Engineering

PENN STATE

The Magazine of the Penn State College of Engineering

Fall 2001


Bogue

Barbara Bogue, director, Women in Engineering Program, was awarded this year's Undergraduate Admissions' Outstanding Recruitment and Retention Award by the University. The award recognizes Bogue's development and implementation of the Women in Engineering Program Orientation (WEPO). Undergraduate Admissions officials said WEPO has become an invaluable tool in recruiting and retaining young women in the engineering field.


Bose

Nirmal Bose is the latest recipient of the Charles H. Fetter University Endowed Fellowship in Electrical Engineering. His appointment as the Fetter Fellow lasts through August 2004.

Eric Cross, professor emeritus of electrical engineering, was named a distinguished life member of the American Ceramics Society for his achievements, contributions, and service to the ceramics profession.

Enrique del Castillo, associate professor of industrial engineering, received the Institute of Industrial Engineers' Transactions award for best paper in 2000. His winning paper is titled "Long run and transient analysis of a double EWMA feedback controller."

Sam Zamrik, professor emeritus of engineering mechanics, was elected to the Board of Governors of the American Society of Mechanical Engineers during this year's annual meeting.

Louis F. Geschwindner Jr., professor of architectural engineering, was named Tau Beta Pi's 2001 National Outstanding Advisor. The award recognizes faculty who make important contributions to students and collegiate chapters. Geschwindner is the longtime chief advisor to the Pennsylvania Beta chapter of Tau Beta Pi at Penn State.

Eric Mockensturm, assistant professor of mechanical engineering, was awarded a NASA-American Society of Electrical Engineers Faculty Fellowship, which allowed him to spend this summer working with NASA researchers. Mockensturm chose to work at the Langley Research Center's structural dynamics branch in Hampton, VA.


Srebric

Jelena Srebric, assistant professor of architectural engineering, received the 2001 Homer Addams Award from the American Society of Heating, Refrigeration, and Air-Conditioning Engineers.

A team of Penn State engineers won a best paper award from the Institute of Electrical and Electronics Engineers Ultrasonics, Ferroelectrics, and Frequency Control Society for 2000.


Shung

The team was comprised of K. Kirk Shung, distinguished professor of bioengineering; Tim Ritter, former assistant professor of bioengineering; X. Geng of Blatek in State College; Pat Lopath, a former master's student and research assistant in bioengineering; S.E. Park, former research associate at the Materials Research Laboratory; and Tim Shrout, senior scientist at the Materials Research Laboratory and professor of materials.

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4 Information AND COMPUTATIONAL SCIENCES

A special look at how the College of Engineering is impacting teaching and research in computer science and information technology.

Departments

On the cover

Special goggles allow researchers to use the FakeSpace RAVE system, a set of eight-foot by eight-foot monitors that create stereoscopic images. The goggles turn the images into 3-D illusions.

From the Editor

As you page through this issue of *Engineering Penn State*, you'll notice some changes to the way it looks. Over the past several months, our staff has been working to redesign the magazine to offer readers something fresh and new, while remaining provocative and informative.

These changes include:

-A new "Awards & Honors" section highlighting the many achievements of Engineering faculty;

-A "special report" section consisting of the cover story and related stories. In the coming issues, you'll see themed special reports focusing on the overall research and teaching efforts in specific areas of the College, such as information science, nanotechnology, or environmental engineering. Although not comprehensive, we believe that these special reports will give you a better sense of the breadth and depth of the daily efforts here at Penn State;

-An "Engineering Notebook" section offering a variety of short, easy-to-read news stories ranging from student activities to research to faculty achievements;

-And, of course, full color to all pages of the magazine.

Old favorites are still here, though. Class notes, the alumni section, and student section are all back, but each with a new look.

Engineering Penn State will continue evolving to better serve you, our reader. We'd love to hear your opinion on the magazine's new look. Comments can be sent to the address on the back of this magazine, or by e-mail at news@engr.psu.edu.

Sincerely,

Curtis Chan, Editor

Charting the digital frontier

Penn State engineers are helping to define tomorrow's innovations

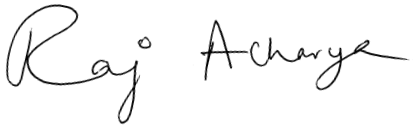
Foreward

Greetings from Happy Valley! As we enter the 21st century, we are seeing information and computational sciences transform every aspect of our lives, including the way we live, work, and entertain ourselves. Indeed, the information and computational sciences are playing a critical role not only in our economic growth, but the security of the American homeland.

Research and teaching in this important area permeates all of the College of Engineering, including electrical engineering, engineering science, aerospace engineering, and of course, computer science and engineering. Faculty members from numerous disciplines are combining their knowledge and expertise to solve problems and create innovations. Engineers are applying their talents to everything from computer vision for flight safety to power consumption research for mobile computing, and computer analysis on the human genome.

The Department of Computer Science and Engineering is serving as the core of these research and teaching activities. As new department head, I plan on working to enhance Penn State's reputation as one of the premier information and computational institutions in the country. We will continue collaborating closely with colleagues within and outside the College to usher in the amazing innovations we have yet to dream of.

Powerful new tools such as parallel computers and virtual reality are helping researchers solve a variety of problems, including understanding air flow's impact on the fuselage of an Apache helicopter.



—Raj Acharya, *head, computer science and engineering*

"The work on these innovations isn't just restricted to one department but is spread across many departments and disciplines in the College of Engineering."

The unprecedented period of economic growth over the past few years was fueled in large part by the high technology sector. Although the New Economy has cooled some compared to a year ago, the digital revolution continues as innovations emerge on the scene.

Crafting these innovations, however, often takes years of research and development.

"We have numerous cutting-edge information technology projects coming down the pipe," says Raj Acharya, head of the computer science and engineering department. "The work on these innovations isn't just restricted to one department but is spread across many departments and disciplines in the College of Engineering."

Acharya says much of the major research effort is focused in five areas: wireless computing, power consumption, virtual reality, parallel computing, and bioinformatics.

Look Ma, no wires

Taking the country by storm in recent years, wireless technology has manifested itself in cellular telephones, pagers, wireless modems, and personal digital assistants (PDAs).

Experts say, however, that the capabilities available to users now represent merely the tip of the wireless iceberg. Some of the newest devices are even more "connected" than their predecessors. The newest cell phones, for example, offer users the ability to surf the Internet, while the latest wireless PDAs tout capabilities including real-time stock quotes, sports scores, and Internet shopping.

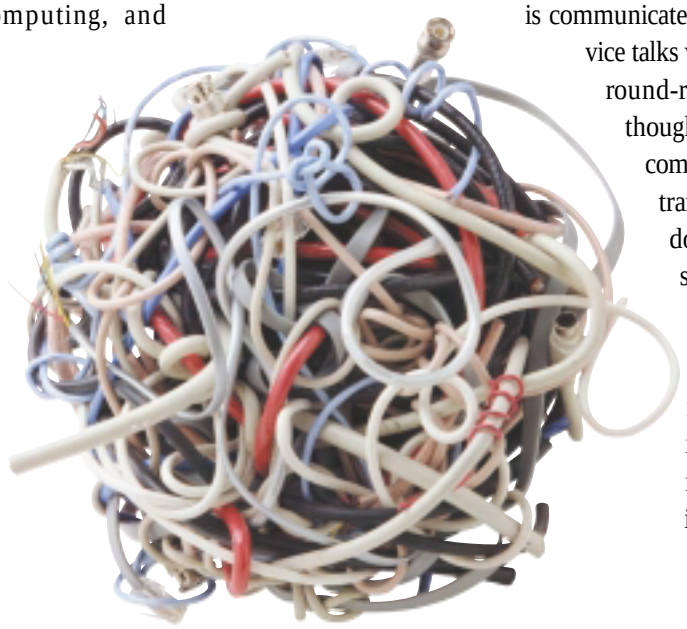
As these devices proliferate and demand for these services grow, wireless access to the Internet may slow or stop.

"The Internet has become more multiservice—services that the Internet was not designed to support," observes George Kesidis, associate professor of electrical engineering and computer science and engineering.

Kesidis is one of many researchers in the College focusing on what he describes as "Internet traffic engineering."

Kesidis's work centers on Bluetooth, a short-range, wireless data communications technology. Bluetooth's advantages, he says, lie in the fact that it is inexpensive, transmits on a public band, and doesn't need to be in direct sight of the transmitter or receiver.

The problem, Kesidis says, is the manner in which data is communicated. Typically, a "master" device talks with "slave" devices using a round-robin polling method. Although this works fine for normal communications, he says bursty traffic such as Internet access doesn't lend itself well to this scheduling scheme.



Kesidis's team is developing an alternative to the round-robin method called flexible polling. The proposed method's main advantage is its ability to handle asyn-

As computing becomes more mobile, a new generation of computer scientists and engineers will be needed to develop tomorrow's breakthroughs.

chronous data traffic with "elastic" bandwidth needs by polling heavily trafficked devices more often. Tests performed by the team found that the new method had a higher throughput percentage than the conventional round-robin scheme. They also found savings in power consumption as devices with less traffic were polled less frequently.

Mohsen Kavehrad, professor of electrical engineering and holder of the William L. Weiss Chair in Information and Communications Technology, is also focused on wireless traffic, but of a different nature than Kesidis's Bluetooth work.

He and research associate Svetla Jivkova have been working on creating a wireless local area network that uses infrared light for transmissions. It is low powered but also highly reliable.

The task, however, is easier said than done.

Kavehrad explains there are two ways to transmit wirelessly. "Line-of-sight or point-to-point infrared signal transmission, which is used, for example, in television remote controls, is highly efficient at low power levels but suffers from the need for alignment between the transmitter and receiver. If someone 'shadows' or blocks the remote control beam while you're trying to change the channel, the signal can't get through.

"On the other hand, non-line-of-sight transmissions, which use a broad diffuse beam, suffer less from shadowing but usually forfeit the power efficiency, broadband, and low error rate values that infrared transmissions can offer."

Now, however, Kavehrad and his colleagues at Penn State's Center for Information and Communications Technology Research have developed a new link design that uses a multi-beam transmitter with a narrow field-of-view receiver. The system has a bit-error rate of only one error per billion bits and uses milliwatt transmitted power levels. Kavehrad says, "This error rate is unmatched considering the offered transmission capacity."

To use the Penn State signaling scheme, for example, to form a local area network for a group of computers in a room, each machine is equipped with a low power infrared source and a holographic beam splitter. The original low power beam is separated into several narrow beams, which strike the ceiling and walls at points that form an invisible grid throughout the entire volume of the room. Because the beams are also reflected at each of the strike points, they can be used to send or receive information.

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New course to focus on handheld computing

With help from a grant by Microsoft, **Anand Sivasubramaniam**, assistant professor of computer science and engineering, is creating a new course focused solely on handheld computing.

"A lot of issues we cover in normal computing are different with handheld devices," Sivasubramaniam explains. "You have limited battery power, memory, and no hard drive. They're also not as fast as your desktop computer, and they have no bandwidth."

Until now, no course offered any training in this area. He says the class will look at the issues and problems native to building and designing handheld devices, such as personal digital assistants and cellular telephones. Topics discussed will range from system architecture to operating systems to wireless communications.

Students taking the hands-on course will be using a brand new laboratory equipped with 15 to 20 handheld devices. Sivasubramaniam hopes to offer the course starting in fall 2002.

"We're hoping this course will give students what they need," he says.

The CEDE's facilities give students all the tools they need to complete their tasks, including work benches, hand tools, and electrical measurement and test equipment.

New center combines engineering expertise with business smarts

This summer, Hammond Building's third floor was transformed into the new Center for Engineering Design and Entrepreneurship (CEDE).

The center provides students with the capability to take a product from concept to prototype. Designed to fuse engineering with business, the CEDE's facilities include two computer design laboratories, three flexible classrooms, and three engineering design workshops/laboratories.

"An important aspect of the center's mission is to provide an environment in which students are able to gain a better understanding of the role of entrepreneurship and business considerations in the engineering process," says **Bruce Knoll**, the center's coordinator. "Students using the labs will have the opportunity to experience the types of problems that actually occur in industry. They will also acquire hands-on experience with the types of computer work often encountered in business settings."

Students begin working on their designs in the computer laboratories, which are equipped with networked NT and UNIX machines and computer-aided drafting software. Communicating ideas can be done in the center's flexible technology classrooms, which have overhead projection equipment tied to the wireless computer network, as well as video teleconferencing facilities.

After designing their products, students may build, test, and dissect them in the design studios and model shop. Everything engineers need—workbenches, hand tools, electrical measurement and test equipment—is at their disposal.

Groups already using the CEDE include first-year seminars, engineering design and graphics classes, engineering entrepreneurship minor courses, product assembly and disassembly classes, and the College's women and minority engineering programs.

CEDE also supports technologies needed for international collaboration. First-year engineering students in the ED&G 100 honors course already use conferencing and collaboration tools available in CEDE to work on industry sponsored design projects with Université d'Artois in France. This effort is being expanded to include other classes and countries like Germany, England, and Spain.

But engineering students won't be the only ones using the CEDE's facilities.

"Business students will be able to take advantage of joint classes with engineering students to develop their knowledge of engineering practices," Knoll says. "At the same time, engineering students will come in contact with the limitations placed on engineering projects by business concerns. The goal is to help both business and engineering students understand the kinds of problems commonly faced by practicing engineers in a concurrent engineering environment. This knowledge will help them interface with an engineering team in industry." ■

Since the beams created by the splitter are narrow, narrow field-of-view receivers are used. Using a narrow field-of-view receiver makes it easier to filter out noise. In addition, receivers consisting of more than one element can ensure continued coverage when some of the transmitter's beams are blocked.

"If a device is mobile, then it has a limited energy supply, a limited input/output capacity, and limited form factor."

Traffic, however, isn't solely restricted to how information is transmitted between devices. Devices trying to access the Internet or databases may also run into traffic.

Ali Hurson, professor of computer science and engineering, says problems arise when a device of limited processing capabilities and resources tries to sift through massive amounts of data through a wireless connection. Hurson's solution to the problem is the concept of the mobile data access system (MDAS). Using wired and wireless connections, MDAS can access heterogeneous data sources such as news, weather, stock information, and the World Wide Web.

This is accomplished by superimposing a multi-database system over a wireless-mobile environment. Working like a super-search engine, the multi-database gives users access to multiple databases with a single query and integrates the results.

The beauty of MDAS, Hurson says, is its ability to manage query traffic so that gridlock doesn't happen when more than one user wishes to access the same database. Using a concurrency control algorithm called V-lock, two users can access different parts of the same database. Hurson explains V-lock uses semantic information to examine a query and makes an "educated guess" when it directs traffic.

Power plays

But network traffic isn't the only thing working against handheld wireless devices.

"If a device is mobile, then it has a limited energy supply, a limited input/output capacity, and limited form factor," states Mary Jane Irwin, distinguished professor of computer science and engineering.

A research team including Irwin is examining ways that embedded devices can be designed more efficiently. Embedded systems have, as the name implies, everything they need built into them. Irwin says these systems not only include laptop computers, cell phones, and PDAs, but also home appliances such as microwaves, consumer electronics such as VCRs, and micro-controllers such as in cars and the space shuttle.

The team consists of Vijaykrishnan Narayanan, assistant professor of computer science and engineering; Mahmut Kandemir, assistant professor of computer science and engineering; Anand Sivasubramaniam, assistant professor of computer science and engineering; and Irwin. Each team member brings to bear a different area of expertise in embedded systems, including hardware, software, code compiling, and operating systems.

"We're looking at power consumption at all levels in order to optimize the system as a whole," Irwin explains.

The team has already created an application called SimplePower that allows designers to quickly and accurately estimate energy consumption in both hardware and software.

The hope for the project, Irwin says, is to get designers to be more energy aware as they put future devices on the drawing board.

Sight beyond sight

Another area of research in the College receiving a great deal of visibility (pun intended) is computer vision.

Rangachar Kasturi, professor of computer science and engineering, and Rajeev Sharma, associate professor of computer science and engineering, are developing image processing methods for computer vision.

Experts believe computer vision and pattern recognition will play a vital role in the security and intelligence fields. Kasturi says proposed technologies such as fingerprint recognition, face recognition, and retinal scans all rely on computer vision. He says the University's Computer Vision Laboratory is working on video analysis systems to help intelligence agencies extract more information from video intelligence.

Using computer vision, an engineering research team consisting of Lee Coraor, associate professor of computer science and engineering; Octavia Camps, associate professor of electrical engineering and computer science and engineering; and Kasturi, has built an on-board flight system to warn pilots about impending mid-air collisions. Funded by NASA, the system was successfully tested on an Air Force test aircraft.

"The work is being extended to warn helicopter pilots about potential hazards such as electric lines during low altitude flights," Kasturi states. "This technology might also enhance helicopter flight safety during search and rescue operations."

Sharma has used computer vision technology for other applications, developing an interactive computer map called iMAP. The iMAP uses computer vision to recognize gestures and combines it with speech recognition software to create a new interface people can use.

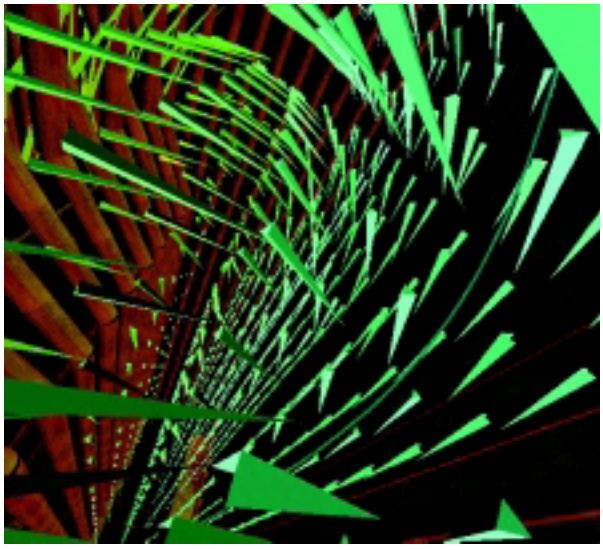
Interestingly, Sharma says the idea for gesture recognition came from watching forecasters on the Weather Channel and how they interacted with the television map.

Creating this speech/gesture interface gives people a new method of accessing information.

"You're trying to access the database behind the map," Sharma explains. "You say something like, 'Show me my dorm,' and it'll display all the dorms. Then you point and say, 'This one,' and it'll go to that one."

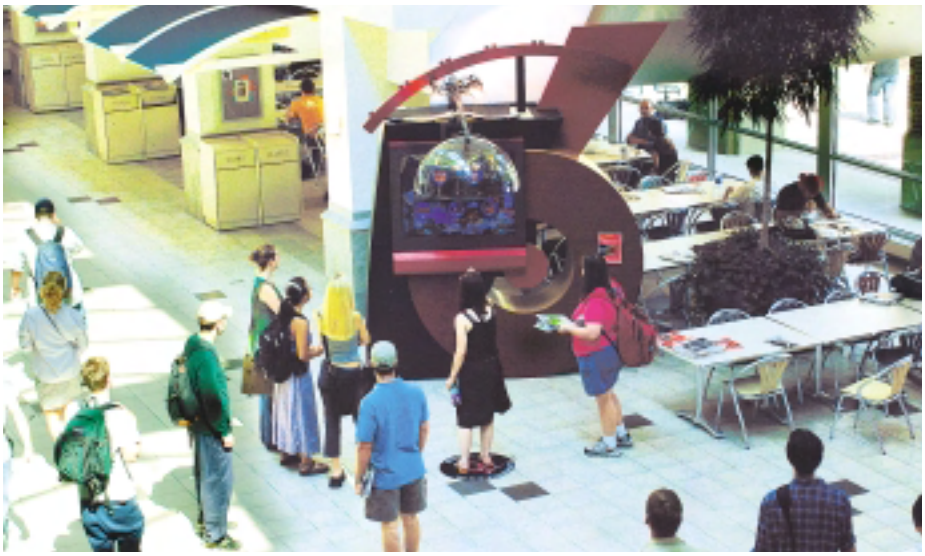
Sharma has already improved upon the original iMAP technology, creating a new system called eOz.tv. The system was recently set up in the HUB to promote the fall career fair and for passersby to play with.

"The technology has evolved to become more robust and stable," says Sharma of his new creation. "It immerses the user in the interface."



Unlike the iMAP, eOz.tv doesn't just track the user's hand—it tracks the user's entire body. People using the eOz.tv system step in a circle on the ground, and the computer tracks the person. The new system uses improved

Virtual reality machines such as the University's FakeSpace RAVE system allow researchers to step inside experiments. Pictured here is a simulation of how tires are burning in an incinerator.



Curious passersby experiment with Sharma's eOz.tv "infotainment center" at the HUB.

computer vision and deals better with environments that are crowded or poorly lit.

Sharma describes eOz.tv as an "infotainment center." Students who used the system in the HUB could not only get information on some of the companies recruiting at the Bryce Jordan Center but also play games.

"This new system is very immersive as well as interactive," he says.

Virtual reality exists elsewhere on campus, too.

At various locations throughout the University are FakeSpace RAVE systems, eight-foot by eight-foot monitor "walls" connected to powerful computer workstations. Users don goggles to create 3-D illusions out of the large displays' stereoscopic images.

But you won't find people using these systems playing games. The systems are devoted entirely to research and can be connected to the ultra high speed Internet2, allowing for collaboration between colleagues across the country.

In addition to the goggles, RAVE users are equipped with a wand, which acts like a three-dimensional mouse," explains Paul Plassmann, assistant professor of computer science and engineering. "With the wand you can poke data, change conditions and parameters, and see what happens in real time."

Until the advent of virtual reality technology, researchers could only perform complex computations on clusters of PCs. Systems like the RAVE allow them to not only compute data, but visualize and analyze results, says Lyle Long, professor of aerospace engineering. RAVEs let people watch complex data unfold in 3-D or 4-D (3-D plus time) simulations.

"You can tweak the data and the parameters that control the experiment," Plassmann says. "You learn by doing things. You build intuition and get a better understanding."

Parallel potential

With or without virtual reality, parallel computing remains a potent tool for researchers. The College already offers a graduate minor in high speed computing, and one faculty member in the College is trying to make parallel computing even faster than the mind-boggling speed of today's machines.

"Everything you can do, you want to do it faster," says Padma Raghavan, associate professor of computer science and engineering. She says the need for speed isn't a frivolous endeavor.

"Almost all simulations are done on computers. Therefore, the more power you can get, the better the simulations," she explains. "There are some things that can't be solved today."

For example, Raghavan says we don't have the ability to accurately model how our nuclear weapons stockpile deteriorates over time.

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First-year students are introduced to electrical engineering through a hands-on seminar on digital music.

Sweet sound of education

There's a class that's held in a small laboratory in the basement of Electrical Engineering West where the required materials doesn't include calculators or rulers. Instead, it reads more like a Billboard hit list than an engineering course—the Beatles, Pink Floyd, and Electric Light Orchestra.

The class is a first-year seminar on digital music, and it's proven to be very popular with a new generation of students weaned on music through compact discs and MP3s, instead of the traditional cassette tape or record.

"My goal is to use a topic that students find interesting," says **David Salvia**, who instructs the class and also serves as an adviser for the electrical engineering department. "The students like digital music but don't necessarily understand the technical aspects of it."

Salvia says digital music serves as a perfect vehicle for introducing first-year students to principles in electrical engineering. "We want them to at least consider majoring in electrical engineering," he states.

Students in the class are presented ideas such as digital signal processing and how an analog signal can be converted into numbers and remain a signal.

"We present these theorems in a level they can understand," Salvia explains. Class projects include creating clarinet and bell sounds from scratch using computers souped up with speakers, subwoofers, and headphones.

The students giggle and laugh as they wrestle with the day's lesson in backwards masking—taking a signal, recording it digitally, and then playing it backwards to find the hidden message.

They scour old Beatles and Pink Floyd songs looking for the messages, gleefully raising their hands to tell Salvia of their discoveries.

They then move on to another exercise: recording their voices on the computer and running them through various digital filters including "chipmunk" and "padded cell."

"Hello? Wow, that sounds weird," remarks one student after recording and listening to his greeting.

Another tries his attempt at an Irish accent on the computer. "Top o' the mornin' ta ya," he breathes into the microphone.

One student, reacting to his voice on playback, says, "It sounds like Barry Manilow or something. Wait—I mean Barry White."

All this work culminates in an unusual final project for the students. "At the end of the semester, students use a combination of the various digital processing techniques learned in class to compose a new digital music version of the Penn State fight song, 'Fight On, State,'" Salvia explains. " Past semesters' projects have included 'Fight On, State' done in the style of 'Dueling Banjos' as well as numerous techno-mix versions of the song. Perhaps the strangest project yet was one in which the student created a synthesized version of the song using his cats' meows as the instruments!"

The class has been such a hit with freshmen that Salvia constantly gets e-mails from students wanting to enroll in the course. He says limited facilities keep each class at a maximum of twenty students.

Those already in the class give the course a thumbs-up. Jayne Litzinger of Pittsburgh says, "It's an awesome course. I like music a lot, so it seemed like the perfect combination."

Brett Noel, a first-year student from New Tripoli, agrees. "My major is computer science, and I wanted a class that had something to do with it. Also, I thought it'd be cool to mess around with music files."

Because the class is focused so much on music, Salvia says it's advantageous for the students to meet downstairs in EE West. "It's far away from faculty labs and offices, so we can make all the noise we want!" ■

—Curtis Chan

David Salvia can be reached at (814) 865-7227 or by e-mail at dsalvia@psu.edu.

Her own work is looking at simulating nanotechnology and whether it can be effectively used in future computers.

"Can you make a transition junction out of carbon? Can you take fifty atoms and make them into a 'T' and not have it disintegrate? Will it have the properties of a transistor?" Raghavan asks. Because fabrication is extremely expensive, she says it's crucial that the simulations answer these questions.

"Once we can prove these 'T' junctions work and mass produce them, they'll be much closer to reality than quantum computing or biocomputing," she says.

Potential applications for this new technology include language processing, multimedia processing, and weather modeling, Raghavan says.

DNA and CPUs

Research in computer science and engineering isn't limited to commercial applications or Internet use, however. Engineers are also using computers to unravel the genetic mystery behind humans and animals.

This field, called bioinformatics, utilizes computer technology to compare the genomic DNA sequences between two mammals.

Webb Miller, professor of computer science and engineering, is focusing his efforts on comparing the human genome with that of mice.

"Humans and mice have the same number of genes within one percent of each other," he says. "Lots of people will be surprised by how large regions of the human genome are identical to the mouse genome. There are regions in the two that are strikingly similar, but we don't know what they do."

"We're looking at new facilities and, more importantly, new opportunities to collaborate with the faculty in the School of Information Sciences and Technology."

Miller says that the process of evolution doesn't change all of the DNA in an organism at once. "Evolution doesn't impact all areas of the genome as uniformly as we thought. It's more complicated than anyone thinks," he says.

He goes on to explain, "The DNA sequence that doesn't change is like a little red flag that says, 'This piece is doing something useful for the organism.' Because it's doing something useful, it'll be resisted to evolutionary change."

The trick, Miller says, is to isolate the regions of the genome that have not changed during the course of evolution. Using software he developed, he is comparing the genomes of humans and mice in hopes of finding these unchanged regions.

There is a payoff in comparing humans to mice. "If you can find the corresponding genome in the mouse, then you can start doing experiments."

Ain't seen nothin' yet

Acharya says the innovative work happening in computer science and engineering is merely the beginning. In 2003, the department is slated to pack its bags and move into the new IST Building (for more on the building, please see the back cover).

"We're looking at new facilities and, more importantly, new opportunities to collaborate with the faculty in the School of Information Sciences and Technology," he says. "*Then* you'll see some remarkable innovations!" ■

—Curtis Chan, Barbara Hale, A'ndrea Messer, and Bridget O'Brien

Bookshelf

Chandra publishes new book on statistical quality

As businesses focus more effort on quality, a new textbook by an industrial and manufacturing engineering faculty member offers to help engineers understand the concepts and techniques behind quality control.

Written by **M. Jeya Chandra**, professor of industrial engineering, *Statistical Quality Control* is designed for graduate-level students and professionals working in design and quality control.

The 284-page hardcover volume presents techniques in the same order in which they are used in most real applications; provides detailed treatment of the steps required in sound quality assurance and quality control methodologies; includes in-depth coverage of tolerancing and loss function; dedicates whole chapters to Optimum Process Means and Process Setting; and sequences and integrates various techniques used in quality control and assurance.

The book is published by CRC Press and may be purchased online at www.crcpress.com for $89.95.

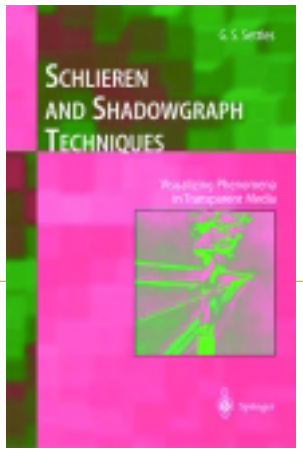
Settles text gives complete look at optical techniques

A new book by **Gary Settles**, professor of mechanical engineering and director of the Gas Dynamics Laboratory, provides a unified treatment of schlieren and shadowgraph optical methods.

Titled *Schlieren and Shadowgraph Techniques*, the 390-page text is designed for scientists and technicians who want to use these optical methods.

Schlieren techniques are basic and valuable tools in a range of scientific and engineering disciplines. They allow otherwise invisible light refractions (phase differences) in transparent media to be seen and recorded.

The book is published by Springer-Verlag and may be purchased online at www.springer-ny.com/detail.tpl?isbn=3540661557 for $89.95.



New coating technique

Penn State researchers have pioneered a new thermal barrier coating application technique that they say can extend—up to 12 percent—the life and/or efficiency of coated components vital to the energy, vehicle, microelectronics, and aerospace industries.

Jogender Singh, professor of materials science and engineering and head of the Advanced Coatings unit of Penn State's Applied Research Laboratory, says, "Nearly 75 percent of aircraft engine components have metallic or ceramic coatings to enhance performance and reliability where corrosion, high-temperature oxidation, and wear are concerns."

While a variety of industrial thermal barrier coating techniques currently exists, each has disadvantages as well as advantages. Singh says that many of the shortcomings of these techniques can often be overcome through the use of electron beam-physical vapor deposition (EB-PVD). In EB-PVD an electron beam bombards and vaporizes ceramic or metallic coating material and, thereby, controls the way in which the coating is deposited and adheres.

Singh emphasizes that using EB-PVD doesn't change the basic chemistry of the coating material. Rather, the way the coating is applied reduces, for example, its thermal conductivity and enhances its ability to resist corrosion and high-temperature oxidation.

Aerospace students win 2nd place

A team of Penn State aerospace engineering students took second place at the National General Aviation Design Competition in Oshkosh, WI, this summer.

The student engineers designed "Defiance," a four-place, single engine, turbofan-powered aircraft. Defiance's twin tail boom, twin vertical tail layout uses both aluminum and modern composite materials, and features advanced aerodynamics, avionics, and support systems.

The competition's winners were recognized at a ceremony at AirVenture 2001, the Experimental Aircraft Association's annual convention and fly-in. The annual contest is part of a national effort to rekindle interest by U.S. students in the general aviation sector. Students are challenged to meet the engineering goals of the Advanced General Aviation Transportation Experiment project.

For its efforts, the Penn State team takes home a $2,000 prize. The group's faculty adviser is **Hubert C. "Skip" Smith**, associate professor emeritus of aerospace engineering.

Penn State has won a place award in each of the competition's seven years.

Two new department heads

Koubek

Two new faces greeted the students, faculty, and staff of the industrial and manufacturing engineering department and computer science and engineering department this fall.

Richard J. Koubek was named head of the Harold and Inge Marcus Department of Industrial and Manufacturing Engineering.

Koubek was formerly professor and chair of biomedical, industrial, and human factors engineering at Wright State University. He was also associate dean for research and graduate studies for the Wright State College of Engineering and Computer Science.

He received a B.A. in theology and chemistry from Oral Roberts University and a B.A. in psychology and human factors from Northeastern Illinois University. He earned an M.S. and a Ph.D. in industrial engineering at Purdue University.

Raj Acharya was named head of the Department of Computer Science and Engineering.

Acharya

Acharya was chair of the Department of Computer Science and Engineering at SUNY-Buffalo. He was also director of the Networked Multimedia and Visualization Laboratory at SUNY-Buffalo.

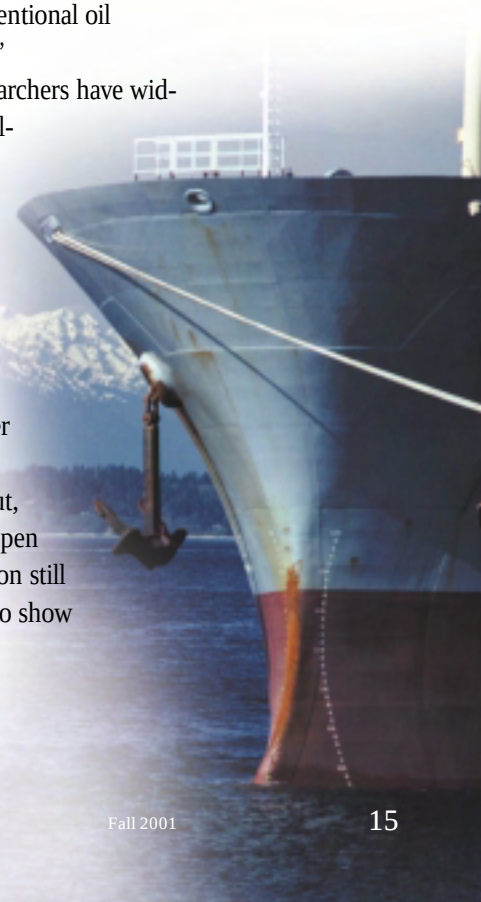
Acharya holds a Ph.D. from the University of Minnesota/ Mayo Graduate School of Medicine.

Oil spills can be burned

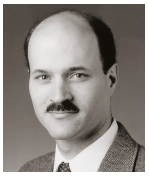
Penn State researchers have shown in laboratory experiments that some open water oil spills previously thought to be incombustible potentially can be cleaned up via burning—the most efficient, rapid, and environmentally friendly option.

Anil K. Kulkarni, professor of mechanical engineering, says, "Oil spill combustion can be a highly effective clean-up measure for contained spills occurring on open water bodies, such as an oil spill on the ocean contained by booms or a spill surrounded by ice. When feasible, it is an inexpensive technique that can have a very high efficiency of removal, possibly greater than 99 percent. The burning is very rapid and any resulting ecological damage is less severe compared to conventional oil removal methods."

Penn State researchers have widened the applicability of burning by showing that diesel fuel emulsions up to 80 percent water and crude oil emulsions up to 35 percent water can be ignited. Kulkarni points out, however, that an open water demonstration still needs to be done to show proof of concept.



College mourns Donald Streit



Donald Streit, professor of mechanical engineering and director of the Graduate Automotive Technology Education Center of Excellence, died suddenly of a heart attack on Aug. 1 at the age of 46.

He was most recently a Fulbright Scholar at the University of Addis Ababa in Ethiopia between January and June.

Streit, a member of the Penn State faculty for 15 years, was well known for his passion for teaching. Since 1995 he served as the faculty adviser for the Society of Automotive Engineers' hybrid electric vehicle team.

Streit received the Penn State Engineering Society's 2001 Outstanding Advising Award.

"Don was a born teacher," said Richard Benson, head of the mechanical and nuclear engineering department. "He cared passionately about his students and seemed to have an infinite reservoir of energy for those in his care."

Known to friends and colleagues simply as "Don," Streit was born in Chicago. He received his B.S. in engineering at Valparaiso University, his master's at Oklahoma State University, and his Ph.D. in mechanical engineering at Purdue University.

High marks in *U.S. News*

In the 2002 *U.S. News & World Report America's Best Colleges*, Penn State Engineering is rated 14th among schools of engineering.

The College was previously ranked 15th for best undergraduate engineering programs at schools whose highest degree is a Ph.D.

"These rankings are just one of the many indicators of the excellence of our engineering programs at Penn State," said **Dean David Wormley**. "We're pleased to be graduating high-caliber engineers as the quality of our programs gets better and better with each passing year."

The College's individual specialties also fared well in the *U.S. News* rankings. Penn State's nuclear engineering program was ranked 3rd, while the industrial engineering program was ranked 5th.

Also receiving top 20 rankings were aerospace engineering (10th), chemical engineering (16th), civil engineering (12th), computer engineering (20th), electrical engineering (19th), and mechanical engineering (14th).

Sciabica joins Women in Engineering

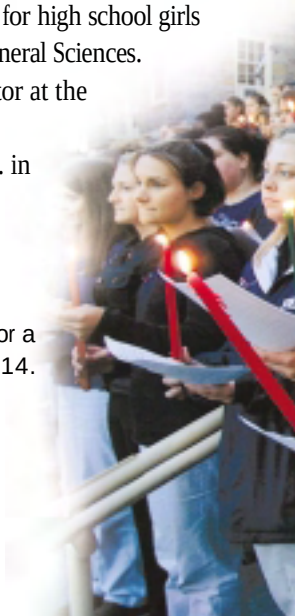
Mary Severs Sciabica has been named assistant director of the College of Engineering's Women in Engineering Program (WEP).

As assistant director of WEP, Sciabica will coordinate WEPO, a year-long orientation for first-year women engineering students that includes mentoring and networking programs, hands-on and academic enrichment classes, and facilitated study groups.

She will also assist with WEP's Girl Scout Saturdays, a program offering hands-on learning activities for Brownies and Girl Scouts, and VEC-Tour (Venture in Engineering Camp), a summer engineering program for high school girls sponsored by the Colleges of Engineering and Earth and Mineral Sciences.

Before joining Penn State, Sciabica was a science educator at the Museum of Science and Industry in Chicago.

She holds a B.S. in biology from Penn State and an M.S. in curriculum and instruction with an emphasis in science education, also from Penn State.



People gather at Old Main for a candle-lighting memorial on Sept. 14.

Engineers called upon during tragedy

As the horrific events of Sep. 11 unfolded, Penn State engineers offered their assistance to deal with the disaster.

A team of four acoustics specialists were dispatched to New York City in an effort to find survivors and search for the two airplanes' "black boxes." The team included Anthony Atchley, professor and head of the graduate program in acoustics; Thomas B. Gabrielson, senior research associate in the Applied Research Laboratory; Thomas Donnellan, associate director for materials and manufacturing in the Applied Research Laboratory; and Matthew Poese, graduate student in acoustics.

Other faculty members were sought by media organizations for their expertise on the situation. Professors who were featured prominently included Theodor Krauthammer, professor of civil engineering and director of the Protective Technology Center; Louis Geschwindner, professor of architectural engineering; Richard Behr, head of architectural engineering; Kevin Parfitt, associate professor of architectural engineering; and Barnes McCormick, professor emeritus of aerospace engineering.

Penn State engineers were quoted in the Gannett News Service, Associated Press, Reuters, ABC News Online, *USA Today*, *Washington Post*, *BusinessWeek* Online, *New York Newsday*, *San Francisco Chronicle*, *Houston Chronicle*, *Sacramento Bee*, *Harrisburg Patriot-News*, *Cleveland Plain Dealer*, *Hartford Courant*, *San Diego Union-Tribune*, *Centre Daily Times*, and Knight-Ridder's Philly.com website, which hosts the *Philadelphia Inquirer* and the *Philadelphia Daily News* online editions.

Geschwindner also put together a web site for Penn State architectural engineers with continuously updated news and accounts of the tragedy. His site can be accessed at www.engr.psu.edu/www/dept/arc/server/WTC/WTCTragedy.html.

Photo courtesy of Penn State Intercom

Student marshal

Dean David Wormley, right, presents Battles with his award.

Zachary Battles was named the student marshal for the College of Engineering at Penn State's summer commencement on Aug. 4. Battles was awarded three degrees: a B.S. in computer science, a B.S. in mathematics, and an M.S. in computer science and engineering. He also completed a minor in French.

Battles chose **John J. Hannan**, associate professor of computer science and engineering, to be his faculty escort.

He is the son of Barbara and Richard Battles of State College, PA, and a graduate of State College Area High School.

Battles was a member of the Phi Beta Kappa Society and the Schreyer Honors College. He received the Society of Distinguished Alumni Endowed Scholarship, the Garner Rothrock Memorial Scholarship, the Paul Morrow Endowed Scholarship, and the Lockheed Martin Engineering Scholars Award. He also holds membership in the Phi Kappa Phi Honor Society.

Earlier this year, Battles was named a Rhodes scholar. As a winner of this prestigious academic fellowship, he is currently studying numerical analysis at Oxford University in England.

Leading the way

New minor adds leadership to engineers' list of talents

Team building is an integral part of the Engineering Leadership Development Minor's experience.

It's no secret that Penn State Engineering graduates are highly prized by corporate recruiters. But employers are quickly finding out that many of their Penn State hires are not only good engineers, but effective leaders as well.

In addition to the array of engineering disciplines to choose from, today's students also have the option of enrolling in the College's Engineering Leadership Development Minor (ELDM).

Donald Horner, the minor's director, says ELDM was created to complement students' engineering knowledge with non-technical professional skills such as writing, speaking, presentation, teamwork, and leadership skills. Those skills, he says, are in very high demand by the marketplace.

Since its inception in 1997, the minor has graduated a total of 81 students. According to Horner, enrollment has skyrocketed from 20 students in spring 1998 to 81 students in fall 2001.

"What the students are telling me is that the private sector is really looking for the experience and knowledge that you accrue in this minor," says Horner about the program's growing popularity.

In addition to the 81 students who are currently enrolled in the minor, Horner says there are another 45 students en-

rolled in courses from the program—including some non-engineering majors from speech communication, food science, journalism, and management.

The ELDM curriculum itself consists of 18 credits within six courses. The courses include leadership principles, leadership in organizations—touted by students as the 'mini-MBA course,' technology-based entrepreneurship, individual leadership experience, and creativity, innovation, and change. Two three-credit electives are also included in the minor.

Students aren't limited to merely studying leadership in the College. A separate student-run organization called Engineering Leadership Development Unlimited (ELDU) gives participants the chance to put theory into practice.

"In the minor, you learn a lot about the theory behind leadership. You learn skills like consensus building. ELDU was developed to give students a chance to practice all this and make mistakes," says Molly Riley (IE '01), past president of ELDU.

Riley explains that ELDU is modeled after successful Fortune 500 companies, with divisions in operations, marketing, human resources, and information management training. Some of ELDU's endeavors include its Engineering Mentorship Program, corporate affiliates program, LeaderShape, and the Penn State Dance Marathon.

Graduates of the minor say their potential employers often ask about the minor during interviews.

"The private sector is really looking for the experience and knowledge that you accrue in this minor."

Whether it's a new program or a continuing one, ELDU members say the large amount of effort put into each is well worth it.

Sam Walk, who participated in ELDU's annual six-day LeaderShape Institute, says that even though days could run from 8 a.m. through midnight, the leadership experience was completely worth it.

"You learn a lot about yourself from introspection and others' feedback," Walk, a senior in electrical engineering, says. "This allows you to really look into how you behave in decision making and teamwork."

Walk, who raves about the experience, recalls, "A lot of the time, even after formal discussion, some of us would continue our discussion after meetings. The material always proved so relevant and interesting."

Other experiences were equally satisfying. Melanie Harris, a senior in industrial engineering, was on the team that helped create the Engineering Mentorship Program for freshmen.

"It was a new experience we did together that we could see how successful it could be," she says. "I enjoyed watching the freshmen take part in activities we designed and tell us how fun it was."

Greg Brown (EE '01), a systems engineer with Applied Signal Technology in Maryland, knows first-hand the corporate interest in ELDM and ELDU.

"It was a new thing they've never heard about before," he says. "Ninety percent of the time spent in my interviews was spent talking about ELDM or ELDU." ■

Senator engineer?

(Editor's Note: This summer, mechanical engineering senior Brian Pandya participated in a unique program for engineers in our nation's capital. The following story is Pandya's reflections on the experience.)

An interest in politics and economics is something that I have had for as long as I can remember. However, as an engineering student, I felt these had to remain just interests. Fortunately, this summer I had the opportunity to participate in an elite program that bridges the gap between engineering and public policy. As one of fifteen students nationwide chosen for the Washington Internships for Students of Engineering (WISE) program, I spent ten weeks living and working in Washington, D.C.

During the internship, WISE interns learn how government officials make decisions on complex technical issues and how engineers contribute to legislative and regulatory public policy decisions. Throughout the ten weeks, I had numerous interactions with leaders in Congress, administration, industry, and prominent non-governmental organizations.

In addition to attending the daily seminars and meetings, WISE interns researched a technical issue facing their sponsoring society and Congress. I was very fortunate to have a topic—nanotechnology—that is a hot issue for Capitol Hill and the agencies, a key priority for American Society of Mechanical Engineers (my sponsoring society), and interesting to me. Indeed, shortly before arriving in Washington, scientists at Hewlett-Packard told Sen. Ted Stevens that shortages in the nanotechnology workforce could cripple future economic growth. Thus, an interest existed for any assessments of the nanotechnology workforce pipeline.

My research found that although the current need for workers in nanotechnology is only for doctoral-level researchers and their accompanying technicians (I call them "nano tool and die makers"), a demand will exist for engineers who can integrate multiple disciplines and transcend the boundaries of engineering and science. The robustness of our educational system will determine how much America will capitalize on this technology.

As a thanks for his hard work in Washington, Pandya was given one of the American flags flown over the nation's Capitol Building.

The WISE program helps you develop both tangible (communication, writing, networking) and intangible (perspective on the role of public policy in engineering) skills. Conducting the research improved my critical thinking and analytical skills.

Since returning to campus, several students asked me if I would recommend the program. I respond with a resounding 'YES,' not only because I learned so much in Washington, but because of something my dad said when I interned with Ford Motor Company in summer 2000. He said that while learning the technical aspects of engineering is important, it is more important to learn how a corporation runs (or doesn't run). In that way, Washington, D.C., is the ultimate factory for ideas. While you may not be performing calculations or drawing designs, you are definitely sharpening your mind inside the Beltway. Thus, you'll become a well-rounded engineer, or perhaps you'll become a politician who can solve a differential equation! ■

Continuing Education

Wastewater Biology

Various times and locations in the United States and Canada

Through a series of modules, this workshop presents a biological approach to the operation of wastewater treatment plants and teaches participants to recognize and correct conditions causing plant operational or upset problems. Contact the Engineering Continuing Education office or visit our web page for locations and dates.

Reader mail

[In the Spring 2001 issue in the story, "Honoring the past, investing in the future," on pg. 18] How can Gifford Albright be "founding head" of the AE department when I have a BAE degree from 1957, long before Albright's tenure? "Uncle Louie" Richardson was department head in that era. A clarification in the next issue, please!

—John F. Albrecht (AE '57)

Editor's reply: According to Mike Bezilla's book, *The College of Engineering at Penn State: A Century in the Land-Grant Tradition*, the architectural engineering program and the architecture program were originally housed in the Department of Architecture. This remained until 1962, when the Board of Trustees detached the architecture program and created the College of Arts and Architecture. AE was then incorporated as its own department in the College of Engineering, headed by Gifford Albright.

Pennsylvania Housing Workshop

February 2002—Pittsburgh area

February 2002—Valley Forge area

March 2002—State College area

Topic to be announced.

This annual workshop and exhibit, co-sponsored by the Pennsylvania Builders Association, the Pennsylvania Electric Association, and the Pennsylvania Housing Research Center, provide a forum for the exchange of information about the latest technology and advancements in the residential housing industry.

Annual Airport Conference

Mar. 18-20—Hershey, PA

Co-sponsored by the FAA, this conference and exhibit provide airport administrators and engineers an opportunity to network and to update their knowledge of the latest developments in airport engineering and operation.

Smoke School / Visible Emissions

Mar. 19-20—McKeesport, PA

Mar. 26-27—Allentown, PA

Apr. 2-3—University Park

This lecture / laboratory course covers the regulation and behavior of visible emissions (plumes) from industrial processes. Each individual's ability to evaluate plumes will be tested, using a smoke generator. Those who pass the tests will be certified in accordance with EPA Method 9.

Independent Study Courses

Want to upgrade your skills, but can't come back to campus? The following Engineering courses are now available through Penn State's World Campus. Since they are instructed through technology, they can be taken virtually anytime and anywhere. For information, contact the Engineering Continuing Education office.

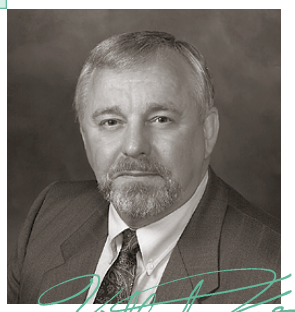
- AE 461 (3) Architectural Lighting Design Practice
- AE 565 (3) Architectural Daylighting
- EE 497B (3) Engineering Reliability
- EE 545 (3) Semiconductor Device Reliability
- EE 538 (3) Advanced Antenna Engineering
- EE 305 (3) Introduction to Electrical Engineering—for non-EE majors
- Noise Control Engineering—three Acoustics courses
- Review for the Fundamentals of Engineering Examination (non-credit)

For more information

Additional information about these and other engineering conferences can be found on the World Wide Web at the College's Continuing Education Web site:

www.engr.psu.edu / cde

You may also contact Engineering Continuing Education directly at:
Phone: (814) 865-7643
Fax: (814) 865-3969
E-mail: TDR10@psu.edu



Will Kresge

From your president

Dear Alumni and Friends,

As I write this column, we are winding down another busy fall season of PSES alumni activities. The September meeting of board and committee members was held in the new Hintz Family Alumni Center. It may be my imagination, but I truly believe that holding our meeting in that beautiful building contributed to a most productive and lively session. We plan to hold our Mar. 15 meeting there also. For those of you who haven't yet seen your new alumni "home," I urge you to come back to campus in March and take the opportunity to visit the PSES meeting as well as take a tour of the alumni center. The Faculty and Staff Awards Program, sponsored by PSES, will take place following the meeting.

The 9th annual PSES Golf Classic returned to its "roots" at Toftrees Resort on Sep. 15. The first "Classic" was held there in 1993 with 20 players. This year's turnout numbered five times that many golfers and generated much-needed financial support for the PSES Endowed Undergraduate Student Scholarship fund. The 2002 Golf Tournament will be held in early October.

Our Membership-Marketing Committee continues to recruit active members who can participate from their homes and businesses. Those opportunities include: selection of top Co-op students, recruitment of first-year engineering applicants, and helping to spread the word about PSES at chapter and regional events and meetings.

I still believe that coming "home" to Penn State is the best way to re-connect with your College. Therefore, I urge you to consider a visit to the spring PSES meeting on Mar. 15 and try out a comfortable chair next to the fireplace in your alumni home—the Hintz Family Alumni Center. ■

CALENDAR OF EVENTS

February 23
PSES Student Recruitment Training Seminar
Nittany Lion Inn

March 15
PSES Board and Committee Meetings
Hintz Family Alumni Center

College Faculty / Staff Awards Program
Kunkle Activities Center, Hammond Building

April 14-15
Outstanding Engineering Alumni (OEA) Awards Program

May 31
PSES Board and Committee Meetings
Stavely Conference Room, Hammond Building

June 1
PSU Reunion Weekend
College Open House, 9:30 - 11:00 a.m.
Kunkle Activities Center

PSES

The Penn State Engineering Society is the alumni advisory arm of the Penn State College of Engineering.

PSES means:

- Interaction with students, faculty, and engineering alumni.
- Awareness of and support for meeting the academic and professional needs of students.
- Active involvement with the College and the University.

A note to recent graduates:

You are now a member of PSES! We welcome your participation, so please call me to find out how to stay involved with the College of Engineering.

For more information, contact:

PSES
c/o Cindy Jones
e-mail: cjjdo@engr.psu.edu
101 Hammond Building
University Park, PA 16802
Tel: (814) 865-9031
Fax: (814) 863-4749

Penn State fellows

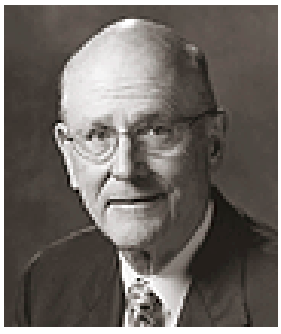
Johnstone

The University's Alumni Association honors two engineers as Alumni Fellows

On Oct. 11, two engineering alumni were honored with the permanent title of Alumni Fellow in a special ceremony at the Penn Stater Conference Center. George W. Johnstone, a 1960 graduate of the civil and environmental engineering department, and Kenneth S. Moffitt, a 1955 graduate of the industrial and manufacturing engineering department, were conferred with the title Alumni Fellow by President Graham Spanier.

This annual award is the highest honor given by the Penn State Alumni Association and recognizes prominent and outstanding alumni who are leaders in their fields.

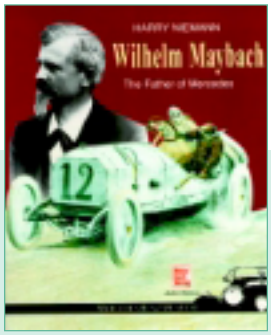
George Johnstone retired as president, CEO, and director of American Water Works Co. in Voorhees, NJ, in 1997. At American Water Works, the country's largest privately owned water utility, Johnstone was praised for his renowned leadership style, which focused on ethics, professionalism, and commitment to his employees and his customers. Johnstone was described by Dean David Wormley as "one of our most involved and committed alumni. His volunteer contributions to the department of civil engineering, our Industrial and Professional Advisory Council, and the College Campaign Committee have included significant amounts of time and energy."



Moffitt

Ken Moffitt is retired from Ingersoll-Rand Corporation, Rotary Drill Division, in Garland, TX, where he was vice president and general manager. Moffitt's support of Penn State includes the role of Key Executive to the University from Ingersoll-Rand and being an active member of the Penn State Club of North Texas. Moffitt learned about Penn State early in his life from his father, Vaun, a 1921 alumnus, and continues his ties to the community as he and his wife, Barbara, recently moved to State College.

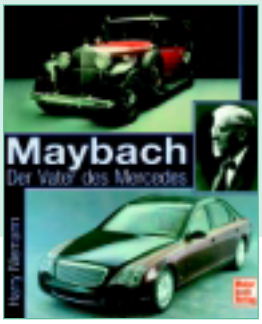
Johnstone and Moffitt were both honored by their respective departments as Outstanding Engineering Alumni in 1995. ■



Gift adds two unique books to engineering library

A gift by **Hansjakob Rothenbacher**, professor emeritus of veterinary science, will allow visitors to the Engineering Library some rare insight on Wilhelm Maybach, one of the co-inventors of the automobile.

The text, *Wilhelm Maybach—The Father of Mercedes* by Harry Niemann, was written for Maybach's 150th anniversary in 1995 and produced in English and German. The books were supplied by Daimler Chrysler AG and MTU Motoren-und Turbinen-Union of Friedrichshafen, Germany.



The books were donated in memory of alumnus **Guenter Wilhelm Maybach**, who received his Ph.D. from the College in 1959 and is the grandson of Wilhelm Maybach.

Altruistic endeavors

Leonhards give $2 million to benefit engineering, musical theater, and education

Students in Penn State's musical theatre program in the College of Arts and Architecture will benefit from a $1 million endowment created by William E. and Wyllis M. Leonhard. The State College couple has also given $1 million to divide equally between two existing endowments in the College of Engineering and the College of Education.

Income from the Wyllis M. Leonhard Endowment for Music and Dance will enable Penn State's School of Theatre to recruit outstanding students and prepare them for professional careers in musical theatre.

The Leonhards committed an additional $1 million to be divided equally between the Leonhard Honors Scholarship Program, which they previously endowed in the College of Engineering, and a scholarship fund in the College of Education that is named in honor of their daughter, Jeanne, a 1968 College of Education graduate.

William Leonhard, a Middletown native, retired as chair and chief executive officer of the California-based Parsons Corp., one of the world's largest construction and engineering firms, in 1990. Before joining Parsons, he had a 28-year career in the Air Force and Army Corps of Engineers. He is a 1936 Penn State graduate in electrical engineering.

The Leonhards are the top benefactors for the Penn State College of Engineering

The Leonhards have been benefactors of Penn State for many years. In the College of Engineering alone, they have endowed the Leonhard Center for the Enhancement of Engineering Education, several faculty positions, and an honors program. They have also endowed a chair in the College of Education. The Leonhard Building, formally dedicated in 1999 on the University Park campus, was named in 1993 in recognition of their generous support to Penn State. ■

Dome sweet dome

For **Joseph Luksic** (IE '94), there's literally no place like "dome." That's because Joe and his family—wife Ann-Marie and daughters Sandra and Sophia—live in a "dome home" on Kwajalein, a 1.2-square-mile island located midway between Hawaii and Australia.

Joe's job as a senior test director with Boeing's National Missile Defense Program brought the Luksics to Kwajalein. Their 3-bedroom dome is constructed of molded fiberglass, and resembles a trailer without wheels.

"We consider the dome acoustically challenged," laughs Joe. "Kwajalein averages 100 inches of rain a year, and believe me, you hear every drop!"

According to Joe, Kwajalein is a great place to raise children—no crime, no drugs, no consumerism—and no cars. Bicycles are the chief mode of transportation, and Joe commutes to his job on another island by catamaran. But living at the end of a long supply chain means the selection of food and other items is limited.

Despite this, there is little the Luksics miss about the "real" world. "It's difficult to describe how quickly you can drop out of what seemed important before," says Joe.

The Luksic family in front of their dome home on Kwajalein.

The following are College of Engineering alumni who have been confirmed dead as of press time in the Sep. 11 terrorist attacks on the United States:

Michael D. Ferugio (IE '87)

David P. Kovalcin (ME '83, MS '85)

David Suarez (IE '99)

The Penn State Alumni Association has created a support message board on their web site for Penn Staters who wish to contact fellow alums and friends in the wake of the tragedy. The site can be accessed at www.alumni.psu.edu.

1950s

Lincoln A. Warrell (ChE '53) was inducted into the National Confectionery Sales Association's "Candy Hall of Fame" in May. Warrell is chairman of The Warrell Corporation in Camp Hill, PA, which owns Pennsylvania Dutch Candies, Katharine Beecher Candies, and Melster Candies. Nominated by his peers, Warrell was recognized for his achievement, dedication, and service to the candy industry. His name has been added to the Candy Hall of Fame exhibit at Hershey's Chocolate World, alongside previous inductees that include Milton S. Hershey. Warrell and his wife, Marilyn, reside in Carlisle, PA.

Albert L. de Richemond, P.E. (ESci '72) is associate director of ECRI's Accident and Forensic Investigation Group. ECRI is an independent, nonprofit health services research agency located in Plymouth Meeting, PA. De Richemond performs incident and accident investigations for hospitals throughout the world.

1970s

Edward R. Valentine (AE '78) was named 2000 Builder of the Year, Central Region, by his employer, Gilbane Building Company. The award recognizes Valentine's work as project manager during construction of an 80,000-square-foot data center facility for Progressive Casualty Insurance Company. Valentine has more than 20 years' experience in project and field construction management. He resides in North Royalton, OH.

1980s

John M. Bako, C.P.M. (ChE '88) is purchasing manager at Westvaco Corporation in Luke, MD. Bako holds an MBA from Frostburg State University and earned a certified purchasing manager designation in 1997. He has held several positions at Westvaco during the past 13 years, including power and recovery project engineer, group leader, and purchasing engineer.

Douglas S. Miller (ME '85) and his wife Debra Brandenburg Miller announce the birth of their first child, Joseph, on Mar. 15. Miller is a senior project manager for restraint system electronics at Delphi Automotive Systems, Delco Electronics Systems Division, in Kokomo, IN. His e-mail address is sackfamily@earthlink.net.

1990s

Frank B. Arieta (ChE '96) married Marcia A. Peer on Apr. 28, in Tunkhannock, PA. Arieta is a member of the Penn State Engineering Society board. He and his wife are employed by Procter & Gamble in Mehoopany, PA.

Steven L. Barber, P.E. (CE '90) is regional manager of Camp Hill operations for Pennoni Associates, Inc., Consulting Engineers. Barber specializes in transportation engineering and has a diverse background in transportation services, land development, and intelligent transportation systems. He

Alumnus donates award to Engineering

Casimer DeCusatis (ESci '86), a senior engineer for IBM, was recently named Innovator of the Year by *EDN Magazine*. The international award is presented annually to an engineer who demonstrates outstanding innovation and contributions to the profession.

DeCusatis decided to donate the $5,000 award he received to the College of Engineering in the form of a scholarship.

DeCusatis leads a group of a dozen engineers designing fiber-optic-network systems and he holds 32 patents in this area. The team's most recent achievement allows a pair of optical fibers to transmit as many as 32 wavelengths of light and each wavelength to carry one or more duplex channels at a maximum speed of 2.5 Gbps. It uses innovations that greatly increase traffic capacity, simplify network installation, and increase reliability while reducing cost.

In addition to this award, DeCusatis has been named Outstanding Young Electrical Engineer by the Eta Kappa Nu national electrical honor society and was given a citation by President Clinton.

previously worked for the Pennsylvania Turnpike Commission and is a past president of the Mid-Atlantic section of the Institute of Transportation Engineers.

Habib Daneshvar (MEng ESci '95 Capital) is a faculty member at West Chester University where he teaches courses in computer systems. Daneshvar also provides computer systems consulting support in plastics and robotics engineering for multiple corporations. He participates in many ASME activities by means of Web technology and is an active Berks and Capital Campus volunteer providing free consultation and career coaching. Daneshvar may be reached at hdaneshvar@wcupa.edu or hdaneshvar@aol.com.

Joshua M. Donaldson (ME '97) received a research assistantship at the Milwaukee School of Engineering's Fluid Power Institute, where he is pursuing a master's degree with a fluid power specialty. Donaldson married Susan McCloskey on Aug. 18. They live in Grafton, WI.

James H. Harvey (ChE '94) married Mary Hungerford on Oct. 13. Harvey is a research engineer for Lonza, Inc.'s research and development facility in Williamsport, PA. The newlyweds reside in Montoursville, PA.

John G. Johnson (ESci '93) married Shana Pribesh on May 19. Johnson is employed by Bayer Corporation as an engineering specialist, non-metallic materials. His responsibilities include corrosion prevention by specifying and assuring installation of a variety of non-metallic linings and materials of construction. Johnson and his wife live in League City, TX.

Kevin M. Meehan (ME '90) is a mission evaluation room manager at NASA's Johnson Space Center. Meehan's responsibilities include managing real-time mission engineering support for the International Space Station Program.

David D. Palmer (EE '92) received a Ph.D. in electrical engineering from the University of Washington at Seattle in March 2001. His dissertation was titled "Modeling Uncertainty for Information Extraction from Speech Data."

Dean F. Poeth, P.E. (IE MS '90, PhD '93) is principal engineer at Knolls Atomic Power Laboratory in Schenectady, NY, where he is responsible for five schools that specialize in advanced electronics training for the U.S. Navy. Poeth is an SME-certified manufacturing engineer. He resides in Schenectady with his wife, Opal, and son, Dean, Jr.

Timothy D. Struna (ME '95) and his wife, **Michelle Lavra Struna** (Edu '95), announce the birth of their son, Alexander Michael, on Feb. 11.

Charles W. Whitehead, III (IE '93, MS '96) has been certified in production and inventory management by the American Production and Inventory Control Society. Whitehead is a supply manager with W.L. Gore & Associates. He and spouse **Lori Kline Whitehead** (IE '95) live in Lincoln University, PA.

In memoriam

Henry M. Foltz, Jr. (EE '39) died May 27, 2001, in Sarasota, FL. A registered professional engineer, Foltz was a Mercedes Benz/Buick automobile dealer in Williamsport, PA, for many years.

A Time for Community

The events of Sep. 11, 2001, impacted all of us throughout the country and beyond. As we consider the implications of these events, we begin to understand even more our sense of community. The events have impacted us in the College in many different ways. We know of three engineering alumni who were lost on Sep. 11 as a result of the terrorist activities. As the events at the World Trade Center unfolded, our faculty were contacted regarding the structures themselves, the response of structures to fire, and of methods that can be used to search for and find survivors. As always, our faculty responded immediately, offering their expertise to assist in understanding the impacts of the events and in helping to address both immediate and long-term problems.

Dean David Wormley

Engineering as a profession is a service to humanity and society. As our faculty and students grapple with the issues that have arisen, we understand even more our sense of community in the College and in the country. We are a country that for many years has been a haven and attracted people from throughout the world. In our colleges and universities, we provided an environment that supports people from around the globe working together to further society. This sense of world community was heightened in September and provides an opportunity to understand how people from the farthest reaches of the world can work together in the future.

The events of Sep. 11 brought together students, faculty, staff, and local residents in an unparalleled manner.

In previous articles, I described our efforts to produce graduates who will become world-class engineers, who are aware of the world and who seek to work in an environment to create a better world. Certainly, the events of Sep. 11 will strengthen our efforts to develop a sense of community that will lead to a stronger and better society.

David Wormley

Computer science and engineering to get new home

Above: This computer rendering shows the IST Building looking north on Atherton Street from the bus terminal. The Garfield Thomas Water Tunnel is pictured on the left. *Below:* A view of the IST Building looking from central campus towards the West Campus.

Ground was broken in October for a new home for the College's Department of Computer Science and Engineering and the School of Information Sciences and Technology.

When completed, the IST Building will allow students and faculty from both schools to take advantage of new learning, teaching, and research opportunities. It will feature multimedia systems installed in the atrium, display, and demonstration rooms; a "cybertorium," with multiple communications and information media for 150 students; a cyber café featuring a video wall with images from around the world; a wireless environment for laptops and personal digital assistants; and telephone, cable television, satellite, and computer backbone connections.

The three-story building will straddle North Atherton Street at the intersection of Pollock Road. Its unique design incorporates a pedestrian overpass that will allow people to travel safely between central campus and the new West Campus.

The $58.5 million building is slated for completion in 2003.

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