generating impact. Over $27 million in new scholarship and fellowship endowments has begun opening Engineering's doors to many more promising students. This fall we hired 16 exceptional new faculty members — some hires made possible by the $16 million in new professorships and chairs that make us competitive with our peers.

To all 10,000 campaign participants who demonstrated the power of numbers: Thank you! Your gifts will transform the future — and it's an exciting one.

Matthew O'Donnell
Frank and Julie Jungers Dean of Engineering

Impressive Results

Participants ~

New donors (first-time gifts to Engineering)
- 4,457 individuals
- 968 organizations

6,055 donors made multiple gifts

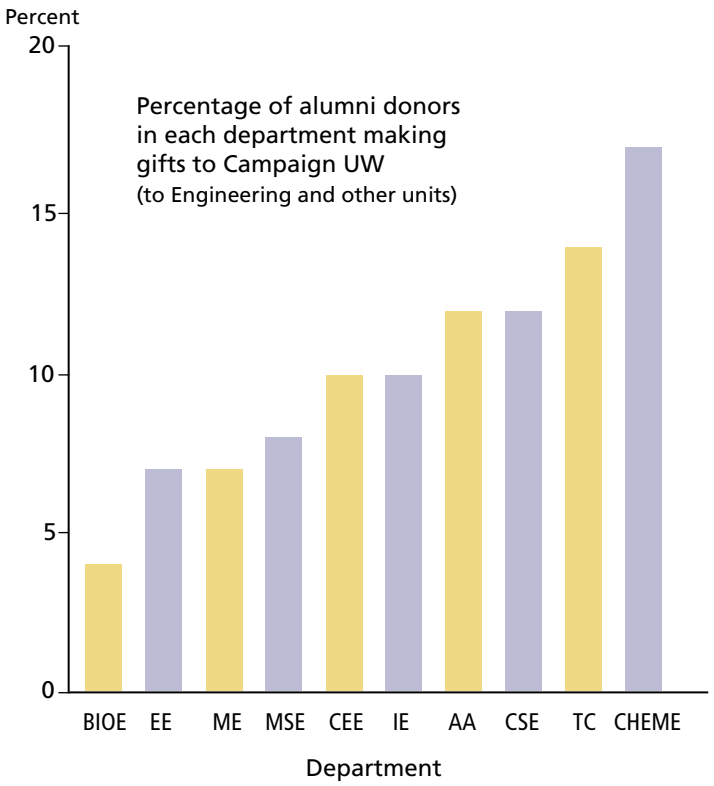
Matching Initiatives ~

UW Matching Gifts Initiative
- 29 new endowments
- $20.6 million gift and match total

Students First Initiative
- 45 new scholarships and fellowships
- $20.7 million gift and match total

Faculty, Staff, Retiree Campaign
- 54 faculty, staff, and retiree donors made gifts of $5000 or more through June 30.
  (FSR campaign extends through December 31)

Alumni Participation by Department



A transformative gift

Frank and Julie Jungers Endowed Deanship in Engineering

Frank Jungers (ME '47) knows plenty about leadership. He met presidents, kings, prime ministers, and assorted VIPs over a 31-year career with Arabian American Oil Company (Aramco), the last five (1973–78) as chairman and CEO.

Based in Saudi Arabia for 27 years, he was in the hot seat during the 1973 OPEC embargo on oil to the United States. Jungers became the "go-to-guy" for the U.S. media, including an interview by Mike Wallace on "60 Minutes." He criss-crossed the U.S. and Europe to confer with corporate CEOs, and even visited the White House for a brief meeting with President Nixon.

Jungers also led years of complex negotiations for the transfer of Aramco ownership from U.S. oil company shareholders to the Saudi government. He won plaudits for making the right decisions at the right time, for his imaginative problem solving, and ability to engender trust and respect at all levels from oil field laborers to the Saudi royal family to the halls of U.S. government and corporations.

With strong insight on the transformative power of leadership, it's no surprise that he has created endowments to attract and support outstanding leaders for the college. Prime among them is The Frank and Julie Jungers Endowed Deanship in Engineering, the first of its kind at the UW. It enabled the college to recruit Matt O'Donnell in 2006.

"I like to support programs in ways that have a big multiplier effect," Jungers said. "The endowment was an opportunity to bring in a preeminent leader with vision and ability to do things in new ways to move the college forward." He feels the results are already evident in the high caliber of recent faculty hires, expanding research programs, and new methods of instruction.

An earlier endowment, the Frank Jungers Professorship in Chemical Engineering, drew Mary Lidstrom, a highly regarded microbiologist, to the UW in 1986. Lidstrom founded and co-directs the NIH-funded Center of Excellence in Genomic Sciences. An exceptional scientist and administrator, she was appointed UW vice provost for research in 2001.

"Both these endowments have had tremendous multiplier effects," Jungers affirmed. "The returns they are bringing to Engineering and the University, in both activity and outside funding, are worth far more than the money I put into them."

Raised in North Dakota and Oregon, Jungers served in the Navy during World War II, then entered the UW to study mechanical engineering. In 1947 he joined Aramco in San Francisco. After a transfer to Saudi Arabia in 1949, he steadily rose from field engineer at a refinery into the ranks of management.

In retirement Jungers has been busy as an independent investor and consultant and with service to several corporate boards and two higher education institutions. He was a founding member of the UW Foundation board (1988–1992).

He and his wife, Julie, a talented photographer, reside in Portland and Bend and enjoy traveling to locales such as Antarctica, Africa, India, the Middle East, and Myanmar, with China next on their itinerary.

Leadership + Private Support = CoE on the Rise

Visionary leadership, backed by strong private support, is taking the college to new heights in educational and research excellence. A few highlights:

- CoE is attracting top-quality faculty who are winning major grants and prestigious national awards. An all-time high of 16 new faculty are on board for the 2008–2009 academic year. CoE is growing!
- New cross-disciplinary initiatives in molecular engineering, alternative energy, and global health are forging links across Engineering departments and the University.
- New professional masters degree programs in electrical engineering and pharmaceutical bioengineering are meeting community and industry needs.
- Applications for our fall 2008 freshman class were up, including an increase in underrepresented minorities and women — a testament to outreach programs and to expanding scholarship support for promising students.

Support for graduate students

Steven and Connie Rogel Endowed Fellowship in Chemical Engineering

"Beyond everyone's wildest dreams" is how Steve Rogel (ChemE '65) sums up the great success of Campaign UW for the University and the College of Engineering. As chair of Engineering's Campaign Executive Committee he's had a hand on the wheel of the ambitious initiative, and in encouraging alumni to get on board.

"More than 5,400 alumni, individuals, and organizations made first-time gifts," Rogel said. "That is as heartwarming as it was essential, given the magnitude of the campaign. We proved engineers can open their wallets," he added with satisfaction.

More than doubling the number of student and faculty endowments merits even louder toots of the horn. "We have excellent leadership at the college and with more support, we can keep attracting the talent necessary to move to the next level of achievement and recognition," he said.

As the campaign headed into its closing months, Rogel and his wife, Connie, contributed generously to that effort by establishing an endowed professorship in Chemical Engineering. They made the gift at a significant transition time in their lives. Rogel retired in April after 11 years as CEO of Weyerhaeuser, though he continues serving as chairman of the board of directors. He and Connie, an alumna of Seattle University and member of its board of regents, have built a waterfront home in Port Ludlow, where they plan to enjoy their boat and continuing proximity to Seattle and their alma maters.

They've had quite a journey from Ritzville, a small wheat-farming community in Eastern Washington where both were born and raised. The son of the local Buick and GMC dealer, Rogel was servicing cars and trucks by age 13 and running heavy farm machinery not long after. Gritty summer manual-labor jobs convinced him that earning a UW chemical engineering degree would broaden his career opportunities.

A summer internship at St. Regis Paper Co. drew him into the forest products industry, and following graduation, assignments that would take him from the southeastern U.S. to Canada. He joined Portland's Willamette Industries in 1972 and worked his way up the ranks to CEO in 1995, gaining a reputation as a strategic thinker with a sharp eye for cost efficiencies. From there it was a short jaunt north to Federal Way in 1997 and the significantly bigger arena of Weyerhaeuser.

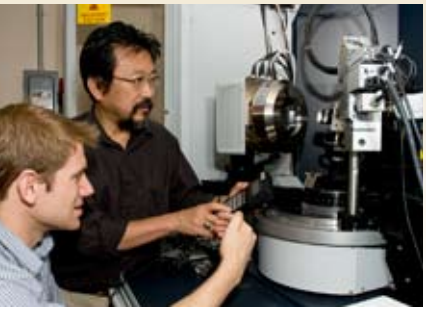
"I owe so much of my success to my engineering education that I felt a need to return something to the UW," Rogel said. He believes the Rogel endowed professorship comes at an exciting transition time for the Chemical Engineering program.

"The stopwatch and bucket brigade measurement of flows and volumes is over," Rogel said. He points to dramatic changes in the past 10-15 years, as the discipline has moved off a primary focus on industrial processes and into an interdisciplinary juncture with bioengineering and medicine and work on the molecular and nanotechnology levels.

"It's a new world, and I hope our endowed professorship will enable the department to hire or retain exceptional faculty who will forge a leadership role for the department in this area."

Micron Gifts Further Innovation

A quest for ever faster and smaller semiconductor devices drives the need to develop and incorporate new combinations of materials in chip structure. Boise-based Micron Technology, Inc. and the Micron Foundation provided advanced equipment and funding to launch the Micron Laboratory for Combinatorial Materials Exploration (CME) in Roberts Hall, directed by Fumio Ohuchi, professor of materials science and engineering. This year Micron provided additional funds to set up a new X-ray photoelectron spectroscopy machine in a Micron CME lab in the Physics Building, also used by Ohuchi and his team.



Gift of property to fund undergrads

Richard E. and Mary Lou Amen Endowed Scholarship in Engineering

A member of the Engineering Campaign Executive Committee, Rich Amen shares a hometown with Steve Rogel, a fellow alumnus of Ritzville High School in Eastern Washington. "He graduated a year ahead of me, and his wife Connie was my classmate," Amen says.

Amen was raised on a wheat farm, and like Rogel, operated heavy-duty farm machinery and loved fixing cars as a teen. A ham radio hobby sparked an interest in electronics, and drew him to the UW Electrical Engineering program, bucking the Coug allegiance of his parents and brothers.

In 1965, degree in hand, Amen headed to Palo Alto for a position in design engineering and to earn an MSEE at Stanford, where he later returned for an MBA. By 1976 he had been recruited as CEO for a struggling tech startup producing desktop word processors. "It was so much fun to come into a company and get people charged up and focused on the goal to build the business," he says.

For his next CEO challenge, with a corporation developing optical character scanners, he grew revenue 40-fold and completed its initial public offering. In 1988 his career took another turn when he and his wife, Mary Lou (a Seattle University grad), founded Venture Management Associates (VMA), a private investment banking and corporate development firm. He guided strategy and managed more than 30 merger, acquisition, and financing projects for businesses in the information technology sector.

Now living on the Southern California coast and semi-retired for the past seven years, Amen turned his focus to real estate, buying and upgrading rental apartment buildings in the Phoenix area. "The tenants love it," Amen says. "Everything I've done over my whole career has had the same themes — building value, building success, and improving the lives of people."

Those same themes motivated the Amens to make a gift of property to be divided among their three alma maters. Its sale will fund the Richard E. and Mary Lou Amen Endowed Scholarship in Engineering, along with 50 percent UW matching funds through the Students First initiative.

"We'd like to see the scholarships go to high-potential students from Eastern Washington, where many students need financial support to be able to attend college and improve their lives," Amen says.

Campaign Leadership

Campaign Executive Committee

Steven R. Rogel (ChemE '65), *Chair*

Tom A. Alberg
Richard E. Amen (EE '65)
Donald W. Baker (EE '60)
Jeet S. Bindra (ChemE '70)
Robert A. Davis (MSE '64)
Tom H. Delimitros (MSE '66)
Michael J. Denton
Emer Dooley (Business '00)
Hon. Daniel J. Evans (CEE '49)
Jeremy A. Jaech (CSE '80)
George W. Jeffs (AA '48)
Agnes S. Kwan (CSE '82)
Allan F. Osberg (CEE '45)
John P. Roundhill (ME '73)
Donna M. Sakson (TC '82)
Henry T. Schatz (ME '64)
Howard W. Wahl (CEE '57)
Sophia Zervas-Berg (Cheme '78, MBA '97)

Honorary Committee

J. Ray Bowen
Ark G. Chin (CEE '52)
Mrs. John M. Fluke, Sr.
Max E. Gellert
Sally Jewell (ME '78)
Frank Jungers (ME '47)
Donald R. Mack (EE '48)
Tomio Moriguchi (ME '61)
Donald E. Petersen (ME '46)
Joseph F. Sutter (AA '43)

Computer Science & Engineering Campaign Leadership

Tom A. Alberg, *Co-chair*
Jeremy Jaech (CSE '80), *Co-chair*

Tony Audino
Kirk (CSE '83) and Melissa Glerum
David (CSE '86) and Cathy Habib (CSE '86)
Brian (CSE '83) and Suchada (CSE '83) MacDonald
Bill McAleer
Linden Rhodes (Law '02)
Rob Short (CSE '87) and Emer Dooley (Business '03)
Brad Silverberg
Ben Slivka and Lisa Wissner-Slivka (Business '88)
Tom (CSE '87) and Anne Snyder

At the forefront in creating value

Tom H. and A. Jeannette Delimitros Endowed Fellowship for MSE

"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 in college, 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.

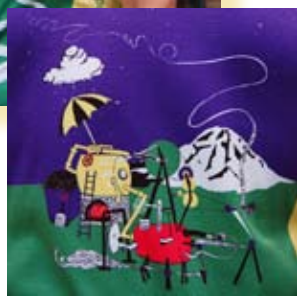
"Engineering offers a great skill set for self-expression that can take you in many directions," Delimitros affirmed. "I see our fellowship as a vehicle for that. You can make things happen if you have passion, enthusiasm, and commitment." In that regard, he says, "being an engineer can be just as good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

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

"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."

Pastry-Powered T(o)uring Machines Endowed Fellowship in Computer Science & Engineering



From left: Paul Franklin, Ruben Ortega, and Lauren Bricker. Their shirts, much-admired in the biking community, feature CSE's Turing machine mural on the back. The book Bakeries by Bicycle *is an essential for training rides, and the team motto is "We live to eat… we bike to eat more!"*

What's not to like about young alumni who work hard, pedal hard, and can point you to the best bakeries in the region? And, they contributed to the Campaign UW pie by establishing a fellowship to support "a starving grad student" through surely the most creatively named endowment in UW history.

Meet CSE alumni Lauren Bricker (MS '93, PhD '98), Ruben Ortega (MS '94), and Paul Franklin (MS '98). They were among a dozen grad students and alumni who formed a team to ride in the 1995 Seattle to Portland (STP) bike race — with the team name inspired by CSE's Steam-powered Turing Machine mural.

Many team members continued riding together even as they pedaled off campus and into careers and family life. Bricker and Ortega have sons aged 17 and 9, the younger of whom rode the first half of the STP this year. Ortega, an expert in search technology, worked at Amazon.com for nearly 10 years and is now with the startup Trusera.com. Bricker consults on user interface architecture and teaches and does IT work at Lakeside School. Franklin is a software developer at Amazon.

The three contributed to the Allen Center capital campaign and this year organized a consortium through the bike team to fund a Students First endowment. They made generous lead gifts to enable the 50 percent match in UW funds, and by June 30 contributions had topped $256,000 with gifts from 11 alumni and friends.

"We got a great education at the UW, which opened the doors to great jobs, so we wanted to give back to CSE," Ortega said. "Creating an endowed fellowship offered a terrific opportunity to do that and the timing was right for all of us," Franklin noted.

"You don't have to be a team member to contribute to the endowment," Bricker said. "Just visit the website to learn more." (http://pptm.cs.washington.edu).

They plan to give the first fellowship recipient a PPTM team jersey. If the student happens to be a biker, well, that would be ice cream on the pie because he or she could join the group on training rides. By the way, their favorite refueling stops are Alki Bakery and Café and Snohomish Pie Company.

Consortium gifts tap power of collaboration

Industrial Engineering Gains Endowed Fund for Students

IE alumus Ed Rhone

For many alumni, a consortium endowment is a perfect way to magnify the impact of their gifts. The opportunity to contribute to IE's first endowed student fund certainly appealed to Ed Rhone (BS '01, MS '03). At an early stage of his career, establishing his own endowment was out of the question.

Giving back to IE is a high priority, though, and he made his first gift after joining Lake Partners, a business strategy consulting firm in downtown Seattle. "The company instills the importance of supporting community organizations," Rhone said, "and they match gifts up to $1000." He gives annually to IE and represents the new generation of young alumni philanthropists in the UW President's Club.

A native of Pasco, Rhone transferred to the UW after a year at the University of Idaho on a football scholarship. He chose to major in IE for its practical focus and the good tools it provided for a career in business or industry. He credits Professor Cindy Atman for having a big influence on him. "Dr. Atman urged me to get an MS and gave me a research assistantship," Rhone said. "Contributing to the IE Endowed Fund is a way I can repay that and help current students."

Gifts from 115 donors including alumni, faculty, staff, students, friends, and organizations total $122,737 to date, and qualified for $61,309 in Students First matching funds.

Honor Roll of Donors

This honor roll reflects cumulative gifts and pledges of $5,000 and above made between July 1, 2000 and June 30, 2008.

~ Individuals & Family Foundations ~

$1 million and above
Tom A. Alberg
Paul G. Allen
C. Gregory Amadon
Anonymous Gifts-Friends
David Auth
William and Elizabeth Baxter
Wilma Bradley
Donald* and Ruth Mary Close
Ursula Crawford
Bill and Melinda Gates
Jeremy and Jacquelyn Jaech
Frank and Julie Jungers
Paul and Mei-Yea Liao
Charles and Helen Matthaei
Steven Mylroie
Allan and Inger Osberg
Jonathan Pool
Linden Rhoads
Barbara Robinson
Frank Robinson
Steven and Connie Rogel
Henry Schatz
Brad and Jan Silverberg
Charles Simonyi
Karsten* and Louise Solheim
Howard and Carroll Wahl
Benjamin Slivka and Lisa Wissner-Slivka
Michael Wolf and Anne Dinning

$500,000 to $999,999
Corin Anderson
John and Sandra Baxter
Edward and Wanda* Bock
Dale and Sally Brooks
Jeff Dean and Heidi Hopper
Max and M. Carol* Gellert
Kirk and Melissa Glerum
David and Catherine Habib
Kenneth and Margaret Hoyt
George and Lorraine Johansen
Thomas and Tricia Rehm
Jean Schuler
Robert Short and Emer Dooley
Charles and Virginia Wright

**Deceased*

$250,000 to $499,999
Richard and Mary Lou Amen
Edward Ammer
William and Marilyn Conner
Ronald Crockett
Tom and Jean Gibbs
Robert and Cori Glaser
James Gray*
Donald and Cindy Hacherl
Gary and Christine Kimura
William Kipple
Todd Laney
Shun-Tak Leung
Paul and Yaffa Maritz
Anthony and Elizabeth Naughtin
Alan Nelson
Raymond and Louise Pedrizetti
Richard and Terri Rashid
Andy Studebaker
Robert and Irene* Sylvester
John and Patricia Torode
David and Marsha Weil
Flora Winter

$100,000 to $249,999
Christopher and Mary Allard
Eugene Allen*
Tony and Michelle Audino
Jonathan and Shelley Bagg
Rex and Reva Bates
Marjorie Bevlin
A. Kumar and Roberta Bhasin
Jagjeet and Janice Bindra
David and Caroline Browne
Kenneth and Joanne Burkhardt
John and Laurel Coltart
Walter Cook
Robert and Claribel Davis
Tom and Jeannette Delimitros
Michael Denton
Donald* and Phyllis Dorset
Herbert and Patricia Drosdat
Gilbert Drowley
Cornelius Duffie
Michael Elke
Donald and Diane Emon
Betty Frick
Ed and Kathy Fries
Richard Tait and Karen Fries
Robert Fries and Debra Dahlen
Will Gillett
Michael and Hannelore Gresser
Gerald and Carolyn Grinstein
Mark and Carolyn Guidry
Neil and S. Ann Hawkins
Warren and Sally Jewell
Rodney and Methyl Knudson
John and Sharen LaVillette
Paul Leach and Susan Winokur
Daniel Ling and Lee Obrzut
John and Cristi Ludwig
Brian and Suchada MacDonald
Louis and Patricia Marsh
Roy and Darlene Martin
William and Colleen McAleer
James and Betty McCurdy
Clifford and Betty McNeal
Beverly Morgan
A. Pat and C. Beverly Miller
Lionel Ng and Chi-Chuen Chan
Ruben Ortega and Lauren Bricker
Harlyn and Eileen Prouty
John Purvis
David and Valerie Robinson
Stephanie Rosenbaum
Jonathan Mark and Donna Sakson
Theodore Sarchin
James and Patricia Schader
Richard Scherrer
John and Carolyn Schwager
Robert and Kristine Shanafelt
George W. Snyder*
Mary Thornton
Theron and Kalee Tock
Mark Tuttle and Lisa Messing Tuttle
Rao and Usha Varanasi
Frank and Jane Wagstaff
Wen-Hann and Irene Wang
Gary Williams
Craig and Gretchen Wittenberg
Brian Yamasaki and Debora Chen

CAMPAIGN UW *Engineering Milestones* ▶

First $1-million gift 9/00

Paul G. Allen Center naming gift 2/02

Jungers deanship gift 10/03

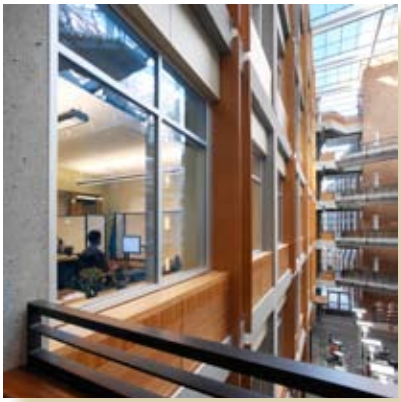
Allen Center opens 9/03

First TC endowed scholarship 12/03

2000	2001	2002	2003	2004
131 Endowments Market value $64.7 million			$100 million reached 12/02	

$50,000 to $99,999

Stephen Arnold and Laurie Bauman
Lyle and Marsha Asplin
Winslow and Linda Buxton
Harold and Anita Campbell
Rose Christie
David and Devon Cohn
Douglas and Jill Crow
David Cutler and Debbie Girdler
Paul Franklin
Nicholas and Mary Graves
Allan Hoffman
Naveen and Anu Jain
George and Enid Jeffs
Harold Kawaguchi and Shaun Hubbard
Scott Kildall
Kristin Kildall
Pavel Khijniak
Agnes Kwan
Scot and Diana Land
Mark and Nicole Lawrence
Steven and Arlene Lazarus
Donald Lobo and Mari Tilos
Lawrence Medwin and Eleanor Hertzberg
Richard and Susan Martin
Ruth Meese*
Dorothy Mills
Dale and Marjorie Myers
Russell and Whitney Paul-Jones
Arthur and Linda Pederson
Gary and Pauline Sager
Katie Sako and Kendall Flint
Mary Tecklenburg
Arthur Thue
Jack and Sallie Tuttle
James* and Virginia Webster
Stewart and Teresa Wu



$25,000 to $49,999

Paul and Kathleen Anderson
Jean-Loup and Diane Baer
David and Leigh Bangs
Pauline Batchelor*
Samuel and Ardis Beard
Gwendolyn Bell
Gordon Bell
Philip Bernstein and Luisa Recalcati
Robert and Nancy Betcher
Ted Biggerstaff and Patricia Downey
Carl Binding
Byron and Sheila Bishop
David Bonn
Stephen and Sylvia Burges
Robert and Nancy Burr
Richard and Martha Draves
Joseph Duncan
Richard Edwards and Anita Gale
Daniel and Nancy Evans
Bruce Forstall and Linda Plato*
Jennifer Flexman
Steven Frank
Rolf-Dietrich and Beate Fromm
Tetsuya Fukuoka
Peter and Beth Golde
Hellmut and Marcy Golde
Dwight and Dorothy Gowdey
Keith* and Claire Grinstein
Keith Grochow
Scott and Susan Hauck
Paul Hertzberg
James and Suzanne Hewitt
Gregory and Lisa Hitchcock
Lin Holley
Takashi and Tetsuko Honda
James Hoskins and Jean Hertzberg
Dennis Irvin*
Bruce and Gretchen Jacobsen
William King
H. William* and Barbara Kirschner
Charles Klawitter
Albert and Elizabeth Kobayashi
Richard and Linda Koffenberger
Michael and Deborah Koss
Bruce Kuramoto and Yumi Takeuchi
Edward Lazowska and Lyndsay Downs
Rebecca Liebman
Greg and Corina Linden
Marilyn Lytle
Donald and Sally Mack
Mary Maybee
Kelly McGee

Michael McKibben and Sarah Merner
Richard and Kathryn Miyauchi
Peter Model
David and Jacquelyn Moore
Joseph and Marian Mullally
Craig and Marie Mundie
Cameron and Linda Myhrvold
Brandt and La Vey Norquist
David Notkin and Catherine Tuttle
Kenneth Oien
Judith Ramey
Rao and Satya Remala
Bard and Julie Richmond
Louis and Carol Scharf
Michael and Jackie Schmidt
Richard and Joanna Segal
William and Christa Shackleford
Thomas and Anne Snyder
Charles Stephens
Michael Templeman
J. Hayden Thomas and Shannon Bell
Padma and Sridevi Venkata
Douglas and Margaret Walker
Daniel Weld and Margaret Rosenfeld
Edward Wenk and Betty Wagner
Raymond West
Jo-Anne Wisniewski
Wayne and Wei Liu Yamamoto

Continued on page 18

First ME endowed chair 6/04

Foege Bldg opens 3/06

Dean O'Donnell arrives 8/06

Guggenheim renovation completed 9/07

First IE endowed scholarship 6/08

312 Endowments
Market value $151.4 million

2005 | **2006** | **2007** | **2008**

$150 million reached 12/04

$250 million reached 2/08

$268 million reached 6/30/08

$10,000 to $24,999

Douglas and Barbara Allan
David and Vickie Allstot
James and Maureen Anable
Arnold and Ellen Andersen
Charles and Barbara Anderson
Dennis and Connie Anderson
Thomas Anderson and Robin Briggs
Leo and Judith Azure
Frederick Bachmann*
Gregory Badros
Leonard and Dorothy Barlow
Joseph Benezra*
Mark and Judith Benjamin
Arvid Berg and Sophia Zervas-Berg
Jay* and Mary Berkman
Christophe Bisciglia and Theresa MacDuff
Curt Blake and Kelli Curtis
Karl Bohringer
Derek Booth
David Bosi
J. Ray and Priscilla Bowen
David Bradlee and Kathryn Gardow
Suzanne Brainard
Douglas and Nancy Calkins
Craig and Sylvia Chambers
Ark and Winifred Chin
Richard Christie
Sung Chung
John Colleran and Michelle Kastner
Brian and Mimoza Countryman
Clyde Crawford and
Sidnee Andersen-Crawford
Daniel and Sheila Dahlgren
Damon and Ania Danieli
John Davis
Kurt and Suzan DelBene
Christopher D'Hondt and
Theresa Avanti-D'Hondt
Wesley and Evelyn Dickson
John and Marilyn Dimmer
Chris and Mary-Ellen Diorio
Dempster and Sylvia Drowley
Larry and Virginia Erickson
Oren and Ruth Etzioni
Brian and Mary Fabien
Peter Farrell
Bruce and Patricia Finlayson
John and Susan Fluke, Jr.
Frank and Norma Fogde
Daniel Frech
Curtis and Kristine Fuehr
Bill and Mimi Gates
Joseph Gerberg
Harry and Lynn Glaze, Jr.
Keith Golden and Ellen Spertus
James and Betty Gustafson
Christopher and Rebecca Guzak
William* and Ann Hadley
Alon and Oriana Halevy
Michael and Molly Hanlon
Richard and Mary Kay Hansen
Gary Hansen
Richard and Jo Ann Harbert
Brett and Simone Helsel
Noel Henry
Charles and Carol Hirsch
Brian and Lee Horman
Tai and Yuang Hou
Roderick and Patricia Howard
Patricia Hsu
George and Margaret Huang
Tudor Huddleston and Elizabeth Otis
Wendell and Carrilou Hurlbut
Satoru Izawa
Herve Jamrozik and Ana Tessadro
Alex and Meei-Jane Jen
James Jensen
David Johnson
Larry and Naomi Johnson
William Joyce and Diane Melde
Yoshio Kataoka
Chris and Lisa Kenworthy
Karl Kirker
Alexander Knight
Edward and Arlene Koetje
Janet Koplowitz
Leonard and Carolyn Kosonen
Mary Kravik
Jesse and Sharon Krider
Dave Larson
Robert Larson*
Walter and Heather Lee
Dennis and Jean Lee
Henry Levy and Ronit Katz
Yi-Bing Lin and Sherry Wang
Henry and Fayne Loew
Michael and Vanessa Lorengo
Henrique and Regina Malvar
Udi and Rachel Manber
John Manferdelli and Catherine Stricklin
Matthew and Carol McIlwain
James and Patricia McManus
John and Diane Milton
Wilmarth and Josephine Mootz
Willa Mylroie
Allison Myrick
Robert Nelsen and Ellyn Hennecke
Mahlon and Jeanne Nichols
Warren and Ellen Nielsen
Bruce Oberg
Matt and Catherine O'Donnell
Grace and Richard Okita
Wayne Olson
Steven Omoto
Lloyd and Sue Otteman
Jerome and Linda Paros
Leo and Irene Peden
Richard and Edna Perrault
George Petersen
Dmitriy Portnov
Allen Potvin
Andrew and Carol Price
Ceon Ramon and Barbara Hlavin
Mamidala and Vinati Ramulu
Lois Rathvon
Paul and Sharon Reeves
Garth Reistad
Betty Richey
Larry and Beverly Ricker
James and Joyce Riley
Scott and Catherine Roberts
August and Margo Rossano
Keth Rowe and Ann Stover
Barbara Sando
Friedrich and Roberta Scholz
Richard and Judith Schweikhardt
Ralph and Loraine Scriba
Jonathan Shakes and Xi Tian
Olga Shen
James Shibley
Ward Spear
Paul Goodrich and Shannon Sperry
Scott Stark
Thomas and Janet Stoebe
Adam Stone
Helmer Sundt*
Joseph Sutter
John* and Martha Swanson
Stephen and Terri Thomas
John Thomas
Ritchie and Lorna Tilson
Gerard Tolentino
Brian Valentine
Taylor Van Vleet
Cathy Wasem
Elsie Wetter
Hugh Williams
Daniel and Joann Wilson
Ross and Bonnie Wolf
William P. Wood*
Phil Wood and Judy Mahoney
Jimmy and Gloria Yoshinaka
Clark Zentrum
Douglas Zongker

$5,000 to $9,999

Einar Andersen
Arthur Anderson
Brian and Jane Andrew
Anonymous Gift – Friend
John Brew and Mary Asmundson
John Balciunas
Alan and Lois Bauer
Lois Baugh
Emilio Beltran
Kermit Bengtson*
Andrew and Deborah Berman
Brian and Carol Bershad
Jeffrey and MacKenzie Bezos
Eric Blohm
Milton and Ann Bohart
Gaetano Borriello and Melissa Westbrook
Christopher Bradley
Vladimir and Sophia Brayman
Aaron Bregel
Richard Brown
Charles Brown
George Butler and Barbara Krieger-Brockett
Neal Cardwell and Genevieve Guenther
Ronald Champoux
Arthur and Lisa Chan
J. Bradley Chen and Elizabetta Conti
Cary Cherng
Stephen and Robin Ching
James and Susan Claypool
Tinsely Coble

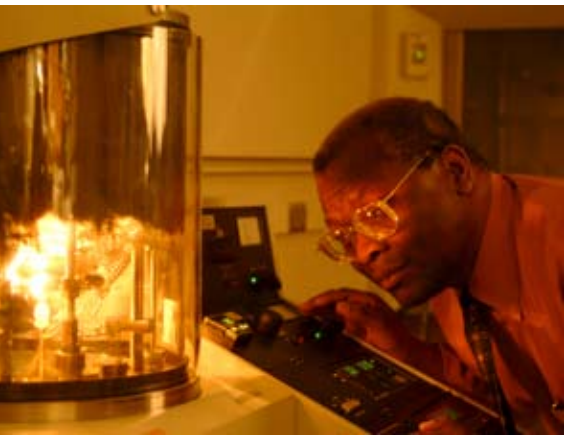
Robert Cochran and Lauri McNeal
Addison and Ann Cole
Larry Cooper
Brian and Jelena Curless
Daniel and Helen Dahlgren
Denice Denton*
David Dion and Shelley Pennell Dion
Jeffrey and Jacqueline Dirks
John and Christa Donahue
John and Kathleen Ehrenberg
A. Herbert and Billee Ershig
Jake Ferderer
Hugh Ferguson
John and Lynn Ferguson
David and Patricia Fischbach
Harold and Marilyn Fogelquist
Patricia Foley
Eric Forbes
Harold and Betty Forsen
Joseph Garbini and Jamie Leschen
John and Derenda Gray
Maya Gupta
Jeremy and Kathryn* Hales
Charles and Dolores Harbert
James and Debra Hartl
Terry and Carol Hartman
Darryl and Sherri Havens
Robert and Mary Hawthorn
Lucille Hebner
Stanley and May Holm
Allen Holmes
Frank and Lynda Holmstrom
Richard and Debra Howarth
Donald and Jing Huang
Harry Hull
Allen and Nettie Israel
Ivor and Doreen James
Samson Jenekhe
Patrick Jenny and Kathleen Higgins
Edwin and Kathleen Johnson
Simon Kahan
David and Anita Kaplan
John and Gloria Kasonic
Geoffrey and Erika Keith
Heng-Pin and Shirley Kiang
Yongmin and Eunai Kim
Jeffrey and Kimberly Johnson
Alan and Carolyn King
Michael and Nancy Kirk
Stephan Kleine and Gloria Van Dusen
Donald* and Julia Krick
Yasuo and Tomoko Kuga
Philip Kummer and Cynthia Weeks-Kummer
Alan and Sue Lampson
Chuck Lenzmeier
A. Gudran LeRose
Gene LeRose
Derek Leslie-Cook
Dennis Lettenmaier
Marc and Alice Levin
Mark and Bernadette Lielke
Jing Jing Long
Mark and Cynthia Lucovsky
William and Kiesha MacLean
Philip Magnusson
Norm* and Judy Maleng
Erik Mattson
Carol Matsumoto
Edwin and Grace Merrill
Thomas and Teresa Miller
Emmett and Carol Miller
Kent Murdoch
Mark Murray
Joshua Newman
Brian Ngo
Jerre* and Margarete Noe
Jonathan Nowitz
Rebecca Oliver
Christopher and Allyson Olsen
Eugene Onishi
Vincent Orgovan
U-Sun and Haijoo Park
M. Dean Parsons
William and Becky Parzybok
Frank and Cheryl Perazzoli
John Perkins
Kenneth Pierce
Ernest and Emma Pogge
Rahda Poovendran
James Prekeges
Carol Purvis
James Ramsey*
V.N. Padmanabha and Visweswari Rao
Dorothy Reed
Eddie Rhone
Jeffrey and Joanna Richey
Norman Ringlee
Gary Garrabrant and Eve Riskin
Andris and Inara Rogainis
Theodore and Shannon Romer
Samuel and Josephine Roskin
Kevin Ruddell and Heather Kroll
Patrick Russell
Scott and Mary Rutherford
Gerald and Sylvia Rutledge
Bruce and Christine Schwager
Daniel Schwartz and Susan Damon
William and Joan Scott
James Seferis and Anne Vernez-Moudon
Jane Shafer
I-yeu and Judy Shen
James and Betty Skaggs
Leon and Marian Smoot
Stephen Snelling
George and Adeena Snyder
George Soli
Anne Steinemann
H. David and Patricia Stensel
Richard and Margaret Storch
Duane Storti
Hilmer Swanson
Tsuneo Tanaka
Cameron Tangney
Arthur Teare
Ingrid Tenggren
David Thompson and Judy Jesiolowski
Phillip and Jeanne Thompson
Jon and Kay Tompkins
Michael and Melissa Trumbore
Alberto and Jean Velez
Geoffrey Voelker
Daniel and Joyce Waldorf
Vernon and Jean Wambo
James and Diane Watson
J. William and Joan Whitaker
Anthony Wiederkehr
Valerie Williams
Alastair and Yvonne Wolman
Gary and Keri Wood
John and Elizabeth Zahorjan
Paul and Dora Zia
Mary Zosel

Estate Gifts

Estate of Mitchell Taylor Bowie
Estate of Paul Arnold Bundy
Estate of Paul Carlstedt
Estate of N. Craig Crawford
Estate of Clayton Emida Danner
Estate of Robert J. Dorwart
Estate of George K. Dragseth
Estate of Douglas B. Duckering
Estate of Evelyn S. Egtvedt
Estate of Ruth S. Ellerbeck
Estate of Ammie B. Ford
Estate of Bernice Frank
Estate of Ruth Frink
Estate of John H. Goldie
Estate of Louise Graves Trust
Estate of Abraham Hertzberg
Estate of Verelynn M. Hewett
Estate of Edward E. Johnson
Estate of Leon C. Johnson
Joel Manley Kenney Irrevocable Trust
Estate of Paul C. Leach
Estate of Brian W. Mar
Estate of Joseph L. McCarthy
Estate of Myrtle Louise Michalski
Estate of Ronald E. Morud
Estate of Ralph Wells Moulton
Estate of Kathleen B. Ogle
Estate of Richard Carl Outsen
Estate of Robert A. Pearse
Lawrence E. Putnam Testamentary Trust
Estate of Suparb Putnam
Estate of Helen A. Reynolds
Estate of Margaret Frances Skelton
Estate of Karsten Solheim
Estate of Frances I. Stulle
Estate of John A. Tershin
Estate of Dean D. Thornton
Estate of Henrik Valle
Estate of Alma Zaloudek

Donors acknowledged here have made cumulative contributions of $5000 or more between July 1, 2000 and June 30, 2008. Every effort has been made to create an accurate and complete list. If an error or omission has occurred, please contact the College of Engineering donor relations office at 206-616-8259 so we may correct our records.

Corporate Partnership Spotlight

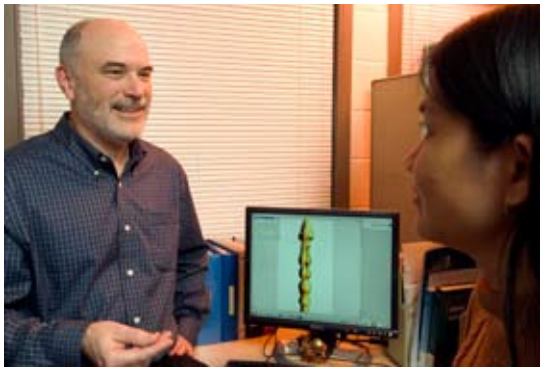


***Sam Jenekhe**, Boeing-Martin Professor of Engineering and professor of chemistry, is using nanotechnology methods to develop organic solar cells with self-assembled polymer nanowires. He watches a thermal evaporator complete the final steps of fabrication.*

The Boeing Company

The partnership between Boeing and the UW College of Engineering dates to the earliest days of both institutions. Each year the college turns out high-caliber, innovative graduates — and thousands have launched careers at Boeing. Since 1986, Boeing has endowed nine faculty positions, several honoring UW Engineering graduates who became world leaders in shaping the aerospace industry. These endowed positions encourage exceptional faculty to pursue fascinating, leading-edge research and to train and mentor the next generation of engineers.

Boeing has been a true partner with the college, touching many aspects of our mission. The company has funded directed research and donated surplus equipment and supplies for research and student design projects. Boeing engineers have collaborated with college faculty and offered advice and guidance on several student-led design projects. The company continues to provide critical funding for scholarships, curriculum development, and programs. Perhaps most significantly, Boeing consistently supports our diversity initiatives, including outreach efforts for student recruiting, partnerships for K-12 initiatives, and retention programs that help students thrive within the engineering fields once they arrive at the UW.



***Jim Riley**, PACCAR Professor of Engineering and professor of mechanical engineering, conducts research on fluid dynamics and turbulent flows.*

PACCAR

An endowed professorship established by PACCAR in 2001 rotates between Mechanical Engineering and Electrical Engineering. PACCAR technical experts continue long-standing collaborative partnerships with these departments, serving on advisory boards and providing guidance and support for student-led design projects. A favorite student field trip is a visit to the PACCAR Technical Center test track in Mount Vernon to learn about the company's technical innovations and observe vehicle tests. Engineering faculty and PACCAR technical experts collaborate on research that benefits both organizations, such as fluid dynamics, advancements in manufacturing processes, and combustion research. These experiences at the company help to bring classroom learning to life for our students.

Weyerhaeuser

For many years, Weyerhaeuser has supported UW efforts to increase the number of students from diverse backgrounds who enter the science, math, and engineering fields. As an early supporter of Washington MESA (Mathematics, Science, Engineering Achievement), Weyerhaeuser plays a significant role in expanding programs to serve teachers and develop curricula in school districts with a significant percentage of students from groups traditionally underrepresented in science and engineering. To honor the success of MESA, Weyerhaeuser in 2004 established the first endowed scholarship program for MESA program participants studying at UW. The Weyerhaeuser Foundation furthered its commitment to the college by establishing the Weyerhaeuser Endowed Professor in Chemical Engineering to support a professor teaching and conducting research related to the forest products industry.

***Proud of their Awards** Middle school students are excited about winning individual medals and a plaque for their school during a Seattle MESA Day math, engineering, and science program.*

~ Corporations and Foundations~

Cumulative gifts and pledges of $100,000 and above between July 1, 2000 and June 30, 2008.

$10,000,000 and above

Bill & Melinda Gates Foundation
The Boeing Company
Intel Corporation
Microsoft Corporation

$1,000,000 to $9,999,999

Alfred P. Sloan Foundation
American Heart Association
The David & Lucile Packard Foundation
Eastman Kodak Company
Ford Motor Company
Gordon and Betty Moore Foundation
The Grainger Foundation Inc
Hewlett-Packard Company
Hitachi, Ltd
Howard Hughes Medical Institute
IBM Corporation
Intel Foundation
M. J. Murdock Charitable Trust
Madrona Venture Group
Pentax Corporation
The Seattle Foundation
Semiconductor Research Corporation
SRI International
Tektronix, Inc.
United Way of King County
Wallace H. Coulter Foundation
Washington Research Foundation
The Whitaker Foundation

$500,000 to $999,999

Adobe Systems Incorporated
Alias Wavefront, Inc
Battelle Memorial Institute
Canon, Incorporated
Electric Power Research Institute
Google Inc.
The Henry Luce Foundation, Inc
Institute for the Study of Learning and Expertise
International Computer Science Institute
Lumera Corporation
Merck & Co., Inc.
Micron Technology Foundation, Inc
Micron Technology, Inc
Montefiore Medical Center
MSNW
PACCAR Foundation
Pacific Earthquake Engineering Research Center
Scripps Clinic & Research Foundation
Teranode Corporation
Universities Space Research Association
VisionGate Inc.
Weyerhaeuser Company Foundation

$250,000 to $499,999

Advanced Technology Institute
Agilent Technologies
Akibene Foundation
American Chemical Society
Andrews Space & Technology
Archus Orthopedics, Inc
Areva T & D
Artemisinin Research Foundation
Chevron Corporation
Dragoon Technologies, Inc
Fidelity Investments Charitable Gift Fund
Foster-Miller, Inc
HDR Engineering, Inc
High Q Foundation
Honda Research and Development Company, Ltd
Industrial Technology Research Institute
Insitu Group Incorporated
J.S.S. Foundation
Kimberly-Clark Corporation
Legacy Emanuel Hospital & Health Center
LG Electronics, Inc
Martin Marietta Space Group
Microvision, Inc.
National Action Council for Minorities in Engineering, Inc
National Space Biomedical Research Institute
R & D Institution of Metals & Composites
RealNetworks
SAMSUNG
Siemens Corporation
Smartronix Inc
Social Venture Partners
Sony Corporation
Stroud Water Research Center
Sun Microsystems, Inc
Telcordia Technologies, Inc
Texas Instruments, Inc
Unmanned Systems Technology Laboratory, Inc
Xilinx, Inc

$100,000 to $249,999

Alcoa Foundation
Alliance for Cancer Gene Therapy
American Institute of Steel Construction Inc.
American Society of Civil Engineers
Amgen, Inc
Apple Computer
Archer OpTx, Inc
ATR Research Laboratories
Avago Technologies Limited
Barlow Scientific, Inc
Biomolecular Switches, Inc
Bosch Corporation
Boston Scientific Corporation
Cabot Microelectronics Corp
Cambridge Systematics, Inc
Carl M. Hansen Foundation, Inc
Ceramatec, Inc
CESI Centro Elettrotecnico, Ltd
Chongqing Holley Holdings
Chunghwa Telecom Company, Ltd
Citigroup Global Impact Funding Trust, Inc
College Spark Washington
Community Foundation Silicon Valley
Crane Aerospace & Electronics
DaimlerChrysler AG
Dow Chemical Company Foundation
Dr. Clark Research Association
Economic and Engineering Services Inc
Electronic Arts
EM Photonics Inc
EMX Group
Engineering Information Foundation
ERA Digital Media Inc.
ERC Inc
Ewing Technology Associates
Ex One Corporation
Extrude Hone Corporation
Exxon Mobil Foundation
Fidelity Foundation
Fordham Street Foundation
Fred Hutchinson Cancer Research Center
GE Foundation
General Dynamics
Genie Industries
Genzyme Corporation
Health Services of Fox Chase Cancer Center
High Speed Connectivity Consortium
Hydrogen Power Inc
Information Storage Industry Consortium
Insightful Corporation
Institute for Responsible Management
Institute for Systems Biology
Integration Partners, Inc
International Vision
Isis Pharmaceuticals, Inc
Isotron Corporation
J. David Gladstone Institutes
JP Innovations, LLC
Kronos Advanced Technologies, Inc
LaZure Scientific, Inc
Lightwave Microsystems Corporation
Lockheed Martin Corporation
Materials Resources International, Inc
MathSoft, Inc
Matsushita Electric Works, Ltd
Medina Foundation
Medtronic, Inc
Mesosystems Technology, Inc
Micro Magnetics Inc
MicroEnergy Technologies, Inc
Mitsubishi Electric Power Products, Inc
Molecular Sciences Institute
National Applied Science, Inc
National Hemophilia Foundation
National Semiconductor
National Steel & Shipbuilding Company
New Energy and Industrial Technology Development Organization
Newaz Technologies, Inc
Nintendo of America, Inc
Nippon Telegraph & Telephone Corporation
Nokia
PATH
PJM Interconnection, LLC
The Procter & Gamble Company
Sakson & Taylor, Inc
Scripps Institute of Oceanography
Seattle Art Museum
Sequoia Scientific, Inc
Shannon & Wilson, Inc
Solar Turbines, Inc
SunPlus Technology Co, Ltd
Susan G. Komen for the Cure
Swiss Federal Institute Zurich Institut Fuer Polymer
Syshubs Global Service, Inc
T-Mobile USA, Inc
Toray Industries, Inc
Toyo Kohan Company, Ltd
Vanguard Charitable Endowment Program
Voyager Capital, LLC
Water Environment Research Foundation
Western Digital Corporation
Woods Hole Oceanographic Institution
Yadav Technology, Inc
Yahoo! Inc
ZymoGenetics

2008 | ENGINEERING LECTURE SERIES

Engineering Inspired by Nature

Join us for these exciting, free programs • 7 pm ~ Kane Hall 110 UW Seattle

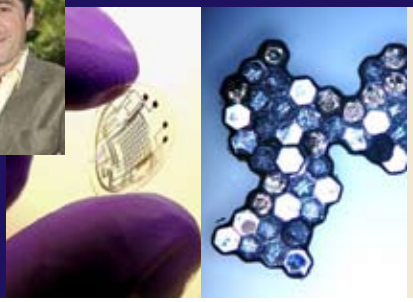
Beyond Oil: Powering the Future Thursday, October 30, 1008


Miles P. Drake, Senior Vice President, Research and Development, and Chief Technology Officer, Weyerhaeuser

Daniel Schwartz, Boeing-Sutter Professor, UW Chemical Engineering, and Associate Dean of New Initiatives, UW College of Engineering

Transportation consumes 70 percent of the oil used in our country. But as worldwide demand for oil soars, supplies tighten and prices skyrocket, how will we keep transportation moving? Current and emerging technologies can quickly convert a wide range of plant matter to transportation biofuels, offering a partial solution. Solar, wind, hydro, nuclear, tidal and wave power will contribute to an increasingly diversified and "greener" energy future.

Back to Nature for the Next Technology Revolution Wednesday, November 19, 2008

Babak Parviz, Associate Professor, UW Electrical Engineering

Just 40 years ago, a computer had 2,000 transistors. Today's CPUs have one billion and tomorrow's units will have billions and billions of tiny components. But they can't be manufactured with today's technology. So where do we turn? Engineering researchers such as Bakak Parviz are studying nature on the nanoscale to create the next technology revolution. Imagine using DNA as a template to "grow" electrical devices, or custom designing molecules to build transistors. It could transform our future.

The lecture series is sponsored by the **College of Engineering** in partnership with the UW Alumni Association.

All lectures are free, but seating is limited. **REGISTRATION REQUIRED.** Register online at UWalum.com or by calling 206-543-0540.

http://www.engr.washington.edu • Tel: 206.543.0340 • Fax: 206.685.0666

The Trend in Engineering

Matthew O'Donnell, PhD
Frank and Julie Jungers Dean of Engineering

Judy Mahoney
Assistant Dean for Advancement

Heather Hoeksema
Director of Communications

Sandy Marvinney
Editor

Hannah Hickey
Matt Vivion
Contributing Writers

Mary Levin
UW Photography

Send address comments or corrections to:
Editor, The Trend
trend@engr.washington.edu

UNIVERSITY of WASHINGTON
COLLEGE *of* ENGINEERING
A Community of Innovators

371 Loew Hall, Box 352180
Seattle, Washington 98195-2180