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FROM THE DEAN

The demands that this system imposes on a junior faculty member these days are nothing short of daunting. They are expected to be effective, caring and stimulating teachers, able to excel at the cutting-edge of a relevant field, and to craft successful proposals for grants from government agencies and foundations to fund their laboratories and research initiatives. They must recruit, train and inspire their doctoral students—guiding their “academic progeny” often just as they are starting their own real families. Professors are also expected to be good university citizens, to participate in a myriad of activities, including outreach to K-12 schools, recruitment of students and of new faculty, participation in university committees and governance, and outreach to alumni and donors.

The wonderful news is that our junior faculty members do all these things willingly and that they do them extremely well. When someone of my vintage examines the productivity of one’s younger colleagues and their impact in and outside the classroom, it is impossible not to ask oneself the obvious question: “Would I succeed if I were coming through the system today? Would I earn tenure?” These are ill-posed, unanswerable questions, but the fact that we are asking them is yet another evidence of the great advances Penn Engineering has made in recent years. We hire only the best, the brightest, the most talented. In the recruitment process we often have to face very difficult decisions, but we have made the right choices: the collective wisdom of my colleagues has resulted in young faculty cohorts endowed with exceptional gifts.

I am proud to be a member of a remarkable group of people: the Penn Engineering faculty. 

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We Are Who We Hire

A school is a very interactive community of faculty, students and staff, but the special role of the professorate is undeniable. Great classrooms and laboratories are essential, yet they are but a means to an end: the school and the students it attracts can only be as good as its faculty. With this in mind, I am delighted to report on the superior quality of the professors that Penn Engineering is recruiting these days. In the pages that follow you will read about five exceptional new people. Three of them, Drs. Christopher B. Murray, Robert W. Carpick and Cherie R. Kagan, are senior faculty members who are already demonstrating powerful leadership in the field of nanotechnology. In July, we will welcome two highly promising assistant professors, Drs. Ani Nenkova and Katherine J. Kuchenbecker, who bring a fresh perspective and advanced knowledge to their respective departments. I trust that you will be able to sense the talent and energy as well as the currency of the research for all of our new arrivals.

American higher education is one of the most notable successes of our great country and is the envy of the entire world. One of its core components has been the tenure system which, for all its faults (and it has many), has served Penn and its peer institutions extremely well. Under the tenure arrangement, universities and their faculty follow a “contract” that places tremendous hurdles on young professors, giving them a well-defined window of time to prove that they are worthy of a lifetime commitment on the part of the institution and, hopefully, on the part of the professors as well.

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Remarkable material properties emerge at nanoscale dimensions of approximately 1/100,000th of the thickness of a piece of paper, or more precisely between 1 to 100 nanometers. At this miniscule domain, thanks to an unusual tug of war between the regimes of quantum and classical mechanics, materials can be engineered for super strength, high elasticity, unusual conductivity, unique optical properties and bio-compatibility. Engineers and scientists are racing globally and at Penn to collaboratively engineer these capabilities into nanoscale devices that offer huge potential benefits for biomedicine, energy-generation, the environment, optics and electronics.

"If you had to name one area for investment that would have the broadest impact across this campus, nothing even comes close to the emerging field of nanotechnology," says Penn Engineering Dean Eduardo Glandt, who is working to orchestrate a campus-wide investment in new faculty, state-of-the-art instrumentation, and plans for the new nanotechnology facility's shared space for experimentation and education.

"Nanotechnology is an agreed-upon next wave of technology that will inform all six departments of the engineering school and will influence education and scientific research throughout Penn," says Glandt. "It’s an area where the boundaries between science and engineering become blurred because it involves manipulating chemistry and physics at an atomic level where the granularity of matter—it’s chemistry and physics—is of the essence."

According to Robert W. Carpick, Associate Professor of Mechanical Engineering and Applied Mechanics, who joined Penn’s faculty in January from the University of Wisconsin-Madison, “Penn is about to make a dramatic investment in nanotechnology just as the field is making a rapid transition from probing the underlying science.
toward developing technology with real world impact—which in turn will drive new science. We’re now at the point where we have the capability to model and control materials at the atomic and molecular level. The experimental modeling is getting powerful enough, the experimental techniques are getting smaller and precise enough, and the different disciplines are interacting closely enough that there is tremendous potential to make new materials, new devices, and new systems that are designed at the scale of a few atoms.”

Already there’s an established, well-regarded cadre of faculty members at Penn who work in nanoscale research and technology development: a modest estimate would count 25 to 30 Penn Engineering faculty and another 25 faculty in Penn’s School of Medicine and the School of Arts and Sciences. As new nano-related insights, tools and technologies influence virtually every scientific discipline and the broader economy, the number of Penn faculty members working on nano-topics is snow-balling—drawing in more scientists across campus and raising new opportunities for involvement by faculty at the Wharton School, the Graduate School of Education, and the Law School.

“It’s almost impossible to keep up with the need for facilities that make this type of research possible,” says Glandt, who has launched an ambitious multi-year plan to recruit faculty members who are recognized leaders in nano-related research. Their joint appointments reflect Penn President Amy Gutmann’s “Penn Integrates Knowledge” (PIK) initiative to recruit faculty whose research, teaching and service cut across disciplines and are relevant to real world challenges. “To recruit the best people, it’s all about the laboratories,” says Glandt.

One such key recruit is Christopher B. Murray, who joined the Penn faculty in January as the Richard Perry University Professor and was previously head of the IBM T.J. Watson Research Center’s Nanoscale Materials and Devices Department, a leading industrial research center. Murray describes the new nanotechnology facility as “an opportunity to develop infrastructure and capabilities that are far beyond the financial capacity of individual scientists, departments and even schools within Penn. Collectively, we can compete globally for funding and scientific talent.”
Penn’s new nanotechnology facility will incorporate:

- A virtually dust-free, vibration-free clean room laboratory that’s a pre-requisite for work at the nanoscale because dust corrupts experiments and instrumentation, and vibrations move objects on a scale that’s much larger than the nanoscale. This clean room will be designed for semi-conductor processing and also fabrication with new nano-materials that have not been traditionally processed in clean rooms before such as soft materials, polymers, and biological or bio-compatible materials.

- An expanded and relocated ‘nano/bio probe innovation facility’ that will offer a suite of technologically sophisticated tools that will allow people to image and manipulate single atoms and molecules. Tools will include single molecule probes developed at Penn as well as optical and scanning probes to access structure and properties in systems ranging from molecular electronics to proteins.

- An improved and relocated electron microscopy facility will offer a variety of electron microscopes that use a beam of electrons instead of light to “see” the structure of materials, yielding information at the scale of atoms and micrometers about topography, morphology, composition and crystallinity.

- Micro-fabrication tooling for fabricating devices with very small structures in that essentially dust-free, vibration-free space. This will include typical lithography tools for manufacturing silicon micro-devices and computer chips, as well as new nanolithography tools for developing future generation devices with materials other than silicon.

- Laboratory and education space that will serve as a collaborative hub and shared space for the entire Penn campus and is expected to be a particular draw for faculty, undergraduate and graduate students in Penn Engineering, Arts and Sciences, the School of Medicine and the Wharton School.

While the costs associated with this infrastructure and tooling are significant, not making this investment is viewed as equally costly. The risk would be that Penn would miss participating fully in a historic scientific transformation that’s expected to be on a par with the Industrial Revolution and the Information age. “Almost all institutions globally are putting tremendous investments in precisely these areas,” says Murray. “The costs of not embracing this opportunity at Penn would be tremendous and would put at risk the great legacy of science and engineering at Penn. This initiative is an important and visionary part of how Penn not only stays competitive but actually helps to elevate the level of scientific activity across campus by bringing people together with a shared mission and in a space where scientists will develop a tremendous sense of community.”

Cherie R. Kagan, Associate Professor of Electrical and Systems Engineering (formerly manager of IBM’s T.J. Watson Research Center’s Molecular Assemblies and Devices Department), Murray and Carpick each joined Penn’s faculty in January—lured in part by Penn’s institutional commitment to the nanotechnology field and also by Penn’s collaborative culture with its strong multi-disciplinary research centers and the PIK initiative.

“This initiative is an important and visionary part of how Penn not only stays competitive but actually helps to elevate the level of scientific activity across campus by bringing people together with a shared mission and in a space where scientists will develop a tremendous sense of community.” CHRISTOPHER B. MURRAY
Kagan, whose research focuses on crafting novel materials and devices using specially engineered molecular and nanoscale organic and inorganic materials, was eager to return to her undergraduate alma mater. “The Penn faculty and administration’s enthusiasm and support for nanoscale research were convincing factors—along with the opportunity to teach students and to look broadly at scientific problems,” Kagan says. “Nanoscale science is very competitive; and Penn’s peer institutions continue to build. We need to invest in the experimental resources and capabilities that will allow Penn to lead in this exciting area.”

A major shift in industrial funding of science may be a boon for planned future faculty recruitments. Murray, who has joint appointments in the Department of Materials Science and Engineering and in the Department of Chemistry in Arts and Sciences, notes that, “Many of the nation’s major industrial labs with broad scientific missions in nanoscale research have had to adjust their focus and narrow in on near-term objectives. There are a lot of really good ideas that need to be developed in the university setting where they can be transferred from basic science through engineering to get out into the world to attract new commercial partnerships. Penn has all the right pieces to be successful in this endeavor: strong scientific, engineering and medical school programs and the skills and innovation at the Wharton School that can look more broadly at how to get new technology development out into the marketplace.”

Among faculty at Penn with expertise in nanoscale research, there’s growing excitement about plans for future hiring and the new nanotechnology facility—as well as about the acceleration of scientific exploration toward technology development. “Some people ask ‘when is the big hit coming?’ But you can’t predict the potential revolutionary advances in nanotechnology. It’s a new tool box that will stimulate new ideas, new perspectives on longtime fields of research, and also new collaborations among scientists,” says Dawn Bonnell, Trustee Term Professor of Materials Science and Engineering and Director of Penn’s Nano/Bio Interface Center. “The breakthroughs will extend far beyond predictions based on current tools. The intellectual engagement of the faculty is what will actually move the science forward. We’re creating a new environment at Penn for collaborative research that will lead to significant breakthroughs.”

Anticipated campus-wide involvement and collaborations in nanoscience and nanotechnology development are in keeping with Penn’s origins, says Carpick. “We’re starting to make this transition from basic science to technology with real world impact. As we face the challenges of how to put nano-science to good use, Penn is the perfect place to consider the implications. There’s a history and tradition here of carrying out science for the benefit of people. If you look back at Benjamin Franklin’s influence in shaping Penn’s commitment to public service, we’re building on a tremendous ethic of societal concern and responsibility that’s intrinsic to this institution.”

“The breakthroughs will extend far beyond predictions based on current tools. The intellectual engagement of the faculty is what will actually move the science forward. We’re creating a new environment at Penn for collaborative research that will lead to significant breakthroughs.” DAWN BONNELL
Adnan Aziz is a 2004 SEAS graduate and the Founder and Executive Vice President of First Flavor, a company that has developed the technology to produce small, soluble flavor strips that mimic the flavor of products ranging from soda to oral care to alcoholic beverages. The product, which looks and feels much like the dissolving breath strips made by Listerine and others, has common sense appeal for both the consumer (Sample before you buy!) and the cost-conscious advertiser (Cheap direct-mail campaigns and point-of-sale displays!). “We want to really get out to the consumers and show them what their shopping experience could be like, and what it should be like,” says Aziz. “It’s really a win-win for both the consumer and the marketer.”

In developing the First Flavor business concept, Aziz hopes to emulate the marketing success of the fragrance industry, which significantly boosted sales by including scent inserts in magazines during the 1980s. Taste samples, reasons Aziz, should have no less of an effect. “We think that the consumer should expect to be able to, as we say, ‘take a taste drive,’” says the 24-year-old Philadelphia resident. “It’s possible, it makes sense and I absolutely think that before you have to buy something you should be able to see if it’s for you.”

The humble roots of First Flavor stretch all the way back to Aziz’s sophomore-year dorm room at Penn and a certain semi-hallucinatory Roald Dahl creation. “I was watching Willy Wonka and the Chocolate Factory in my dorm room,” says Aziz, “and there’s that scene where they’re walking through the hallway and they’ve got the edible wallpaper there. … And just in my layman’s knowledge of watching the food network, I thought, ‘Hey, this is probably possible.’”

Aziz was named one of Businessweek magazine’s top entrepreneurs under 25 and he made his national television debut on ABC’s Money Matters on December 20, 2006. He has also been back to the Weiss Tech House to speak with Penn undergrads.
Aziz, a double major in Bioengineering and Political Science, and two friends actually first pitched the idea as edible art to the student-run Innovation Fund Committee at the Weiss Tech House. The committee was impressed enough to supply Aziz with his first grant. “I clearly remember it like it was yesterday,” says Weiss Tech House Director Anne Stamer. “He made this interesting proposal… and the committee thought it was a cool idea, but he didn’t really know how to go about doing that yet. So he started working on it, started doing research, doing some testing.”

Aziz’s edible art concept eventually morphed into a business venture focused on advertising. He connected with his first investor, current chairman and Wharton grad Josh Kopelman (W’93) through the Weiss Tech House mentoring program. Current CEO Jay Minkoff (WG’83) ultimately came on board as well.

“Penn in general was great in the way that it encouraged cross-pollination between fields,” says Aziz. “I learned the most, really, from my peers and that, I think, is the most amazing part. Certainly my professors and the facilities and everything were outstanding, but to hear the feedback and the way you could bounce ideas off of [my peers] and collaborate with them was fantastic.”

Born in India, Aziz arrived at Penn via Houston, Texas. His father Kaiser, an engineer, and his mother Sultana moved to the United States when Aziz was a year old. Now, as First Flavor targets the end of the second quarter to make its appearance on the market, the business world has started to take notice of the Bala Cynwyd-based company and its founder. Aziz was named one of Businessweek magazine’s top entrepreneurs under 25 and he made his national television debut on ABC’s Money Matters on December 20, 2006. He has also been back to the Weiss Tech House to speak with Penn undergrads.

The attention is nice, says Aziz, but he remains singularly motivated to see his idea reach the marketplace and succeed. “Otherwise,” he says, “I couldn’t have gotten through all of those years of plugging along by myself.”

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BY PROPOSITION

INDUSTRY

BY ERIC McCOLLOM

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BY PROPOSITION
THE SENIOR
OF PROCESS DESIGN

WHEN IT COMES TO TEACHING PROCESS DESIGN, PENN ENGINEERING’S WARREN D. SEIDER LITERALLY WROTE THE BOOK.
Warren D. Seider, Professor of Chemical and Biomolecular Engineering, is writing the third edition of his text, *Product and Process Design Principles: Synthesis, Analysis, and Evaluation*, to be published by John Wiley and Sons, Inc. The current text, co-authored by J. D. Seader and D. R. Lewin, is highly regarded and widely used in engineering schools and industry around the world.

The evolution of the third edition speaks volumes about Seider, his dedication to his field, his respect for his students, and his passion for new knowledge. The modest professor might consider it all in a day’s work.

“Penn has been very good to me,” says Seider. “Much of my work has followed the opportunities that have been created through interactions with faculty here plus the ability of my students to find interesting new areas that are related to the things I do.”

Clearly, Seider knows how to make things happen. He has been called “the pathfinder for the computer-aided process design community” and is lauded for his contributions to new computing architectures for process simulation.

He played a leading role in such landmark design projects as ASPEN, Advanced Simulator for Process Engineering, and introduced a new generation of students to computer-aided process design through his teaching, research and early textbooks. He has helped found and has led such organizations as the Computing and Systems Technology (CAST) Division of the American Institute for Chemical Engineers and the CACHE Corporation, a not-for-profit which supports collaborative projects in computer-aided design for chemical engineering education.

The good fortune for Penn Engineering students is to have Warren Seider at the helm of their process design education. For nearly 40 years, he has taught the capstone senior process design course in Chemical and Biomolecular Engineering, hailed by one colleague as “the jewel of our undergraduate program.”
Part of a two-course sequence which includes an initial semester of classroom instruction, the spring component is CBE 459, devoted to the solution of authentic design problems. The 2006-07 class is working on nine projects. Part of the genius of the course is that seniors work in small groups led by Penn Engineering faculty and are advised by engineers currently working in industry. This collective braintrust makes the senior design course at Penn Engineering unique and sought-after. Through his myriad connections in industry, Seider each year assembles a high-level group of industrial consultants [see sidebar] to meet weekly with the students in small groups. Together, they develop real-world design problems and devise original solutions to them. Many of the industrial consultants have been with the program for a decade or more. One of them is Leonard A. Fabiano, now an adjunct professor in the department. He joined the industrial consultant team in 1977 while he was manager of process engineering at Arco Chemical Co. in Philadelphia, and now works with Seider to assemble the industrial consultant team.

Having collaborated on academic projects with Seider for nearly three decades, Fabiano considers his colleague’s course design “one-of-a-kind.” Fabiano explains: “The difference being that real life is what we want to introduce to our students as what they will likely expect when they get out in industry. The collaboration with the industrial consultants makes it all that much more binding.”

Another incentive for students is the Molstad Prize, named for late Penn Engineering professor Melvin C. (Mike) Molstad. As the early innovator of the design curriculum, he had begun to develop the courses as they are currently taught and to involve industrial consultants in the 1950s. In the late 1970s, alumnus F. K. “Ken” Chan, ChE ’62 endowed the Molstad Prize, which is awarded annually to the most outstanding design group in the senior class. The winning projects are notable for their timeliness and variety, and in some cases, their applications. The winner of the Molstad Prize last April (2006) was entitled: “PlasmaFluor Microfluidic Blood Coagulation Analyzer.” Professor John Crocker was the faculty advisor on this project. The students designed a compact lab-on-a-chip to perform blood coagulation tests for trauma patients during ambulance rides, saving emergency room physicians valuable time. Other
earlier winning designs included a process to manufacture methyl-tert-butyl-ether (MTBE), an antiknock fuel additive to replace toxic tetra-ethyl lead, and new approaches to oxygen delivery for patients in hospitals. At press time, the 2006-07 winner had not yet been selected, but the range of projects illustrates their broad potential.

Students are working on “product designs that are much more closely tuned to what’s happening in the research that we do, which is shifting heavily to smaller length and time scales and toward the biochemical and biomedical,” says Seider. At the same time, much emphasis continues on more conventional process designs and he has arranged for his students to work with leading researchers on their designs.

Students are collaborating with premier biotechnologist Scott L. Diamond, the Arthur E. Humphrey Professor of Chemical and Biomolecular Engineering and Bioengineering, on the manufacture of ciprofloxacin, a principal antibacterial pharmaceutical. They are working with microfluidics expert John C. Crocker, Skirkanich Assistant Professor of Innovation, Chemical and Biomolecular Engineering, on the high-throughput screening of kinase inhibitors, promising anti-cancer pharmaceuticals. And electronic materials expert Talid R. Sinno, Associate Professor of Chemical and Biomolecular Engineering, is leading a senior design group on the chemical vapor deposition of epitaxial silicon in microelectronics processing.

The extraordinary academic opportunities Seider offers are a draw for the nation’s top students. Thomas A. Adams II was considering top-tier schools for his graduate study of semicontinuous distillation and contacted Seider to learn more about his research group. Adams recalls: “He took about an hour to talk to me over the phone. . . . Dr. Seider’s philosophy, personality, and expertise made the choice easy.”

Graduate student Anjana Meel is another beneficiary of Seider’s long and generous reach. She is working on an interdisciplinary project Seider launched with Wharton’s Risk Management and Decision Processes Center on the risk assessment of inherently safe chemical processes. She calls the professor “amazing,” as well as “the most organized person I have ever met.” (He is renowned among colleagues for his “legendary” preparation.)

And his quiet enthusiasm for his work is infectious: Seider has been witness to sea changes in engineering broadly and in process design
specifically. He has no intention of merely standing by or bringing his students to anything less than the vanguard of the field.

The new edition of Seider’s book will reflect all this, and more. In its 26 chapters and the accompanying CD-ROM, with multimedia instruction, Seider and his co-authors will offer students the essentials of process design and what it means as the field transforms itself from thinking big (how to develop large quantities of chemicals, how to design factories and refineries) to thinking small (creating limited quantities of chemicals, pharmaceuticals, and electronic materials, even down to the nanoscale).

The third edition will address the other seismic shift in Seider’s field: the growing movement from process design to product design. As such, the five-part text will focus anew on the three kinds of chemical products and the relationship of process to product.

For expertise in that area, Seider turned to one of his own former students, Soemantri Widagdo, now a manager in the display and graphics business laboratory at 3M. Along with authors Seider, Seader and Lewin, Widagdo will write the third edition of *Product and Process Design Principles*. Seider, on sabbatical to work on his book, is spending time at 3M writing with Widagdo and learning “first-hand” about 3M product design strategies. A teacher collaborating with one of his own students is a “very proud” moment, Seider says.

For his part, Widagdo believes that Seider’s open-minded approach to the new edition is exemplary. “It is good to know that the faculty at Penn are always at the front of changes, willing to change, willing to look at things differently,” he says.

Seider’s work has won recognition in the most esteemed quarters, from a NASA traineeship to a Medal of the City of Paris when he presented a plenary lecture at the Computers in Chemical Engineering conference there. He has been a director of AIChE and the Lady Davis Visiting Professor at the Technion-Isreal Institute of Technology. He has won the prestigious Warren K. Lewis Award and the Computers in Chemical Engineering Award, both from AIChE.

Perhaps the most meaningful accolade for Seider, however, was the special edition of *Industrial and Engineering Chemistry Research*, published in his honor in December 2006. In his preface, textbook co-author Daniel R. Lewin praised his colleague for “advancing the art and science of computing in chemical engineering.”

For Seider, there is still much to be done, and Penn Engineering is precisely where he wants to do it. With an engineer’s twist on the axiom “getting there is half the fun,” Seider takes great pleasure in the process. And, as he calls to mind his colleagues, his students, and his work, he knows the product too is a lovely one. He says simply, “It’s a good life.”
Showcasing cutting-edge research conducted throughout Penn Engineering was the focus of the Research Forum@Penn Engineering: Turning Science into Reality. The February 20th symposium highlighted advanced research at all levels: tutorial overviews on computational, biomolecular, and nanotechnology research presented by senior faculty, research talks by select graduate and post doctoral students, poster presentations and tours of various research laboratories.

The research forum also brought industry leaders and career representatives to the school, who explored the current research of this highly talented group of faculty and graduate students, and examined the potential for career opportunities and research collaborations. Corporate sponsors for the event included General Motors, Google, Honeywell, Lockheed Martin, and Merck.

Deputy Dean Susan Davidson, seen at right with students, praised the positive educational and networking activities held throughout the day. To view some of the day’s exciting highlights, please visit the web site at [http://www.seas.upenn.edu/researchforum](http://www.seas.upenn.edu/researchforum).

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The time commitment is minimal, but the rewards can be enormous. For more information and to register, visit [www.seas.upenn.edu/alumni/events/mentoring.html](http://www.seas.upenn.edu/alumni/events/mentoring.html).
avid Pakman has two professional loves—music and technology. Lucky for Pakman, neither demands a monogamous relationship in today’s marketplace.

The 1991 SEAS grad has spent over a decade cultivating his two passions into a successful and groundbreaking business, a journey that has taken him from behind a drum set at Penn to Silicon Valley to his latest stop as President and CEO of eMusic in New York. “I view myself as very lucky to have been born when I was born,” says Pakman, “because it just so happened that I graduated from college when the digital entertainment industry was emerging.”

A Computer Science Engineering major, Pakman began to cultivate his dual interests as a student at Penn. “I was also really into music and played in bands all through college,” he says. “So I kind of had an early passion for music and technology when I was there.”

With the concept of digital media still years away, Pakman didn’t necessarily see a lot of professional overlap between the two fields at the time. He began working for Apple as a student rep while at Penn, and after graduation transitioned that experience into a job at Apple in Silicon Valley. “I was pretty convinced that I was going into technology,” says Pakman. “I was a computer science engineer so that’s where I was headed.”

It didn’t take too long, however, for music to re-enter the picture. After three years in California with Apple, Pakman relocated and
Pakman left Apple in 1997 to join N2K, one of the first digital music companies, and would later co-found the innovative digital music locker company Myplay. He remained in the digital entertainment business before taking time off to have a second child with his wife Meredith and invest in digital media companies. In 2003, he joined Dimensional Associates, a media-oriented private equity fund, and the group purchased eMusic shortly thereafter.

With a library of over two million tracks from over 13,000 independent record labels, eMusic is the world’s largest independent music retailer and the second largest digital music retailer overall behind iTunes.

Pakman believes the future of the music industry lies in something eMusic already offers—interoperability. Unlike iTunes or other music services such as Yahoo! music, any download from the www.emusic.com website comes in the MP3 format and can play on any device, regardless of its maker. “Until the rest of the market follows,” says Pakman, “the digital market will never grow as fast as it otherwise could, and I think we all agree the digital market is the future of the music industry.”

Anticipating the future of the digital marketplace is a skill that stretches back to Pakman’s days at Penn. Under the tutelage of his professor and mentor David Farber, Pakman’s senior project—a digital video capture card that digitized video and transmitted it over broadband ISDN networks—was well ahead of its time. “Now that sort of device exists in every computer today,” says Pakman, “but it didn’t exist back then. So we were very early in understanding the importance in transmitting digital audio and video over the net. And I got that, really, from Penn.”

The Westchester County, New York resident does all that he can to give back to his alma mater. He has guest lectured at Penn Engineering, as well as the Wharton School, attends seminars and is working on a project or two with Dean Eduardo Glandt. “I’m involved as much as I can be,” Pakman says. “It’s a labor of love.”

One might say the same thing about his career.
What do India, Ecuador, Cameroon and New Orleans have in common? All have been visited by volunteer teams from CommuniTech, a Penn Engineering service organization that refurbishes donated computers and distributes them to schools and non-profit agencies.

Though CommuniTech is based in SEAS, it is open to “anyone in the University who wants to bridge the digital divide,” says Brian Quimby (E’08). Quimby joined CommuniTech in his freshman year, was elected president in his sophomore and junior years, and has served in a leadership role for the last two major projects: in Cameroon, for two and a half weeks over winter break, and in New Orleans for six days during spring break.

The Cameroon visit was funded in part by Google, Pro-Literacy, and the Cameroon-based Meta Quality of Life Improvement Foundation. “We were in a rush and put 125 computers in a shipping crate to lower costs and sent it on ahead,” he recalls. “From our experience, we expected that about 20% of them wouldn’t work. So we got 100 of the 125 working, with some of the remainder kept for parts and repairs.”

In Mbengwi, Cameroon, the students (see sidebar for names) joined Dr. Godlove Fonjweng (GSAS ’97), Assistant Dean of Advising in the College, and Jenny Jinor (Graduate Student, SP2), who assists non-profit outreach agencies in Cameroon. Dr. Fonjweng is originally from Cameroon, and was instrumental in establishing this project. The project was co-led by Steve Hershman (EGr/C ’08).

With local help, the team installed computers in labs at educational institutions ranging from a nursery school to a university, and at non-governmental organizations such as the Akwi Memorial Foundation, which will now provide computer-literacy training. Fonjweng is working to set up a consortium to ensure sustainability among the labs. “Sustainability is one of our goals,” notes Quimby. “There are not a lot of computer-repair people in Cameroon.”

The donated computers were mostly Pentium 2 and Pentium 3 machines, which in Cameroon can cost nearly $320—more than many schools and non-profit agencies can afford.

WALKIN’ IN NEW ORLEANS

The spring trip took a second team headed by Quimby to twenty businesses in New Orleans, ranging from a community bookstore to a hair salon to child-care centers. “Idea Village, a New Orleans non-profit that drives social change through entrepreneurship, brought us on board to aid entrepreneurship through technology development and training,” he explains. Google helped sponsor the group.

“In Cameroon, we focused on community technology centers because we wanted to give ordinary people access to using and learning about computers. In New Orleans, we focused on small-business development, after Hurricane Katrina—’How can technology help your business get back to the place it was before or even a little further?’ It could be something like a website or e-commerce, or speeding up a checkout or inventory system.”

The New Orleans project was the brainchild of Joseph Sun, Director of Academic Affairs, who also oversees the school’s community technology/outreach initiatives. After reading about Idea Village’s work and Penn alumna Miji Park’s (C ’06) involvement, Sun spoke with leaders in CommuniTech and Technology Entrepreneurship Club (TEC) about their possible interest in a combined project. With everyone’s enthusiastic commitment, Sun spoke with Sonya Gwak, SEAS’ Student Affairs and Advising Associate Director, who agreed to spearhead its implementation.

The CommuniTech and TEC teams worked closely together, fielding a group of 10 students. At most businesses, CommuniTech donated a computer and basic training, while TEC consulted on business technology. The teams also met for group dinners to plan the next day’s activities. The field work was overseen by Gwak and Megan Doherty, Service Initiatives Program Coordinator for SEAS.

TEC put together a guide to help entrepreneurs understand how to establish a web presence and create a website. CommuniTech installed 17 Pentium 4 computers and has shipped additional machines, thanks in part to donations from Computing and Educational Technology Services (CETS) at Penn Engineering and Wharton Computing.

“Our goal was to help each business use technology to recover, improve, and expand,” Quimby says. “At the Community Book Center, we installed a point-of-sale system and linked it with a database of all the books in inventory. At Voodoo Authentica, a small
shop in the French Quarter, we set up a computer-fax system for taking orders online. Some of the other businesses just needed basic computer training, or help with specific programs."

The team also installed computers loaded with educational games at child-care centers. One center had had five computers pre-Katrina, each stuffed with educational software. Quimby hopes that the single computer the team installed will act as a seed for rejuvenation.

**A RETURN FROM DEVASTATION**

Quimby saw New Orleans as “definitely a city in transition. One street looks completely normal, and the next has boarded up shops and houses. It’s one thing to see pictures on TV, but entirely another to walk through the city streets.”

In February, *The Philadelphia Inquirer* noted that “hundreds of [New Orleans’] best and brightest have made the wrenching decision to leave at a time when the population is supposed to be rebounding.” The emigrants cite a high crime rate, high rents, and a lack of leadership, among other problems. “While many poorer residents have moved back, the ‘brain drain’ of professionals that the city was experiencing before the storm appears to have accelerated,” the *Inquirer* article added.

Yet Quimby found that “most of the people we met were really hopeful for the future. The fact that the small business owners we assisted had returned to New Orleans was a testament itself to their dedication to bringing the city back. By the end of the trip, I absolutely saw why they loved their city so much.”

Future CommuniTech projects this year, says Quimby, will include several local installations and Web/software development efforts, and a possible summer installation stint in India and possibly Pakistan. There’s also a “slim chance” of a project on the Caribbean island of St. Lucia the following summer.

Both Cameroon and New Orleans provided the teams with an immediate and gratifying response, often expressed in invitations to dine: “In Cameroon, we had six different offers of whose house we could go to for dinner—‘Come over, we’ll feed you.’ And in New Orleans we had to turn down some dinner invitations because we had already accepted others.”

In other words, the volunteer work of organizations like CommuniTech and TEC can feed both the body and the spirit. 🍽️
The field of robotics has come into its own in the almost 30 years since Dr. Ruzena Bajcsy founded the General Robotics, Automation, Sensing and Perception (GRASP) lab at Penn in 1979. A new SEAS master’s program is leveraging the expertise of faculty working in the lab, and positioning the next generation of robotics experts for maximum effect.

According to the program’s director, Dr. George Pappas, “The big challenge in robotics is putting very heterogeneous things together. You’re putting sensors together with a mechanical system, with software, with hardware, and now with computer networks… and it’s very hard to have people really think about the complete, integrated picture.” To meet this challenge, Dr. Pappas and his colleagues in SEAS created the Robotics master’s program, which integrates coursework in the departments of Mechanical Engineering and Applied Mechanics (MEAM), Electrical and Systems Engineering (ESE), and Computer and Information Science (CIS), giving students hands-on experience with that complete, integrated picture.

“It’s difficult to get the right mix of courses through any individual department,” as Dr. Pappas puts it, “and therefore we decided to actually provide the right balance of courses across the [three] departments.” The core of the curriculum integrates coursework in Robotics and Automation in MEAM, Control Systems Design in ESE, and Machine Perception and Artificial Intelligence in CIS. From there, students are able to choose electives and an optional thesis project in order to more fully explore aspects of building, instrumenting, and programming robots.

This new master’s degree is unique among a handful of programs worldwide in robotics, not only for its integrated curriculum, but also because it is administered from a world-class robotics lab. Students have the opportunity to work side by side with 12 faculty
members and some 70 post-docs and fellow students, on such cutting edge research as robotic locomotion, the development of smaller and smaller robots which can work in groups for surveillance and security of buildings, the deployment of robots in highly unstructured environments, and the development of a robotic sense of touch to further refine the field of minimally invasive surgery.

Graduates of the program will be poised to apply the integrated knowledge they acquire through the robotics program. Some will continue their research in pursuit of PhD degrees, while others will extend their reach beyond the GRASP lab, working in commercial, medical, or aerospace industries, the military, or national security.

Another new master's program, this one in Integrated Product Design, applies its leverage not only across three disciplines, but also among three schools at Penn. Dr. Mark Yim, the program's director, knew that he and his colleagues; Vijay Kumar, Chair of Mechanical Engineering and Applied Mechanics department at SEAS; William Braham, Associate Chair of the School of Design's Architecture department; and Karl Ulrich, Chair of Wharton's department of Operations and Information Management (OPIM); were on to something special, even before the program received official approval. Word of mouth and student interest generated enough enthusiasm for the crosslisted MEAM/OPIM Product Design course to force the addition of a second section, which, in its turn, became oversubscribed. Outreach efforts, and a contagious sense of excitement engaged the interest of successful design experts currently in practice, and an innovative program was in the works.

Successful product design stands at the crossroads of engineering, business, and aesthetics, and is grounded in an understanding of the market for products, their manufacture, use, and appeal to the customer. While students starting the master's program in Integrated Product Design may have a background in either engineering, business, or design, the power of this program is that its cross-disciplinary curriculum provides a professional understanding in all three elements of design development, allowing experts in one sub-field to communicate effectively with colleagues in another. Dr. Yim states, "In the joining of design arts, and business, and engineering, there's a center, which is really interesting… Each one supports the other in a way that you can't have if they're alone, which makes things pretty exciting."

Coursework for the program is designed to ensure a firm footing in each area of study, while allowing students to specialize in at least one area. The curriculum's requirements include the popular Product Design class, as well as a new MEAM course in Visual Thinking, which focuses on creativity and the communication of design ideas from an engineer's point of view. Students can then choose from courses covering manufacturing, marketing, finance, project management, design of mechatronic devices, such as cell phones and MP3 players, and furniture design. Students then work on a master's research studio project, either individually, or as part of a team. Dr. Yim hopes “… to have a diverse set of students in the program, because they're going to be interacting a lot. Ideally, you form teams, where you've got the business person, and the art person, and the engineer, … [who work] on a thesis project together, and they get all that experience together.”

From there, newly minted integrated product designers have a range of options ahead of them. They will be well positioned to start their own design firms, serve as big picture people in smaller companies, or act as design polyglots, keeping the lines of communication open among engineers, business people, and designers in larger companies. SEAS will welcome the first groups of students to the master's programs in Robotics and Integrated Product Design in the middle of 2007. Once here, the students will be in the best possible position to leverage integrated knowledge, and to maximize the advantage of their efforts.

“...to have a diverse set of students in the program, because they're going to be interacting a lot. Ideally, you form teams, where you've got the business person, and the art person, and the engineer, … [who work] on a thesis project together, and they get all that experience together.”
Who is this nattily dressed woman, and what is she doing atop a 1910 rail car? She’s not a hobo surely, a train robber or movie heroine?

As a woman, Mary Engle Pennington was something almost as rare in her day—an engineer who rode the rails for thousands of miles researching the proper temperatures for transporting and storing food to prevent spoilage. In the end, Pennington—sometimes ruefully referred to as the Ice Lady—set the U.S. Department of Agriculture regulations for commercial refrigeration.

No one person did more than Pennington to advance the safe handling of food, a fact recognized by her posthumous induction into the Hall of Fame of the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE). Former SEAS Dean Joseph Bordogna accepted the award in her name at the ASHRAE meeting held in Dallas this January. Over the course of the 20th century, refrigeration, this onetime luxury, became an indispensable feature of the American home, and is ranked 10th in the National Science Foundation’s list of greatest engineering achievements.

Mary Engle Pennington was born in 1872 in Nashville, Tennessee, but moved to Philadelphia to be near her mother’s Quaker family. In her early teens, she picked up a book on medical chemistry from a local library and became entranced by the world of things she couldn’t see. If, for example, the world’s invisible oxygen disappeared, she realized, all living things would die.

She entered the Towne Scientific School in 1890 and completed a major in chemistry with minors in zoology and botany, earning a “certificate of proficiency” (see inset) in 1892, then obtaining a PhD in chemistry in 1895. After post-doctoral research at Penn and Yale, she was named director of the Clinical Laboratory at the Women’s Medical College of Pennsylvania in 1898. Later, at the Philadelphia Bureau of Health, she was in charge of ensuring the safety of milk and dairy products sold in the city.

Bordogna delights in her pragmatic approach to developing regulations: “She conducted public policy that was very wise. When regulations were contemplated on how to prepare ice cream and keep it safe to eat, she first went into the streets, got to know the vendors and showed them slides of the kinds of bacteria that were in their pots. She talked them into boiling their equipment.” When the regulations were later introduced, they met little opposition.

In 1905, Pennington joined the U.S. Department of Agriculture as a bacteriological chemist. Later, she was chosen chief of its Food Research Lab, established following the 1906 Pure Food and Drug Act. There, she promulgated her wide-ranging regulations on food handling, based on solid, empirical research. In 1922, after a short stint with a commercial maker of refrigeration insulation, she started her own consulting firm, which she ran until 1952, the year before her death.

Along the way, she was awarded the Notable Service Medal from President Herbert Hoover in 1919 and the Francis P. Garvan medal—the highest award to women—from the American Chemical Society in 1940. “She was a real engineer,” says Bordogna, “in the sense that she put new knowledge to beneficent use in everything she did. Great engineers get their ideas into practice when they have a talent for influencing people about what they’re trying to do. She’s an example of that. I don’t think you can go through a career like hers unless you can interact well with people.”

Today, we benefit in big ways and little from Pennington’s attention to detail. “I get a kick out of knowing that she also invented the precursor to the clever egg cartons we buy our eggs in today,” adds Bordogna.

Why did Mary Engle Pennington, who had completed all the work necessary for a bachelor of science degree, receive only a “certificate of proficiency,” even though she was then able to go on to a PhD? In 1892, the Towne Scientific School (now part of SEAS) was a department of the College, which did not award bachelor degrees to women. However, all PhD degrees were administered by the Department of Philosophy (now the Graduate School of Arts and Sciences), which had been open to women from its inception in 1882.
New Faculty

Katherine Kuchenbecker, Skirkanich Assistant Professor of Innovation in Mechanical Engineering and Applied Mechanics

PhD in Mechanical Engineering from Stanford University

Dr. Kuchenbecker will join Penn Engineering in July 2007 from a post doc at Johns Hopkins Research Center on Computer Integrated Surgery. Her research is in haptics and telerobotics, the science that deals with touch and the technology that uses robotic devices to create the perception of touch. Dr. Kuchenbecker’s work is unique in its quantitative focus on human experience and dynamics-based approach to improving the feel of haptic rendering. This work will allow for collaborations within the School as well as with the School of Medicine.

Ani Nenkova, Aravind K. Joshi Term Assistant Professor of Computer and Information Science

PhD in Computer Science from Columbia University

Dr. Nenkova will join Penn Engineering in July 2007 after completing a post doc at Stanford University. Her research is in the area of natural language processing with applications to Web search and information presentation. Her work involves the development of algorithms for text summarization as well as evaluation metrics. Dr. Nenkova’s background in logic, statistics and computer science has aided her work in computational models for speech intonation.

Awards and Honors

Sanjeev Khanna, Professor of Computer and Information Science, has been awarded a prestigious 2007 Guggenheim Fellowship for his work in theoretical computer science. The John Simon Guggenheim Memorial Foundation recognizes distinguished scholarly achievement and exceptional promise for future accomplishment by granting aid to scholars, artists and writers pursuing research in one of 78 different fields, from the natural sciences to the creative arts.

Gershon Buchsbaum, Professor of Bioengineering, has been appointed Interim Chair, effective January 1, 2007. Dr. Buchsbaum, a distinguished scholar and educator, previously served as Chairman from 1996-2000. “We are appreciative of Gershon’s leadership commitment and dedication to the department,” stated Dean Eduardo Glandt. Dr. Buchsbaum earned his PhD in Engineering Science in 1978 from Tel-Aviv University, and joined Penn the following year. His research interests are in image coding in the visual system.

Pedro Ponte Castañeda, Professor of Mechanical Engineering and Applied Mechanics, was awarded the 2007 George H. Heilmeier Faculty Award for Excellence in Research for his remarkable contributions to predicting the behavior of nonlinear, heterogeneous materials. Dr. Ponte Castañeda’s seminar on February 20, 2007, “Recent Developments in Nonlinear Homogenization and Applications,” was the capstone event of the Research Forum@Penn Engineering: Turning Science into Reality (see page 13). Named in honor of alumnus and SEAS Overseer George H. Heilmeier, this prestigious award recognizes Dr. Heilmeier’s extraordinary research career, his leadership in technical innovation and public service.

Roch Guérin, Professor of Electrical and Systems Engineering, has been named a Fellow of the Association for Computing Machinery (ACM) for his contributions to the resource management of data networks. Dr. Guerin is among 41 ACM members recognized as 2006 Fellows for their work in the practical and theoretical aspects of computing and information technology.

Milo Martin, Assistant Professor of Computer and Information Science, received an NSF CAREER Award for his work “Semantics and Hardware Implementation of Transactional Memory.”

Ritesh Agarwal, Assistant Professor of Materials Science and Engineering, received an NSF CAREER Award for his work “Semiconductor Nanowire Quantum Heterostructures: Growth, Characterization, and Quantum Confined Properties and Photonics at the Nanoscale.”

Nader Engheta, the H. Nedwill Ramsey Professor of Electrical and Systems Engineering and Bioengineering, has been named by Scientific American magazine as one of the 2006 Scientific American 50, the magazine’s annual list of leaders in science and technology. Dr. Engheta was cited for his research contributions in plasmonics, an emerging field of scientific inquiry regarding the optical and electrical properties of solid matter, such as metals, at nanometer scales. His development of plasmonic versions of conventional electronic components, including resistors, capacitors and inductors could allow engineers to build circuits at nanometer scales using light instead of electricity.

Vukan Vuchic, Professor of Electrical and Systems Engineering, has been elected to the Russian Academy of Architecture and Construction Sciences, Section of Urban Planning, as a Foreign Member.

Jonathan Smith, Professor of Computer and Information Science, has been named as a member of the President’s Council of Advisors on Science and Technology (PCAST) Advisory Group on Networking and Information Technology.

Warren D. Seider, Professor of Chemical and Biomolecular Engineering, has been honored with a Festschrift published by the journal Industrial & Engineering Chemistry Research, for his role as “pathfinder” for the computer-aided process community for the last 40 years (see story on page 8).
John H. Davis, SEAS Overseer, died on November 19, 2006 at his home in Rumson, NJ at the age of 68. John was born in 1938 in Paducah, Kentucky. After earning a bachelor of science in electrical engineering from the Georgia Institute of Technology, he began a long and successful career with Bell Laboratories in Murray Hill, NJ in 1962. He earned a master’s degree from the Massachusetts Institute of Technology and a PhD from the University of Pennsylvania, both in electrical engineering.

John enjoyed a 35-year career with Bell Labs and AT&T, working his way up the ranks to become CTO of AT&T Communications Services. John conceived the architecture and managed the initial development of Bell’s digital switching system, the backbone of today’s public telephone network. In the 1980s, he led the installation and commercialization of the first cellular systems in the United States. John was elected a Fellow of IEEE in recognition of his leadership in digital switching and a Fellow of the Radio Club of America for his pioneering work in wireless communications.

John took early retirement in 1997, and in 2001, he co-founded and became a Principal of Technology Advisors Group, working with investors, boards and management teams of high-tech companies. A news release at that time referred to him as “one of the visionary technologists of the telecommunications revolution.” He was CTO of Allied Riser Communications, a broadband IP-based communications provider, and served as a Principal at GeoPartners Research, consulting to senior executives of Fortune 50 companies. He was also a member of the board of directors of several companies, including Novatel Wireless, Inc. John was also active in his community as a volunteer fireman and EMT for over 35 years.

John was an enthusiastic and generous member of the Board of Overseers since 2003, and recently made a significant financial contribution to build a laboratory in the Department of Electrical and Systems Engineering, a facility that will be known as the John H. Davis Laboratory.

John is survived by his wife Beverly, his daughter Christina, his son Robert, and his grandson Ryan.

Bernard Steinberg, Professor Emeritus in the Department of Electrical and Systems Engineering, died on February 21, 2007. He was 82.

Dr. Steinberg was born in Brooklyn, New York on October 19, 1924, and earned both bachelor and master degrees in electrical engineering from the Massachusetts Institute of Technology in 1949. Afterward, he worked in research and development at Philco in Philadelphia before co-founding General Atronics, a communications technology company.

In 1971, Dr. Steinberg earned a PhD in electrical engineering from the University of Pennsylvania, and joined the faculty as an assistant professor in The Moore School of Electrical Engineering. He was appointed as Director of the Valley Forge Research Center, housed near Valley Forge Park. Over the next 20 years, with military and NSF research support, he and his co-workers and students developed and demonstrated the basic principles of the radio camera—multiple radar antennas together with adaptive signal-processing techniques that provide two-dimensional radar images with angular resolution 100 times finer than previously obtainable.

Dr. Steinberg wrote three books on high-resolution radar imaging, and holds several patents in radar and electronics. He was a Fellow of the Institute of Electrical and Electronics Engineers (IEEE) and received an IEEE medal for his contributions to radar. As Professor Emeritus, Dr. Steinberg studied and lectured on the history of the ancient Israelites.

Professor Steinberg’s first wife, Jacqueline R. Steinberg, died in 2003. He is survived by his wife of two years, Barbara Block; sons Harris, Geoffrey and Lowell; a daughter, Emily; and seven grandchildren.

In Memoriam

Saul Gorn Lecture Series was established in honor of the late Professor Saul Gorn who played a key role in the establishment of the Department of Computer and Information Science. This year’s distinguished speaker was Hector Garcia-Molina, the Leonard Bosak and Sandra Lerner Professor of Computer Science and Electrical Engineering at Stanford University, who presented a lecture on April 9, 2007 entitled, “Generic Entity Resolution.”
Join the many alumni and friends who have created a legacy for Penn Engineering by including the School as a beneficiary in their estate plans. Bequests and beneficiary designations, both large and small, have been crucial to our success since our founding in 1852. With exciting transformations taking place and ambitious plans for the future, Penn Engineering needs your support now more than ever.

Honor the Past...

Join the many alumni and friends who have created a legacy for Penn Engineering by including the School as a beneficiary in their estate plans. Bequests and beneficiary designations, both large and small, have been crucial to our success since our founding in 1852. With exciting transformations taking place and ambitious plans for the future, Penn Engineering needs your support now more than ever.

Become Part of a Promising Future

“I made plans in my estate for Penn Engineering because engineers are critical to our society. Our future rests in making advances in technology which can be achieved by supporting engineering students and research.”

Richard A. Mulford, ME’52, GME’57

For more information on gift planning to Penn Engineering, please contact Jennifer Sabatini at 215-898-6564, jsab@seas.upenn.edu, or visit www.alumni.upenn.edu/giftplanning.
Joseph S. Sun is Penn Engineering’s founding Director of Academic Affairs. Joining the School in 1997, Joe worked closely with the deans to bring three separate administrative operations together under one roof: undergraduate education, graduate education and research, and student records and services. This effort produced what we now call the Office of Academic Programs, better known by its acronym, APO. Previously, Joe served as Wharton Undergraduate Division’s Director of Academic Affairs.

**What is your role as Director of Academic Affairs?** As Director, I work closely with the Dean, Associate Deans, and other senior members of the administration to carry out the School’s educational mission. My responsibilities include overseeing and managing the staff and work that is undertaken in APO. In addition, I am directly responsible for international programs and advising, community technology/outreach/K-12 initiatives, professional education, master’s recruiting, and institutional research, assessment, and accreditation.

**Can you describe your typical day?** Actually, each day seems different throughout the entire year! I frequently meet with APO staff, other colleagues in SEAS and Penn, and faculty members to deal with problems or to discuss academic, student, or programmatic issues. Most importantly, I set aside one day a week for advising appointments with undergraduates.

**How have APO and your role changed over time?** Ten years ago, my work focused on organizational planning and development, strengthening procedures and practices, implementing a robust administrative IT environment, and managing personnel issues. We then moved into a period of program development, working with the deans and departmental faculty on a variety of new initiatives. Some of these new initiatives span the departments, so APO has become the central administrative home for them. The newest initiatives include the Engineering Information and Communication Program launched in spring 2007, and the Engineering Honors Program scheduled for fall 2008.

**Can you share a story about the students you see each day?** Last week, a graduating senior informed me that she had been accepted to several medical schools and was offered a position as an inner city high school teacher with Teach for America. She had also applied to join the Peace Corps. I’ve known this student since her first day at Penn, having had the good fortune to serve as her curriculum deferred advisor. During her four years, she served in countless leadership roles on campus, in SEAS, and in the college house system, all while maintaining a stellar academic record. Last year, she became the founding student coordinator of a summer global service program. She has decided to serve with Teach for America after graduation, deferring medical school until after her teaching stint. While a stand-out in her own right, this student is representative of so many other fabulous students we have in SEAS. It’s really a great feeling of satisfaction to know that our work is making a difference in our students’ education and future direction.
The University of Pennsylvania values diversity and seeks talented students, faculty and staff from diverse backgrounds. The University of Pennsylvania does not discriminate on the basis of race, sex, sexual orientation, gender identity, religion, color, national or ethnic origin, age, disability, or status as a Vietnam Era Veteran or disabled veteran in the administration of educational policies, programs or activities; admissions policies; scholarship and loan awards; athletic, or other University administered programs or employment. Questions or complaints regarding this policy should be directed to: Executive Director, Office of Affirmative Action and Equal Opportunity Programs, Sansom Place East, 3600 Chestnut Street, Suite 228, Philadelphia, PA 19104-6106 or by phone at (215) 898-6993 (Voice) or (215) 898-7803 (TDD).