Engineering Launches Eminent Faculty Initiative in Sustainable Energy

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- Ilies Captures NSF CAREER Award
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University of Connecticut President, Dr. Michael Hogan addresses the media during a joint press conference as Connecticut State Senator and President Pro Tempore Don Williams looks on.

Special Section Reporting on Sustainable Engineering
see page 11

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Dear Alumni and Friends of the School of Engineering:

September yielded the formal announcement, at the Legislative Office Building in Hartford, of a new research initiative that emerges from a unique academic/State/industry alliance: the Eminent Faculty Initiative in Sustainable Energy. The State has established a permanent budget line item of $2 million annually in support of the initiative, with a matching one-time sum of $2 million pledged by industrial partners. This research nexus will reside permanently in the School of Engineering and expand upon our existing critical mass of research excellence in fuel cells, biofuels, photovoltaics and other green technologies. A national search is underway to recruit a world-class senior researcher and several other sustainable energy team members to propel Connecticut onto the national energy stage.

More broadly, this initiative will enhance our larger core of allied research in environmental engineering, hydrology monitoring, foul weather prediction, smart construction and community development, and smart/secure transportation. Please see pages 11-20 for details of the new initiative and profiles of some of our superb research aimed at creating realistic alternatives to fossil fuels, monitoring water resources on the African continent, studying how natural disasters impact buildings, and helping Connecticut and the nation prepare for—and avoid—unexpected disasters such as the Minneapolis bridge collapse and other hazards of an aging infrastructure.

A critical theme within our school is synergistic “cross disciplines.” To address 21st century challenges and remain vital, we must broaden our scope to embrace greater measures of cell biology, agriculture, psychology and public policy, for example. As you read of our accomplishments in research and teaching, this interdisciplinary undercurrent will become more apparent. Tomorrow’s engineers must excel in fundamental engineering practice while also developing their capacity to adapt and apply non-engineering concepts to engineering solutions. A broader challenge to the engineering community is how to provide general engineering education to the public at large: unless Americans—and particularly policy setters—understand basic science and engineering, the nation’s economic security is in jeopardy.

New Dean

I am delighted to announce that the University has named Dr. Mun Choi to be the next Dean of Engineering. Dr. Choi earned his Ph.D. at Princeton and comes to us from Drexel University, where he is Associate Dean for Research and Graduate Studies in the College of Engineering and Department Head of Mechanical Engineering and Mechanics. He will commence his duties as Dean in January 2008. At Drexel, he helped to develop six different U.S. Department of Education Graduate Assistance in Areas of National Need (GAANN) site programs and was instrumental in securing $6.5 million in funding from the National Science Foundation (NSF) for a joint graduate collaboration between Drexel and the University of Pennsylvania. I invite you to read about Dr. Choi on page 4.

New Head for CMBE and New Faculty

Dr. C. Barry Carter (see p. 5) joined us as Department Head of the Chemical, Materials & Biomolecular Engineering Department. He was most recently the 3M Harry Heltzer Endowed Chair in the Department of Chemical Engineering and Materials Science at the University of Minnesota. In addition, we welcomed seven talented new faculty members (see pgs. 25-26) in August. Each brings expertise in an area of strategic importance to the School, from environmental and transportation engineering to biomaterials and biomedical engineering.

Other News

This issue debuts the first of our alumni company profiles, with a spotlight on Phonon Corporation of Simsbury (see pgs. 6-7), a powerhouse company that employs UConn engineering graduates and maintains strong ties with our School.

Those who receive our electronic news page, eFrontierNews, will recognize many of the stories appearing on the following pages. For an advance look at our most immediate news, subscribe to our monthly eFrontierNews at your desktop. It’s free. Please see page 4 for subscription information.

This issue of FrontierNews will be my last as Interim Dean. It has been my great privilege to serve the School of Engineering and all of you who make up our dynamic community. I remain thankful for all of the support I have received, and I am confident that the UConn School of Engineering will continue its climb to the top.

Sincerely,

Erling Smith
Interim Dean

I am pleased to report that this issue of FrontierNews was printed on 50% recycled/25% post-consumer waste paper stock. I think you’ll agree that it looks and feels great, but another bonus of going green is that we can do so at no additional cost. Going green isn’t just an aesthetic and socially responsible decision anymore, it’s also economical!
A joint press conference held at the Legislative Office Building in Hartford unveils an ambitious new research campaign, the Eminent Faculty Initiative in Sustainable Energy, which will reside in the School of Engineering. See story on page 12.

FrontierNews
SCHOOL OF ENGINEERING

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Provost Appoints Choi as Dean of Engineering

The School of Engineering is delighted to welcome Dr. Mun Choi as Dean, effective January 2008. UConn Provost Dr. Peter Nicholls announced Dr. Choi’s appointment, the culmination of an extensive national search, in early July. Dr. Erling Smith will continue as Interim Dean through the end of 2007.

During interviews and campus visits, Dr. Choi was impressed with the University culture and focus on both research and instructional distinction. “The excellent reputation of the faculty and their scholarly activities, the high quality of undergraduate and graduate students, the strong commitments from the upper administration, and active and loyal alumni groups were important elements that attracted me to UConn,” said Dr. Choi.

“The School of Engineering at UConn is poised to become one of the premier institutions in the country and will develop leadership in critical areas of emerging research and innovative academic programs,” he remarked.

Dr. Choi received his M.A. and Ph.D. degrees from Princeton University in 1989 and 1992, respectively, in the field of mechanical and aerospace engineering. He currently serves as Associate Dean for Research and Graduate Studies in the College of Engineering, and as Department Head of Mechanical Engineering and Mechanics at Drexel University in Philadelphia.

Before joining Drexel in 2000, Dr. Choi held academic and administrative appointments at the University of Illinois in Chicago. He also conducted post-doctoral research as a National Research Council Post-Doctoral Fellow at the National Institute of Standards & Technology (NIST) in Gaithersburg, MD from 1992-93.

Dr. Choi’s current research interests focus on the effects of sooting and radiation on droplet combustion, and soot diagnostic techniques. In collaborations with researchers at NIST and Sandia National Laboratory, Dr. Choi has measured optical and physical properties of soot produced from various-scale flames and fires. Other investigations involve research on spherically-symmetric droplet combustion and have enhanced the understanding of how sooting and radiation behaviors influence droplet burning characteristics. His experiments on droplet combustion are slated to be conducted aboard the International Space Station. Many of his studies focus on understanding the performance characteristics of alternative liquid hydrocarbon fuels and additives typically used in automotive and jet engines.

Dr. Choi has championed educational initiatives throughout his career. He helped to develop six different U.S. Department of Education Graduate Assistance in Areas of National Need (GAANN) site programs and was instrumental in securing $6.5 million in funding from the National Science Foundation (NSF) for a joint graduate collaboration between Drexel and the University of Pennsylvania. In addition, he was a co-investigator on an NSF GK-12 fellowship program for doctoral students and collaborated on an NSF Bridge to the Doctorate program for minority students.

He is president of the international mechanical engineering honor society, Pi Tau Sigma, which boasts 160 chapters nationwide. Dr. Choi has received numerous awards for excellence in research and teaching, including the Harold A. Simon College of Engineering Award for Excellence in Teaching (’98), the College of Engineering Inaugural Faculty Research Award (’98), the university-wide Award for Excellence in Teaching (’99) and the system-wide University Scholar award (2000-03)—all at the University of Illinois in Chicago. In 2006, he was awarded the Drexel University College of Engineering Robert G. Quinn Medal for Leadership and the NSF Greater Philadelphia Region Louis Stokes Alliance for Minority Participation Award for Excellence in Education.
New Department Head Arrives in Storrs

Dr. C. Barry Carter took the helm July 1 as Head of the Chemical, Materials & Biomolecular Engineering (CMBE) Department. Dr. Carter was most recently the 3M Harry Heltzer Endowed Chair in the Department of Chemical Engineering and Materials Science and a professor in the Chemical Physics Program at the University of Minnesota.

His academic career spans 16 years as a faculty member at the University of Minnesota (’91-’07) and 12 years with the Materials Science and Engineering department at Cornell University (1979-91).

Dr. Carter earned his D. Phil. in Metallurgy & Science of Materials at Oxford University in 1975, and in 2005 he received the Sc.D. degree in Natural Sciences from Cambridge University.

As CMBE Department Head, Dr. Carter oversees 22 full-time faculty members and three research faculty and instructors, as well as three administrative personnel.

His research interests include interfaces and defects in ceramics and semiconductors.

He is co-Editor-in-Chief of the Journal of Materials Science and serves as General Secretary of IFSM, the International Federation of Societies for Microscopy. He has received many honors throughout his career and is a past president of the Microscopy Society of America and the co-author of Transmission Electron Microscopy: a Textbook for Materials Science. He is a Fellow of the American Ceramic Society and a co-author of the new textbook Ceramic Materials: Science & Engineering, published by Springer in April 2007.

Student Profiles

Katherine Etter: Finding the Balance – Engineering, Political Leadership and Mentoring

Biomedical Engineering student Katherine “Kade” Etter (Spring ’08) is sharpening her mastery of juggling, a skill that will serve her well in her career—whether medicine or law, or a marriage of both. Careful time management and focus allow Kade to balance competing demands in her roles as Speaker of the Undergraduate Student Government (USG), Community Assistant in the Northwest dorm, and a Biomedical Engineering undergraduate enrolled in the University’s Honors Program.

“The School of Engineering has an innovative approach to education and student life. Freshmen are grouped together in courses to facilitate the development of friendships, encourage group projects, and provide a support network for classes. UConn’s foresight in requiring group projects and individual presentations mirrors current trends in industry. Additionally, undergraduates have numerous opportunities to conduct research. Combine these opportunities with the rest of the engineering program and our graduates are among the best prepared for the future.”

Read Kade’s complete profile on our website at www.engr.uconn.edu. Click on “Prospective Students & Outreach” and locate the submenu item “Meet Students.”

Fuel Cell Research Attracted Ph.D. Student Kyle Grew

Graduate student Kyle Grew, a native of the farm belt state of Ohio, came to UConn in 2005 to pursue his doctoral studies after earning his B.S. in mechanical engineering at the University of Dayton, OH.

Under faculty advisor Wilson Chiu, Kyle is studying the optimization of solid oxide fuel cell (SOFC) anode microstructures. SOFCs are made of solid-state materials. Since they operate at high temperatures, 650-800° C, SOFCs can use a wide variety of fuel stocks and operate without the need for a costly catalyst.

“I am studying the various transport mechanisms—such as mass, electronic charge and ionic charge—and reaction/interaction mechanisms (i.e., electrochemical oxidation reactions) at the pore scale level. This involves trying to develop computational models to achieve a pore-level understanding of these processes in the state-of-the-art SOFC, and then designing microstructures that are feasible to manufacture and that minimize efficiency/power losses associated with the described transport mechanisms.”

Kyle’s project is funded by both the National Defense Science & Engineering Graduate Fellowship Program and the Army Research Office.

Read Kyle’s complete profile on our website at www.engr.uconn.edu. Click on “Prospective Students & Outreach” and locate the submenu item “Meet Students.”
A small high-tech company co-founded by two UConn engineering alumni, Phonon Corporation of Simsbury, has carved out a niche as one of the leading military surface acoustic wave—or SAW—device designers and manufacturers in the world. Led by Tom A. Martin (M.S., Ph.D., ’71, ’74), President and Chairman of the Board, and Clement Valerio, Jr. (B.S., M.S., Ph.D. ’70, ’76, ’84) Vice President of Research & Development, Phonon develops high tech analog microcircuits used in defense and space applications.

Phonon is a 65-employee company founded in 1982 by Drs. Martin and Valerio, along with Dick Fraley, former Vice President of Sales & Operations who retired recently, and Pierre Dufilie (B.S., M.S. ’70, ’71) who left in 1989. Within its 15,000 sq. ft. dedicated facility—located on pastoral farmlands where tobacco once dominated the agricultural economy—Phonon employees design, build and test novel surface acoustic wave, or SAW, units for customers that include Raytheon, Northrop Grumman, Lockheed Martin, and some government agencies.

“We’re the leading U.S. company that sells exclusively to the defense industry,” said Dr. Martin. “There are other, large, SAW companies that focus on commercial applications, such as cell phones and other consumer devices. We are the only American company to focus on purely defense applications.”

Phonon’s products deploy acoustic waves across the surface of special solid-state materials to achieve their unique signal processing capabilities. An input transducer converts electrical impulses into tiny acoustic waves that then travel through the solid propagation medium to the output transducer, where the waves are then converted to electrical signals. Phonon’s SAW devices and subsystems are used in radars, electronic warfare programs, communications systems and even deep space.

Among Phonon’s critical resources, none is more fundamental than its employees, many of whom hold degrees from the University of Connecticut.

“We maintain close contact with UConn,” said Dr. Martin. “We are truly a technology company. Our business is based on people skills: good, bright engineers are our lifeblood.”

Because SAW technology is a “very niche business,” Dr. Martin said, only one academic program in the nation trains its students in SAW technology, a Florida institution. “We made the decision years ago to seek out bright engineers and train them ourselves. UConn is our main source for engineers. We are very pleased with the relationship.”

Phonon hires UConn engineering graduates, provides on-site training, and encourages its engineers to return to school for their graduate degrees, offering fee reimbursements, flex-time scheduling and other incentives. Many of the Phonon’s 14 engineers are enrolled in, or have completed, graduate studies at UConn.

Besides Drs. Martin and Valerio, the company’s 14 engineers include UConn electrical engineering alumni Dan Porga (B.S. ’93), David Miller (M.S. ’96),
The U.S. military uses SAW technology to improve the speed and accuracy of small target detection by radars, which are increasingly subjected to sophisticated, powerful jamming and deception techniques. In electronic warfare, SAW technology is used to disable hostile electronics and to protect against electronically controlled threats. SAW devices are used in military communications as well, to handle voice, video, or digital data signals at high rates while providing signal security and jam resistance.

Despite its exclusive reliance on government contracts, Phonon’s business is both stable and growing at a rate of about 10% annually, according to Dr. Martin. “Our contracts are very large and long term—decades in length—in fact. It’s the nature of the defense industry. Take the Patriot missile, for example, which initially began some 40 years ago. The long-term nature of these military projects makes our business very stable.”

All design, manufacturing and testing of Phonon’s devices—which are proprietary and custom-tailored to each customer’s needs—is conducted within the Simsbury facility. The SAW units are constructed in two class-100 clean rooms, one dedicated to wafer fabrication and the other to component assembly, where employees carry out their work attired in sterile coveralls, hoods, booties and gloves. The wafers are made using photolithographic processes, the same techniques used in the manufacture of integrated circuits. Phonon personnel subject every unit to rigorous testing before it is shipped to the customer.

In hiring engineers for its unique operation, Phonon takes advantage of one particularly effective hiring portal, the senior design program in the School of Engineering. Phonon has sponsored a senior design team in the Electrical & Computer Engineering department for several years. Senior engineering students take this capstone class during their last year as a culmination of their preceding years’ classroom studies. Corporate sponsors, who provide financial support, present an undergraduate team with a genuine design challenge and appoint a corporate mentor to advise the team throughout the year. Phonon engineer Tom Reinwald (B.S. ’03), who is pursuing a master’s degree at UConn, is the Phonon mentor to the senior design team. He spends between two and four hours weekly with the students throughout the school year, helping them understand the design challenge within the context of Phonon’s needs. The students also visit Phonon several times and deliver a final presentation before a phalanx of the company’s engineers, who grill them with questions. “They do a very good job,” said Dr. Martin.

The 2006-07 Phonon-sponsored senior design team was charged with development of a programmable logic controller to update the increasingly outdated Solitec track system Phonon uses at the start of its photolithography process. Dr. Martin explained that the company purchases older (20-30 year old) semiconductor wafer fabrication units and adapts them to their needs, since new units can cost millions of dollars. While older equipment carries a reasonable price tag, the units suffer from increasingly obsolete or unavailable replacement parts. The student design team of Michael Kelley, Benjamin Romeo and Jeffrey Travis, with oversight from Mr. Reinwald and faculty advisor Dr. Mohammad Tehranipoor, designed and developed a cost-effective programmatic controller to replace an aging system. The project is ongoing, and a new team of electrical engineering seniors will examine a different aspect of the device during the 2007-08 school year.

Mr. Reinwald is very enthusiastic about his work with Phonon. “My goal in a career was to never wake up in the morning and say to myself, ‘I really don’t feel like going to work today.’ I have never felt that sentiment at Phonon. It’s a very rewarding environment, and we have a lot of freedom to face challenges. Tom [Dr. Martin] is very supportive of continuing education. We have three UConn engineering Ph.D.s at Phonon, and they are great mentors and teachers; it’s like having three more professors. Plus, with a core group of UConn engineers, we share the same educational experiences and training, and even refer to classes by number (e.g., ‘remember in 234, when we were studying...’).”

Phonon’s success originates in the company’s unique, high quality products, unapologetic quest for excellence, and commitment to providing continuing education for its employees. Its deep roots and ongoing alliance with UConn’s School of Engineering help the company sustain its high level of flexibility and innovation. Please visit Phonon’s company website at www.phonon.com for more details.
Robert Weiss, Board of Trustees
Distinguished Professor (2003) of Chemical, Materials & Biomolecular Engineering, was named the UTC Professor of Advanced Materials and Processing at the University of Connecticut. The position is associated with the UTC Advanced Technology Clinic endowment.

In receiving the new title, Dr. Weiss said “I am honored to accept this prestigious title. UTC is among the world’s premier corporations and a technological powerhouse.”

Dr. Weiss was previously honored as the Anthony T. DiBenedetto Distinguished Professor of Engineering (1998) and a Distinguished Professor of Engineering (2002). Within his profession, Dr. Weiss has garnered the Society of Plastics Engineers’ International Research Award (2002), International Education Award (2000), and Fred O. Conley Award for Plastics Engineering/Technology (2003). After receiving his Ph.D. in chemical engineering at the University of Massachusetts-Amherst in 1976, Dr. Weiss accepted a position in the Corporate Research Labs of Exxon Research and Engineering Company and joined the University of Connecticut in 1981.

His research focuses primarily on ionomers, a type of polymer containing bonded salt or acid groups. His interests also span proton exchange membranes—used in fuel cells, polymer blends, wetting of thin polymer films, electrically conductive polymers, and hydrophobically modified hydrogels. He is a Fellow of the American Physical Society, the Society of Plastics Engineers, the American Thermal Analysis Society and the Polymeric Materials: Science and Engineering Division of the American Chemical Society.

Dr. Weiss is a former Associate Director of the Institute of Materials Science and former Director of the Polymer Program at UConn. He has 18 U.S. patents and has published more than 400 peer-reviewed journal articles, book chapters and conference proceedings. In addition, he is the Editor-in-Chief of the Society of Plastics Engineers’ journals, Polymer Engineering and Science (1996-current) and Polymer Composites (1997-current); and former Associate Editor of both publications. He serves on the editorial boards of Macromolecules, the Journal of Applied Polymer Science, Polymer and Polymer Composites, and Chemistry Central Journal. He is also an adjunct Professor of Materials Science at the University of Florida.

The School of Engineering is pleased to welcome a new Director of Advising, A. Brian Schwarz, who joined the School in August following the retirement of Dr. David Jordan, emeritus professor of Electrical & Computer Engineering, who served as Director of Advising for seven years.

With oversight from Assistant Dean of Undergraduate Education Marty Wood, Brian will advise students in planning their academic programs and career goals; in the pursuit of scholarships, awards and internships; and in identifying industry co-ops, internships and job placement opportunities. He will also help students navigate academic difficulties. In addition, he will audit student records to determine eligibility to graduate; assist with recruiting, registration, orientation and other initiatives; meet with parents to discuss academic policies and their child’s performance, as needed; and maintain a host of informative statistics, including enrollment, admissions, dismissals, registrations, degree program changes and similar matters.

Brian earned a B.A. in psychology at Temple University, Philadelphia, and an M.A. in Student Affairs in Higher Education at Indiana University of Pennsylvania, Indiana, PA. He brings seven years’ experience in student advising and counseling at the University of Massachusetts – Amherst, which he joined in 1999 as the Assistant Director for Field Experience with the Campus Career Network. He joined the College of Engineering one year later as Director of Recruitment and Transfer Affairs, and just last year Brian became Director of the college’s newly-created Career and Student Development Center. For a more complete biography, please see www.engr.uconn.edu/advising.
Women Faculty Named 2007 Women of Innovation

The Connecticut Technology Council (CTC) named Drs. Mei Wei and Quing Zhu two of nine 2007 Women of Innovation award recipients. Dr. Wei, an assistant professor in the Chemical, Materials & Biomolecular Engineering Department, received the academic innovation and leadership award in recognition of her contributions in the field of biomaterials. Dr. Zhu, an associate professor of Electrical & Computer Engineering, received one of two awards presented in the area of research innovation and leadership for her development of a novel breast cancer detection device. UConn School of Pharmacy doctoral student Kristyn Greco captured the collegian innovation and leadership award.

The Women of Innovation awards, begun in 2005, recognize outstanding contributions by Connecticut women in the fields of science, engineering, education and business. Awards are made in eight categories, and this year the committee received a total of 120 nominations.

"Ms. Wei and Ms. Zhu are truly remarkable women working in science and technology," said Mike Scricca, Membership Director of the CTC. The council is Connecticut’s industry association for the technology sector and it seeks to attract and unite various state constituencies to enhance the technological prowess, culture of innovation, and economic well-being of the state.

In presenting the awards on January 25, Elizabeth Alquist of Day Pitney, chair of the event’s planning committee, said "These women are making a difference in their workplace and in academia, but more importantly, they are role models and innovators."

Dr. Wei’s research centers on the application of biomaterials in bone repair and in orthopaedic and dental implants. She seeks to develop "a new generation of biomaterials, which have excellent biocompatibility, sufficient mechanical strength, good osteoconductivity and osteoinductivity, and which are suitable for dental and orthopedic applications…As life expectancy grows longer, there will be a demand for a significant increase in the survival rate of implants."

Dr. Wei is investigating new synthetic composite materials, woven from apatite and polymer fiber, for use in promoting bone repair, spinal fusion and other skeletal healing. She believes hydroxyapatite/polymer material will enhance structural integrity as bones repair. Dr. Wei’s research was profiled in the Winter 2006 issue (page 5) of Frontiers. To view a copy, visit our website at www.engr.uconn.edu, select “School News” and click on FrontierNews Magazine.

Dr. Zhu was recognized for her novel breast cancer imaging device, which combines near infrared (NIR) and ultrasound to overcome the limitations of each individual technology, yielding more accurate diagnoses. She was awarded two U.S. patents on the technology, which has garnered over $3.3 million in funding from the National Institutes of Health and Department of Defense. She was named a Donaghe Investigator in late 2006 by the Donaghe Foundation, West Hartford, CT, and was elected a member of the Connecticut Academy of Science & Engineering in early 2007. Her research was profiled more extensively in the December 5, 2006 issue of eFrontierNews. Please visit our website at www.engr.uconn.edu, select “School News” and click on eFrontierNews.

Engineering Programs Undergo Accreditation Review

In October, following two years of preparation and extensive reporting, the School hosted evaluators from the Accreditation Board for Engineering & Technology (ABET), who reviewed 11 of the School’s undergraduate programs. ABET is the specialized accreditor for college and university programs in applied science, computing, engineering, and technology. In addition, the Computing Accreditation Commission reviewed the School’s degree programs in computer science, computer engineering and computer science & engineering. Accreditation is akin to an academic seal of approval: it provides the assurance that a college or university program meets the quality standards established by the profession for which it prepares its students.

The School’s programs were last reviewed for accreditation in 2001-02. At that time, the six bachelor’s degree programs reviewed—Chemical Engineering, Civil Engineering, Computer Science & Engineering, Computer Science, Electrical Engineering, and Mechanical Engineering—received the maximum accreditation. The newer undergraduate degree programs were ineligible for evaluation in 2002. However, they are undergoing ABET review this cycle.

The 2007 accreditation visit culminated two years of preparation that included a practice review by visiting external experts commissioned to assess each degree program. For each program detailed, expansive self-study reports were prepared for the reviewers, which included survey results and analyses, performance measures, goals and objectives, outcomes and other assessment material. In addition, each program surveyed its faculty, alumni, Industrial Advisory Boards and students to identify strengths and areas of concern; these results led to the development and implementation of an improvement plan for each program.

Thanks to our significant advance preparation, the ABET review process proceeded smoothly. Final results will be announced during summer 2008.
UConn Honors Alumnus John Krenicki ('84)

Engineering alumnus John Krenicki, Jr. (B.S.E. Mechanical Eng. ’84) was presented an honorary Doctor of Science degree from the University of Connecticut during the May 2007 commencement ceremonies. UConn President Philip Austin presented the honorary degree, lauding Mr. Krenicki for his impressive career accomplishments and international recognition as one of the nation’s top corporate strategists. During his 23-year career with General Electric, Mr. Krenicki has served as CEO of four major GE units.

As President and CEO of GE Energy, Mr. Krenicki oversees a world-leading supplier of technology, products and services to the energy industry. “GE technology supports about 1/3 of the world’s electricity,” said Mr. Krenicki. “GE leads in many areas such as wind energy, with $4 billion in revenues in wind power yearly. We manufacture wind turbines, which are installed on location at wind farms mostly in California, Texas, Colorado and other western states. We’re also involved in solar, but it’s more expensive and has more materials science hurdles that must be countered before it can expand beyond distributed power applications. GE Energy is also involved in nuclear and in coal gasification and carbon sequestration. For environmental reasons, nuclear energy ultimately may prove crucial to the nation’s future. Sustainable energy fits our economic and environmental commitments, and today’s customers are willing to pay a little more for cleaner energy, so a diverse energy mix makes good economic sense.”

This year, Mr. Krenicki and his wife, Donna (Samson; B.A., Fine Arts, ’84) established scholarships in the schools of Engineering and Fine Arts. The Paul Krenicki Endowed Scholars in Sustainable Energy scholarship will support an undergraduate or graduate engineering student whose interests lie in clean energy. The scholarship is named in honor of Mr. Krenicki’s younger brother. “Paul was very curious and always interested in science and technology. Sadly, he died of cancer while in college and never had the opportunity to pursue his dreams.”

During his multifaceted career, Mr. Krenicki has worn many GE executive hats. He was the CEO of GE-Bayer Silicones (a GE joint venture) in Erkath, Germany, from 1997-99. He was then named a GE Company Officer and became a Vice President and General Manager of the Americas for GE Lighting. Mr. Krenicki was Vice President and General Manager of GE Superabrasives in Worthington, OH, before being promoted to President and CEO of GE Transportation Systems in June 2000. In that role, he staged the unit’s turnaround from a cyclical downturn that saw sales of freight and passenger locomotives drop by half in just two years. In early 2003, he was named a Senior Vice President of GE and President and CEO of GE Plastics. A year later, the merger between GE Plastics, GE Silicones and GE Quartz resulted in formation of GE Advanced Materials, over which he presided as President and CEO until July 2005.

Mr. Krenicki’s training as an engineer provided an important platform for his career. “Engineering is a great foundation—for business, medical school, law, anything. Being an engineer is like passing through the tollbooth fully prepared.” Looking back on his own varied career, he advised students to go with the flow, don’t plan too much, and be open to change.

He has been a passionate advocate for diversity in the engineering workforce, and in 2005, GE established a $500,000 gift to the School of Engineering for creation of the GE Advanced Materials Endowed Scholar Program Fund, which focuses particularly on African American engineering students at UConn. In 2000, Mr. Krenicki received the School of Engineering’s Distinguished Engineering Alumni Award, and in 2003 he was inducted as a founding fellow of the Academy of Distinguished Engineers. He serves on the Advisory Board of the School of Engineering.

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Raytheon Partners with UConn for Advanced Materials

An interdisciplinary faculty team received a $1.47 million subcontract from defense giant Raytheon Company to assist in the development of engineered nanocomposites for optical applications. The project is being funded by the Defense Advanced Research Projects Agency (DARPA) and managed by the Office of Naval Research (ONR).

The project team includes principal investigator Eric Jordan, a professor of Mechanical Engineering (ME), and deputy manager Maurice Gell, a research scientist affiliated with the Chemical, Materials & Biomolecular Engineering department (CMBE). Critical tasks will be overseen by Baki Cetegen, professor and department Head of ME, and Mark Aindow, professor of CMBE. Partnering with the UConn-led, multi-institutional team are Inframat Corporation of Farmington, CT and researchers from MIT and the University of Michigan. Raytheon has subcontracted other portions of its larger DARPA contract to Rutgers University and the University of California - Davis.

The UConn team will seek to develop a new ceramic material that has the necessary optical properties as well as excellent mechanical and physical properties. These requirements greatly limit the choice of potential materials systems, according to Dr. Jordan. “To achieve optical transparency, it is necessary for the material to be fully dense and free of light-scattering defects such as micro-pores and cracks. Accordingly, the materials to be made are at or beyond the cutting edge of ceramics processing,” he said.

The UConn team was chosen in large measure because of a unique new ceramic processing method it pioneered in partnership with Inframat Corporation, called Solution Precursor Plasma Spray...
In the last decade, these subjects have drawn considerable attention from the scientific community, policy makers, the media and concerned citizens the world over. Demands on the Earth have exploded as Asia invests heavily in an unprecedented industrial revolution, drought and war exact a dangerous toll, and energy usage swells to staggering levels.

The School of Engineering is committed to the development of technologies that will address these myriad, integrated challenges. Within our laboratories, engineering faculty are forging exciting new energy technologies, examining how human activity alters the environment that sustains us, designing more intelligent transportation and grappling with the intersection between technology/policy/human impacts.

In the ensuing pages, we profile some of our groundbreaking research in these areas, and we invite you to explore our activities in greater detail, to partner with us, or to become part of the solution in other ways.
During a joint press conference on September 18th, held at the Legislative Office Building in Hartford, the University of Connecticut formally unveiled an ambitious new research campaign, the **Eminent Faculty Initiative in Sustainable Energy**, which will reside in the School of Engineering. The University of Connecticut's new president, Dr. Michael Hogan—joined by Connecticut State Senator and President Pro Tempore Donald Williams, Jr., UConn Provost Peter Nicholls, industry partners FuelCell Energy, the Northeast Utilities Foundation and UTC Power, and members of Connecticut's General Assembly—enthusiastically discussed the public-private initiative.

The Eminent Faculty Initiative represents a unique partnership between UConn, the Connecticut General Assembly, and the industrial partners who are committed to propelling Connecticut onto the international stage in the development of sustainable "green" energy. The initiative is rooted in the July 2006 passage of a senate bill entitled "An Act Concerning Jobs for the Twenty-First Century," which was championed by Senator Williams and enacted by both houses in the Connecticut General Assembly. A provision of the bill charged UConn's Board of Trustees to develop a program to attract world-renowned faculty members to the University in a research area deemed strategically important. Provost Nicholls invited competitive proposals from across campus and awarded the first eminent faculty position to the School of Engineering to address the critical area of sustainable energy.

Dr. Hogan, who officially commenced duties just the week before, said the State has a rare opportunity to provide leadership in developing viable sustainable, environmentally sound alternatives to conventional energy technologies. Other speakers included Ray Necci, President and Chief Operating Officer of Connecticut Light & Power; Frank Wolak, Vice President of FuelCell Energy; Tom Jarvi, UTC Power's Director of Technology Development; Senator Williams; Provost Nicholls; and various State senators and representatives.

Senator Williams said the commitment to sustainable energy is essential to Connecticut's future. "Connecticut is already a world leader in fuel cell technology," he remarked, with 15 percent of fuel cell employees around the world located in Connecticut. He also lauded the Connecticut Global Fuel Cell Center as a role model that attracts visitors from across the globe. He thanked his colleagues on both sides of the aisle for passage of the jobs bill, including Senators Joan Hartley, Judith Freedman and Gary Lebeau; and Representatives William Hamzy and Pam Sawyer.

In his remarks, Provost Nicholls praised Dr. Smith for developing the important energy proposal and thanked the legislators and industrial partners for joining together to "solve one of the greatest challenges we face as a nation."

Commenting on the partnership, Dr. Smith said "This is an exceptional opportunity to build a results-oriented, visionary research and development program in renewable green energies, at a time when the nation is just beginning to grapple with its precarious dependence on fossil fuels."

— Erling Smith

This is an exceptional opportunity to build a results-oriented, visionary research and development program in renewable green energies, at a time when the nation is just beginning to grapple with its precarious dependence on fossil fuels.
Eminent Faculty continued from page 12
dependence on fossil fuels.” He said that, in addition to cutting-edge research, the initiative would allow the School of Engineering to develop educational programs to train tomorrow’s energy leaders and entrepreneurs.

Mr. Necci recalled that when Northeast Utilities received the proposal from the School of Engineering, he was excited because it fit precisely with the company’s three areas of investment, in economic development, workforce development, and environmental stewardship. His comments were echoed by FuelCell Energy’s Frank Wolak and UTC Power’s Tom Jarvi.

Dr. Smith said the School will immediately launch a national search for a scholar of international stature and reputation who will effectively leverage and expand the School’s research and development activities in sustainable energies, including fuel cells, biofuels and photovoltaics. The School expects to hire several additional senior faculty members and support staff to complement ongoing activities in the area of alternative energy. The School’s resources include the Connecticut Global Fuel Cell Fuel Cell Center (CGFCC) and the Biofuel Consortium, as well as current research involving photovoltaics and other green energy technologies.

MacKay Research Examines Impact of Antibiotics in Environment

Research conducted by associate professor Allison MacKay (Civil & Environmental Engineering) is aimed at helping scientists better understand how antibiotics and other organic compounds enter the nation’s waterways, disperse and change over time.

In 2004, the U.S. Geological Survey (USGS) published disturbing findings from a study of water and fish in tributaries of the Potomac River, among them a “high incidence” of male smallmouth bass endowed with oocytes, or eggs, in their testes. Analyses of water samples taken in the study revealed measurable levels of antibiotics, animal feed additives, arsenic, pesticides and other so-called “endocrine disruptors”—pharmaceutical or natural compounds that alter the ordinary functioning of hormones in living things.

With the emergence of antibiotic-resistant strains of bacteria, the prevalence of antibiotics in aquatic systems—including municipal reservoirs—is cause for concern. A major source of antibiotics in the environment is animal feedlots. In 2004, the U.S. agricultural industry used 21.7 million pounds of antibiotics, which are commonly added to animal feed to prevent disease and promote growth.

Scientists believe that a very large percentage—more than 60 percent—of ingested antibiotics are excreted by livestock and eventually enter the nation’s waterways. The American Medical Association and American Academy of Pediatrics are among the more than 300 health, consumer, environmental, sustainable agriculture, and other organizations that have called for an end to the routine use of medically-important antibiotics as feed additives.

Dr. MacKay, along with Dr. Dhami Vasudevan, associate professor of Chemistry at Bowdoin College, is interested in better understanding what happens to these agricultural antibiotics after they leave the animal. Their research, supported by the U.S. Department of Agriculture and the National Science Foundation, seeks to unveil the so-called “fate” of such contaminants in soil and water: how—and how far—they travel; how they are changed over time; how they are degraded, etc. Dr. MacKay explained that sunlight, temperature, flow rate, bacteria and other microorganisms, soil types and mineral composition—all may affect how these antibiotics are degraded.

“Antibiotics are designed to be biologically active even at low levels, so their impacts and environmental interactions can be much subtler and more complex than many contaminants,” said Dr. MacKay.

According to Dr. MacKay, the most widely used agricultural antibiotic is tetracycline, which is added to the feeds of cattle, swine and even farmed fish. After leaving the animal, ingested antibiotics typically begin their journey in surrounding soil before being washed into bodies of water or seeping into groundwater. Dr. MacKay commented that antibiotics tend to remain active longer in soil than in water, for a variety of reasons. “In water, for example, if these compounds remain close to the surface, they may be broken down by sunlight. Antibiotics may also be degraded by bacteria more quickly in water than in soil.”

It is here, in the soil, that Drs. MacKay and Vasudevan have focused their research in an effort to determine how different soil compositions may affect the movement and active life of tetracycline.

Once Dr. MacKay and her team finish characterizing the soils and complete tests regarding the movement of tetracycline through these soils, they will develop a mathematical model that replicates the movement and fate of the antibiotics as they move through soils of different composition. They ultimately hope to expand the scope of the model to accurately reflect the movement of not only tetracycline but a wider array of antibiotics. In seeking to develop a macro- or generic model, they are looking at the interactions of tetracycline and soil at a molecular level. A more complete version of this story appeared in the August 22 issue of eFrontierNews. Please visit our website at www.engr.uconn.edu, select School News and click on eFrontierNews.
Danbury-based FuelCell Energy (FCE) hosted a celebratory summit at the Connecticut Global Fuel Cell Center (CGFCC) on Thursday, September 6th to announce its successful demonstration of a novel distributed generation hydrogen production technology called Electrochemical Hydrogen Separator (EHS). The successful demonstration offers promise that hydrogen-powered automobiles may become a reality. The summit featured remarks by various energy leaders, a round-table discussion, a ribbon-cutting ceremony and demonstration of the EHS unit.

The technology was developed to address a barrier to widespread use of fuel cells in transportation—the lack of a hydrogen infrastructure capable of supporting hydrogen generation, storage and transport. To test the unit’s sustained performance, FuelCell Energy installed a laboratory-scale EHS unit at the CGFCC that separates the excess hydrogen generated by high-temperature fuel cells. According to FCE representatives, the unit operated for more than 6,000 hours with no degradation in performance.

The celebratory event capped a successful industry/university/government collaboration aimed at refining and testing the novel EHS technology and propelling it toward commercialization. The partners included FuelCell Energy, the Connecticut Clean Energy Fund, the U.S. Department of Defense and the UConn School of Engineering. The Connecticut Clean Energy Fund provided seed funding to the project, and the U.S. Army Corps of Engineers’ Engineer Research & Development Center provided an additional $2.6 million in DOD funding that allowed FCE to continue development of the technology, which consumes little energy, involves no moving parts, and is less costly than existing mechanical technologies.

A recurring theme during the summit was the challenge to make often costly renewable energy technology more economical, and to move it from the lab to commercial markets. Among the speakers sharing remarks were Lise Dondy, President of the Connecticut Clean Energy Fund; Dr. Pinakin Patel, Director of Special Systems and Research at FuelCell Energy; Franklin Holcomb, Fuel Cell Projects Manager for the Army Corps of Engineers’ Construction Engineering Research Laboratory (CERL) in Champaign, IL; Trent Molter, CGFCC Research Scientist and Business Development Officer; UConn Provost and Executive Vice President for Academic Affairs, Dr. Peter Nicholls; and Interim Dean of Engineering, Dr. Erling Smith. FuelCell Energy’s Dr. Patel; Keith Frame, Associate Director—New Technologies and Project Management with the Connecticut Clean Energy Fund; Dan Tyndall of Air Products & Chemicals; Joel Rinebold of CCAT; and Franklin Holcomb of DoD-CERL—and other sustainable energy leaders and policy makers participated in an afternoon round-table brainstorming session intended to foster continued industry/academic/government collaborations on energy development.

During its operation at CGFCC, the EHS unit produced enough hydrogen to fuel three fuel cell vehicles per day. The demonstration also showed that dramatic cost savings of between 30-60 percent are possible compared with commercially available hydrogen separation systems. FuelCell Energy believes the technology could make the cost of hydrogen competitive with that of gasoline.

The alliance exemplifies the positive synergies that can emerge between commercial partners and the university’s unique R&D centers, which are equipped with exceptional resources.
Connecticut Transportation Institute Slated a National Center of Excellence

The Connecticut Transportation Institute (CTI), a unit of the School of Engineering, was notified in July that it has been tabbed to receive millions of dollars in federal funding as a National Center of Excellence for Transportation Security. The grant was announced jointly by Connecticut Senators Chris Dodd and Joe Lieberman, who championed the selection of CTI, one of seven charter programs to receive a combined $18 million/year in homeland security grants over four years. The program is part of the Rail and Public Transportation Security portion of so-called H.R. 1 Implementing the 9/11 Commission’s Recommendations, which passed both the House and Senate with strong majorities and was signed by President Bush on August 3.

A total of $72 million has been allotted for the four-year project. At this time, the legislation is not yet budgeted.

CTI is one of seven entities chosen to receive the federal monies. The other institutions are the Mack-Blackwell National Rural Transportation Study Center at the University of Arkansas (Fayetteville), the National Transit Institute at Rutgers University (New Brunswick, NJ), Texas Southern University (Houston), Tougaloo College (Jackson, MS), the Mineta Transportation Institute at San Jose State University, and the Homeland Security Management Institute at Long Island University (Brooklyn, NY).

The transportation security Center of Excellence at UConn will draw upon experts in sustainable energy, smart transportation, chemical and biological sensing, IT, the first-responder community and other entities to bring enabling research and instructional expertise in the following areas:

- Structural hardening (especially bridges), stress monitoring and detection, and failure prediction
- Real-time traffic monitoring systems to identify congested areas and offer recommendations for traffic rerouting
- Identification of soft transportation targets
- Sensing to detect biological and chemical agents
- Development of sustainable, non-fossil fuel energy alternatives that will help the nation gain energy independence and reduce its reliance on petroleum refineries and distribution networks that can be targeted by terrorists
- Development of real-time monitoring, multi-sensor data fusion and communications systems capable of deploying critical information to first-responders
- Sub-marine surface sensing and communication networks

“The selection of the Connecticut Transportation Institute as a National Center of Excellence for Transportation Security is a tribute to the excellent work conducted at CTI and the University of Connecticut,” Lieberman said. “The accompanying grant will transform CTI into one of the leading authorities on transportation security, which has become a critical area of study in the wake of numerous terrorist attacks against transportation systems around the globe.”

“The urgency and relevance of the research work of Dr. Richard Christenson and his team, profiled in our winter 2007 issue of FrontierNews (pgs. 16-17) was recently underscored by natural events. Days before Dr. Christenson, an assistant professor of Civil & Environmental Engineering, and his undergraduate students Adam Scianna and Dominick Mantoni, arrived in Thailand for their summer 2007 trip to examine the impact of seismic events on building structures, a Richter scale magnitude 6.3 earthquake struck the northern border of Thailand. A 6.3 earthquake is considered “strong,” and capable of causing considerable damage to buildings, destruction of chimneys, movement of houses on their foundations, and other serious consequences.

The three-year project, supported through the International Research Experiences for Students (IRES) project, focuses on the exploration of smart civil structures that can sense and react to their environment. Dr. Christenson, along with Adam, Dominick and their Thai colleagues from Chulalongkorn University, flew to the northern city of Chiang Mai, where they conducted seismic downhole tests to measure shear wave velocity for site-response analysis. The resulting data revealed information about the wave parameters and soil characteristics of the immediate area that, paired with local earthquake data, was used to develop contour maps of earthquake intensities in the region. The seismic intensity data provide valuable insight into the strength of a particular earthquake at a particular location, in contrast with the gross impact data offered by Richter scale measurements.

Read a complete account of the team’s 2007 research travels at www.engr.uconn.edu/cee/christensonresl
Connecticut Bridges Safer Thanks to DeWolf

In the wake of the August 1 Minneapolis bridge collapse, which sent cars and trucks plummeting 60 feet into the Mississippi River during the evening rush hour, it is reassuring to know that Connecticut has a secret weapon in the battle to ensure bridge safety. Dr. John DeWolf, a professor of Civil & Environmental Engineering at UConn, has spent more than two decades on field research involving bridge monitoring. With funding from the U.S. Federal Highway Administration and the Connecticut Department of Transportation (ConnDOT), he began research in 1985 to examine how existing technologies can be used to monitor in-service bridges on a variety of performance criteria, and how bridges perform and age over time.

According to the American Society of Civil Engineers (ASCE), the U.S. has 596,842 public bridges. In 2003, more than 27% of these were judged structurally deficient or functionally obsolete; 33% of Connecticut’s over 5,350 bridges were deemed deficient or obsolete. Twelve have received ratings so low they are considered to be in critical condition.

In carrying out their research, Dr. DeWolf and his team selected a cross section of the State’s most important bridges and paired them with different sensor systems to determine which provided the most useful and reliable information. Each monitoring array is custom tailored based on the inspection concerns, traffic, age and materials specific to the bridge. The monitoring apparatus includes a computer and hardware that operates various sensors. The data are collected at intervals and stored in the computer, from which they can be accessed remotely.

Dr. DeWolf uses sophisticated finite element analysis to make sense of the raw data. The resulting profile is then compared against the field inspection results, and the points of convergence or deviation allow Dr. DeWolf to refine and improve his analytical model.

Dr. DeWolf conducts both short-term and long-term monitoring studies. He explained that the short-term monitoring is meant to complement the State’s inspection system and is conducted on selected bridges that have been targeted for some type of repair, with the objective of helping Dr. DeWolf’s studies involve quantifying metrics that reduce the subjective nature of the inspections and enhance bridge safety.

Dr. DeWolf has used as many as 52 sensors on any one bridge, and as few as 14. The arrays may include a combination of tilmeters, accelerometers, strain gauges, and thermocouples that measure tilt, vibration, strain and temperature at various locations on a bridge. He currently has long-term monitoring arrays installed on six Connecticut bridges. His objective with these long-term monitoring studies is to better understand how bridges perform and degrade over time, under different weather and temperature conditions, with varying use, etc., and to develop assessment guidelines that can be applied uniformly and universally.

One of the new systems Dr. DeWolf’s team deployed is the first of its kind: an array that relies on solar panels for its power source. Wireless structural monitoring systems require batteries located at each sensor, but the monitors mounted at various places on bridges are often extremely difficult to reach, said Dr. DeWolf, making it difficult to change spent batteries and keep the monitoring system operational. The introduction of solar energy will improve the team’s ability to keep an array in place and capture critical data over long periods. His next goal is to automate the entire process.

For example, if inspectors find a crack, we can help them determine more precisely the nature of the problem and how it can be addressed for optimal safety while avoiding unnecessary repair costs. — John DeWolf
Fuel Cell Center Establishes Fuel Cell UPS Test Facility

With financial support from Connecticut Innovations’ Yankee Ingenuity Technology program, the Connecticut Global Fuel Cell Center (CGFCC), a unit of the School of Engineering, has established an accelerated testing facility for fuel-cell based backup power systems. Fuel-cell backup power systems, or uninterrupted power supplies (UPS), offer a number of important advantages over battery backup systems, including higher energy density and power density, lower weight, lower maintenance, and potentially higher reliability—all at a lifecycle cost comparable to that of battery systems.

The CGFCC offers a number of excellent test features for evaluating the performance, efficiency, and reliability of multi-kilowatt (kW) fuel-cell power modules. These include:

1. A water-cooled load bank that can dissipate current up to 1500 amps at a maximum of 60 volts. The load bank has an add-on module to enable measurement of the cell/stack impedance spectrum, providing additional diagnostic information about cell/stack performance.
2. An automated system that simulates grid power loss and monitors the start-up reliability of the backup-power units.
3. A Thermotron environmental chamber (-60°C to 180°C) that can impose a variety of indoor and outdoor conditions to test the accelerated shelf decay of backup-power units, which are typically shut down or idle during the majority of their service life. Additionally, temperature transients can be simulated for accelerated-degradation studies.

Fuel Cell Conference Draws 400

With the famed Brooklyn Bridge as a backdrop, the American Society of Mechanical Engineers (ASME) staged its fifth International Conference on Fuel Cell Science, Engineering and Technology June 18-20, 2007. Dr. Nigel Sammes, formerly the UTC Chair Professor of Fuel Cell Technology in UConn’s Connecticut Global Fuel Cell Center and editor of the Journal of Fuel Cell Science and Technology, chaired the conference with co-chair Scott Samuelsen, director of the National Fuel Cell Research Center (NFCRC) at the University of California - Irvine.

The conference provided an insider’s view of the state of fuel cell science and commercialization to nearly 400 attendees—academic and government researchers as well as industry leaders—from 27 countries.

Four distinguished fuel cell leaders presented plenary sessions:

- **Patrick Davis**, Acting Program Manager of the U.S. Department of Energy’s Office of Hydrogen, Fuel Cells and Infrastructure Technology
- **John Scott**, Chief of the Energy Conversion Branch at NASA’s Johnson Space Craft Center in Houston
- **Wayne Surdoval**, Fuel Cells Technology Manager for the U.S. Department of Energy’s National Energy Technology Laboratory (NETL)
- **Heinrich Lienkamp**, Ph.D., Head of the Business Development/Chemical Engineering Department for the Division Energies and Utilities of Infraserv GmbH & Co. Höchst KG

Abstracts of their talks may be found at www.asmeconferences.org/FuelCell07/Keynote.cfm.

Speakers from pioneering companies participated in the conference, including individuals from General Motors, Rolls Royce, United Technologies Research Center, UTC Power, Hamilton Sundstrand, Tokyo Gas, General Electric, FuelCell Energy, H2Gen Innovations, Inc., Consolidated Edison, Keyspan Business Solutions, Plug Power, Avelance, the National Institute of Standards and Technology (NIST), National Institute of Advanced Industrial Science and Technology (AIST), Pacific Northwest National Laboratory (PNNL), the National Energy Technology Laboratory (NETL), NYSERDA, the Connecticut Clean Energy Fund and several leading academic programs.
UConn Demonstrates Continuous Biodiesel Production

In late June, faculty and students associated with the multidisciplinary Biofuel Consortium staged a technological first for academic biodiesel production: the continuous 16-hour operation of a pilot-scale reactor converting waste cooking oil to pure biodiesel. Following several short-run trials aimed at determining the conversion efficiency of the reactor, found to be functioning at a 99 percent conversion rate, the unit began an uninterrupted overnight demonstration run. At the end of the trial, the team had produced 230 gallons of biodiesel that will be used in the University’s fleet vehicles.

The Consortium comprises students and professors associated with several University departments and programs who share a common interest in stimulating a biofuels industry within Connecticut, thus reducing the state’s reliance on fossil fuels and associated environmental and health impacts. The Consortium emerged from the research efforts of Dr. Joseph Helble, former Head and professor of Chemical Engineering, who—working with two students in 2004—transformed waste cooking oil collected from campus dining halls into biodiesel that successfully fueled a University shuttle bus.

Richard Parnas and Benjamin Wilhite, both faculty members in the Chemical Engineering Program, headed up the 16-hour demonstration project. Dr. Parnas is director of the Biofuel Consortium. The prototype production system was constructed by chemical engineering graduate student Matt Boucher. The demonstration team also included chemical engineering students Katie Bower, Steven Unker, Cliff Weed, Si-Yu Li and visiting India Institute of Technology - Delhi student Rajdeep Das.

According to Dr. Wilhite, what differentiates the UConn demonstration from other university biodiesel projects is the reactor’s ability to operate continuously. “Other university biodiesel projects rely upon batch production, which limits the volume that can be effectively and economically produced,” said Dr. Wilhite. The reactor’s unique design features make it attractive to industry, said Dr. Parnas, who added that there is significant industrial interest in the new reactor technology. Several companies have approached UConn to request licensing rights to the reactor, for which Dr. Parnas filed a patent application in January 2007.

The Biofuel Consortium uses waste cooking oil as a feedstock in the reactor, thus avoiding the food-versus-energy debate currently surrounding corn-based ethanol. However, spent cooking oil contains contaminants that must be removed before the oil can be used in the reactor. Greenleaf Biofuels donated 500 gallons of yellow grease, a commercial waste vegetable oil, for the demonstration. In the week preceding the continuous run, Mr. Boucher pretreated the waste cooking oil to neutralize and remove free fatty acids and contaminants that resulted from the oil’s earlier use in food production.

The UConn reactor incorporates reaction technology along with gravimetric separation to produce two liters per minute of usable biodiesel and a small amount—averaging 10 percent—of byproduct. The reactor is continuously fed a 4:1 (volumetric) mixture of waste vegetable oil and methanol with an overall flow rate of approximately two liters per minute. The reactor design is also easily scalable to much larger production rates.

One byproduct is glycerol, which is used extensively in cosmetics and other personal care products, pharmaceuticals and commercial foods. Because the market is generally glutted, the team is investigating possible applications of glycerol as a feedstock for fuel cells or for use in polymers. Unreacted methanol, one of the two most important reactants, is mostly dissolved in the glycerol stream and is extremely costly to waste. To reduce methanol loss, during the 16-hour run, Si-Yu Li used the glycerol in a 20 liter batch distillation unit to recover over 40% of the methanol removed in the glycerol stream.

Looking back on his more than 20-hour sojourn with the biofuel reactor, Mr. Boucher commented that “I learned that our reactor technology works extremely well, even when the equipment budget was quite low, and that despite several early equipment failures, hard work brings good things. We aren’t only making biodiesel in that lab, we are making a difference.”

In commercial applications, biodiesel is typically mixed with conventional diesel fuel, often at a ratio of 2:8 for the so-called “B20” fuel. When used in vehicles, biodiesel produces no sulfur dioxide, and significantly reduces hydrocarbon and particulate emissions compared with conventional petroleum-based fuels.

In recognition of his commitment to the development of sustainable fuels, Dr. Parnas was honored with receipt of the University’s 2006-07 faculty Environmental Leadership Award. Dr. Parnas was lauded for his efforts to not only reduce the CO2 footprint of the University but also to position UConn in the forefront of sustainable energy development. The Environmental Leadership Awards are presented by the University’s Environmental Policy Advisory Council (EPAC) as a way to acknowledge individuals who continuously strive to lead environmentally responsible lives at the University of Connecticut and who, through their positive example, have inspired others to follow suit.
School Seeks New Director for Connecticut Global Fuel Cell Center

Associate Dean for Research & Graduate Education Mehdi Anwar announced that the School of Engineering has launched a search for a permanent Director of the Connecticut Global Fuel Cell Center (CGFCC). The CGFCC, established in 2001 with significant investment from Connecticut Innovations and Connecticut industry, is housed in a dedicated, state-of-the-art facility located at the Storrs campus. The Center has enjoyed funding of over $10 million during its six years of operation and ranks among the largest academic fuel cell R&D centers in the nation.

The Director will report directly to the Dean of engineering and will oversee all short- and long-range operations of the CGFCC. Dr. Anwar said that candidates should possess the leadership qualities necessary to attract significant financial and human resources to the Center, along with a commitment to building and maintaining collaborative partnerships between the CGFCC and industrial and government partners. Additionally, applicants should have demonstrated experience and interest in marketing and promotion, a record of successful funds generation, and the leadership skills necessary to foster visionary team-based research and development.

The School seeks to fill the open position immediately with a qualified individual. Applicants must hold a Ph.D. in engineering or a related physical science discipline, a distinguished record of research in fuel cell technology, and an established national/international reputation in their research areas. Dr. Anwar said the School invites self nominations as well as secondary nominations of individuals who fit these criteria. Additional details of the candidate search may be found on the Center website, at www.engr.uconn.edu/ctfuelcell.

Ethiopian Hydrologic Studies Excite Multi-Institutional Student Team

A team of nine undergraduate and graduate students from the U.S. and Ethiopia spent the summer intensively studying the hydrology of a key Ethiopian watershed as part of a three-year National Science Foundation-funded project headed by Dr. Mekonnen Gebremichael, assistant professor of Civil & Environmental Engineering (CEE). The team seeks to develop reliable methods of monitoring the water resources in the region over time, using ground-based sensing methods, satellite data and physically-based hydrological and meteorological models.

Ethiopia is an important target for hydrology and weather research. Dr. Gebremichael said, “Studies have shown that weather originating in Ethiopia eventually travels to the continental U.S. One recent study reported that about 70% of the Eastern Atlantic tropical cyclones originated with incipient disturbances that developed in the Ethiopian highlands, so understanding climatological events in that part of Africa will help us better predict and understand the impact on the U.S.”

The CGFCC serves as a nucleus for research, commercialization and educational activities focusing on proton exchange membrane fuel cells (PEMFCs), solid oxide fuel cells (SOFCs), direct methanol fuel cells (DMFCs), molten carbonate and other fuel cell types, and by efforts in micro- and micro-miniature fuel cell systems. The Center partners with Connecticut fuel cell leaders such as UTC Power, FuelCell Energy, Distributed Energy Systems; Connecticut state alternative energy leaders including the Connecticut Clean Energy Fund/Connecticut Innovations; and national funding agencies such as the U.S. Department of Energy, National Science Foundation, DARPA, ONR and many others.

With faculty researchers from various engineering disciplines as well as chemistry and biology, the CGFCC is advancing the state of the art in fuel cell science and technology and bringing fuel cells to the next stage of commercial development in countless domestic and military applications, from laptop computers and automobiles to primary power units used by infantry personnel in remote environments. Our center also offers on-site facilities for fuel cell and stack performance testing, and education aimed at training tomorrow’s energy leaders in diverse fuel cell and other sustainable energy technologies.

The biggest challenge in monitoring and predicting water resources variability in Africa in general, and in Ethiopia in particular, is the lack of ground-based systems for observing water resource variables such as rainfall, stream flow, soil moisture, etc. Dr. Gebremichael is keenly interested in developing basin hydrological data for Ethiopia and comparing it against satellite data and hydrologic models. He believes such studies will help Ethiopia and the U.S. to better predict foul weather and permit Ethiopia to invest in sustainable development as more is known about water resources in the target area.

The field team included Dr. Gebremichael, UConn graduate Alana Rebollo (B.S. political science, ‘07); Caitlin Bathrop, an undergraduate in Civil & Environmental Engineering at Tennessee Technological University (TTU), Cookeville; UConn CEE graduate students Dawit Zeweldi, Feyera Aga and Tadesse Taye; Continued on page 20.
Alumnus Bernie Berson (’57) Takes Reins at NSPE

Please visit our website for the full-length version of this story, including Bernie’s memories of his undergraduate days at UConn: www.engr.uconn.edu/alumni/alumlinks.php.

Bernard R. Berson, P.E., who earned his B.S. in civil engineering at UConn in 1957, was installed as president of the National Society of Professional Engineers (NSPE) during the annual conference in Denver (July 26-29). The NSPE serves 45,000 members nationwide and promotes engineering licensure and ethics, continuing education opportunities and other activities that enhance the preparation and reputation of practicing engineers.

As President, Mr. Berson plans to focus on three core initiatives: the continued improvement of state and national partnerships to enhance member services, benefits and incentives as well as licensure; continued and expanded efforts toward building enterprise and company-wide memberships; and development of strategies for attracting young engineers and enhancing outreach with colleges and universities. The young engineer initiative is a particular priority for him.

Mr. Berson operated a private practice for nearly 30 years—Berson, Ackermann & Associates, Inc., located in Fords, NJ, and later Piscataway, which provided site engineering, surveying, and public works design services. He later founded a consulting practice specializing in general consultation, forensic engineering, and professional development seminars. He holds Professional Engineer (PE) and Land Surveyor licenses (LS) in New Jersey and Pennsylvania; PE licenses in Delaware and Massachusetts; and LS licenses in Virginia and Maryland. He is also a PE and LS in Connecticut (retired status), and in New York (inactive status).

Mr. Berson is dedicated to enhancing the educational opportunities and professionalism of engineers nationwide—particularly young engineers. For four years, he produced “PEPP Talk,” an electronic newsletter with a circulation of approximately 13,000 members of the NSPE and Professional Engineers in Private Practice (PEPP). As Chair of NSPE/PEPP (2001-02), he created the PEPP Young Engineers Advisory Council with the goal of engaging young engineers and shedding light on the issues and concerns relevant to them. Mr. Berson has conducted professional development seminars to engineers, architects and land surveyors, many in participation with construction claims attorneys, and he co-authored (with Douglas Benner) a signature 2007 book, Career Success in Engineering: A Guide for Students and New Professionals.

Raytheon Partners continued from page 10

(SPPS). In this process, chemical precursor droplets are injected into a plasma jet to form the ceramic in its brief flight to the substrate. The SPPS process offers significant advantages that are favorable for the DARPA project. It involves molecular-level mixing of multi-component ceramic materials, the ability to control chemical purity, and the flexibility to rapidly explore new compositions.

A project goal is to achieve transparency in the infrared optical range. To do so, the team must produce a nano-grained material that is stable at elevated temperatures. Dr. Jordan explained that thanks to its high cooling rates, the SPPS process commonly produces oxide ceramic microstructures with grain/crystal sizes of less than 100 nanometers. A nanometer is 10^-9 meters, a size so minute that it would take 80,000 nanometers to equal the width of a human hair. The SPPS process can effectively produce multi-component microstructures at the nanometer scale, called nanocomposites, that are high-strength as well as resistant to erosion and thermal shock. For this first phase of the DARPA contract, the UConn-led team will screen potential optical materials and optimize the SPPS process.

The modeling of useful optical properties is also important and will be carried out by both Raytheon and UConn, where the effort is led by Dr. Paul Klemens, professor emeritus of physics.
Bar-Shalom Research to Aid Defense

Dr. Yaakov Bar-Shalom, Marianne E. Klewin Professor in Engineering and a Board of Trustees Distinguished Professor of Electrical & Computer Engineering, received a $630,000 three-year grant from the U.S. Department of Defense to develop practical multi-target tracking and multi-sensor data fusion algorithms that will aid the U.S. military in accurate detection and characterization of targets in the field. The work is expected to enhance the efficiency of surveillance systems when it is deployed for use with domestic and overseas radar systems.

The research draws upon research underway in Dr. Bar-Shalom's lab, which involves estimation and statistical decision theory combined with mathematical optimization. In collaboration with his colleagues, Electrical & Computer Engineering professors Peter Willett and Krishna Pattipati, Dr. Bar-Shalom will develop algorithms that accept input from multiple and diverse sensors; optimize reliability by reducing clutter and noise as well as individual sensor biases; send the sensor data to a central point where it can be merged and organized to reveal an accurate “single integrated” picture of multiple targets simultaneously; and trigger an appropriate response. The algorithms will be used in large computers housed either on ships or air command centers to track both aircraft and ballistic missile targets, and possibly land or sea targets.

Dr. Bar-Shalom commented that the team will publish their results in leading peer-reviewed journals to ensure the greatest integration of the algorithm into defense applications. “The algorithms I developed that are used in a large number—more than 50—of Raytheon radars were picked up from my open literature papers and short courses I offered.”

A recognized international expert in target tracking, Dr. Bar-Shalom is credited with originating the probabilistic data association filter (PDAF) for target tracking in a low signal-to-noise ratio environment; pioneering the theoretical information limit for estimation in the presence of false measurements—and an algorithm that meets this limit; and developing the optimal track-to-track fusion (Tr2F) equations for real-world asynchronous decentralized surveillance systems. These tools and tracking paradigms are used worldwide for target detection and tracking by military and national defense organizations.

For a more complete story, please see www.engr.uconn.edu/shalom0707.

Enderle Receives ASEE Merryfield Award

Dr. John D. Enderle, professor of Electrical & Computer Engineering and Director of the Biomedical Engineering program, was presented the 2007 Fred Merryfield Design Award in recognition of his distinguished accomplishments in senior design. The Merryfield Award is presented by the American Society for Engineering Education (ASEE) and is one of three national engineering awards given each year. The award was established in 1981 by CH2MHill—the international engineering consulting and construction firm founded by professor Merryfield—to recognize engineering educators for excellence in the teaching of engineering design.

Since joining the School of Engineering in 1995, Dr. Enderle has won a number of awards. In 2006, he received the American Association of University Professors (AAUP) excellence in service award and the Theo Pilkington Outstanding Educator Award (American Association for Engineering Educators). He previously was presented the IEEE Engineering in Medicine and Biology Society’s service award (2004) and in 1998, he was selected a University of Connecticut Teaching Fellow.

Dr. Enderle is Editor of the annual publication on NSF Senior Design Projects to Aid Persons with Disabilities carried out by universities throughout the U.S. He co-authored the text Introduction to Biomedical Engineering (1st edition ’99, 2nd edition ’05, Academic Press), and he is Editor-in-Chief of IEEE EMBS Magazine and BME Book Series Editor for Morgan and Claypool publishers. He also serves on the Editorial Board of the Academic Press Biomedical Engineering Book Series.

In 2006, Dr. Enderle co-authored three short books on probability theory for biomedical engineers and authored a book on bioinstrumentation (Morgan and Claypool). He is also a member of the Connecticut Academy of Science & Engineering (CASE). His current research interest involves characterizing the neurosensory control of the human visual and auditory system from the molecular to large system level. Dr. Enderle received his Ph.D. from Rensselaer Polytechnic University in 1980.

Fred Merryfield, for whom the award is named, was a sanitary engineering professor and researcher at Oregon State University for 35 years. Professor Merryfield motivated his students to measure river pollution and report their findings to the Oregon State Board of Health. He was eventually credited as the driving force behind the cleanup of the Willamette River and other estuaries in Oregon.
The School of Engineering honored six outstanding individuals with special recognitions during the annual banquet and awards ceremony in April. Five of the honorees were named to the School’s Academy of Distinguished Engineers and one was presented the 2007 Distinguished Engineering Service Award. The event, which also included the award of merit scholarships to outstanding students, took place before an audience of over 600 alumni, corporate friends, faculty, and scholarship awardees and their parents. University of Connecticut President Philip E. Austin, along with Interim Dean Erling Smith, welcomed guests and presented opening remarks. University Provost Peter Nicholls and Dean Smith then introduced the Academy of Distinguished Engineers inductees and service award recipient.

The 2007 inductees include Ronald D. Goldblatt, Julie A. Pollitt, John R. Rhode, Jr., Sudhakar V. Shenoy and Jack E. Stephens. The Distinguished Engineering Service Award was presented to professor emeritus Mahmoud Melbye of Electrical & Computer Engineering. Short profiles for all of the award recipients appear below.

For profiles of previous Academy inductees since 2003, visit www.engr.uconn.edu/alumni/ on the School of Engineering website.

During the evening the School awarded more than $550,000 in academic merit scholarships to 217 continuing students and offered another $800,000 to entering engineering students. The scholarships are funded by donations from generous corporate friends and alumni.

Ronald D. Goldblatt (M.S., Ph.D., Materials Science, ’84, ’87) is an IBM Distinguished Engineer and Senior Manager of Advanced Silicon Science and Process Technology at the T.J. Watson Research Center, Yorktown Heights, NY. He joined IBM in 1981 and has held technical positions of increasing responsibility culminating in his appointment to the executive position of Distinguished Engineer in 2005. Dr. Goldblatt has made outstanding contributions to silicon processes and engineering and is a leader in semiconductor materials research. He was instrumental in IBM’s transition to copper metallurgy in semiconductor processing in the mid 90’s. As the technical leader and—later—technical manager, he was responsible for initial feasibility, proof of concept, scale-up into development, and technology transfer to manufacturing. He holds key patents in this area. The transition to copper afforded IBM a 15% performance increase and a clear leadership position lasting several years.

Since 2002, Dr. Goldblatt has led a joint research-development team that creates prototypes for many of the breakthrough technology concepts originating in IBM Research and has enabled implementation of these processes in the 300mm manufacturing line in IBM’s semiconductor fabrication facility. He is currently leading his team in new, expanded directions, exploring the ultimate capabilities of silicon based devices as well as novel post-CMOS concepts.

Julie A. Pollitt (B.S. Mechanical Engineering, ’88) is a Program Analyst in the Office of Program Analysis & Evaluations, Office of the Administrator at the National Aeronautics & Space Administration (NASA), Washington, DC. Her duties include development of an agency-level performance management system; negotiation of externally tracked performance metrics with the Office of Management and Budget; and product development and reporting on NASA programs and projects for the White House’s Budget and Performance Integration Initiative. Since joining NASA Headquarters in 2002, she has also served as Deputy Program Manager of NASA’s largest aeronautics research program, and as a Strategic Analyst.

Ms. Pollitt began her career as a Design Engineer with the NASA-Ames Research Center’s Mechanical Systems & Controls unit, Moffett Field, CA in 1988. She held various positions of responsibility, including Mars Airplane Conceptual Design Team Co-Lead; Business Development Manager; and Intelligent, Digitized Shuttle Application Lead. As a Congressional Science & Technology Fellow assigned to Rep. Tony Hall (3rd District - OH), she was responsible for legislation affecting the U.S. Air Force and related to access-to-space/reusable launch vehicles, aging aircraft and the insufficient investment in defense aerospace science and technology. Ms. Pollitt has received numerous NASA honors, including the Special Achievement and Spotlight Awards. She earned her M.S. at Stanford University (1991).

John R. Rhode, Jr. (B.S. Electrical Engineering, ’60) is the Founder and Managing Director of Sound Consulting Associates LLC, which caters to service and manufacturing clients in the development and implementation of strategic plans, performance improvement and breakthrough management projects. Earlier in his career, as Director of Strategic Planning for Engelhard Corporation (1991-95), Mr. Rhode helped the company quadruple its stock price and led a key Engelhard re-engineering team whose successes were cited in Michael Hammer’s book, The Reengineering Revolution.

Prior to joining Engelhard, Mr. Rhode was a Senior Consultant, Director of Planning, and Vice President of Marketing and Planning for the Industrial Products Group of Combustion Engineering; Vice President of Marketing and Planning for the Power and Industrial Sector; and CEO of a Combustion Engineering subsidiary.
He previously served as Vice President of LPL Technology’s Amphenol subsidiary, and Chief Engineer for the command and data links on the APOLLO Project for MIT’s Instrumentation Lab, where he was responsible for the command and data transmissions to and from the spacecraft and also participated in the preflight training of the astronauts. Mr. Rhode was a member of the Board of Directors of The Strategic Planning Institute. He earned his M.S.E. in Computer Applications from MIT and an MBA from Harvard University.

Sudhakar V. Shenoy (M.S. Electrical Engineering, ’71; MBA ’73) is founder (1981), Chairman and CEO of Information Management Consultants, Inc. (IMC), which received the Golden Hammer Award, presented by the Vice President of the U.S., and the Government Computer News Industry Information Technology Award. Earlier in his career, Mr. Shenoy was a Senior Business Analyst with American Management Systems (’78 - ’80), held technical positions with Windsor Manufacturing (’73 - ’78) and was an adjunct faculty member in the UConn School of Business (’72 - ’74).

Mr. Shenoy represented the U.S. in a Presidential trade and development mission to India (’95) and on trade missions to Spain and Berlin. He was named among the Top 25 Most Influential People in the Washington, DC high-tech industry; the 2004 Small Contractor Executive of the Year by the Northern Virginia GovCon Council, the Professional Services Council and Washington Technology; and the Washington Area Minority and Small Business Person of the Year (1995). He received the Greater Washington High Technology Entrepreneur of the Year Award in 1998. Mr. Shenoy served on the State of Virginia Technology Commission (’98); he currently serves on the non-resident Indian Advisory Board on Foreign Direct Investment to the Prime Minister of India, and on the Board of Advisors of the UConn School of Business.

Jack E. Stephens (B.S. Civil Engineering, ’47) Ph.D., P.E., who died in August, was a professor emeritus, Civil & Environmental Engineering (CEE) at the University of Connecticut; a Public Service Specialist with the Connecticut Technology Transfer Center (T2); and a Senior Research Advisor to the Connecticut Advanced Pavement Lab (CAP Lab). Please see Dr. Stephens’ memoriam on page 30.

Mahmoud A. Melehy (Ph.D., University of Illinois, ’52) is a professor emeritus of Electrical & Computer Engineering (ECE) at UConn. He joined the ECE faculty in 1958. Dr. Melehy’s research has been devoted mainly to generalizing Einstein’s 1905 theory of Brownian motion to surfaces, membranes and other interfaces. The generalized theory has led to a unified theory for semiconductor diodes and solar cells, which accurately corroborates experimental data reported, over more than 25 years, by some 27 authors. The general theory has further revealed that the first and second laws of thermodynamics require that electric charges reside at most interfaces. This result explains numerous natural phenomena, such as surface tension, capillarity, fog and cloud suspension, atmospheric electricity, particle adhesion to surfaces, and the mystery of generating static electricity by rubbing two different surfaces against one another. Dr. Melehy has published on this subject some 80 scholarly journal publications and one book. He has presented his work in numerous international conferences, including the Paris, 2005 “Einstein Century International Conference.”

In 1960, Dr. Melehy consulted at Shockley Transistor, Mountain View, CA, resulting in two published papers with Dr. W. Shockley, inventor of the junction transistor and co-recipient of the 1958 Nobel Prize in physics.

Student News

Doctoral student Nisar Ahmed, Electrical & Computer Engineering, received best thesis laurels at the 2006 IEEE VLSI Test Symposium. He was presented the Test Technology Technical Council (TTTC) best doctoral thesis award amid a highly competitive field of challengers.

Graduate student Jessica Chau (Environmental Engineering) won a competitive travel grant, based on her mini-proposal submission, to attend the IUGG (International Union of Geodesy and Geophysics) 2007 Perugia General Assembly in Italy July 2-13, 2007.

Two May 2007 Civil Engineering graduates, Daniel Espinosa and Christopher Wall, were recognized by the national Chi Epsilon civil engineering honor society. Daniel was presented the 2006-07 Chi Epsilon New England District Scholarship Award ($1,500), and Chris received the Joseph L. Brandes National Chi Epsilon Scholarship Award ($3,000), for their outstanding academic achievements and contributions within Chi Epsilon.

Bethany Lepine (B.S. Biomedical Engineering, ’07) received the University of Connecticut’s Spitzer/Duerer Humanitarian Achievement Award for her community outreach. Bethany was recognized for her volunteer work as program director for the UConn Community Outreach homelessness project, through which she trained and oversaw the efforts of 60 volunteers associated with community homeless shelters in Willimantic and Rockville, CT.

Doctoral student Wesley Marshall (Civil & Environmental Engineering) won a prestigious 2007 Dwight David Eisenhower Graduate Transportation Fellowship, presented by the National Highway Institute. He received the award for his proposed research involving community design, road safety and transportation sustainability. The two-year fellowship conferred $61,500 in funding and a stipend allowing Mr. Marshall to attend the Transportation Research Board Annual Meeting in January 2008, where he will

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Ilies Captures NSF CAREER Award

Dr. Horea Ilies, assistant professor of mechanical engineering, was named a National Science Foundation Early Career Development (CAREER) Award winner in 2007. The five-year $400,000 award will support his investigation into ways to improve the design and manufacture of mechanical systems whose function depends on inherent contact between moving geometries. Such systems are typically encountered in the design and manufacture of mechanisms such as gears and cams, but the same underlying principles are found in other application domains such as computer aided manufacturing, geometric modeling and computer graphics, engineering design, tool path planning in manufacturing, and computer assisted surgery.

Many failures arise when the contact between the parts does not conform to the designed or intended contact, which can be traced to the fact that certain mathematical singularities of the mathematical models have not been taken into consideration during the design stage. Dr. Ilies will seek to develop a generic theoretical framework and computational algorithms for predicting, quantifying, and correcting malfunction or unintended behavior of such systems due to unintended changes in the contact between the moving geometric objects. Such a capability, which could be used, for example, to predict contact disruptions during the early design stages of parts moving in contact, would result in significant reductions in the product development time. In turn, such a decrease in the product development time would induce substantial financial benefits to a company.

Dr. Ilies commented that his CAREER research will “advance the state of the art in computer aided manufacturing, path planning, and geometric modeling by providing algorithms which will, for example, significantly improve on-line testing of tool paths and CNC codes for arbitrarily complex shapes and motions that will reduce under- or over-cutting in machining, improved swept volume calculations and improved collision detection.” Please see page www.engr.uconn.edu/news/ilies07 of our website for the detailed story.

Student Profiles

Kolawole Ladoja: Destined for UConn Engineering

A childhood lesson instilled at his father’s knee led senior computer engineering major (Dec. ’07) Kolawole Ladoja to decide at an early age that he wanted to be an engineer. Returning to the U.S. after many years in Nigeria, Kolawole was convinced by both his impressions of the university and his mother’s urging, to attend UConn. The road from Nigeria to Storrs was anything but straight. “I grew up mostly in Nigeria and returned to the U.S. (I was born here) in 2001. My Dad is a civil engineer, and when I was little, he told me that in resource-rich Nigeria—because we didn’t have manufacturing operations—raw materials are exported and transformed into expensive products that are sold back to Nigerians. I knew then that I wanted to be an engineer, because I felt engineers produced goods.”

“I am the kind of person who needs to be challenged to perform. My performance has always been proportional to how much I was pushed. UConn has not disappointed me in this respect; in fact, it has exceeded my expectations. I am continuously challenged by faculty, staff and students. This enables me to realize and acknowledge my weaknesses as well as work on being a more well-rounded individual.”

Read Kolawole’s complete profile on our website at www.engr.uconn.edu. Click on “Prospective Students & Outreach” and locate the submenu item “Meet Students.”

Colette Opsahl: From Step Dancing to Cardboard Canoes

Mechanical Engineering senior Colette Opsahl (’08) has taken advantage of exceptional opportunities during her UConn years, including studying abroad in Ireland, teaching Irish step dance and interning with Hamilton Sundstrand.

“I spent six months, including the spring ’06 term, at the University of Limerick in Ireland. It took some work to get my coursework arranged. Dr. John Bennett served as a liaison with ABET (Accreditation Board for Engineering & Technology) to ensure my courses were transferable from Limerick to UConn. European programs aren’t accredited in the same way that U.S. engineering programs are accredited, so this took some coordination. My study abroad experience was excellent.”

Colette began a year-long internship at Hamilton Sundstrand over the summer working on the Joint Strike Fighter program. “I would like to stay with Hamilton Sundstrand. In fact, I’ll split my time next month between Hamilton Sundstrand and UConn. United Technologies [parent company] pays for its employees to pursue graduate studies and even offers the further incentive of awarding $10,000 in UTC stock when employees complete their graduate degree.”

Read Colette’s complete profile on our website at www.engr.uconn.edu. Click on “Prospective Students & Outreach” and locate the submenu item “Meet Students.”
School Welcomes New Faculty

Seven new faculty members joined the School of Engineering and commenced their academic duties at the start of the fall ’07 term. The new faculty members, whose brief profiles appear below, bring expertise in areas of strategic importance to the School as it plans its research future, including environmental and transportation engineering, biomaterials and biomedical engineering.

Civil & Environmental Engineering

The Civil & Environmental Engineering (CEE) Department welcomed a record four new junior faculty members: Drs. Joseph Bushey, Maria Chrysochoou, Nicholas Lownes and Adam Zofka.

Dr. Joseph Bushey earned his Ph.D. in environmental engineering at Carnegie Mellon University (2003) and his M.S. in environmental engineering and science at Stanford University (1996). He brings expertise in water quality engineering, and his research interests include the transport of metals and toxins within natural systems. Before joining UConn, he conducted post-doctoral research at Syracuse University involving the effect of landscape on mercury cycling, and the mobility and bioavailability of mercury within forest ecosystems. Earlier in his career he worked as a research assistant in the Department of Civil Engineering at Stanford University, and as a research chemist/engineer with P.H. Glatfelter Co. of York, PA. Dr. Bushey co-authored five book chapters and scholarly journal papers. In addition, five of his conference presentations have appeared in published proceedings.

Dr. Maria Chrysochoou earned her Ph.D. at the Stevens Institute of Technology, Hoboken, NJ (2006) and her M.S. at the Technische Universitaet Dresden, Germany (2003), both in environmental engineering. After completing her doctorate, Dr. Chrysochoou held a post-doctoral research position at the Stevens Institute that involved in-depth examination of fly ash, chromite ore processing, and munitions remediation. She was named the graduate assistant of the year (2005) by the Stevens Institute Department of Civil, Ocean and Environmental Engineering. Dr. Chrysochoou has published more than 10 scholarly papers in refereed journals and delivered 13 presentations at professional conferences. Her research interests involve the geoenvironmental and geochemical characterization of soil, waste, industrial by-products and complex media.

Dr. Nicholas E. Lownes earned his Ph.D. in August 2007, and his M.S. degree in 2005 – both at the University of Texas-Austin in transportation engineering. Dr. Lownes was awarded a number of honors throughout his academic career, including four named graduate fellowships. He has published one scholarly journal paper and three refereed conference papers to date. In addition, he held leadership roles in several student chapters of professional societies and honor societies. Dr. Lownes brings expertise in traffic engineering—including highway safety, human factors and cost-benefit analysis—traffic micro-simulation, network analysis and public transportation systems. Dr. Lownes worked as an Installation Water Resources Manager with ESA Environmental following receipt of his B.S., and through four college internships he gained experience in building demolition and reconstruction, human/traffic engineering, and construction inventory control.

Also joining the CEE department with expertise in transportation engineering is Dr. Adam Zofka, who was awarded his Ph.D. by the University of Minnesota (2007) and his M.S. by Gdansk University of Technology, Poland (2001), both in civil engineering. Dr. Zofka’s research interests include pavement engineering—particularly the characterization, testing and modeling of bituminous materials: asphalt mixtures, asphalt binders, and reclaimed asphalt pavements (RAP); pavement performance and non-destructive testing. He has published six scholarly papers in peer reviewed professional journals and conference publications. Dr. Zofka has garnered a number of scholarships and honors, including the Matthew J. Huber Award for Excellence in Transportation Research and Education, presented by the Center for Transportation Studies at the University of Minnesota in 2006, and the 2001 Gold Medal of the President of Gdansk University of Technology.

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Computer Science & Engineering

Dr. Yufeng Wu joined the Computer Science & Engineering Department with expertise in computational biology and bioinformatics. He received his Ph.D. in 2007 from the University of California – Davis and his M.S. from the University of Illinois at Urbana-Champaign in 1998. Dr. Wu is particularly interested in computational problems in population genomics, including association mapping of complex diseases and inference of genealogical networks from population-scale variation data. He employs combinatorial or probabilistic approaches in resolving these complex problems. Dr. Wu has published seven scholarly journal papers and conference presentations. He received a best student paper award for his presentation concerning models and efficient algorithms for association mapping of complex diseases with ancestral recombination graphs. Before embarking on his doctoral program, Dr. Wu was a software engineer (1998-03) at PrairieComm, Inc. (now part of Freescale Semiconductor, Inc.), an Illinois startup company.

Mechanical Engineering

Two new faculty members joined the Mechanical Engineering Department: Drs. Shiva Kotha and Wei Sun, both in areas spanning biomaterials.

Dr. Shiva Kotha was previously an assistant professor in the School of Dentistry at the University of Missouri – Kansas City. He obtained his Ph.D. in biomedical engineering from Rutgers University and the University of Medicine and Dentistry of New Jersey in 2000. Dr. Kotha conducted post-doctoral research in aerospace/mechanical engineering at the University of Notre Dame, and in orthopaedic surgery at Washington University of St. Louis, MO. His research interests include scale-dependent tissue mechanics, bone adaptation to mechanical loading, devices and materials for improving chronic health problems, non- and minimally-invasive tissue engineering, and the development of novel composites for use in prosthetics. Dr. Kotha’s current research focuses on evaluating the molecular profiles underlying bone adaptation to mechanical loading in non-invasive regeneration/shaping of bone, and in the development of novel devices and materials for improving chronic health issues. He has published more than 20 scholarly papers in prestigious scientific journals.

Dr. Wei Sun received his Ph.D. in bioengineering from the University of Pittsburgh in 2003 and his M.S. in Materials Engineering from Shanghai Jiao Tong University, China in 1993. Following receipt of his doctoral degree, Dr. Sun was a post-doctoral fellow in the Mechanical Engineering Department at the Georgia Institute of Technology, and a staff engineer in the Heart Valve Therapy R&D department at Edwards Lifesciences LLC, Irvine, CA. His research focuses on the experimental study and constitutive modeling of cardiovascular biomaterials, and the study of tissue and organ function using computational biomechanics tools. Earlier research has involved new heart valve and annuloplasty prosthesis design, modeling of biomimetic fiber scaffold materials for artery substitutes, and the biomechanics of heart valve biomaterials.

Sayma Rahman, an M.S. graduate student in Environmental Engineering, has been awarded a 2007-08 Education Foundation Fellowship of $12,000 by the American Association for University Women (AAUW). The AAUW Education Foundation exclusively targets women pursuing graduate studies who are at critical stages of their careers, and those pursuing professions where women are underrepresented. A total of 26 candidates were selected across the nation in 2007-08, and Ms. Rahman was the only winner from Connecticut.

The UConn Material Advantage (UCMA) Student Chapter was selected to receive two prestigious national honors, the World Materials Day Award and the Chapter of Excellence Award. The Chapter of Excellence Award is presented to just five yearly of the 75 student chapters nationwide. Both awards bring visibility and prestige to the UCMA chapter. They were presented in September to the UCMA officers, who include Jacquelynn Garofano (graduate president), Amber Black (undergraduate president), Julie Anne Mackey (vice president), Salay Stannard (secretary) and Samuel Brewczynski (treasurer). The group is advised by assistant professor of Chemical, Materials & Biomolecular Engineering Rainer Hebert.
Reda Ammar, Department Head and professor of Computer Science & Engineering, was general chair of the 20th International Conference on Parallel and Distributed Computing and Systems, which took place September 23-26, 2007 in Las Vegas.

Professor emeritus of Chemical Engineering Mike Cutlip and professor Mordechai Shacham of Ben-Gurion University have published the second edition of their signature book, with a revised title: Problem Solving in Chemical and Biochemical Engineering with POLYMATH, Excel, and MATLAB. The 752-page book is published by Prentice Hall (ISBN-10 is 0131482041).

Gerald Engel, professor of Computer Science & Engineering (Stamford campus) was elected to a three-year term as Vice President of the International Federation for Information Processing (IFIP). IFIP was created by the United Nations. Dr. Engel represents the U.S. IEEE Computer Society on the General Assembly and has served as an IFIP trustee.

In May, Howard Epstein, professor of Civil & Environmental Engineering, was presented the Benjamin Wright Award of the Connecticut Society of Civil Engineers (CSCE) section of the American Society of Civil Engineers (ASCE) for his significant contributions to the civil engineering profession. It is the highest honor that ASCE can bestow upon a member of the civil engineering community.

Lei Wang, assistant professor of Electrical & Computer Engineering, is co-inventor on a new patent entitled “Receiver and Method for Mitigating Temporary Logic Transitions,” which was awarded U.S. Patent No. 7,200,821 in April 2007. His collaborator is E. Fetzer of Intel Corp.

Mohammad Tehranipoor, assistant professor of Electrical & Computer Engineering, co-organized a panel at the 2006 IEEE VLSI Test Symposium, on the subject “Three Questions to Oracle,” that garnered a “best panel award.” Dr. Tehranipoor was also a 2006 Design Automation Conference (DAC) best paper candidate for his work on “High-Quality Transition Delay Fault Test in Nanometer Technology Designs.”

Board of Trustees Distinguished Professor of Electrical & Computer Engineering Bahram Javidi delivered the plenary address at the Optical Microsystems 2007 (OMS 2007) conference in Capri, Italy September 30-October 3. His topic was “Improved Performance Three Dimensional Sensing and Visualization by Integral Imaging.” Meeting sponsors were the European Optical Society (EOS), the Institute of Electrical and Electronics Engineers (IEEE) Lasers Electro-Optics Society (LEOS), The Institute of Physics, and other European organizations.

Peter Luh, Department Head of Electrical & Computer Engineering and SNET Professor of Communications & Information Technologies, delivered the opening plenary talk at the 2007 IEEE International Conference on Automation and Logistics held in Jinan, Shandong, China, in August 2007. The title of the talk was “From Manufacturing Scheduling to Supply Chain Coordination: The Control of Complexity and Uncertainty.”

Assistant professor of Materials Science Ramamurthy Ramprasad was a co-inventor on two U.S. patents issued on November 14, 2006. Patent number 7,136,029 for a “Frequency Selective High Impedance Surface,” and patent number 7,136,028 for “Applications of High Impedance Surfaces,” were issued to Dr. Ramprasad and his co-inventors, M.F. Petras and C.T. Tsai.

Assistant professor of Chemical Engineering Ranjan Srivastava spent the summer in Silver Spring, MD as a Fellow at the Naval Medical Research Center, where he worked in the Viral & Rickettsial Diseases Department. His studies involved development of a genome database and genome-scale metabolic modeling of Orientia tsutsugamushi, a bacterium responsible for scrub typhus.

Mohammad Tehranipoor, assistant professor of Electrical & Computer Engineering, delivered the plenary address at the 20th International Engineering Science & Engineering, was general chair of the 20th International Engineering Conference on Parallel and Distributed Computing and Systems, which took place September 23-26, 2007 in Las Vegas.

Professor emeritus of Chemical Engineering Mike Cutlip and professor Mordechai Shacham of Ben-Gurion University have published the second edition of their signature book, with a revised title: Problem Solving in Chemical and Biochemical Engineering with POLYMATH, Excel, and MATLAB. The 752-page book is published by Prentice Hall (ISBN-10 is 0131482041).

Gerald Engel, professor of Computer Science & Engineering (Stamford campus) was elected to a three-year term as Vice President of the International Federation for Information Processing (IFIP). IFIP was created by the United Nations. Dr. Engel represents the U.S. IEEE Computer Society on the General Assembly and has served as an IFIP trustee.

In May, Howard Epstein, professor of Civil & Environmental Engineering, was presented the Benjamin Wright Award of the Connecticut Society of Civil Engineers (CSCE) section of the American Society of Civil Engineers (ASCE) for his significant contributions to the civil engineering profession. It is the highest honor that ASCE can bestow upon a member of the civil engineering community.

Lei Wang, assistant professor of Electrical & Computer Engineering, is co-inventor on a new patent entitled “Receiver and Method for Mitigating Temporary Logic Transitions,” which was awarded U.S. Patent No. 7,200,821 in April 2007. His collaborator is E. Fetzer of Intel Corp.

Mohammad Tehranipoor, assistant professor of Electrical & Computer Engineering, co-organized a panel at the 2006 IEEE VLSI Test Symposium, on the subject “Three Questions to Oracle,” that garnered a “best panel award.” Dr. Tehranipoor was also a 2006 Design Automation Conference (DAC) best paper candidate for his work on “High-Quality Transition Delay Fault Test in Nanometer Technology Designs.”

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Outreach Initiatives
Excite Prospective Students

The School of Engineering conducts a series of important programs each year that help students in K-12 gain a better understanding about engineering principles and careers. These efforts familiarize students with engineering in an exciting, often hands-on format that appeals to young people.

For more information about our outreach activities, please contact:

Marty Wood
Assistant Dean for Undergraduate Education
191 Auditorium Road, Unit 3187
University of Connecticut
Storrs, CT 06269-3187 USA
Ph.: (860) 486-5466
Email: marty@engr.uconn.edu

BRIDGE

Forty incoming engineering students participated in the five-week summer BRIDGE 2007, a residential readiness program designed to prepare students for the freshman-year experience. The program provides intensive preliminary coursework in core mathematics, chemistry, physics and computer concepts. Admission is limited to qualifying students who have applied or been admitted to the UConn School of Engineering. BRIDGE specifically targets students who are members of groups traditionally underrepresented among the nation’s engineers, including women, African Americans, Hispanics, Puerto Ricans and Native Americans.

Each BRIDGE day included classroom instruction in chemistry, computer programming, calculus and physics. Evenings were reserved for scheduled group study sessions. Students also completed practice tests and engaged in team exercises intended to improve their group problem solving skills—an important part of the undergraduate experience and engineering practice. Other activities included off-campus site visits to the Anheuser-Busch plant in Merrimack, NH, Pratt & Whitney in East Hartford, the Millstone nuclear power plant in Waterford, CT, and home and personal care products manufacturer Unilever (Trumbull, CT).

Participating students enjoyed complimentary on-campus housing, weekly meals, tuition and books. Social, recreational and cultural activities were integrated into the five-week program. After successfully completing BRIDGE, qualifying students could receive either a stipend of up to $800 or one of several renewable scholarships of up to $2,000 per year.

For more information about our BRIDGE program, please visit www.engr.uconn.edu/diversity/bridge/.

MULTIPLY YOUR OPTIONS

On April 13, 150 female eighth-graders from 14 middle schools convened at the UConn Storrs campus for a one-day Multiply Your Options (MYO) conference spotlighting science and engineering. Working in teams, the young women constructed rudimentary motors from magnets, wire and batteries; designed and assembled prototype sails to test on a raised track with fan-generated wind; electrolyzed water into its constituent hydrogen and oxygen molecules using saltwater, pencils and a 9V battery—and enjoyed other activities geared to introduce engineering and science concepts in a fun manner.

Now celebrating its 13th year, MYO is intended to help young women explore engineering and scientific principles.

The workshops are taught in a hands-on, problem solving format by practicing women scientists and engineers, many of whom are UConn alumnae and graduate students. An afternoon session involved attendees in a deductive reasoning game in which female role models brought five tools from work that offered hints about their occupations and the students strove to correctly deduce their careers.

The workshops covered a dozen subjects, from the relationship between electricity and magnetism to construction of batteries using galvanic cells, how color changes indicate chemical reactions and how fluids are recycled in a closed ecosystem such as that found on the international space station.

For additional details of our Multiply Your Options program, please visit www.engr.uconn.edu/diversity/myo/.

ENGINEERING 2000

In June, 91 students from 74 high schools participated in the week-long Engineering 2000 (E2K) residential program. E2K participants are nominated by their high school math, science, or technology teachers to attend the residential program. Working in small groups, with instruction and mentorship provided by faculty members and engineering students, participants explore engineering careers; learn and demonstrate engineering concepts; and fabricate a working model of an engineering device.

Topics in this year’s E2K spanned a variety of subjects, such as “Transportation Planning for the National Parks,” “Bioenergy Production from Waste,” “Using GPS in Geomatics and Transportation,” “Modeling of Automotive Motion with Model Cars,” “Thermal-Fluids Engineering: A Power Plant as a Case Study,” “Target Tracking” and “Metal Processing and Properties: Bobby Pins to Swords.” The week wrapped up with demonstrations of items the students created, such as rudimentary EKG devices, fuel cell and other energy efficient devices, wooden bridges, solar cells, and audio monitoring.

For more information about our Engineering 2000 workshop, please visit www.engr.uconn.edu/soc.php?p1d=engr2k.
DA VINCI PROJECT

One July week, the School of Engineering hosted eight math, science and technology teachers, who sought to learn engineering fundamentals and develop interesting curricula and exercises for their classrooms. The participants were immersed first in general engineering instruction, followed by a choice of three workshops in which to focus their learning. The workshops targeted fuel cells, bio-materials, and math optimization and game theory.

The fuel cells group built and tested their own fuel cell from scratch and, along the way, learned the physics and chemistry of this fascinating “new” (1839) technology. Participants in the bio-materials workshop created and tested synthetic bone-like material, and investigated biomedical and materials engineering, which fuse chemistry, biology and physics concepts. In the math optimization/game theory workshop, teachers learned that combinatorial optimization problems are ubiquitous and are solved daily by many industries, from electric utilities to delivery services. Participants learned how to identify and solve such problems using methods rooted in mathematical optimization and game theory. Visual illustrations involving simple games such as crypto puzzles, riddles, or even Sudoku provided the teachers classroom examples sure to spark the interest of a high school audience.

To learn more about the da Vinci Project, please visit www.engr.uconn.edu/davinci/.

2007 NORTHEAST REGIONAL SCIENCE BOWL

On March 17, the School hosted and sponsored the 2007 Northeast Regional Science Bowl (NRSB) for high school students. A total of 27 teams gathered to match wits, aided by 80 volunteers. The bowl included both a Jeopardy!-style quiz bowl and a model fuel cell car race.

The NRSB drew teams from across Connecticut as well as New York, Rhode Island and New Hampshire. Throughout the morning, teams competed in round-robin tournaments of two eight-minute halves, with the top performers meeting in championship rounds mid-afternoon. The questions spanned astronomy, earth science, physical science, life science, math and general science. Teams were given just seconds to slap a buzzer and answer each question. Fuel cell race competitors designed and built their entries for optimal power and speed. By day’s end, the 2006 champion team from nearby E.O. Smith High School claimed the winner’s laurels and the honor of representing the region in the National Science Bowl tournament. Greenwich High School captured top honors in the fuel cell race.

For details of the Northeast Regional Science Bowl, please visit www.sciencebowl.uconn.edu.

CONNECTICUT INVENTION CONVENTION

The School of Engineering once again hosted and co-sponsored the Connecticut Invention Convention (CIC), which took place April 28 at Gampel Pavilion and attracted over 570 inventors in grades K-8; more than 170 judges; and thousands of teachers, family members and sponsors to the bustling Storrs campus. The introductory program included a keynote presentation by civil engineer Peter Halvordson, Vice President of Engineering for General Dynamics Electric Boat. During the judging portion of the convention, teams of two-to-three volunteer judges reviewed the inventions and asked the young inventors about their projects, encouraging peer-to-peer discourse, before selecting the top three contenders within each judging circle of 8-12 students. The Connecticut Invention Convention is a nonprofit program underwritten by grants and in-kind support from community, educational institutions, businesses and charitable organizations.

For more information about the Connecticut Invention Convention, visit www.CTInventionConvention.org.
In Memoriam
Jack E. Stephens

The School was deeply saddened by the loss of alumnus (B.S. Civil Engineering ’47) and emeritus professor Jack Stephens, who died August 6th. Dr. Stephens was elected to the School’s Academy of Distinguished Engineers in April, in recognition of his countless contributions to not only the School of Engineering but also the State and the civil engineering profession. Though retired from academic duties, Dr. Stephens, a professional engineer, remained very active as a Public Service Specialist with the Connecticut Technology Transfer Center (T2) and a Senior Research Advisor to the Connecticut Advanced Pavement Lab (CAP Lab). He served on the CEE faculty from 1950-89 and was Department Head from 1965-72.

Dr. Stephens helped to shape many facets of Connecticut’s transportation-related governance and research infrastructure. He was instrumental in the State’s decision to fund both the Connecticut Cooperative Highway Research Program (CCHRP)—jointly with the Connecticut Department of Transportation at UConn in 1962—and the Connecticut Transportation Institute (CTI), founded in Storrs in 1974. As CTI’s first Director, he established the T2 Center, which provides training for town employees, and the CAP Lab, which researches and tests hot-mix bituminous concrete.

Dr. Stephens was a life member and past president of the Connecticut section, American Society of Civil Engineers (ASCE); past president, Connecticut Society of Civil Engineers; and past Chair, Transportation Committee of the Connecticut Academy of Science & Engineering. He received the University of Connecticut Alumni Association Distinguished Public Service Award (’82), the Engineering Alumni Award (’86) and the Connecticut section of ASCE Benjamin Wright Award (’89). Dr. Stephens was awarded his M.S. (’55) and Ph.D. (’59) degrees at Purdue University.

Dr. Stephens was profiled in the summer ’05 issue of Frontiers (p. 18), which may be found on our website under School News. Memorial donations may be made to the Jack E. Stephens Scholarship Fund, payable to “UConn Foundation” and sent to the University of Connecticut Foundation, 2390 Alumni Dr., Storrs, CT 06269-3206.

In the Swim with Senior Andrea Ryan

What motivated senior Andrea Ryan, an Iowa native and valedictorian of her Bettendorf High School class, to pursue her engineering studies halfway across the country in Storrs? This Chemical Engineering major was attracted by the combination of academic excellence, a compact campus, and a competitive swim team.

“UConn offered me a strong scholarship package that made coming 18 hours [driving time] east from Iowa actually cheaper than remaining in-state. Although my primary focus when choosing my future university was the academic programs, I was interested in continuing my swimming career and UConn possessed strong programs in both those areas of my life. After I visited the campus, I was convinced that UConn was the right choice for me.”

“As a captain of the swim team, I’ve had to challenge myself to inspire and lead a great group of female student-athletes…We practice twice a day, do weight training, and also have team study halls…Balancing my time between practice and classes does prove hard at times, but it is all about good time management.”

Read Andrea’s complete profile on our website at www.engr.uconn.edu. Click on “Prospective Students & Outreach” and locate the submenu item “Meet Students.”

Michael Smith Mixes Ballroom Dancing with Computer Science

The campus diversity and strong curriculum were deciding factors in Michael Smith’s decision to choose UConn for his university experience. The junior Computer Science major has found not only his engineering niche but also extracurricular activities, such as leading the DanceSport competitive ballroom dance team, since coming to UConn from Wakefield, RI.

“The University Scholars program allows students to take on a two-year research project on a large topic of their choice; it’s something I will be applying for, and which I think is one of the best possibilities you could have, to be able to do research in a topic of your choice.”

“At the start of my sophomore year, I joined the DanceSport competitive ballroom dance team. I have had an amazing time with this club and the people in it. Dancing on a ballroom team was something I never imagined for myself, yet now I am the club’s president responsible for overseeing our club’s organization, funding and travel...It’s been a great experience so far at UConn.”

Read Michael’s complete profile on our website at www.engr.uconn.edu. Click on “Prospective Students & Outreach” and locate the submenu item “Meet Students.”
John Q. Adams (B.S. Civil Engineering, ’93) is a senior transportation engineer with Sebago Technics, Inc., Westbrook, ME.

Bree Vilmos Allen (B.S. Material Science, ’96) is Director of Product Management for Thermo Fisher Scientific, a scientific instrumentation developer that acquired NITON LLC, where he began his career.

Joel S. Becker (M.S. Material Science, ’74) won the Malcolm Baldrige Community Award presented by the Waterbury (CT) Regional Chamber of Commerce. He is the President of the Chicago-based American Supply Association, chairman of Waterbury Hospital’s Board of Trustees, and a board member of Webster Financial Corp.

Robert D. Becker (B.S. Electrical & Computer Engineering, ’82) founded a management consulting firm, the Product Development Advantage Group, LLC, to help software and/or electronics businesses bring products successfully to market. Mr. Becker was formerly Senior Vice President of Engineering and Operations at Mercury Computer. He is a member of the University of Connecticut Academy of Distinguished Engineers (2005).

Steven Bouchard (B.S. Electrical Engineering, ’03) is a product manager for Hubbell Wiring Systems.

William H. Brewster, Jr. (B.S. Mechanical Engineering, ’86) joined Gerber Technology (Tolland, CT) as Vice President, Global Marketing and Product Management. He previously was Vice President of Marketing for Konica Minolta Business Machines U.S.A., Inc.

Benjamin Bulkley (B.S. Electrical Engineering, ’86) was named Chief Operating Officer of Allscripts, a leading provider of clinical medical software, connectivity and information solutions. He previously was Senior Vice President of Global Commercial Operations for Invitrogen Corporation. He was inducted into the UConn Academy of Distinguished Engineers in 2005.

Franklin R. Chang-Diaz (B.S. Mechanical Engineering, ’73), who retired in 2005 from the U.S. astronaut corps after a successful career that included seven space shuttle flights, returned to Costa Rica and built that nation’s first rocket lab. He is constructing a plasma-powered rocket engine that he plans to launch to Mars by 2025.

Wayne Eckerle (Ph.D. Mechanical Engineering, ’85) was promoted to Vice President – Corporate Research and Technology for Cummins Inc., Columbus, IN. Before joining Cummins in 1989, Dr. Eckerle was employed at United Technologies Research Center and as an Associate Professor at Clarkson University. He serves on the external advisory board of the UConn Department of Mechanical Engineering.

Ferdinand Engel (M.S. Computer Science & Engineering, ’72) joined Iron Mountain Digital as Chief Technology Officer. He previously was Chief Technology Officer for Concord Communications until the company was acquired by Computer Associates in 2005. Mr. Engel, who holds several U.S. patents in network management and security, was inducted into the UConn Academy of Distinguished Engineers in 2005.

Mark Gothberg (B.S. Chemical Engineering, ’68) is Chief Operating Officer of Strategic Health Care Communications and editor of eHealthcare Strategy & Trends. Mark also holds an MBA from Columbia University.

Christopher O. Granatini (B.S. Civil Engineering, ’96), P.E., is a senior transportation engineer in the Middletown, CT office of the environmental engineering consulting firm of Tighe & Bond, Inc.

Gordon Hannah (B.S. Electrical Engineering, ’88) is Managing Director of the Public Sector Security and Identity Management Group, BearingPoint Public Sector Security Group. The McLean, VA-based company is a global management and technology consulting company.

Michael J. Hartnett (Ph.D. Mechanical Engineering, ’78) Chairman, CEO and President of Roller Bearings Company of America and Holdings, was inducted into the 250-member Connecticut Academy of Science & Engineering (CASE). He was inducted a founding member of the UConn Academy of Distinguished Engineers in 2003.

Vinod K. Kalikiri (M.S. Civil Engineering, ’95) P.E., PTOE, was named an associate, one of the firm’s senior positions, of Vanasse Hangen Brustlin (VHB) Inc., Watertown, MA. He is a project manager in VHB’s Land Development Group, and responsible for traffic engineering and permitting. Mr. Kalikiri joined VHB in 2001.

Shiva Kalisetti (M.S. Electrical Engineering, ’94) joined ATX Group as Vice President of Business Development. The company is the largest independent provider of telematics to the automotive industry. He was previously employed with Clarity Communication Systems.

Suzanne Brown Koroshetz (B.S. Electrical & Computer Engineering, ’78) was named Principal of Brien McMahon High School, Norwalk, CT in spring 2007. The school has enrollments of nearly 1,500 students. Ms. Koroshetz previously was Principal of Stamford High School.

Stanley B. Levy (M.S., Ph.D. Mechanical Engineering, ’63, ’66) was named Chief Technology Officer for BioSolar, Inc., developer of a technology to produce bioplastic materials from renewable plant sources for use in flexible solar cells. Prior to joining BioSolar, Dr. Levy was a technical consultant.

James Long III (M.S. Civil Engineering, ’98), P.E., is a senior bridge design engineer for Collins Engineers, inc., in the firm’s Newport News, VA office. Collins is a civil, structural and water resources engineering firm.

Richard Mastracchio (B.S. Electrical Engineering, ’82) joined the seven-member crew of the space shuttle Endeavour, which conducted a two-week mission at the international space station in August. Mr. Mastracchio conducted three space walks during the mission, which focused on attaching...
a new truss segment to the space station and replacing a gyroscope that helps control the station's orientation. He previously flew aboard shuttle Atlantis in 2000. He was inducted into the University of Connecticut Academy of Distinguished Engineers in 2003.

Scott Milligan (B.S. Mechanical Engineering, '94) is a manager at CUNO, a division of 3M, in Old Lyme, CT.

Andrew M. Morosky (B.S. Civil Engineering, '88), Town Engineer for Bethel, CT, was also named Public Works Director for the town in August.

Ronald Nault (B.S. Civil Engineering, '84), President of Hamden, CT-based Luchs Consulting Engineers, announced the company has acquired the architectural/engineering firm of DeCarlo & Doll. The combined firm comprises more than 40 design professionals.

Andrew Sadlon (B.S. Electrical Engineering, '81) is President of Hoffman Engineering Corporation, Stamford, CT. He previously was President of Prime Technology, Inc.

Donald E. Scott (B.S., M.S. Electrical Engineering, '57, '59), Ph.D., authored a new book, The Electric Sky – A Challenge to the Myths of Modern Astronomy (Mikamar Publishing) which was published in late 2006. Dr. Scott is a retired professor of electrical engineering who taught at the University of Massachusetts.

Thomas Zarrella (B.S. Mechanical Engineering, '78) was elected President, Chief Executive Officer and Director of GT Solar International, Inc. of Merrimack, NH, a worldwide provider of technology, equipment and turnkey manufacturing solutions across the photovoltaic supply chain. He previously was President and Chief Operating Officer of GT Solar Incorporated, a subsidiary.

In Memoriam


Gordon Lee Bywaters (M.S. '58) died in July 2007 as the result of an auto accident. During his career, he worked for Pratt & Whitney Aircraft as chief engineer of aerodynamic systems and components.

John R. Pavlick, Sr. (B.S., M.S., Electrical Engineering '65, '70) died in June 2007. He was employed with Perkin Elmer, CBS Labs, Consolidated Controls, Raymond Engineering and Lockheed Martin. Mr. Pavlick was a member of the Eta Kappa Nu National Electrical Engineering Honor Society and the Tau Beta Pi National Engineering Honor Society.