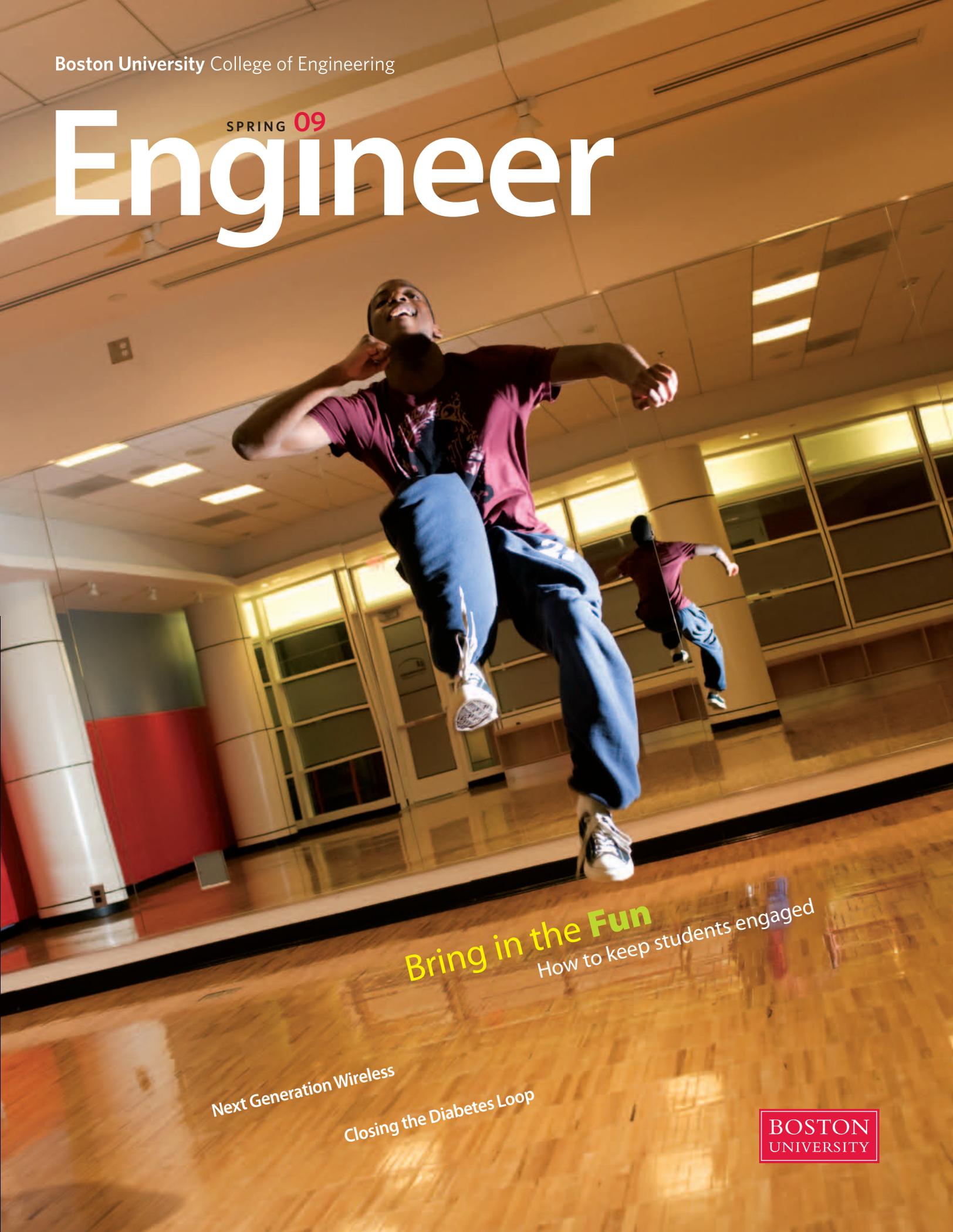


Boston University College of Engineering

SPRING 09

Engineer



Bring in the Fun

How to keep students engaged

Next Generation Wireless

Closing the Diabetes Loop

**BOSTON
UNIVERSITY**



Engineer

SPRING 2009

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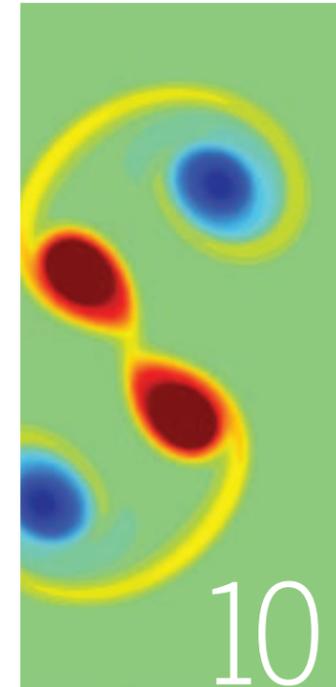
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Remembering Merrill Ebner

COVER: College of Engineering freshman John Wolff practices his moves as a member of the break-dancing club. Participating in activities outside of engineering can help students excel and make the most of their college experience.

A Good Outlook for Engineers

By Dean Kenneth R. Lutchen

Technological innovation has driven the American economy—the world's strongest—since the days of the industrial revolution. In recent decades, we have ceded a portion of our innovation leadership to other countries and we are paying for that now in one of the deepest recessions of the last century. I believe that as we recover from this downturn, America will return to creating the technologies and products that will restore our strength. That work will begin in engineering schools.

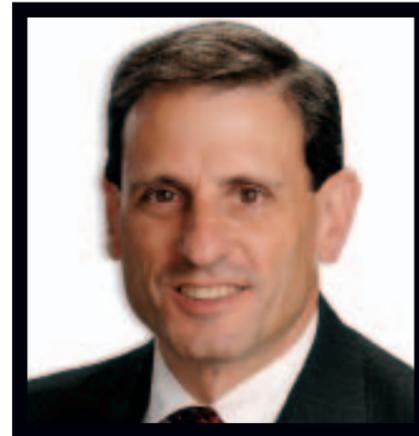
We have heard encouraging words—and promises of government commitment—about the need to restore America's technological leadership by focusing on alternative energy that will reduce the nation's dependence on oil, lessen the impact of energy on our environment, and create a new industry that offers America a chance to be the world leader in this field. This is good news for our College of Engineering, which has long been engaged in researching fuel cells and other alternative energy technologies, as well as ways to improve the systems that distribute electricity throughout the country.

As the nation looks to contain the costs and improve the quality of health care, biomedical engineers will play a role. Researchers in our Biomedical Engineering Department, which is already one of the very best in the country, are involving medical clinicians and engineers from other disciplines to create the health-care technologies of the future.

In short, the technology challenges of today and tomorrow are numerous—and they will be solved by engineers.

As this idea permeates society, I am optimistic that more and more high school students will consider engineering careers. We have lost many students with strong math and science skills to other professions in recent years—including financial services, which attracted them with promises of lucrative careers from an early age. While some graduates—including some with engineering degrees—will no doubt opt for such careers in the future, recent events have shown the complexities of that field. Moreover, as I travel and meet our alumni, I find that many are remarkably successful—and to a person, they feel deeply indebted to their undergraduate engineering foundation, whether they remained as practicing engineers or pursued finance, management, law, medicine, or other careers. The same theme arises: Their engineering education provided them with the superior quantitative problem-solving and creative skill sets to take on any challenge.

This presents talented high school students with the chance to look at engineering as a more stable foundation for job security in the coming decades, a way to make an impact on society over the long term, and a rewarding career path. They can develop new technologies that will improve people's lives all over the world. They can acquire the skills needed to lead a firm that develops technology while building a power-



ful problem-solving portfolio grounded in how complex systems work. Engineers will provide the products that not only help people but also fuel industries such as manufacturing, marketing and, yes, finance.

The change in the economic climate last year gave us the opportunity to take another close look at how we are educating our students. Long ago, the College made a strategic decision to make the education we offer more than a curriculum; we made it an experience. While introduced to our education many years ago, outside-the-classroom components continue to be distinguishing features of a Boston University engineering education and strengths we can build on.

Last November, as the gravity of the global economic situation became clear, we reallocated our Annual Fund—donations made to the College primarily by alumni—to strengthen these outside-the-classroom opportunities. We've expanded the number of undergraduate research positions, added student employees in our Information Technology operation who get hands-on computer engineering experience while serving the College's technical needs, and focused on increasing the already numerous opportunities for internships and co-ops. These and many other extracurricular offerings complement a solid academic program and allow students to put the skills they learn in class into practice before graduation.

At this time of great national challenge, we are preparing well-rounded engineers through excellent academic training and real-world experience. I hope that as an alumnus, you take pride in our College and know that your support is making superior engineering education possible.

ENG Partners in NSF Challenge to Create the Next Generation of Wireless Technology

The National Science Foundation has chosen the College of Engineering to partner in a major initiative to develop the next generation of wireless communications technology based on visible light instead of radio waves. Researchers expect to piggyback data communications capabilities on low-power light-emitting diodes, or LEDs, to create "Smart Lighting" that would be faster and more secure than current network technology.

The NSF recently announced that the Smart Lighting project has been selected for funding as one of five new Engineering Research Centers nationwide. The \$18.5 million, multi-year award went to a group that includes BU, Rensselaer Polytechnic Institute and the University of New Mexico to develop the optical communication technology that would make an LED the equivalent of a WiFi access point. Smart Lighting, which will be headquartered at RPI, is the fourteenth research center affiliated with the College of Engineering.

"This is a unique opportunity to create a transcendent technology that not only enables energy-efficient lighting, but also creates the next generation of secure wireless communications," says Professor Thomas Little (ECE). "As we switch from incandescent and compact fluorescent lighting to LEDs in the coming years, we can simultaneously build a faster and more secure communications infrastructure at a modest cost along with new and unexpected applications."

Little, who is leading the BU team that also includes Associate Professor Jeffrey Carruthers and Assistant Professor Hatice Altug, said LEDs are poised to replace fluorescent and incandescent bulbs within the next 10 to 15 years because of their greater efficiency and durability. Because LEDs can be pulsed on and off rapidly—so fast the human eye cannot perceive the change—they can be used to light a room and transmit information to and from enabled devices simultaneously. Beaming information from lights may replace or augment the



Associate Professor Jeffrey Carruthers (left), Professor Thomas Little and Assistant Professor Hatice Altug plan to light up the communications world with LEDs. Here, they use LEDs (far left) to communicate between two laptops.

radio frequencies used today in computers, cell phones and other portable devices to connect to the Internet and send and receive data.

"Imagine if your computer, iPhone, TV, radio and thermostat could all communicate with you when you walked in a room and just flipped the wall light switch—and without the usual cluster of wires," Little said. "This could be done with an LED-based communications network that also provides light—all over existing power lines with low power consumption, high reliability and no electromagnetic interference. Ultimately, the system is expected to be applicable from existing illumination devices, like swapping lightbulbs for LEDs."

RPI and UNM will work on creating novel devices along with systems applications to better understand the proliferation of smart lighting technologies, plus materials needed for wireless devices to interface with the network. Boston University researchers will focus on developing computer networking applications, notably the solid-state optical technology that

will form the network's backbone. Together with BU, the three partners will have 30 faculty researchers plus students, postdoctoral researchers and visiting industry engineers as regular contributors to the research conducted by the Smart Lighting ERC.

Little and Carruthers will examine what capabilities the lights should have for the communication tasks people will require. By thinking ahead to how people will use these lights, the researchers can influence the design of the devices at this crucial time, just before LEDs begin to gain ubiquity as a lighting source.

Altug will work on design and fabrication of new materials and devices used to build the next-generation LEDs, in coordination with the UNM and RPI groups, which will primarily focus on the device aspect of the work.

"All these aspects we can engineer—the spectral composition, polarization, and temporal modulation—will add the 'smartness' to the lights," Altug says, "And we'd like to control these properties at will to transmit information."

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Showing Them the Way

BU finds success in retaining engineering students

"It's been a great ride so far," says Anthony Rinaldi, a freshman biomedical engineering student midway through his first semester. "I just hope it keeps getting faster and more exciting. I'm sure that's going to happen; there are so many opportunities here."

Rinaldi has started ballroom dancing and rediscovered fencing. He is also learning multivariate calculus and planning to be a cardiologist. In his engineering acoustics class one day, he tried playing a trombone for the first time.

"I was going to pass out," said Rinaldi of his attempted solo. "That was a good class—I liked putting theory into practice."

Taking the first step through the College of Engineering doors opens up a new world to incoming students. Away from home and on their own—often for the first time in their lives—they will learn complex and elegant concepts, may study in a foreign country, and can choose to challenge themselves by building satellites, engineering bacteria, programming

robots or even taking up ballroom dancing.

But not every student starting out in engineering has Rinaldi's sense of purpose. Some begin an engineering education uncertain about what, exactly, an engineer does, or somewhat apprehensive because they've heard that engineering classes are tough.

Engineering programs nationwide strive to keep students captivated through the first two years, when undergraduate curricula are typically filled with foundational courses that focus heavily on math, science, and technical nuts and bolts. Because grasping these courses takes center stage, and first-year students at many engineering schools don't often see how these subjects apply to the real world of engineering, some will switch to non-engineering majors.

Retaining engineering students is a priority at BU and other engineering schools, but while some schools struggle with retention, the BU College of Engineering rates among

the more successful institutions at keeping students. Since the early 1990s—when the College began implementing and enhancing a number of programs aimed at encouraging involvement in University and community activities within and outside of engineering, and helping students see how their early courses relate to an engineer's work—BU's retention rate for engineering students has climbed from around the national average to among the best.

As engineering schools intensify efforts to retain students, national research is suggesting that BU's approach—build an engineering community, link early coursework to practical applications, and expose students to activities and academic work outside of engineering—works. Among other things, the College gives students the opportunity to explore engineering early on, build connections with professors and classmates, study abroad, participate in advisory groups, and live with fellow engineering students.

Step 1: Learn to Engineer

An engineer's education begins with the classes, laboratories and exams that lay the foundation for the eventual application of that knowledge. College of Engineering graduates will eventually assume great responsibility in their careers; the products and decisions they make will touch many lives beyond their own. By necessity, the work is hard.

"It's that first midterm," says Dan Ryan, a junior electrical engineering major who also advises freshmen. "It's usually the same thing for everyone—you get into BU, and it's a good school, but you were in the top of your class in high school. You come here, and you're competing with people of the same academic caliber as your own. So, it's overwhelming when you get a 60 on your first midterm when you're used to acing all the tests in high school."

National studies show that, in general, at least half of students who leave engineering will do so during freshman year for a variety of reasons, and that retaining students on an engineering track relies in part on approachable faculty, a supportive academic environment, and the ease a student experiences in building relationships with peers and faculty.

BU engineering students band together on engineering dormitory floors, the Women in Science and Engineering dormitory floor, study

groups, nightly tutoring sessions, and small advisory group meetings.

"It's good because you're with other people who are in the same situation. When we do a lab report, we can compare, 'What can we say we learned? Or what if we looked at it another way?'" says Rinaldi. "How would I do this if I didn't live on an engineering floor? It is really helpful to be there."

Salwa Masud, a sophomore majoring in biomedical engineering, lived on the Women in Science and Engineering floor freshman year; the skills and relationships she developed then continue to help her now.

"You meet people who enjoy the same things you do. I met my best friends there, and I also learned time management," she says.

Freshmen also forge connections in the Freshman Advising Seminar. A faculty advisor and an upperclass student advisor lead each of these mandatory meetings that are held every Friday throughout the first semester, either with the entire freshman class or in smaller groups.

Freshman Amy Ashur says, "I find it helpful because I'm undeclared, so it's nice to see other people saying, 'Maybe I'll major in mechanical, maybe electrical.'"

"For a very long time it has been a philosophical principle of the College to make an early bond between a small group of freshmen and a faculty advisor," explains Professor Michael

Ruane. "It gives them a place where they can talk to other freshmen and comfortably explore some of their advising or career questions. Interestingly, I think one thing they're worried about is *not* appearing worried. The student advisors have recently lived through this, so they know. They say, 'OK, no one has any problems? Well, how about that calculus midterm coming up?' and they go, 'Oh yeah, we are worried about that but didn't want to say anything.'"

The meetings offer advice on managing classes and planning for the future, from career options to study-abroad opportunities. They give practical guidance on resources such as tutoring and the College of Engineering's Career Development Office.

"I always tell students, the best thing to do when you're doubting it is to think what else you would want to do if you weren't in engineering," says Elena Simoncini, a junior biomedical engineering major and student advisor. "If something else seems more important, then maybe engineering is not right for them. But if the doubts are, 'This is too hard for me,' I say, 'Well, you got in for a reason and there are people out there who can help you. Focus on what you can do to help yourself understand it. Professors' office hours and the tutoring center are great resources.'"

Step 2: Find Out What an Engineer Does

Students may start an engineering degree program with only a vague idea about what an engineer does and what career opportunities are available. Even if they already have goals in mind, their long-term vision can be obscured by the immediate concern of chemistry lab reports and calculus tests.

Research has shown that students who switch out of engineering do not always leave because of academic woes; they are often no worse off academically than those who stay. A University of Pittsburgh study indicated that more than half of the students who left did so because they grew disenchanted or disinterested in studying engineering.

"Sometimes you feel like, 'Why am I spending 17 hours doing one problem set? What am I learning from this?'" Simoncini says. "Then you start to see it fit together. Now that I'm taking biomedical classes, I'm realizing where these things are coming in. The biggest hurdle is seeing the overall picture and getting through the basics—it's like learning a new language."

An experiential course connecting the theory and concepts of engineering to an application or professional field can significantly

"You meet people who enjoy the same things you do. I met my best friends there, and I also learned time management."

improve retention; a University of Colorado study found that 64 percent of students in such a class continued in engineering through their seventh semester, compared with 54 percent of those who did not take the class.

BU College of Engineering freshmen get a taste of engineering applications in Introduction to Engineering classes during their first year. Professors design the classes on topics of interest, often related to their research, including tissue engineering, micromachines, drug design, computer hacking and clean energy. The courses ensure that freshmen have close contact with an engineering professor in a small academic setting and can help to engage students and validate their decision to study engineering.

Ruane explains that with the addition of these classes in 1992, the College of Engineering "recognized that students need to see more

engineering faculty and that many of them are resolving their interest in particular fields."

During an Introduction to Engineering class on acoustics taught by Professor Glynn Holt, a guest lecturer spoke about a study of trumpet sound clarity, then students—including Rinaldi with his first-ever trombone solo, and Ashur, an accomplished oboe player—recorded and analyzed the acoustics of different instruments.

Students can also explore engineering by doing research in professors' laboratories, attending guest lectures, and participating in engineering clubs and organizations.

"I joined the Society of Women Engineers," says Iva Kokoshi (ME'12), who recently completed an Introduction to Engineering class on computer hacking and whose dream job is working for NASA or Google. "I think it's very helpful, because the hacking class was just me and 30 guys. One more girl walked in and I was like, yes! It's no problem though. I just want to show that girls can do this too."

"With Engineers Without Borders, it's a practical application of the stuff you're learning right away, and it's affecting people outside the club—really helping people on a world scale. That's what appeals to me," says Max Loflin (ME'12), who joined the BU chapter of the national nonprofit organization during his first semester. Members of the group will travel to

A Day in the Life of a Freshman

BU Engineer's Kate Fink followed an engineering freshman for a day in October 2008. Chronicling nearly 18 activity-packed hours in detail was too much for this space, so here is an abridged diary of the day.

Allison Leemann

Hometown: Matawan, NJ
Major: Biomedical Engineering
Activities at BU: ENGGOV (Freshman class president); Student Union (Voting member, Spirit Committee); Pep Band; American Institute of Aeronautics and Astronautics; attempting to get enough sleep.



9 a.m.

8:15 a.m. Wake up, get dressed, eat a breakfast bar.

9 a.m. EK 127: Intro Engineering Computation (MATLAB) Discussion.

Two upperclassmen lead a review session for a test at 4 p.m. today, made more palatable by their gift of donuts. One nugget of advice: "Never put nothing down for an answer. Always try for at least partial credit."



10:20 a.m.

10:15 a.m. Drop by the Undergraduate Programs Office to discuss organizing an ENG student event at a comedy club.

10:20 a.m. Ingalls Engineering Resource Center. Stop at a computer for a quick e-mail check, then get down to reading Henrik Ibsen's play *Hedda Gabler* for English class this afternoon: "I had to read 50 pages, but I've already read 30 so it's not that bad."



11 a.m.

11 a.m. CH 101: General Chemistry I. Allison takes notes during a chemistry lecture about electron orbitals. She missed most of her high school chemistry class because of appendicitis, but says, "I'm doing OK in chemistry, though—a little above average."



Noon

Noon CH 101: Chemistry Discussion. "We usually have a quiz every week in this class, but this week it's a take-home test." A graduate student goes over past questions and answers on the chalkboard.

continued next page

the remote village of Chirimoto, Peru, this summer to install a water filter.

Students may be new to engineering but have grown up with the concept of globalization and realize their careers will demand an international perspective. Many freshmen at BU apply to enter the College of Engineering's pioneering study-abroad program that allows them to continue their engineering classes during a sophomore year semester in Germany, Mexico or Israel.

"They're here not just to take the courses, but to follow a couple of other subjects that are not in the books," says Ruane. "Most people can look back to some sort of peak intellectual experience, something they did that was very exciting in engineering. It's the revelation that life is not remembering what you learned in a book in a course; it's the thinking skills, the broader perspectives that you weave between these pillars of course knowledge that actually make you into a useful professional."

Step 3: Go Beyond Engineering

Engineering students today do not restrict themselves to a solitary corner of a laboratory, or even an engineering section of campus. They connect their engineering education to other disciplines—engineering-related class



From study abroad to Engineers Without Borders' planning the installation of a water filter in the remote hills of northern Peru, undergraduate engineering students have many opportunities to leave their comfort zones by going outside the classroom and getting hands-on experience.

**"It's the thinking skills,
the broader perspectives
that you weave between
these pillars of course
knowledge that actually
make you into a useful
professional."**

offerings at BU are expanding into entrepreneurialism and clean energy—and use these as a foundation for a broad expanse of careers. The College, in collaboration with the School of Management, has already started offering coursework in commercializing technology innovations, an area rapidly becoming central to the success of today's engineers.

Freshman John Wolff explains, "I have three areas of interest—engineering, business, and international relations. I chose engineering

because I knew it would be a good catalyst to let me branch out, giving me opportunities in other fields. Engineering opens doors for me. When people see you're able to do that work—all that problem-solving—it just leads you to be so much better in many fields." He visited the engineering Career Development Office early in the year to find a summer internship that could help him combine his interests.

"This is the liberal arts degree of the twenty-first century, so even if you decide you don't want to do engineering, graduating with an engineering degree is not an impediment. You can go into almost anything you want from here," says Ruane.

Students can also expand their views and explore a broader community at the University by participating in extracurricular activities beyond engineering classes. Getting involved in different activities outside of the intense coursework is good for a mental gearshift and, according to a recent study in the *Journal of Engineering Education*, also helps some students stick with engineering over the long haul.

"One of the things I regret about freshman year is that I was too focused on my schoolwork; I wish I had gotten involved in clubs and activities earlier. That's something I try to convey to my advisees—get involved! There are tons and tons of clubs all over BU that can add a lot of variety to your life," Ryan says.

Wolff joined the BU Break-Dancing Club. "We had a competition a few weeks ago in Cambridge—I had never been to a break-dance competition before. It's such a different lifestyle—the dress, the music, the whole vibe. The experience is so much fun."

"Ballroom dancing is a good outlet," says Rinaldi. "During a whole day full of science and mathematics courses, it's good to take your methodical thinking down a notch—but as an engineer you still want to get things right and learn those steps."

Becoming a freshman engineering student means beginning to explore a technical, challenging, interdisciplinary and international field. Not every student who takes the first steps into engineering completes the whole dance, but as the College continues to make engineering welcoming and builds intrigue among the challenges, more students persevere and see the myriad benefits of an education, a career, and life as an engineer.

"I know at first I seemed really nervous about the whole thing. I thought engineering was so daunting," says Simoncini. "I even left for winter break in December of freshman year, still unsure if I wanted to stay with it. Once you realize how interesting the classes are and how much the professors care about engineering, though, you want to stay with it. You don't want to leave."

A Day in the Life of a Freshman continued



1 p.m. EN 120: English: 2,500 Years of Tragedy. The class discusses *Hedda Gabler*.

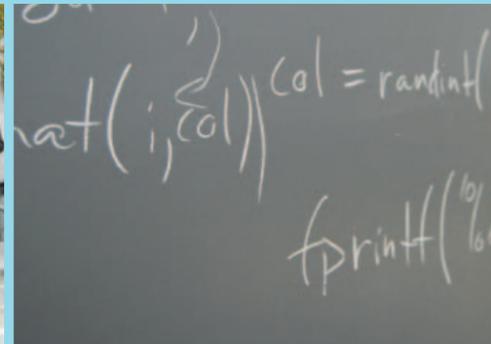


2 p.m. Allison makes a quick stop at her room on the 12th floor of Warren Towers 2 to drop off books.

2:15 p.m. Lunch!



3 p.m. EK 100: Freshman Advising Seminar. The freshman class meets as a large group in Morse Auditorium to learn about study-abroad opportunities, course evaluations, and what the Career Development Office offers.



4 p.m. EK 127: MATLAB Exam. "The MATLAB test was pretty difficult and very, very detail-oriented, so you had to be meticulous when writing programs—but I think I did OK." (She wound up with a B+.)



6 p.m. Prep for Pep Band. After grabbing dinner with other Pep Band members, Allison goes to the band room to pick up her alto saxophone and then heads to Agganis Arena, where Band Director Chris Parks (above left) awaits the musicians.



7 p.m. Basketball Game. Allison and the band play enthusiastically throughout the men's team's narrow overtime loss to George Washington University.



10:30 p.m. Return to Warren Towers to hang out with friends from ENG and Pep Band, chat, watch a movie, and, sometime after 2 a.m., finally go to bed.

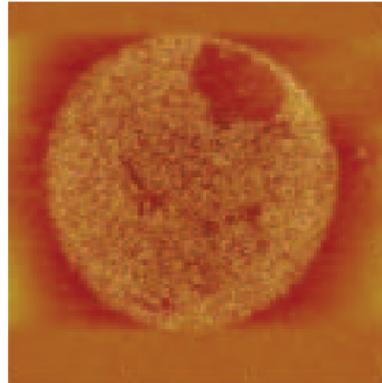
The Art and Science of Seeing the Unknown

College of Engineering researchers bring technical information to light and advance their research by generating images. With microscopes that send electrons to feel along the surface of a tiny object and devices that bounce light against a sample until it scatters in an interpretable way, they reveal materials, interactions and structures hidden from the naked eye. Outside the confines of the laboratory, though, these pictures might be mistaken for works of art as they unveil worlds of color and texture where viruses cling to a gold surface and plastic pillars bend towards each other, looking like a field of molars. Here, a selection of images from College of Engineering laboratories reveals a few glimpses of these researchers' expeditions.

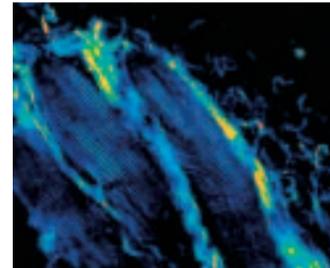
For more information on these images and others from ENG labs, visit www.bu.edu/eng/magazine/spring2009images.



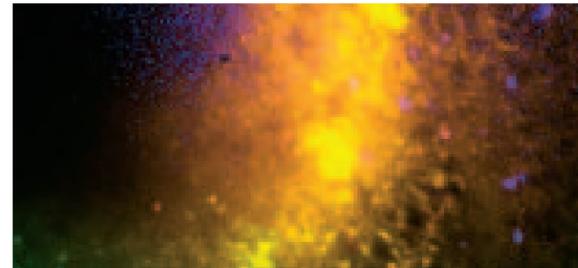
The aurora borealis (Courtesy of Associate Professor Josh Semeter)



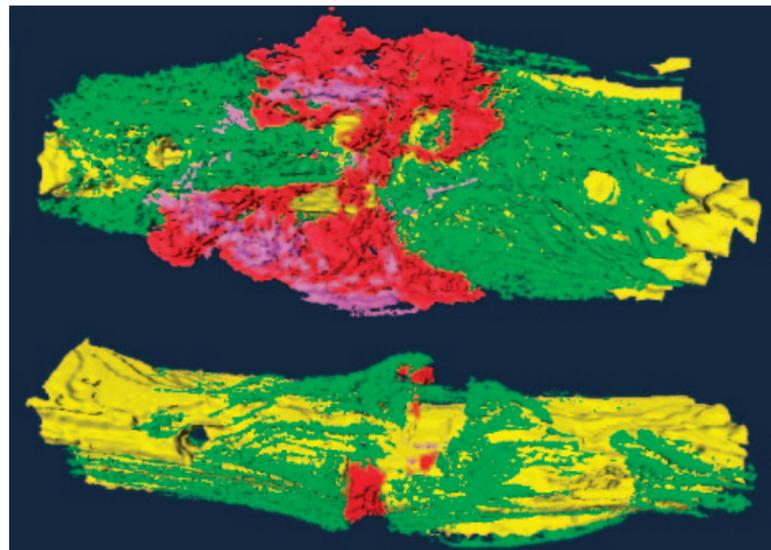
Viruses gather on a gold platform (Courtesy of Assistant Professor Hatice Altug)



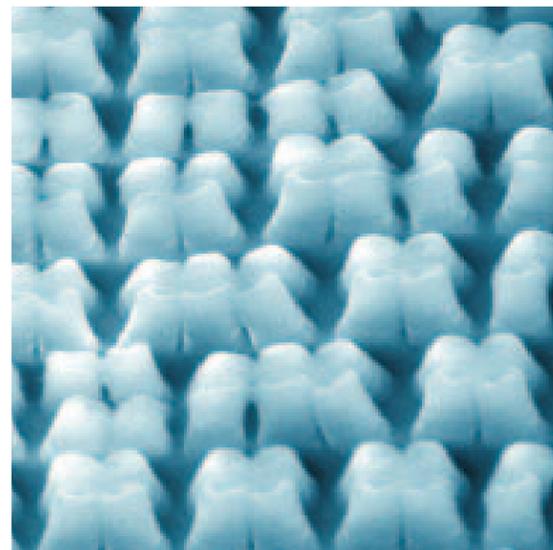
Muscle fibers near the eye (Courtesy of Associate Professor Jerome Mertz)



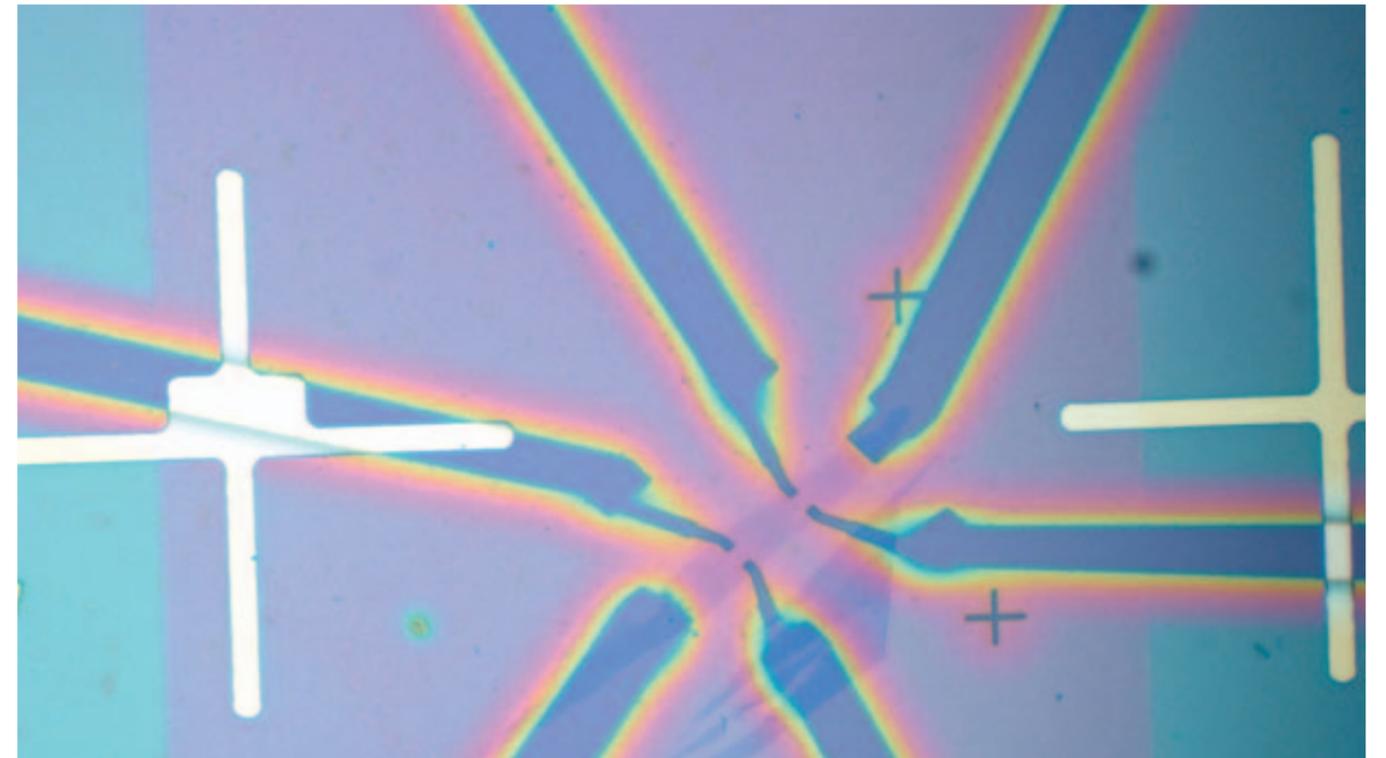
Fluorescence imaging of neural activity (Courtesy of Associate Professor Jerome Mertz)



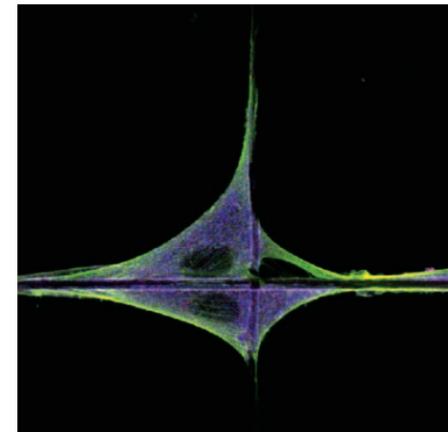
More joint cartilage over less (Courtesy of Assistant Professor Elise Morgan)



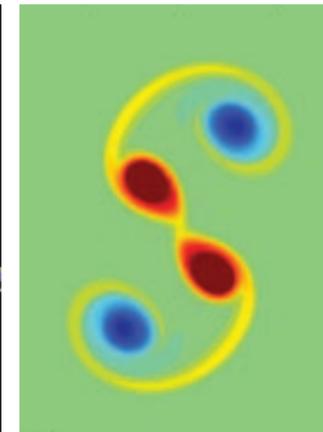
Polymer pillars (Courtesy of Associate Professor Xin Zhang)



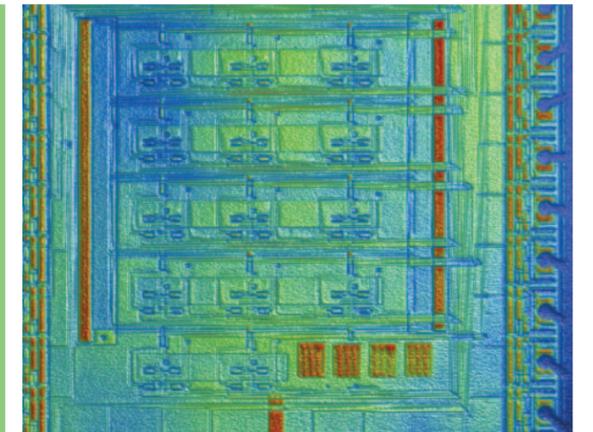
Gold electrodes on a graphene sheet (Courtesy of Associate Professor Anna Swan)



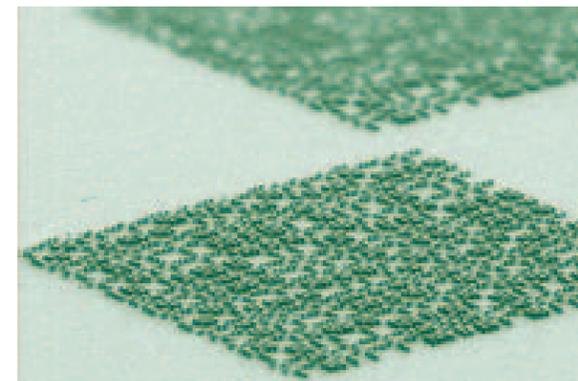
Fibroblast cells cling to fibronectin fibers (Courtesy of Assistant Professor Michael Smith)



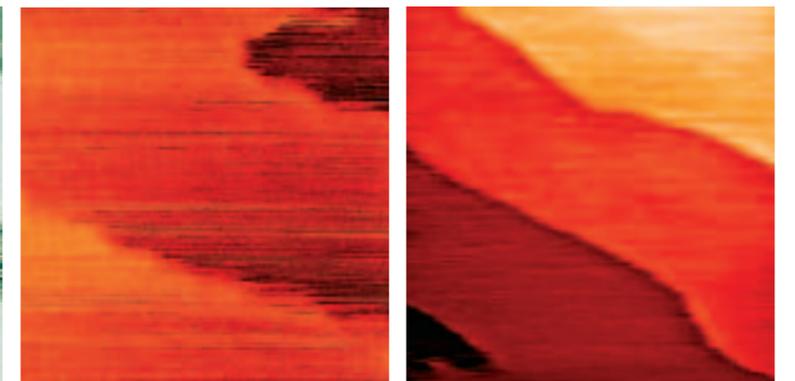
Vortex system simulation (Courtesy of Associate Professor Lorena Barba)



Surface scan of a computer chip used to perform microelectrophoresis (Courtesy of Professor Allyn Hubbard)



An aperiodic array (Courtesy of Assistant Professor Luca Dal Negro)



One-atom-tall gold steps (Courtesy of Associate Professor Kamil Ekinci)

Closing the Loop on Diabetes

Edward Damiano develops a more calculated approach to managing diabetes

Nearly 2 million Americans suffer from Type 1 diabetes. A life-threatening disease, diabetes is the result of an autoimmune disorder in which the immune system attacks insulin-producing cells in the pancreas, shutting down the body's ability to convert glucose into energy. Untreated, it can lead to heart and kidney disease, blindness, and stroke.

To effectively treat the disease, the patient must balance carbohydrate intake with either multiple, daily insulin injections or an insulin-producing pump. While treatment and monitoring continue to improve, the delicate decision of when insulin injection is needed rests with patients.

Associate Professor Ed Damiano (BME) wants to simplify the process and increase its efficacy. Working with postdoctoral researcher Firas El-Khatib and Drs. Steven Russell and David Nathan from the General Clinic Research Center at Massachusetts General Hospital, Damiano is developing an automated device that will continually measure glucose levels in the bloodstream and mimic the natural function of the pancreas by releasing insulin into the body as needed.

"Glucose levels are determined by many different factors, including meal consumption, exercise and even state of mind," Damiano says. "You are not the same person at four in the afternoon that you are at 10 in the morning, especially children. Insulin therapy is a complicated process and needs to be just right."

Damiano's interest in developing an automated delivery system is not purely scientific. His 9-year-old son, David, was diagnosed with Type 1 diabetes as an infant. David's blood sugar levels are checked multiple times daily, and a cell-phone-sized insulin pump attached to his body delivers insulin as needed.

Self- (or parent-) administered insulin, called open-loop control, comes with complications. The delivery decision—including the amount, time and frequency—leaves many factors up to chance.



Edward Damiano



The automated device that mimics the natural function of the pancreas may be the next stage of diabetes-related insulin therapy.

"People with Type 1 diabetes lose their ability to sense their blood sugar because their insulin-making cells are knocked out," Damiano says. "There is a very delicate balance. High blood sugar has been definitively shown to lead to long-term damage to blood vessels and organs, and low blood sugar can lead to death from acute hypoglycemia."

The device Damiano hopes to develop, an automated closed-loop system, is comprised of three parts: a skin-embedded monitor that continually measures glucose levels; an external insulin pump; and a computer chip that allows the two devices to communicate and determine how much insulin a patient will need.

"The open-loop system poses tremendous challenges to patients and parents, literally every day and night," he says. "We want to take the human element and subjective decisions out of the loop and move to a system that

makes an accurate, therapeutic decision at a very high frequency."

Partially funded by a 2007 Wallace H. Coulter Translational Partners grant, Damiano received FDA approval in February 2008 to conduct closed-loop experiments in humans in a controlled setting at Massachusetts General Hospital. Experiments are ongoing, with future clinical trials being designed to incrementally approach an everyday, outpatient setting.

While the closed-loop approach is not the ultimate answer in the fight against diabetes, it can be a revolutionary improvement in treating the disease.

"The goal is to bring insulin therapy to its ultimate potential," Damiano says. "We want to get to the point where there is not much more that you can do to improve upon it. The next step is to cure the disease altogether. But while we're waiting, this can be great in the interim."

Delivering the Goods

Alum's container company is on the move

John Maccarone's company gets you nearly everything you want—he has delivered your food, electronic gadgets, books, bicycles, motorcycles and televisions, even though you've never seen him on your doorstep.

Maccarone is the CEO of Textainer, the largest container-leasing company in the world. The 20- and 40-foot long steel containers he lends to shipping companies cross the globe on ships, railcars, barges and 18-wheeler trucks, transporting all kinds of consumer goods.

Maccarone (ENG'66), had graduated from BU, spent a year in Thailand in the Army, finished an MBA at Loyola, and was working for IBM when he received a call from a container company recruiter in 1976.

"I didn't know what a container was when I took the interview," Maccarone admits. He got the job.

"After 32 years, it still excites me to see one of our containers in some remote corner of the world and realize the process by which it got there," he says. "Containers are interesting because of what they have done to help the growth of world trade and globalization by reducing shipping time and expense dramatically, avoiding cargo damage, and virtually eliminating theft and pilferage."

Today, Textainer operates from 14 offices and leases about two million containers to shipping companies at ports around the world. The \$200 billion container shipping industry uses about 26 million containers, 45 percent of which are leased. Textainer holds 20 percent of the world's leased containers.

Sometimes, though, a container gets stuck in the wrong port at the wrong time, or caught with cargo it shouldn't be holding. "When I just started in the business, one of my very first assignments was to recover containers from a bankruptcy. The only place I had real problems was Manila," Maccarone recalls.

He made six trips there and finally secured the containers' release. "I told the guy holding the containers to let me truck them out, then I would pay the ransom. He wanted the ransom first. Neither of us trusted each other, so



With his finger on the button, Textainer CEO John Maccarone (ENG'66) opens the stock market trading day soon after taking his company public.

we finally agreed that I would stand at the gates of the yard and peel off the cash for each container as the truck went out the gate. We had to have an armed guard to ensure I didn't get mugged with all the cash I had in my briefcase."

On another occasion, one of Maccarone's sons—five years old at the time—called his dad over to the television. A Textainer container was on the news.

"It turned out to be part of a drug bust where the entire contents of the container was cocaine being smuggled into the US," said Maccarone. "Of course I couldn't tell him the negative reason our container was on TV. Once we lease a container to a shipping line, we have no idea what they'll do with it."

At the helm of Textainer since 1999, Maccarone gained much of his entrepreneurial wherewithal and coolheaded management style from his experience starting a container company in 1977 with Jim Hoelster, who'd first hired him into the container industry and preceded Maccarone as Textainer's chief executive officer.

"He has a high energy level and is always analyzing the mechanics of a deal or a transac-

tion to get to the heart of it—and he has a great sense of humor," says Hoelster. Of Maccarone's key role in their start-up container company, Hoelster remembers, "He was in a little, one-room office in Hong Kong with one assistant and a secretary, and he sent us photos of the office. The 'computer room' was a handheld calculator."

Maccarone still visits Hong Kong for business, and he makes a point to walk past that first Far East office—"a rather shabby, low rent, building"—to recall his industry roots.

Despite occasional drug busts and high-wire ransom negotiations, Maccarone most often puts his leadership skills to work in traditional scenarios; he guided Textainer through an initial public offering in 2007 and continues to steer the company through the tough economic climate.

"Our main goal is to make sure we survive the recession, but I think we're in good shape," he says. "We got to be the biggest by acquiring four other competitor container leasing companies, two within the past two years. Now we have another opportunity to acquire competitors."

From Vietnam to ENG and Beyond

Alum makes long journey to a career in patent law

H.T. Than (ENG'85) owns a law firm, practices taekwondo, is a husband and father, and graduated from BU twice, with engineering and law degrees. Before he did all of these things, though, he escaped from Saigon when he was 12 years old, in the final, frantic wave of evacuees at the end of the Vietnam War.

"It was a pretty exciting few hours of my life," Than says of the chaotic two-day period when he, his siblings and their parents left their home—and a brother in the South Vietnamese army—to escape from Saigon on April 29, 1975. His brother had passed up an opportunity to escape with the family and returned to the front in what Than describes as "The most courageous act that I have ever witnessed."

As the North Vietnamese military swarmed southward and the U.S. ramped up its whirlwind evacuation, Than and his family waited at the Saigon airport. They watched as a bomb hit a plane on the runway, dashing their hopes of escaping on the next flight, and found shelter in a ditch for the next night and day as bombs fell nearby.

"We could see the North Vietnamese were about to overrun the airport and the retreating South Vietnamese soldiers running through it. We saw soldiers from my brother's battalion, but no one knew where my brother was," Than says. "People were yelling and screaming. We looked up in the sky, and there were a bunch of American choppers overhead."

He and his sisters ran for the helicopters. In the pushing and jostling, the children lost their parents, but got on a helicopter. As the sun set, the helicopters took off and flew over the South China Sea.



H.T. Than (ENG'85)

"I did not think I would need engineering again when I went to law school, but I use it every day—last week I had to open my thermodynamics book to figure out why an invention works."

"I still remember the name of the aircraft carrier we landed on. It was the USS *Hancock*. The wind from the blades was so fierce it grabbed hold of me and I thought I was going to fall in the ocean, but there was a ring of U.S. sailors surrounding the chopper and I slammed right into one of them," remembers Than.

He has walked a much steadier path since arriving in the U.S., earning bachelor's and master's degrees in mechanical engineering and spending a brief stint as a petroleum engineer for Exxon. He then returned to BU for his law degree and, eight years ago, after seven years at a large New York-based law firm, he started his own firm in Washington, DC, the H.T. Than Law Group.

Than's family—he eventually did find his parents on the aircraft carrier—settled in Tulsa, Oklahoma, and Than gravitated towards math and science at school because he could understand them before he knew English well.

"I remember attending seventh grade and I didn't speak a word of English," he says. "I was put right into the classroom, and the first few weeks were sheer terror. I would have to translate the homework from English to Vietnamese and try to do it in Vietnamese, and then translate it back."

When Than arrived at BU to study engineering, he felt lost at the large university, but his suitemates quickly became lifelong friends, he met his future wife, Kim (ENG'87), and he encountered helpful professors.

"A lot of universities are after the grants, research, publications—you need those—but equally important is the love of teaching lowly undergrads. I really appreciated Mort Isaacson because he very much cares about that," Than recalls.

Than was particularly challenged during a project using small Data General computers for laboratory data acquisition, recalls Associate Professor Isaacson (ME).

"No documentation came with the computers, and they were clunky machines, but H.T. persevered. I remember seeing him in the lab, struggling away, always with a smile on his face, always an optimistic outlook," says Isaacson.

In his work today, Than says, "I did not think I would need engineering again when I went to law school, but I use it every day—last week I had to open up my thermodynamics book to figure out why an invention works."

He has worked on patents for fuel cell cartridges for Bic (a company more famous for its pens), polymer compounds for Titleist golf balls, and polymers in Benjamin Moore paints. One of his toughest cases involved an alleged patent infringement on a device that filters donated blood.

"I had to cross-examine several PhDs in chemistry. I had to understand the finer points of the invention to try to get the exact story out of them. If you can't converse with them, you're not going to win."

Than keeps his firm humming along but has recently stepped back from the intensity of trial work to focus more on family.

For years, the family assumed Than's brother in the South Vietnamese army was dead, but he had survived, held prisoner in the jungles of Vietnam. He eventually came to the



H.T. Than at about age seven, in Saigon, Vietnam.

U.S. after his family sponsored him through a government program.

"A few days before my wedding in 1991 I saw him for the first time in 16 years," says Than. "I have never heard him complain or be bitter about the lost years. I have been trying to live up to his examples. In a way, he is a big part of who I am."

H.T. and Kim Than have two sons and a daughter; the family goes fishing and hiking and does taekwondo together.

"I have been very, very blessed to be living in the U.S. and have the opportunities I do, and I have a pretty strong love for the U.S. Navy."

Faculty Council to Advise Dean on Research Opportunities

As the College of Engineering continues to emerge as one of the nation's leaders in academic research, Dean Kenneth R. Lutchen has introduced the Dean of Engineering Research Advisory Council (DERAC). Serving as a faculty resource, the new council will initiate interdisciplinary research projects and help identify larger, College-wide grants and programs.

"This group of esteemed faculty researchers will be instrumental in helping the College capitalize on its signature spirit of collegiality and collaboration," Lutchen says. "The council will help us identify and pursue the kinds of cross-cutting research initiatives that will make an impact on society."

The creation of the Division of Systems Engineering and the Division of Materials Science & Engineering during the 2007-08 academic year further facilitated

interdisciplinary research. With College expertise that includes bioengineering, micro- and nano-technology, sensors and acoustics, photonics, imaging, and computational modeling, DERAC will identify and catalyze funding proposals for faculty and encourage faculty interdisciplinary research initiatives in larger areas.

"A distinguished group of faculty has accepted invitations to serve on this committee," Associate Dean for Research and Graduate Programs Selim Ünlü (ECE) said. "It reflects the College's dedication to high-impact interdisciplinary research."

The 17-member DERAC was formed on the recommendation of the Executive Committee of the College. The council is co-chaired by Lutchen and Ünlü. Members include Professor Sandor Bajda (BME); Professor Soumendra Basu

(ME); Professor Thomas Bifano (ME); Professor Irving Bigio (BME); Professor David Castañón (ECE); Professor Clem Karl (ECE); Associate Professor Robin Cleveland (ME); Associate Professor Amit Meller (BME); Associate Professor Yannis Paschalidis (ECE); Associate Professor Ari Trachtenberg (ECE); Associate Professor Xin Zhang (ME); Assistant Professor Hatice Altug (ECE); Assistant Professor Luca Dal Negro (ECE); Assistant Professor Elise Morgan (ME); and Assistant Professor Kamal Sen (BME).

According to Ünlü, "DERAC will play an important role in identifying strategic areas for major research initiatives and will help identify and achieve strategic goals throughout the College."

—Jason L. London

All ENG Students to Learn Entrepreneurship

Boston University is increasing collaboration across two of its 17 schools and colleges with a \$50,000 grant from the Kern Family Foundation to teach entrepreneurship to all engineering undergraduates.

The grant, part of the Kern Entrepreneurship Education Network (KEEN), will allow the extension of an existing program that teaches entrepreneurship principles to seniors in the Department of Biomedical Engineering.

Based at the School of Management, the Institute for Technology Entrepreneurship & Commercialization (ITEC) will deliver a new course for engineering juniors on the principles of technology innovation, entrepreneurship and commercialization, in partnership with the College of Engineering.

In their senior year, all engineering students will be required to include a tailored business plan in their Senior Design Project, a yearlong course that challenges students to solve a real-world engineering problem. In addition to detailing their technical plans and creating prototypes, engineering students will address business issues such as analyzing the opportunity in view of the competitive environment, the intellectual property landscape, the costs and timelines for product development, and a preliminary financial forecast.

"In an increasingly interdisciplinary profession, our graduates need to be excellent engineers, but they also need to understand how innovation is commercialized," explains College of Engineering Dean Kenneth R. Lutchen, principal investigator

on the grant. "Boston University, with its focus on collaboration, is the ideal place for this education."

The KEEN grant will help bring entrepreneurship education to engineering students as well as serve as a prototype of a new way to deliver entrepreneurial education outside the School of Management to other Boston University schools and colleges.

The KEEN program's mission is to foster an entrepreneurial mindset among engineering undergraduates who, upon graduation, will contribute to business success. The Boston University School of Management offered its first elective in this program in the spring of 2009.

Two Faculty Win Massachusetts Life Sciences Center Grants

The Massachusetts Life Science Center—the state's primary agency for scientific developments—has awarded two grants to College of Engineering faculty members. The New Investigator Grant was awarded to Assistant Professor Hatice Altug (ECE), and a New Faculty Startup Grant will support Associate Professor James Galagan (BME).

The grants are part of the MLSC's Matching Grant Program, a \$12 million initiative to fund current academic research and develop future research in Massachusetts. Launched in February of 2008, the new program focuses on attracting and retaining top academic scientific talent throughout the state.

Altug's research focuses on virus detection applications and developing new sensor technologies based on nanophotonics. She received the grant for her development of biosensing technologies that detect ultra-low quantities of biomolecules without using labeling methods.

Through nanophotonics, Altug hopes to detect low numbers of biomolecules to discover new biomarkers for various

"I'm extremely excited about the interdisciplinary opportunities at Boston University," Galagan says. "My research is about bringing engineering and biology into the service of medicine. The activities and strengths here are world class."

diseases—such as cancer—and to make portable virus detection platforms for homeland security. Her work can also be used to understand the behaviors and functions of single biomolecules.

"The MLSC grant will allow me to get a strong start towards my goal," Altug says. "It will enable me to work on cutting-edge and high-impact systems, which can lead to larger grants from the National Institutes of Health, the Department of Defense and National Science Foundation."

The MLSC's New Faculty Startup Grant, which covers a portion of startup and salary costs for new faculty, was created to attract and retain prominent faculty at colleges and universities throughout Massachusetts.

Galagan's research sits at the intersection of systems biology and infectious disease, and he has joint appointments in BME and the School of Medicine.

"I'm extremely excited about the interdisciplinary opportunities at Boston University," he says. "My research is about bringing engineering and biology into the service of medicine. The activities and strengths here are world class."

Galagan believes the College of Engineering's inclusion in initial MLSC grants is a strong indication of its reputation throughout Massachusetts.

"It acknowledges the strengths of BU and what we can do in the Boston area by maintaining and keeping people here—it's a great opportunity to keep faculty in the area to continue their research."

—Jason L. London



Hatice Altug



James Galagan

Biomedical Engineers' Detective Work Reveals Antibiotic Mechanism

A series of genetic clues recently led a team of BU biomedical engineers to uncover exactly how certain antibiotics kill bacteria. The findings could help rejuvenate the efficacy of older antibiotics and reveal new antibiotic targets within bacterial cells.

"The research speaks to new insights into how current antibiotics work and how those insights can point toward development of more effective antibiotics," says Professor James Collins (BME), senior author on the publication.

Collins and colleagues used systems biology approaches to identify clusters of genes that became more active in bacteria treated with antibiotics. The researchers then reconstructed the series of events leading to antibiotic-mediated bacterial death, using the changes in these genes as clues.

"Modern tools allow the simultaneous analysis of the many interacting components that make up complex biological systems. Using such a systems approach, Dr. Collins and his coworkers revealed a surprising mechanism of action for certain antibiotics. This lays the foundation for further antibiotic development, a pressing drug development need," says Jeremy M. Berg, director of the National Institute of General Medical Sciences at the National Institutes of Health. Collins's research in this area is supported in part by the NIH Director's Pioneer Award Program.

Previously, Collins, doctoral candidate Michael Kohanski, and colleagues had found a common mechanism of cell death in bacteria. They discovered that several different classes of antibiotics all led to this same

underlying pathway that caused over-production of hydroxyl radical molecules contributing to bacterial cell death. The group's new research, published in the November 14, 2008 issue of *Cell*, describes the details of this pathway and, in particular, the initial trigger of this deadly sequence of events.

The pathway begins with the antibiotic entering a bacterial cell and attacking ribosomes, leading to the production of misfolded proteins, which had long been established. Collins's group's pathway picks up from there. These proteins get delivered to the cell membrane, and the cell is quick to notice their deformities. The bacteria's two-component molecular emergency systems work like a smoke alarm, first detecting the abnormality and then responding to it. The alarm signal is rapidly relayed to the bacterial cell's stress response machinery, which throws the cell into a frantic state, causing it to overproduce hydroxyl radicals, contributing to the cell's death.

These findings open up new possibilities in fighting the looming specter of antibiotic resistance in bacteria. Knowing some of the specific differences between antibiotics that kill bacteria and those that have a weaker effect could allow researchers to transform the weaker antibiotics into more potent ones, which may bring some antibiotics with fading utility back into the limelight to fight infections.

The molecular alarm systems may also present new targets for antibiotic drugs, which have historically aimed their killing power at important cellular functions in the bacteria, such as the ribosomes that



Michael Kohanski, left, and Professor James Collins

translate genetic information. In revealing this new array of peripheral players in the bacteria's function, the Collins team has uncovered new drug targets. Creating drugs that attack these molecular alarms could help cripple the bacteria and, coupled with an older antibiotic, deliver a fatal blow.

"A lot of drug development has focused on targeting something that's important for the cell to live—something essential," says Kohanski. "But if you understand the system and its complexity, you don't necessarily have to hit the gene or the protein that is the essential factor."

—Kate Fink

Grad Student's Inventions Win Grand Prize in Collegiate Inventors Competition

Timothy Lu, a former graduate student in Professor James Collins's laboratory, won the \$25,000 Grand Prize in the 2008 Collegiate Inventors Competition.

Lu won for his research developing innovative bacteriophages—viruses that attack bacteria—to help combat the growing problem of bacterial antibiotic resistance.

"This is the top national prize for young inventors," says Collins, who, as Lu's advisor, received a \$5,000 award. "I encouraged Tim to think about what he could do with engineered phage as a means to attack bacteria, and he came up with several new ideas. Impressively, Tim was able to execute on these innovative ideas and reduce them to practice."

Lu engineered new genetic circuitry in viruses to invent two bacteria-killing bacteriophages. In one virus, he added genes that let the virus break through a bacterial biofilm, a potentially infectious slime layer of difficult-to-eradicate bacteria on surfaces and instruments that plagues hospitals and food-processing plants. In another, he encapsulated instructions in the virus to overproduce certain genes, once it attacked bacteria, that would make the bacteria more vulnerable to antibiotics.

"The winners of this year's competition are truly impressive," says Director of the United States Patent and Trademark Office Jon Dudas. "The ingenuity of their work will help sustain America's role as the world's leader in technology and innovation."

The National Inventors Hall of Fame Foundation presented the awards at a November 19 ceremony in Kansas City, MO,

as part of Global Entrepreneurship Week. The United States Patent and Trademark Office and the Abbot Fund sponsored the competition.

Lu's work, done over several years in Collins's laboratory, has resulted in several patent applications for the engineered bacteriophages, and work continues on the projects.

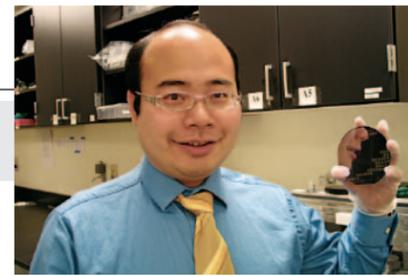
Lu, a student in the MD/PhD program at the Harvard-MIT Division of Health Sciences and Technology, completed his PhD in February of 2008 and continues to work toward his MD. He plans to pursue a career in research.

—Kate Fink

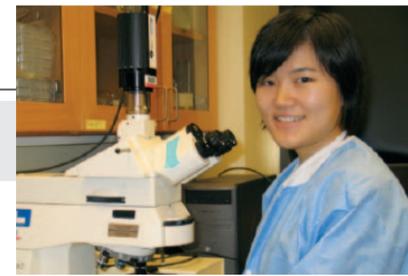
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Timothy Lu (Photo Courtesy of the Lemelson-MIT Program)



I-Kuan Lin



Jane Y. Zhang

Two Students Win Health Care Fellowships

Two College of Engineering doctoral students were awarded fellowships in November through the second annual Boston University/Center for Integration of Medicine & Innovative Technology (CIMIT) Fellowship program.

Peng Zhang, a mechanical engineering student, and Katherine Calabro, a biomedical engineering student, received one-year stipends, full tuition and fees coverage, and travel expenses to present their research at a national meeting.

The BU/CIMIT fellowship is awarded to second- or third-year graduate students who are researching topics that help address health care challenges such as medical device development, creating algorithms and software for use in clinical practice, and engineering in medical environments. The fellowships are potentially renewable for a second year.

"We are pleased to extend these fellowships to such worthy young researchers,"

said CIMIT Executive Director John Parrish, MD. "Supporting research is one of CIMIT's most important missions, and we believe this promising group will benefit from this opportunity for further study."

Working in the lab of Assistant Professor Tyrone Porter (ME), Zhang researches the development and characterization of nano-sized emulsions that move across tumor vasculature. When subjected to ultrasound, they can vaporize and enhance ultrasound-mediated heating and coagulation of solid tumors. Zhang presented these findings at the International Symposium on Therapeutic Ultrasound and is working in collaboration with Harvard Medical School to study the effect of nano-emulsions on specific ultrasound cancer therapy.

In Professor Irving Bigio's (BME) lab, Calabro works with the University's Biomedical Optics Laboratory using small

fiber-optic devices to detect diseases such as colorectal cancer, Barrett's esophagus, and inflammatory bowel disease in the epithelial layers. Using optical spectra collected from patient tissue, Calabro works to streamline the detection and diagnosis of gastrointestinal diseases to minimize the need for time-consuming and costly pathology tests.

CIMIT also awarded continued funding for three second-year CIMIT Fellowship recipients: Jane Zhang develops high-throughput medical diagnostics in Assistant Professor Catherine Klapperich's laboratory; Pui Leong works on developing biologically viable tissue-engineered cartilage and bone in Assistant Professor Elise Morgan's laboratory; and Burkay Birant Orten works on improving CT imaging for diagnosis and monitoring of strokes and cancers in Professor W. Clem Karl's laboratory.

—Jason L. London

Graduate Students' Posters Attain Top Honors

Two College of Engineering graduate students were honored with Best Poster Awards by the American Society of Mechanical Engineers (ASME) and the Center for Integration of Medicine & Innovative Technology (CIMIT).

I-Kuan Lin was selected for his poster, "Elastic and Viscoelastic Characterization and Modeling of Polymer-based Structures for Biological Applications," at the ASME International Mechanical Engineering Congress & Exposition. His was among only five posters selected from 166 by more than 300 competing graduate students and industry professionals.

Lin's poster describes soft polymer materials and their mechanical behavior for

biomedical applications in sensors and lab-on-a-chip microfluidic devices.

"I-Kuan's work and research tackles important problems in mechanical and biological applications," said Associate Professor Xin Zhang (ME). "Understanding the fundamental mechanical issues of soft polymer materials can lead to real developments in high-level applications on the micro- and nano-scale."

Biomedical engineering student Jane Y. Zhang was honored at the CIMIT Innovation Congress. Her poster, "In situ Fabrication of Surface-Enhanced Raman Scattering Substrate in Microfluidic Chip for Ultrasensitive Infectious Disease Detection," won the Most Innovative Research category.

The poster describes methods for rapid and highly sensitive detection of infectious disease using a disposable microfluidic device. Zhang's work in Assistant Professor Catherine Klapperich's (ME) lab aims to detect biologically relevant levels of bacteria with disposable polymer chips, particularly for infectious disease screenings at point-of-care testing in low-resource areas.

"Our goal is to detect disease as fast as possible," Zhang says. "We hope to eventually evolve to detecting and differentiating between infectious pathogens, such as distinguishing normal flu-like symptoms from more potent diseases such as SARS."

—Jason L. London

NSF Challenge continued from page 3

Smart Lighting Could Be Next Generation Wireless Technology

Little envisions indoor optical wireless communications systems that use white LED lighting within a room—akin to the television remote-control device—to provide Internet connections to computers, personal digital assistants, television and radio reception, telephone connections and thermostat temperature control.

With widespread LED lighting, a vast network of light-based communication is possible, Little notes. A wireless device within sight of an enabled LED could send and receive data through the air—initially at speeds of 1 to 10 megabits per second—with each LED serving as an access point to the network. Such a network would have the potential to offer users greater bandwidth than current RF technology that has a limited bandwidth available for use. This means

a massive download by one person in an office or neighborhood can sometimes slow the data transfers of others nearby. With visible light, the BU team envisions that each person on an airplane, for example, might be able to simultaneously download different high-definition movies directly to their laptops without any interference or slowdowns.

Moreover, since this white light does not penetrate opaque surfaces such as walls, there is a higher level of security, as eavesdropping is not possible. LED lights also consume far less energy than RF technology, offering the opportunity to build a communication network with reduced carbon emissions over the long term and without added energy costs.

The technology is not limited to indoor lights; its first real test may very well come outdoors, in the automotive industry.

"This technology has many implications for automobile safety," Little says.

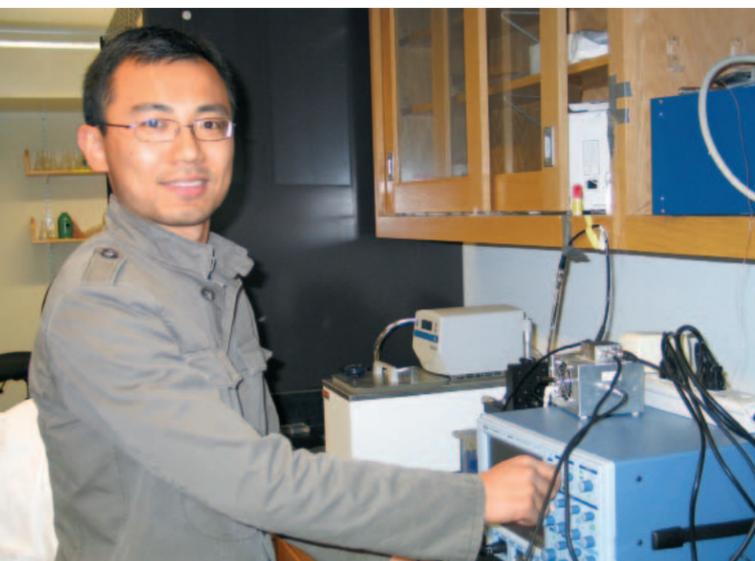
"Brake lights already use LEDs, so it's not a stretch to outfit an automobile with a sensor that detects the brake lights of the car in front of it and either alerts an inattentive driver or actively slows the car."

Beyond the indoor and outdoor applications the researchers have thought of, there are likely many others not yet imagined.

"This center does not exist because of one application, but because it can have a huge variety of them. It's not only transportation or communication. Everywhere you have a light you can find a new application area," Altug explains.

"As a research area it is rich with unanswered questions," Little adds. "And there will be a lot more interesting applications as we move toward ubiquity."

Kate Fink and Ronald Rosenberg contributed to this story



Peng Zhang



Katherine Calabro

Eisenberg Named BME Chair

Professor **Solomon R. Eisenberg**, a 25-year faculty veteran, has been named chair of the Biomedical Engineering Department. Eisenberg served as BME's chairman ad interim during the 2007–08 academic year.

"Sol Eisenberg has served the College with distinction, wisdom and vision in each of the many leadership roles he has played," says Dean Kenneth R. Lutchen. "He has been instrumental in creating many of the outstanding opportunities for our undergraduates and has an exemplary record as a teacher and researcher. As a member of the faculty, he played crucial roles in advancing the department into the elite ranks of biomedical engineering and I am confident his leadership will produce still further advancement. Most impressive is the unanimous respect and enthusiastic support Sol has from the BME faculty to take over as the department chair."

Eisenberg joined BME in 1983 shortly after earning his doctorate at the Massachusetts Institute of Technology. He holds professorial appointments in BME and in the Electrical & Computer Engineering Department.

In 1998, Eisenberg was named associate dean for Undergraduate Programs, a post he continues to hold. He is the chief architect of the College's study abroad programs, which are among the few nationally designed exclusively for engineering undergraduates. The first such program was established in Dresden, Germany, in 2000 and similar initiatives have been added in Guadalajara, Mexico, and Tel Aviv, Israel. He helped win a National Science Foundation grant to establish a Biomedical Engineering Research Experience site at BU, and served as the College's dean ad interim during the 2005–06 academic year.

"As BME chair ad interim he has already played key roles in recruiting superb faculty at every rank and has advanced the success



Solomon R. Eisenberg

of the department's Translational Biomedical Engineering Partnership Program funded by the Coulter Foundation," Lutchen added.

Attaway Named Director of Curricular Assessment & Improvement

In September of 2008, Dean Kenneth R. Lutchen named Assistant Professor **Stormy Attaway** Director of Curricular Assessment & Improvement. In addition to continuing her role as a faculty member in the Department of Mechanical Engineering, in this position Attaway will assume new responsibilities, such as improving the engineering curricula.

"This is a new position charged with overseeing and insuring the quality of our curricular assessment and improvement programs so as to better the academic experience of our undergraduates," says Lutchen. "Stormy is taking on a critical task to identify, implement and coordinate best practices across the College."

Attaway began by soliciting feedback from the constituents of the curricula:

In 1990, Eisenberg was recognized as one of Boston University's best teachers with the Metcalf Award for Excellence in Teaching. He is also active in the lab, where he leads research on electrically mediated phenomena in tissues and biopolymers, including cartilage biomechanics and computational modeling of electric field distributions in the human heart and thorax during defibrillation.

"For the past 25 years, it has been my privilege to be associated with the Biomedical Engineering faculty at Boston University," Eisenberg said. "Many great things have happened during that time and I plan to help the faculty capitalize on that momentum in the coming years."

—Michael Seele

faculty, students and alumni. Trends and themes in their responses help inform decisions on how to modify the undergraduate



Stormy Attaway

programs to best serve engineering students throughout their education and as they venture into employment or graduate school.

"We are always asking, 'What can we do to improve the undergraduate educational experience?'" Attaway says.

Her goal of continually refining the undergraduate curricula is also aiding the College's assessment processes—as the College's programs and departments have become more interconnected, faculty and students move more freely among engineering programs and disciplines, and Attaway will work towards standardizing assessment methods.

"Professor Attaway has extensive experience with undergraduate and accreditation issues as associate chair of Manufacturing Engineering," says Associate Dean for Undergraduate Programs Solomon Eisenberg. "This appointment will go a long way towards rationalizing our approach to assessing and improving our undergraduate programs. Additionally, the fact that she has taught the freshman engineering computation course to virtually every engineering undergraduate since 1989 puts her in a unique position to reach out to current students and our alumni."

—Kate Fink

Scientific Community of Turkey Honors Selim Ünlü

TÜBİTAK, the leading funding and promoting source of the scientific community of Turkey, awarded Professor **Selim Ünlü (ECE)** the TÜBİTAK Special Award for his significant contributions to the advancement of universal science.

The Special Award is reserved for Turkish scientists living abroad and—along with the TÜBİTAK Science Award—is Turkey's highest award given for scientific achievement. According to TÜBİTAK, Ünlü was recognized for "significant contributions to research at the international level in optical electronics and nanotechnology, specifically high-performance photo detectors, near-field scanning microscopy and high-resolution subsurface microscopy fields."

"I am honored to receive this highly prestigious award," Ünlü said. "It's a great feeling to be recognized by the scientific community of my home country."

Ünlü was honored at a ceremony at Turkey's Presidential Palace in Ankara in December of 2008. A native of Sinop, Turkey, Ünlü was nominated for the award by his longtime collaborator, Bilkent University Professor Ekmel Ozbay.

The award is based in part on Ünlü's work on five publications: "Resonant Cavity Enhanced (RCE) Photodetectors" (1991); "Resonant Cavity Enhanced Photonic Devices" (1995); "Near-field Optical Beam Induced Current Measurements of Heterostructures" (1995); "Beam Divergence of Waist Measurements of Laser Diodes by Near-field Scanning Optical Microscopy" (1997); and "High Spatial Resolution Subsurface Microscopy" (2001).

Ünlü's work in optoelectronics and nanotechnology extends over two



President of Turkey Abdullah Gül (left) and Selim Ünlü

decades. He was named a fellow of the Institute of Electrical and Electronics Engineers in 2007. Long active in the IEEE, he is an associate editor for the IEEE *Journal of Quantum Electronics* and served as chair of its Laser and Electro-Optics Society, Boston Chapter. Ünlü has also served as founding chair of the IEEE/LEOS technical subcommittee on nanophotonics and past chair of its technical subcommittee on photodetectors and imaging.

Ünlü joined Boston University as an assistant professor in 1992 and was named the College's Associate Dean of Research and Graduate Programs in 2007. He received his bachelor's degree in electrical engineering from Turkey's Middle East Technical University in 1986 and his master's and doctoral degrees in electrical engineering from the University of Illinois in 1988 and 1992.

—Jason L. London

Belta Wins Air Force Young Investigator Grant

Assistant Professor **Calin Belta (ME)** has been awarded a Young Investigator Research Program grant by the Air Force Office of Scientific Research (AFOSR) to conduct basic research in developing control and communication strategies for teams of unmanned vehicles.

The three-year AFOSR grants are awarded to early-career scientists and engineers who show exceptional ability and promise for conducting research in aerospace, physics, electronics, life sciences, and chemical and materials science. Belta was one of 39 chosen from more than 200 national proposals.

"As a young researcher, it's great to get this recognition from such an important organization," Belta said. "This research is really focused on a communication interface that can be used in unsafe military zones, which is something that really appealed to the Air Force."

Belta seeks to develop an interactive vehicle-to-controller language used in the deployment of mobile robots, such as unmanned military vehicles in combat zones. Combined with algorithms for automatic generation of control and communication strategies, the language could lead to a framework that will allow high-level interaction between vehicles and a human operator.

"Our goal is to create robots that can react to specific situations in a safe and predictable way," he said. "The interaction between the human operator and the robots should be minimal, and achieved through a friendly user interface."

This is Belta's second award for young investigators; he also received the National Science Foundation CAREER award in 2005 and has been the lead investigator on three other NSF projects.

—Jason L. London



Calin Belta

Galagan Wins NIH Grant to Study What Makes Tuberculosis Tick

The National Institutes of Health awarded Associate Professor **James Galagan (BME)** and collaborators a grant to study the bacteria that cause tuberculosis. The team's research efforts could lead to the development of more effective drugs and detection methods to combat the disease.

The research team will use systems biology—an approach that studies the function of a whole organism rather than picking it apart to examine individual genes or proteins—to investigate the inner workings of the bacteria *Mycobacterium tuberculosis*.

"We're tackling the problem from an engineering approach, trying to under-

stand how the system works. By taking a comprehensive view of how an organism causes a disease, you're in a better position to develop drugs, diagnostics and vaccines," Galagan explains. "You have to know your enemy if you want to fight it."

The National Institute of Allergy and Infectious Diseases (NIAID), part of the NIH, awarded the \$19.8 million, five-year grant to co-principal investigators Galagan and Gary Schoolnik, an infectious disease microbiologist at Stanford University. It is one of four research projects that were awarded a total of \$68.7 million from NIAID that will use systems biology approaches to study diseases

including salmonella, influenza and severe acute respiratory syndrome (SARS).

"These new projects promise to deepen our fundamental understanding of the complex molecular processes of microbes and their interactions with the host, including how molecular-level events lead to the initiation and progression of disease," says Anthony S. Fauci, NIAID director.

"James Galagan is among the best of this new breed of scientists who have one foot in the experimental lab and the other in the world of computer algorithms," says Professor Mark Klempner, director of BU's National Emerging Infectious Diseases

Laboratories (NEIDL) where Galagan has a joint appointment and will conduct some of his research. "We now have the ability to generate huge amounts of data in a single experiment, and James is among the few people with an idea about how to make sense of that data; with this award he can use that expertise to unravel the secrets of tuberculosis."

More than 14 million people worldwide have been diagnosed with tuberculosis (TB), and up to one-third of the world's population may have a latent, non-symptomatic form of TB infection, according to

"By taking a comprehensive view of how an organism causes a disease, you're in a better position to develop drugs, diagnostics and vaccines."

World Health Organization statistics. Clues to better treating TB may come from its ability to exist for years in individuals who may not even know they have it.

"These latent carriers can go on to develop active TB, especially if they become immunocompromised," Galagan says. "We think that the state TB is in during latency may be a factor as to why it is so hard to treat. There's surprisingly little known about this area of TB circuitry."

Galagan works on computer models that can help understand which pathways the bacteria turn on or off to transition from a latent to an active state. Such findings could unveil new drug targets to make TB less likely to develop, or prevent the bacteria from becoming resistant to older drugs.

Galagan and Schoolnik will work with a team of several accomplished laboratory and computational TB researchers for the project, including investigators at Brigham and Women's Hospital and the Max Planck Institute in Germany.

—Kate Fink

Teich, Morgan Win ENG Faculty Awards

Recognizing a veteran and a tenure-track professor engaged in high-impact research, the College of Engineering announced the recipients of the Distinguished Lecturer Series Award and the Early Career Research Excellence Award in December. Dean Kenneth R. Lutchen announced that Professor **Malvin C. Teich (ECE)** has been awarded the Distinguished Lecturer Series Award, and Assistant Professor **Elise Morgan (ME)** is the Early Career Research Excellence Award winner.

The annual Distinguished Lecturer Series Award honors a faculty member engaged in outstanding, high-impact research. The award gives the selected faculty member a public forum to discuss and showcase research before the Boston University academic community.

Teich presented the lecture, "Time Fractals in Neural Spikes, Heart Beats and Network Traffic," in March.

Teich's research is focused in photonics, quantum optics and imaging, and information transmission in biological sensory systems. Throughout an academic career that stretches over 40 years, he has co-authored three books, holds seven patents, and has contributed to over 300 book chapters and technical articles.

A member of the Boston University community since 1995, Teich holds numerous positions, including joint appointments in the departments of Electrical &

Computer Engineering, Physics, Biomedical Engineering, and Cognitive & Neural Systems. He is co-director of the Quantum Imaging Laboratory and a member of the Photonics Center, the Center for Adaptive Systems, the Hearing Research Center, and the Program in Neuroscience. He is a former research scientist at MIT's Lincoln Laboratory and a professor emeritus at Columbia University.

The annual Early Career Research Excellence Award celebrates the significant, high-impact research accomplishments of tenure-track faculty less than 10 years removed from earning a PhD.

Morgan joined the College of Engineering in 2003 and is the director of the Orthopaedic & Developmental Biomechanics Laboratory. Her research focuses on the interaction between the mechanical behavior, structure and biological function of tissues such as bone. She received the 2005 International Osteoporosis Foundation-Servier Young Investigator Award.

Working with orthopedic surgeons at Boston Medical Center, Morgan is developing new experimental techniques to study how mechanical stimulation of fractured bones either promotes or prevents new bone growth. She has contributed to over 30 publications, book chapters, review articles and invited lectures and presentations.

—Jason L. London



Malvin C. Teich



Elise Morgan

Grinstaff, Wong, Zhang Named First Distinguished Faculty Fellows

In an effort to further promote the work of mid-career faculty and honor those who have demonstrated extraordinary performance and impact in research, teaching and service, Dean Kenneth R. Lutchen has established the Distinguished Faculty Fellows Program.

The Distinguished Faculty Fellows Award was established for tenured College of Engineering faculty who are on a clear trajectory toward exemplary leadership careers in all dimensions of science and engineering. The five-year appointment includes a discretionary fund for the faculty member's laboratory.

Associate Professors **Mark Grinstaff (BME)**, **Joyce Wong (BME)** and **Xin Zhang (ME)** were announced as the inaugural Distinguished Faculty Fellows at the College's December faculty meeting.

With Boston University since 2003, Grinstaff has a joint appointment at the College of Engineering, College of Arts & Sciences, and the School of Medicine. His research focus includes biomaterials, tissue engineering, drug delivery, macromolecular chemistry and engineering, and nanodevices.

Grinstaff works on teams seeking to develop new treatments for osteoarthritis that feature non-invasive detection techniques and creating a biopolymer that serves as a joint bio-lubricant. He is also collaborating with researchers at Brigham and Women's Hospital to create chemotherapy-eluting strips to prevent locally recurrent lung cancer.

Wong joined the College of Engineering in 1998. She is the associate chair for graduate studies in Biomedical Engineering and principal investigator at the College's Biomimetic Materials Engineering

Laboratory, where her research focuses on developing biomaterials to probe how structure, material properties and composition of the cell-biomaterial interface affect fundamental cellular processes.

Wong has received an NSF CAREER Award as well as a Dupont Young Professor Award. Her current projects include tissue engineering of small diameter blood vessels and developing targeted nano- and micro-particle contrast agents for multi-modal detection of vulnerable plaque.

The Distinguished Faculty Fellows Award was established for tenured College of Engineering faculty who are on a clear trajectory toward exemplary leadership careers in all dimensions of science and engineering.

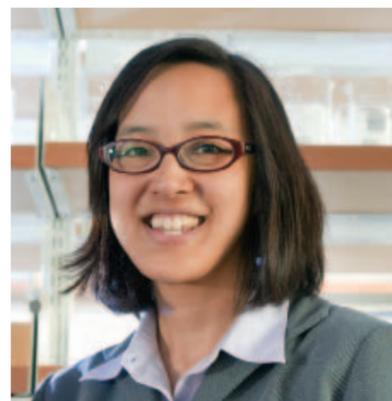
A member of the College of Engineering since 2002, Xin Zhang is the associate chair of graduate programs in Mechanical Engineering. Her research interests include MEMS and NEMS, micro- and nano-mechanics manufacturing, and biotechnology. A member of the Boston University Center for Nanoscience & Nanotechnology, she was the first recipient of the Fraunhofer Assistant Professorship awarded by the Fraunhofer USA Center for Manufacturing Innovation.

Zhang received the NSF CAREER Award in 2003 and in 2007 was recognized by the National Academy of Engineering as one of the country's top engineers between the ages of 30 and 45.

—Jason L. London



Mark Grinstaff



Joyce Wong



Xin Zhang

Grinstaff Wins Award from CIMIT Health Care Consortium

Associate Professor **Mark Grinstaff (BME)** and his cancer research colleagues won the Edward M. Kennedy Award for Healthcare Innovation from the Center for Integration of Medicine & Innovative Technology (CIMIT) in October.

Grinstaff shares the award with Yolonda Colson, a surgeon and director of the Women's Lung Cancer Center at Brigham and Women's Hospital, and John Frangioni, the co-director of the Center for Imaging Technology and Molecular Diagnostics at Beth Israel Deaconess Medical Center.

The three investigators work on complementary projects with the collective aim of identifying and treating cancer that metastasizes into lymph nodes. Colson and Frangioni study the clinical and imaging aspects of the research and Grinstaff develops polymer-based drug-delivery systems. This type of drug delivery would allow treat-

ments to reach only the specific sites where cancer has metastasized while minimizing systemic side effects.

"I am very pleased with this selection," says John Parrish, CIMIT executive director. "The researchers have unique areas of expertise and they are working on very innovative research that has great potential to help vulnerable patients."

The group received the award—which is named for Senator Edward Kennedy because of his pioneering efforts in working for health-care improvements—at a presentation during the CIMIT Innovation Congress in October.

Kennedy commended the researchers "for their promising research on new approaches to make cancer treatments more effective, reduce rates of recurrence and adverse side effects, and improve patient survival. Their cooperative research, drawing together widely different areas of



Mark Grinstaff (left), Yolonda Colson and John Frangioni

expertise, is exactly the kind of work that CIMIT was created to inspire."

The award is the highest honor offered by CIMIT, a Boston-based nonprofit consortium of teaching hospitals and engineering schools that supports interdisciplinary and translational research.

—Kate Fink

Yakhot Named Fellow of American Physical Society

At a November ceremony, the American Physical Society named Professor **Victor Yakhot (ME)** a new fellow, making him a member of a select group including fewer than one-half of one percent of the society's 46,000 members.

The APS particularly noted Yakhot's contributions to the field of turbulence theory.

"I developed some equations that are being used for turbulence simulations and design engineering in the car industry, and beyond. There are a lot of different applications," Yakhot explains.

In addition to his influential turbulence research, Yakhot studies chemical

physics, fluid mechanics, combustion theory, heat transfer, and nanotechnology and nanofluids, and has published 200 papers in these fields. One of his current areas of interest is collaborating with Associate Professor Kamil Ekinci's research group to develop the theoretical side of their work on the vibration of nanoscale wires for sensing applications.

Yakhot earned his PhD in physics at Moscow State University. He has been a member of the BU College of Engineering faculty since 1997 and was named the Aerospace & Mechanical Engineering Professor of the Year in 2007.

—Kate Fink



Victor Yakhot

Museum of Fine Arts Leadership Reception

On November 6, 2008, Dean Kenneth R. Lutchen hosted alumni and friends at Boston's Museum of Fine Arts for a donor Leadership Reception and viewing of the "Art & Empire: Treasures from Assyria" exhibit.



From left, Gordon Walsh (ENG'67, MS'68, GSM'71), Dean Lutchen and Nick Lippis (ENG'84, MS'89) and Lippis's son, Nicholas



From left, seated: Jamie Heller, Karen Panetta (ENG'85) and Ruth Hunter (ENG'64); standing, Al (ENG'62) and Geraldine Muccini



Jeremy Schein (ENG'10) and ENG Alumni Senior Program Coordinator Amanda Magee

Washington, D.C. Alumni Reception

On October 16, 2008, Dean Lutchen hosted a reception for alumni in the Washington, D.C. area. Despite a Boston College event nearby, a Terriers-Eagles standoff was narrowly averted when alums from both schools united to cheer on the Red Sox in the playoffs.

(Photo credit: Scott Muirhead)



Hemal Mehta (ENG'04), Andrew Chow (ENG'07), Thomas Pluta (CAS'72), Dean Lutchen and John Kaufhold (ENG'95)



From left, Patrick Sweeney (ENG'85), H.T. Than (ENG'85, LAW'93), Kim Bassotti (CAS'04), Associate Dean of Graduate Programs Selim Ünlü, Robert Berkovits (ENG'77), Martin Ross (ENG'62), Michelle Tortolani (ENG'82, MS'89) and Mark Bassotti (ENG'03)



William Dixon (ENG'06), Ann Tedford (ENG'78), Diana Pincus (ENG'05) and Benjamin Pulver (ENG'06)



Development Officer Jinara Reyes, Dean Lutchen, Ann Tedford (ENG'78), Michelle Tortolani (ENG'82, MS'89) and Robert Stone (ENG'82)

Alumni Honored at Reception

During October's Alumni Weekend, three alumni received accolades from the College of Engineering at the Distinguished Alumni Awards reception held at the Ingalls Engineering Resource center.

Dean Kenneth R. Lutchen said, "Alumni play a crucial role in any great institution, and in expanding, enhancing and embracing our relationship with alumni, we also strive to celebrate and honor their achievements."

Michelle Tortolani (ENG'82, MS'89) received the Service to Profession award. Tortolani, introduced by student Julia Delogu (ENG'09), dedicates much of her time and energy to championing engineering as a career path for women. She has been involved with the Society for Women in Engineering since her freshman year at BU and is now a senior life member. After serving on the organization's board of directors for six years, she became SWE president for the 2008 fiscal year. Tortolani volunteers her time to the organization, lending her experience and management expertise to strengthen the professional development options available to women engineers and to establish public policy programs for the

advancement of women engineers. As the vice president of Repeater Engineering and Operations at Sirius XM Radio Inc., she is also a role model.

Karen Kullis (ENG'85) received the award for Service to the Community. Kullis, introduced by Karen Panetta (ENG'85), co-founded the Taunton Ecology Awareness Movement (TEAM), a community organization that has coordinated Earth Day cleanup activities for the past 18 years. She has also produced and moderated cable access television programs about recycling and composting in Taunton. In 1994, Kullis helped establish the City of Taunton's recycling program and coordinated the first household hazardous waste collection day in Taunton in 1982. Since 2002, Kullis has been an active member of the ENG Alumni Board and the Engineering Annual Fund Leadership Giving Society and has participated in many student mentoring and Career Development Office activities.

Haidong Pan (PhD'04) was honored for his Service to Alma Mater. Pan is the co-founder and chief executive officer of Beijing-based Hoodong Technologies Co. He leads a team



Michelle Tortolani (left), Karen Kullis and Professor Michael Caramanis (receiving the award on behalf of Haidong Pan)

that maintains the largest Chinese Wiki website encyclopedia in the world. Previously, Pan was the chief information officer of AsiaEC, the largest e-commerce office supply website in China. As vice president of the Boston University Alumni Association of China, Pan has been instrumental in coalescing this group; the BUAC formed just two years ago and has already welcomed 600 members who have collectively pledged more than \$1 million to Boston University. Pan is a key member of this group and sponsors numerous alumni events in China.

BU vs BC Hockey Game

ENG alums gather at the annual ENG tailgate party before attending a BU Terriers hockey game against Boston College on December 5, 2008. The teams played to a 1-1 tie.



Christina Fernandes, Margaret Hartley (COM'08), Melissa Stone (CAS'08), Alexander Whitnall (ENG'08) and Fahim Manzur (ENG'08)



Dean Lutchen and Allan Salzman (ENG'88)

1962

Kathleen (Bready) Pellegrino, BS
Springfield, Massachusetts
Kathleen is principal of LivingStone, LLC, a consulting firm that provides financial, government relations, marketing, and construction management services. Last November, she and her husband, Joseph, starred in a production of A.R. Gurney's *Love Letters* for Panache Productions, a nonprofit theater company. She recently hosted her fiftieth high school reunion at her second home in Sandwich, MA. Contact Kathleen at kpellegrino@livingstonellc.com.

1964

Daniel Tokar, BS, GSM'64
Prescott, Arizona
Daniel is a trainer for Northern Arizona SCORE and on the boards of the City of Prescott Industrial Development Authority and the Prescott Community Center. He is also on several endowment fund boards. E-mail him at petittokar@netscape.net.

1968

Edward Kazanjian, BS
Belmont, Massachusetts
Edward retired from his position of assistant superintendent for business and finance for the Westwood Public Schools. He and his wife, Mary, celebrated their 40th anniversary in November. He now looks forward to golfing, consulting, and spending time with the two children of his daughter, Karen Kazanjian Lilla (COM'95), and son-in-law, Paul Lilla (SED'95). E-mail Edward at eakazanjian@verizon.net.

1969

David Hollowell, BS, MS'72, GSM'74
Wolfeboro, New Hampshire
David retired after 20 years as executive vice president and treasurer of the University of Delaware. He received the university's Medal of Distinction in recognition of his service. David is now consulting and is president-elect of the Boston University Alumni Association. E-mail him at daveh@udel.edu.

Robert E. Jalette, BS

Orange, Connecticut
Robert, a retired member of the U.S. Army Corps of Engineers, is a construction manager with Southern Connecticut Gas Company and chairman of the Northeast Gas Association's Gas Operations School. Contact him at jalettefamily@hotmail.com.

1972

Joe Coffey, Jr., BS
Summerville, South Carolina
Joe is director of GEL Engineering, an engineering

and environmental consulting firm headquartered in Charleston, SC. He serves as president of the Charleston chapter of the South Carolina Society of Professional Engineers. Contact him at jcoffey1@sc.rr.com.

1981

Sheila Hemeon-Heyer, BS
Amherst, Massachusetts
Sheila oversees global regulatory affairs at Boston Scientific Corporation, a medical device company specializing in less invasive procedures. She and her husband, Mark, have three sons, one of whom attends the University of Oregon and one of whom will start college in the fall. "I would love to hear from fellow engineers from the Class of 1981," Sheila writes. Contact her at heyers@bsci.com.

1985

Daramana George Gata, CAS'82, ENG BS'85
Plano, Texas
Daramana is the section manager of the Portable Audio Converters Design group at Texas Instruments, where he has worked for 19 years. "My circuit designs have been a part of over \$1 billion of generated revenue," he writes. "I hold seven patents."

Matthew F. Murphy, BS

Middletown, Delaware
Matthew is a project engineer at DuPont and president of the Wilmington section of the International Society of Automation. He has been with both organizations since 1989. E-mail him at murphytmatt@verizon.net.

1986

Steve Ryan, BS
Malvern, Pennsylvania
Steve recently joined Johnson Controls's Efficiency Group as a service manager covering the Delmarva region.

1987

Noam Levine, BS
Arlington, Massachusetts
Noam is a partner manager at The MathWorks in Natick, MA. Previously, he was a business development manager at Analog Devices and an independent marketing consultant for iZotope, Inc.

Joao "John" Pina, BS, MS'92

Bradenton, Florida
John is vice president of global supply chain at GE Fanuc Intelligent Platforms, headquartered in Charlottesville, VA. He has been with GE for 21 years, including stints in its aviation and security sections. Contact him at johnpina@msn.com.

1988

Lawrence B. Tena, BS
New York, New York
Lawrence, a radiation oncologist, was quoted in the *New York Post* on December 1, 2008 about his new cancer treatment at the St. Vincent's Comprehensive Cancer Center in New York, NY. He is the first person in Manhattan to treat a prostate cancer patient with Varian's RapidArc technology. He was also interviewed by Channel 2 CBS television news in New York City and Fox national television news about the new technology and treatment. Contact him at lbtena@yahoo.com.



Dorothy (Gregg) Jensen atop the living roof at the California Academy of Sciences with sons Will, 16 months, and Robert, 6 years, and husband John.

1990

Dorothy (Gregg) Jensen, BS
Alameda, California
Dorothy welcomed a second son, William James, on August 27, 2007. E-mail her at dorothy@alum.bu.edu.

Ezra Kucharz, BS

Glen Rock, New Jersey
In December 2008, Ezra joined Filife.com, a digital personal finance joint venture owned by IAC and Dow Jones, as president and general manager.

1991

Steve Chen, BS
San Francisco, California
Steve founded and built NewRetirement.com (www.newretirement.com), a website that helps people find information about planning for a financially secure retirement. Professor Zvi Bodie (SMG) is one of the com-

What are you doing?

We want to hear from you! Send your class notes submissions to engalum@bu.edu or visit www.bu.edu/alumni/eng.

pany's advisors. "We're always looking for search engine optimization, online marketing and domain expertise, so feel free to reach out via LinkedIn if you are interested in what we're doing at NewRetirement," says Steve.

1992

Jennifer Wlos Fasciano, BS, SPH'02
Lebanon, New Jersey
Jennifer received an MD from George Washington University in 1997. After earning a master's degree at BU, she became a stay-at-home mom to Ella, seven, Bobby, six, and Lily, two. "We recently moved from Boston to central New Jersey, and I look forward to using some of those degrees soon (at least part time)," she writes. Contact Jennifer at jfasciano731@yahoo.com.

1994

Craig Bernero, BS
San Francisco, California
Craig recently relocated from Upton, MA, to take on an expanded role as a global senior director and general manager for one of six business units at EMC Corporation. "My wife and three children are loving the transition and enjoying everything that the state has to offer—not to mention unbelievable weather," he writes. E-mail him at cbernero@resourceful.com.

Kelley (Garland) Irving, BS

Allen, Texas
Kelley married Joseph Daniel Irving on September 23, 2006 in McKinney, TX. **Amy McCagg ('94)** was a bridesmaid. Contact Kelley at kirving@rtkl.com.

Ketan Kishore Mehta, MS

Mumbai, India
After graduation, Ketan returned to India to start a biotech venture specializing in agricultural and environmental biotechnology, with a focus on bio-fertilizers, bio-pesticides, insect repellants, solid waste management and effluent treatment. Over the years, Ketan has established marketing links with India's leading agri-inputs companies and solid waste management companies such as Tata Chemicals and United Phosphorus. Contact Ketan at ecosense_mamoo@yahoo.com.

1995

A. Mark Mento, BS
Boston, Massachusetts
Mark and Jennifer (Konigsberg) Mento (SAR'97/99, GSM'04) of Boston, MA, announce the birth of their first child, Jacob Andrew, on April 14, 2008. Contact them at jmento@mayinstitute.org.

H. Alex Sanchez, BS

Boston, Massachusetts
Alex was featured in the October 27, 2008, issue of *Forbes* for his work with the missile manufacturer Raytheon using conditioned honeybees to detect explosives.

1996

Jeremy Wellan, BS
Phoenixville, Pennsylvania
Jeremy and Suki Day Wellen (CAS'97) announce the birth of their son, Quinn Joseph, on August 6, 2008.

1999

Adam Bulakowski, BS
Burlington, Vermont
Adam earned an MBA with distinction from the Tuck School of Business at Dartmouth University, where he was a Tuck Scholar. He now works at ipCapital Group, a Vermont-based strategy consulting firm focused on maximizing clients' returns on investments in their intellectual assets. Contact Adam at abulakowski@yahoo.com.

2000

Marissa K Fayer, BS
Stamford, Connecticut
Marissa is engaged to marry Jason Coppola of Stamford, CT. She writes, "We plan to wed in October 2009. Julie Greenspoon (CAS'00) is the maid of honor in our wedding. We hope you are all doing well." Contact Marissa at mfayer@gmail.com.

Kerry Twibell, BS

New York, New York
Kerry is a business development manager at *Newsweek*. She is also an alumni board member of the College of

Engineering and would love to get in touch with old classmates and hear ideas for alumni outreach. E-mail her at kerry.twibell.2000@alum.bu.edu.



Corey (left) and Kelly Young

Kelly (Edmonds) Young, BS

East Hartford, Connecticut
Kelly and Corey Young were married on August 15, 2008, in North Stonington, CT. Tara Shaffer (COM'00) was in the wedding party and guests of the wedding included fellow BU alumni Ellen Seigenthaler (CAS'01), Jennifer (Francis) Gragen (SAR'00), Danielle Terranova (CAS'00), and Renee (Raposo) Desrosiers (CAS'99). Kelly is a validation engineer at Pratt & Whitney and is expecting the couple's first child in June. Contact her at kelle@mail.com.

2001

Erik M. Lawrence, BS
Gaithersburg, Maryland
In October 2008, Erik Lawrence of Gaithersburg, MD, was promoted to associate at the technology consulting firm Booz Allen Hamilton in McLean, VA. He has been with the firm since 2002. E-mail him at erik.m.lawrence@gmail.com

2007

Josh Girard, BS
Lyman, Maine
Josh departed for Zambia in July as part of the Peace Corps Master's International Program. In addition to pursuing a master's degree in engineering, Josh will help local communities create fish farming programs and provide engineering support for water and sanitation projects.

ENG Honors Memory of Merrill Ebner with “Future of Engineering” Symposium

Faculty, staff and friends of the College of Engineering gathered on October 24, 2008, for “The Future of Engineering” symposium held in memory of Professor Emeritus Merrill Ebner.

“Merrill Ebner was one of the founding fathers of engineering at BU, a beloved teacher and mentor to many,” said Dean Kenneth R. Lutchen in his introduction. “We are saddened by his loss but are confident that students will benefit from his legacy for years to come.”

The symposium featured keynote addresses from Philip Cheney, a visiting professor at Northeastern University and former vice president at Raytheon; Thomas Magnanti, a professor and former dean of engineering at MIT; and George Hatsopoulos, founder, chairman and chief executive officer of Pharos and the founder of Thermo Electron Corporation.

Cheney spoke about the Gordon Engineering Leadership program at Northeastern University, a master’s degree program that gives engineers with industry experience a boost in their transition into program management positions.

Ebner had visited the students in this program, Cheney recalled, and studied each individual’s research project in preparation. When he came into the classroom, to the students’ surprise, he asked them very specific questions about their projects.

Magnanti discussed the role universities play in the globalization of engineering, saying that engineering today has different employment opportunities, mobility, information transfer capabilities and technologies than in past generations.

“Last century was the century of the large: the GMs, the Boeings, the Shells of the world. This may be the century of the small: carbon nanotubes, turbines the size of buttons and the evolution of small companies,” he said.

George Hatsopoulos told the tale of his path to becoming an engineer. Most of Hatsopoulos’ family members were engineers and many became professors at the local university in Greece, where he grew up.



(From left) Thomas Magnanti, Dean Kenneth R. Lutchen, George Hatsopoulos and Philip Cheney

“When I was 12 years old, I decided I wanted to do more than that,” he said. He began reading about Thomas Edison and became “infatuated,” not only by Edison inventing the lightbulb, but by the fact that he built a company to apply that invention.

“It occurred to me that an engineer should be focused not just on technology and developing solutions, but also have the ambition to apply that technology to implement it in society,” he said.

Ebner joined the College in 1964, and taught, researched, and mentored students until, and beyond, his retirement in 2006. He died on March 27, 2008, at the age of 76. Ebner’s enduring contributions to the College over more than four decades helped shape the lives and careers of countless students and forged close ties and productive collaborations with his many colleagues and co-workers.

Two of Ebner’s children, Merrill Jr. and Martha, attended the event. Following the three

speakers, audience members including faculty and alumni offered informal anecdotes and remembrances of Ebner.

“I considered him to be my closest colleague and associate,” said Professor Ted de Winter. “At the end of the day it’s what you do for other people that counts...he retired and none of us knew he retired, he was still mentoring students, still in the lab.”

Roger Dorf (’70), who established the College’s Merrill L. Ebner Fund in 2003 to support programs encouraging creative design in manufacturing engineering, reminisced about three qualities integral to Merrill’s personality: his intellectual curiosity, his enthusiasm for life and learning, and his great concern for his students.

Dorf said, “Merrill taught all the time, and he did it because he loved it. He lived the idea of education and that you can keep learning forever.”

The de Winter Challenge

After teaching thousands of College of Engineering graduates over his 45-plus years at Boston University, Associate Professor Ted de Winter has a strong idea as to what provides a foundation for the College: “Alumni commitment and their connection with faculty,” de Winter says. “When students and faculty really interact, that creates loyalty.”

To initiate the alumni-faculty connection, Professor de Winter has issued the “Ted de Winter Challenge” by committing \$10,000 to the Engineering Annual Fund, which will match gifts from first-time alumni donors up to \$100 each. The unique challenge gives donors the opportunity to double the impact of their gifts.

“If alumni can see a faculty member contributing, hopefully it will put a spark into them,” de Winter said.

The Engineering Annual Fund enhances the educational experiences of ENG undergraduates outside of the classroom by supporting programs like Engineers Without Borders, the University Nanosatellite Program and undergraduate research opportunities that extend beyond what tuition and external research funding can provide. These experiences, which come directly from alumni support, help shape future alumni into well-rounded engineers who have a lasting impact on society.

In the current economic climate, your contribution provides critical resources for deserving students.

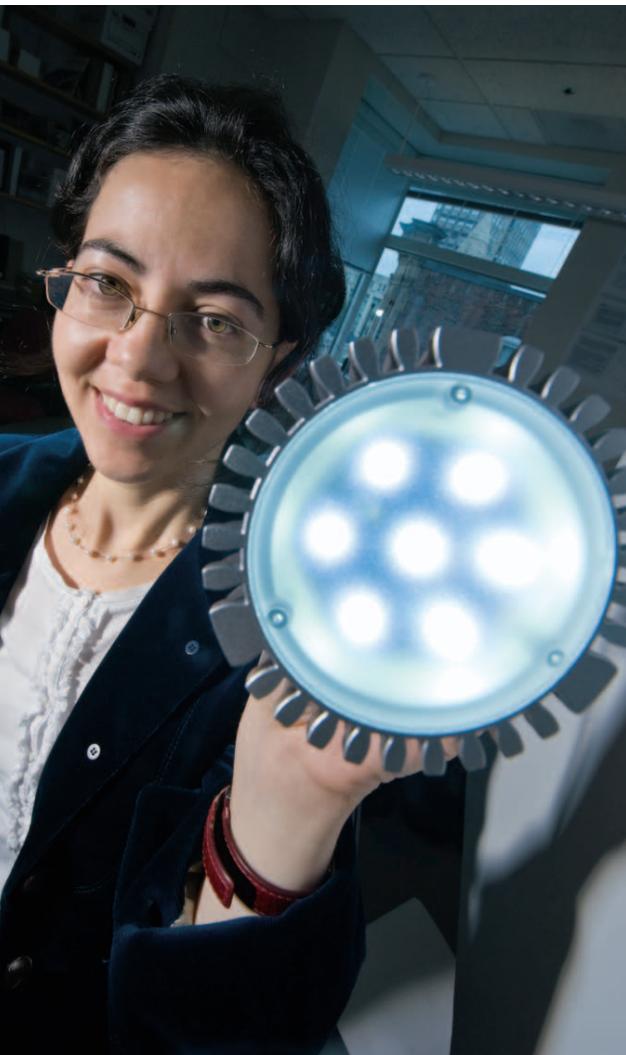
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Hatice Altug

*PhD, Stanford University
Assistant Professor,
Department of Electrical & Computer Engineering*

“My research is in the area of photonics, specifically applied to medical applications. I focus on bio-sensing and bio-detection, which are important for understanding cell behavior, and can lead to new discoveries in cancer research and preventing virus epidemics.

One of the strengths of Boston University is its culture of connecting different people, whether it’s collaborations within the College of Engineering, the School of Medicine or Boston-area researchers. It’s a great interdisciplinary environment, and we have a vision to continue to grow and lead in the engineering community.”

To learn more, visit www.bu.edu/eng.