The Road to Graduate Education

Becoming a Leader
Key Insights From an ECE Alumnus

Making the Grade
Intel Fellows in the Spotlight
On My Mind

Providing a competitive, incomparable education remains ECE’s priority. Toward that objective, the school has many entities—both people and programs—working in tandem via our classrooms, laboratories, and various other campus initiatives.

We recently launched revised master’s and PhD curricula, and this issue of the magazine finds our graduate programs front and center. The cover feature highlights the key curriculum changes and the driving force behind our revisions, detailing how we can better position students for success. You’ll meet several scholars in the pages that follow, including some of ECE’s esteemed Intel fellows.

Top graduate programs also require top faculty. Beginning on page 14 we profile two such professors, Dave Meyer and Kaushik Roy. We’re also privileged to share the insights of Frank Greene, an alumnus and leadership coach who created the GO-Positive Foundation. Turn to page 12 for his thoughts on what it takes to be an effective leader and how students can develop those skills.

We hope you enjoy this inside look at ECE graduate education, and we thank you for your commitment to Electrical and Computer Engineering at Purdue.

Mark J. T. Smith
Michael J. and Katherine R. Birck Professor and Head
School of Electrical and Computer Engineering

In Your Words

Thanks so much for including the announcement of my elevation to IEEE fellow in your last issue. I treasure the memories of my years at Purdue in electrical engineering. It’s truly a tribute to the strong foundation I received in a then totally analog EE world, when the transistor had just been invented and microprocessors were years in the future.

John Tengdin
BSEE ’49

Tell us what you think by sharing your Purdue memories or reacting to a story in this issue. We invite you to write to us via the contact information listed on page 2. In doing so, you grant us permission to publish your letter in part or in whole in an upcoming issue. We also reserve the right to edit letters for length and/or clarity.
<table>
<thead>
<tr>
<th>Contents</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>UP FRONT</td>
<td>1</td>
</tr>
<tr>
<td>A message from the head of Electrical and Computer Engineering.</td>
<td></td>
</tr>
<tr>
<td>AROUND ECE</td>
<td>3</td>
</tr>
<tr>
<td>Research developments, key partnerships, and faculty accomplishments.</td>
<td></td>
</tr>
<tr>
<td>COVER</td>
<td>6</td>
</tr>
<tr>
<td>ECE strengthens its graduate programs by implementing curriculum changes at the master’s and PhD levels.</td>
<td></td>
</tr>
<tr>
<td>Grad students chart a course to success.</td>
<td></td>
</tr>
<tr>
<td>BEHIND THE SCENES</td>
<td>9</td>
</tr>
<tr>
<td>Mark Johnson spearheads our efforts toward instructional innovation.</td>
<td></td>
</tr>
<tr>
<td>IN MY VIEW</td>
<td>11</td>
</tr>
<tr>
<td>Alumnus Frank Greene on developing leadership skills.</td>
<td></td>
</tr>
<tr>
<td>UP CLOSE: FACULTY</td>
<td>14</td>
</tr>
<tr>
<td>Professors Dave Meyer and Kaushik Roy in the spotlight.</td>
<td></td>
</tr>
<tr>
<td>UP CLOSE: STUDENTS</td>
<td>16</td>
</tr>
<tr>
<td>These Intel fellows represent Purdue ECE with pride.</td>
<td></td>
</tr>
<tr>
<td>CAMPAIGN IMPACT</td>
<td>18</td>
</tr>
<tr>
<td>Making graduate education financially feasible for students.</td>
<td></td>
</tr>
<tr>
<td>UP CLOSE: ALUMNI</td>
<td>20</td>
</tr>
<tr>
<td>This “techie” love story began at Purdue.</td>
<td></td>
</tr>
<tr>
<td>ALUMNI NEWS</td>
<td>22</td>
</tr>
<tr>
<td>Introducing our 2007 OECE honorees.</td>
<td></td>
</tr>
</tbody>
</table>
Welcome to the Team!

Laura Sloop is our newest director of development. Most recently, she served as a director of development for Purdue’s College of Consumer and Family Sciences, where she was responsible for annual fund and major gift solicitations. Sloop began her fundraising career in 2001 at her alma mater, Manchester College (North Manchester, Indiana), as the assistant director of development for the Office of College Advancement. She is a 1999 graduate of Manchester with a bachelor’s degree in communication, a concentration in media studies, and a minor in journalism.

John Londt (BSEE ’03) serves as the director of our Industrial Affiliates Program. From 2003 to 2007 he worked at GE Healthcare in Milwaukee, Wisconsin. At GE he was in the Edison Engineering Development Program for two years and then worked as a design engineer and lead program integrator in the Molecular Imaging and Computed Tomography group. In 2006 Londt earned his MS degree in engineering management from Marquette University in Milwaukee. He has two U.S. patents and four patents pending from his work at GE.

ECE Impact is published by the Purdue University School of Electrical and Computer Engineering for 22,000 alumni, faculty, students, corporate partners, and friends. We welcome your comments. Please send them to the following address:

Electrical and Computer Engineering Impact
Purdue University
1435 Win Hentschel Blvd., Suite B120
West Lafayette, IN 47906-4153
E-mail: peimpact@purdue.edu

Articles herein may be reprinted by nonprofit organizations without permission. Appropriate credit would be appreciated.

To make a gift to the School of Electrical and Computer Engineering, or to learn more about naming opportunities for ECE’s new building, please contact:

Margarita Contreni
Director of Development
(765) 496-6453
mcontreni@purdue.edu

Laura Sloop
Director of Development
(765) 494-9945
lsloop@purdue.edu

Purdue is an equal access/equal opportunity university.
Produced by the Engineering Communications Office.
Using ‘Nanopore Channels’ to Detect DNA

Researchers at Purdue's Birck Nanotechnology Center have shown how “nanopore channels” can be used to rapidly and precisely detect specific sequences of DNA as a potential tool for genomic applications in medicine, environmental monitoring, and homeland security.

The tiny channels, 10 to 20 nanometers in diameter and a few hundred nanometers long, were created in silicon; a single strand of DNA was then attached inside each channel. Purdue’s group is the first to attach specific strands of DNA inside these silicon-based channels and then use the channels to detect specific DNA molecules contained in a liquid bath, says Rashid Bashir, a professor in Electrical and Computer Engineering and Biomedical Engineering.

Each channel was fabricated in a thin silicon membrane and bathed in the fluids containing DNA. Because DNA is negatively charged, applying a voltage across the membrane causes the genetic material in the bath to flow through the channel. The DNA is said to “translocate” through the nanopore.

The researchers discovered that single strands of perfectly complementary DNA—strands matching those attached to the inside of each channel—flowed faster and were transported in higher numbers across the pores compared to strands that did not match, Bashir explains.

“We can detect the translocation of specific types of DNA strands by measuring the electrical current across the channel,” he says. “Essentially, we can measure specific signature pulses that happen as a result of the specific DNA movement.”

DNA is made of four different kinds of “nucleotides” identified by a specific “base.” The bases are paired together to form the double-stranded helical structure.

“When the DNA molecules in the bath are perfectly complementary to those in the channels, then this current pulse is shorter compared to when there is even a single base mismatch,” states Samir Iqbal, a postdoctoral research associate.

Being able to detect specific DNA molecules quickly and from small numbers of starting molecules without the need to attach “labels” represents a potential mechanism for a wide variety of DNA detection applications. ■ University News Service

Clicking Nutrition With Camera Diet Study

A Purdue team that includes ECE professors plans to help health-conscious people better gauge what’s on their plates by using cell phone cameras.

Carol Boushey, an associate professor in the Department of Foods and Nutrition, says the project would expand on a technique already in use by adding a strong scientific grounding. Currently, dieters can subscribe to online sites that monitor eating habits by critiquing photos they send of their meals. The idea offers busy people the chance to obtain nutritional feedback without writing down all of their meals, drinks, and snacks.

“This idea of using cameras to evaluate your diet by snapping pictures of your meals is not a new one,” Boushey says. “What makes our proposal different is that we’re designing the software to better evaluate portion sizes and nutritional content. Some of those online sites have sent messages to people advising them to stop drinking a soda when they were actually drinking tea. That will not happen here.”

Edward Delp, a professor in ECE and an expert in image analysis, will work to create a reliable method for estimating the sizes of food in the photos. David Ebert, also an ECE professor, will primarily be responsible for techniques to help confirm portion sizes of the food in pictures. Kyle Lutes, an associate professor in the Department of Computer and Information Technology, will put his experience with handheld computing devices to work by designing necessary programming. As principal investigator, Boushey will provide the nutritional knowledge that forms the basis of the software’s food evaluations and help determine any health impact.

The work is funded as part of a larger initiative, the Exposure Biology Program, from the National Institute of Environmental Health Sciences, a component of the National Institutes of Health. ■ Tanya Brown
Educating Computer Engineers for a Parallel World

A key partnership with Intel allows Purdue and ECE to prepare computer engineers for future challenges—and for a world where all machines are parallel and multi-core.

The rise of multi-core processors, such as the Intel® Core™2 Duo processor, has had a major impact on software development. The current model for most software developers is to add features that may degrade performance, and to let the faster processors transparently make up the difference. With multi-core chips, programmers gain performance by the more difficult strategy of dividing up the work to simultaneously run on multiple cores.

This change threatens the whole economic model of software development. Because the current model allows new features to be added for free, in terms of performance, programmer productivity is driven by the goal of making the software easier to use and more feature-rich rather than performance-tuning. This is compounded by the fact that most developers and computer engineering students lack experience programming for this new model.

Due to this paradigm shift, ECE faculty began to evaluate the school’s undergraduate curriculum in 2005, with the hope of adding parallelism or multi-threading content to all computer engineering courses. At that time the school began cooperating with Intel in these efforts, motivated by faculty attending several Intel workshops on multi-core technologies. The company made a natural partner, having actively supported the education of students and current practitioners in the skills one needs to develop software in this new model.

ECE and its computer engineering area provide leadership toward developing and enhancing courses, enabling future computer engineers to develop software for these platforms—efforts generously supported by Intel. The company’s donations continue a tradition of support for engineering education at Purdue and elsewhere, and provide the hardware to implement course changes supported by a National Science Foundation CPATH proposal awarded to computer engineering faculty.

Intel’s Multi-Core University Initiative was launched in 2006. It provides universities with expertise, funding, development tools, educational materials, on-site training, and sustained collaboration with Intel to incorporate multi-core and multi-threading concepts into computer science curricula.  

---

Transparent Transistors to Bring Future Displays, ‘e-paper’

Researchers have used nanotechnology to create transparent transistors and circuits, a step that promises a broad range of applications, from e-paper and flexible color screens for consumer electronics to “smart cards” and “heads-up” displays in auto windshields. The transistors are made of single “nanowires,” or tiny cylindrical structures assembled on glass or thin films of flexible plastic.

“The nanowires themselves are transparent, the contacts we put on them are transparent, and the glass or plastic substrate is transparent,” says David Janes, a Birck Nanotechnology Center researcher and ECE professor. Other researchers had previously created nanowire transistors, but the metal electrodes in the transistors were non-transparent, making the overall structure opaque. This study demonstrates that nanowire electronics can be fully transparent, flexible, and maintain high performance levels.

The advancement has three broad areas of potential applications:

- transparent displays for such uses as heads-up displays on windshields and information displays on eyeglasses and visors
- flexible displays for future “e-paper,” promising to allow full-motion video
- transparent and flexible electronics for radio frequency identification tags, electronic bar codes, and smart credit cards that resemble ordinary credit cards but contain an embedded microprocessor that replaces the usual magnetic strip—increasing security of data stored on the card and enabling computers to “talk” to the microprocessor.

---

David Janes

---

Emil Venere

---
Lu Visits TSMC, Meets Alumni

Yung Lu, an assistant professor in ECE, recently visited the Taiwan Semiconductor Manufacturing Company (TSMC). His discussions focused on ways to enhance the relationship between TSMC and Purdue, exploring potential areas of mutual interest, including student recruitment and research. During his visit, Lu also had the opportunity to meet with several Purdue alumni.

Professor Neudeck Remembered

Family, friends, colleagues, and former students gathered in West Lafayette on May 19, 2007, to pay tribute to Professor Emeritus Gerold Neudeck, celebrating his contributions as an advisor, teacher, researcher, and friend.

Neudeck died on April 25 at age 70. He had retired on December 31, 2006, after serving ECE for 38 years; from 1988 to 1991 he was an associate dean in the College of Engineering. His many awards included the Semiconductor Research Corporation Aristotle (Inventor) Award in 2001 and the Purdue University Book of Great Teachers in 1999.

During the event, Mark Smith, ECE professor and head, shared with Neudeck’s family—including his wife, Mariellen—the outcome of a fund-raising effort toward naming a graduate student office in Neudeck’s honor. The room will be housed in ECE’s future facility, to be located in Discovery Park.

The event was organized by ECE professor Rashid Bashir and ECE alumnus Laila Razouk, former students of Neudeck.

Faculty Kudos

Congratulations to the following faculty members on their recent honors:

Supriyo Datta received the IEEE Graduate Teaching Award, which recognized his “unique approach to quantum transport that has inspired and educated graduate students in the field of nanoscale electronic devices.”

Guy Lebanon was one of nine recipients of this year’s Teaching for Tomorrow Award at Purdue, an honor that fosters continued teaching and learning excellence on campus.

The local chapter of Eta Kappa Nu presented its spring 2007 Outstanding Teacher award to Ilya Pollak, noting his dedication, availability, and clarity—both inside and outside of the classroom.

Mike Zoltowski was elected vice president for awards and membership in the IEEE Signal Processing Society. His term begins in 2008.
ECE graduate students map a future of unlimited possibilities.
In an increasingly global field, recruiting and retaining native-born students proves challenging for U.S. engineering schools. While countries like India and China report increasing student numbers, *Today’s Engineer Online* notes that “U.S. enrollments are flat at best.”

On the graduate-education front—engineering and beyond—the enrollment of international students declined nationally following the terrorist attacks of September 11, 2001. Yet the Council of Graduate Schools reported in fall 2006 that such declines were on the rebound. In Purdue’s School of Electrical and Computer Engineering, we see a healthy enrollment of international graduate students, particularly at the PhD level.

Still, the school faces enrollment challenges. Professor Chee-Mun Ong, ECE graduate coordinator, affirms the increasing difficulty in recruiting American students. One can attribute this in part to the time commitment involved. “Basically, it takes too long,” Ong says. Plus, students don’t always see the immediate benefits of earning a PhD, unless they plan to pursue academic careers. Therefore, the school sought to establish a streamlined program more adaptive to student needs and less restrictive in requirements.

When ECE began reviewing its graduate programs a few years back, enrollment issues represented an integral part of the discussion, which led to both a revised master’s and PhD curriculum. “I’m quite happy that we were able to get these revisions through,” says Ong, who remains optimistic about the changes implemented in fall 2006.

**Evaluation and Review**

To aid students toward their academic goals, the graduate committee sought widespread input. This entailed soliciting concerns and recommendations from the school’s eight research areas (each with its own mission and objectives), graduate office staff who interact with students daily, and faculty members who supervise students and see firsthand the obstacles encountered. The committee also examined graduate programs at peer institutions to ensure ECE’s programs remain competitive.

Over the years, the school had identified various curriculum concerns, noting several top issues:

- The duration of both the MS and PhD programs
- A need for better counseling and a more project-based curriculum for MS-only students
- A delayed exposure to research at both the MS and PhD levels
- A PhD retention rate (approximately 65 percent) with room for improvement

“It takes almost four semesters for someone to go through the master’s program, so it is quite long,” Ong says. And since the school offers limited summer coursework for graduate students, the program can realistically take two calendar years to complete. It takes the average PhD student approximately nine semesters (about five years) to graduate.

continued on next page
Flexibility and Assistance

Flexibility characterizes part of the curriculum changes. “The more you require, the more rigid it becomes,” Ong says, noting that students need some flexibility in course choice, such as the selection of advanced-level (300- or 400-level) undergraduate courses, which are essential for students pursuing interdisciplinary studies.

Program-wide efforts also will enhance the curriculum. A trial-and-error advising period will help the school to determine whether or not an advisor and advisee have been properly matched, and an increased dialogue between students and faculty should also be beneficial. “We try to get students into the graduate office and connect them with faculty early,” Ong says, noting ECE’s desire to help students structure their plans of study as soon as possible.

And while the revamped curricula have already been in place for more than a year, assessing the outcomes will take time. As Ong notes, the school must wait for the first students to complete each revised program before any impact can be measured. — Matt Schnepf

Curriculum Changes of Note

Early Research Efforts

• MS and PhD students must register for at least one credit hour of research during the first three sessions of enrollment, completing a total of at least six credit hours during their program.

Master’s Degree Changes

• Up to two advanced-level (300- or 400-level) undergraduate courses (maximum of six credit hours) allowed on the MSECE, MSE, or MS plan of study. Students must earn a grade of “B” or better in these courses to fulfill graduation requirements, and courses must be taken during the first calendar year.
• All plans of study must include at least 15 hours of graduate-level ECE courses.

PhD Changes

• Up to two advanced-level (300- or 400-level) undergraduate courses (maximum of six credit hours) allowed on the direct-PhD plan of study.
• Reduction in the number of non-thesis credit hours from 42 (14 courses) to 36 (12 courses).
• Reduction in the “math-course” and “related-area” requirements from a total of seven graduate-level courses to a total of five graduate-level courses.
• Students must register for at least one credit hour of ECE 699 or a new Introduction to Graduate Research course (ECE 695I) during their first and second semesters in the PhD program.

Student Demographics—Fall 2007 Enrollment

Graduate Degrees Pursued

<table>
<thead>
<tr>
<th>Degrees</th>
<th>MS</th>
<th>PhD</th>
<th>Direct PhD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>257</td>
<td>211</td>
<td>154</td>
</tr>
</tbody>
</table>

Citizenship of Graduate Students

<table>
<thead>
<tr>
<th>Citizenship</th>
<th>U.S.A.</th>
<th>International</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>462</td>
<td>160</td>
</tr>
</tbody>
</table>
These grad students are steering their way to high-impact careers.

It takes a solid curriculum to drive a graduate program, but it takes the world’s best students to steer the enterprise to excellence. That’s why ECE prides itself on recruiting top graduate students, future engineers from the United States and nations beyond who excel academically, take our research initiatives to exciting heights, and position themselves for lifelong success. Joey Ernst (above right) and Mandoye Ndoye represent two such esteemed scholars.

Joey Ernst

Hailing from Leawood, Kansas, Ernst came to Purdue in 2006, entering ECE’s direct PhD program with a focus on communications and signal processing. He earned his BSEE at Notre Dame and works closely here with Professor Jim Krogmeier. Ernst had applied to nine graduate schools, but Purdue—and ECE—ultimately won out. “The grad students being part of the student community at Purdue was a big thing for me,” he says.

Balancing social activities with his academic pursuits, he participates in the university’s swing club as well as the HKN (Eta Kappa Nu) electrical engineering honor society. He calls HKN’s lounge located in the EE building the organization’s heart—a hangout of sorts where students purchase coffee and refreshments, relax on couches, and test their Super Nintendo skills. “It’s a place for us to gather,” Ernst says, and he appreciates the group’s camaraderie.

ECE’s faculty also played a decisive factor in Ernst’s choosing to attend Purdue. He notes the personal attention the professors gave prospective students, something missing at other schools visited.

“You learn a lot,” Ernst says of his academic and research endeavors. “So I’m really enjoying being a big sponge right now.”

continued on next page
Mandoye Ndoye

Ndoye, a native of Senegal, came to Purdue in fall 2005 to pursue his PhD in electrical engineering. West Lafayette marks his third stop in the United States after obtaining two other engineering degrees. Upon receiving his BSEE at Rensselaer Polytechnic Institute in New York, he pursued his MSEE at Howard University in Washington, D.C.

For Ndoye, preparing to be an engineer started early in life and intensified in high school. “When I was going to high school in Senegal, the most prestigious course of study was the Serie C option, which emphasizes math and physics,” he says, indicating that students may also pursue other options focused on business, biology, or languages. And while he was required to study other subjects outside of math and physics to receive a well-rounded education, his chosen fields became his focus.

Although he considered attending Purdue as an undergraduate, Ndoye received a scholarship to Rensselaer. Yet the university stayed fresh on his mind. “In Senegal, generally people always associate Purdue with good engineering,” he says, describing his home country’s impression of the institution.

Groundbreaking Research

Research remains a top priority for ECE’s graduate programs, and its graduate students contribute greatly to the school’s eight research areas. Both Ernst and Ndoye are already making their mark.

This semester Ernst served as a research assistant on a military-related project. His next project in signal processing—to be conducted through Civil Engineering with Professor Darcy Bullock—will support the Indiana Department of Transportation.

The state’s roadways include small loops placed underground that provide readings, indicating such data as how many cars are passing through an area, or how fast vehicles are traveling. Ernst’s project will assist with the maintenance efforts, evaluating underground sensors to find the weakest points, while also helping the department to consolidate its collected information. He looks forward to future projects and anticipates getting involved with the Center for Wireless Systems and Applications.

Ndoye’s research centers on applied signal processing. By applying a set of algorithms (similar to those used in communication and radar applications), his research employs sensing and signal processing techniques within the area of intelligent transportation systems. One project seeks to find a robust scheme for accurately estimating link travel time, determining how long it takes cars to get from point A to point B in a transportation network.

Sensors under the road are used to acquire waveforms that capture characterizing features of passing vehicles. Using his algorithms, Ndoye aims to estimate travel time and other metrics imperative for optimizing the operation of transportation networks and mitigating problems like traffic congestion. ■ M.S.
changing the channel on education
mark johnson leads our concerted efforts toward instructional innovation.

mark johnson chairs the instructional innovation group.

Technological advancements and alternative teaching methods are changing the face of education in Purdue’s School of Electrical and Computer Engineering. Walk into a classroom in the EE building, and you may notice students holding remote controls rather than pencils. The use of personal response units or “clickers,” as they are often referred, is one of many changes the school’s Instructional Innovation Group (EI2G) has implemented to enhance our students’ educational experience.

Spearheading the efforts to promote and implement new advancements within ECE is Mark Johnson, EI2G chair. “Our purpose as educators is to prepare our students to function as engineers in a global environment,” he explains. “In order to do this we must constantly improve the techniques we utilize within the classroom.”

The Instructional Innovation Group was formed in fall 2004 to promote the best engineering education possible within the school. This includes promoting the effective use of instructional technology, encouraging collaborations on instructional development, and studying what techniques work best in the classroom.

Johnson, along with top ECE faculty members, the head and associate heads of the school, junior faculty, and faculty from Engineering Education meet monthly to discuss new initiatives. According to Johnson, “We have recently covered topics that have included active learning methods, directed problem solving, presentation of new video classroom recording technology, and, of course, the effective use of wireless clickers in the classroom.”

The clickers allow professors to pose a question, and within seconds the students’ responses are logged on a computer in the front of the room. “As educators we struggle with being able to actively engage the students during the entire class period, gauge their level of understanding, and provide them with prompt feedback,” explains Johnson. “The clickers allow us to do all these things, and they have really increased the level of interaction within the classroom as well as the students’ comprehension rates.”

Beyond new technological advancements, Johnson believes one of EI2G’s greatest contributions has been the creation of a venue that allows education-focused people to come together and consider new practices. “We each do instructionally focused things individually, but before there was no coordination with each other, aside from informal conversations,” he says. “EI2G has become a sounding board for educational issues that may never have been brought to the table.”

Mark Smith, ECE head, also credits Johnson with taking the lead and helping to secure hardware and software worth millions of dollars from Sun Microsystems and Synopsys, Inc. This equipment, which includes Synopsys electronic design automation software that can be used for nanotech device modeling, circuit simulation, and fabrication process modeling, is being used in the classroom for instructional and research purposes.

“Having our students learn these industry standard software tools gives them an invaluable learning experience,” Smith says. “Johnson has done so much to improve the educational atmosphere for our students. His contributions have been nothing short of tremendous.”

Kristen Senior
Frank Greene Jr. is founder and general partner of New Vista Capital, which makes early stage investments in information technology companies owned by women and minorities. Following his studies at Purdue, Greene spent four years in the U.S. Air Force, then worked in research at Fairchild Semiconductor, where he developed the integrated circuit that made the company a leader in semiconductor memory chips in the late 1960s. He has a doctorate in electrical engineering from the University of Santa Clara.

Greene has taught electrical and computer engineering at five universities and founded two software companies: Technology Development Corporation and ZeroOne Systems, Inc. He later became president of Networked Picture Systems, Inc. and spent several years in venture capital, culminating in the formation of New Vista Capital in 1993.

He has received a number of honors, including Purdue’s Outstanding Electrical and Computer Engineer award (1999) and Distinguished Engineering Alumni award (2002).

A venture capitalist, he has spent 20 years working as a leadership coach.

**Q: What inspired you to pursue leadership coaching?**

**A:** Desperation inspired me to go into coaching, to an extent. Being in the venture capital business, I realized that often we were investing in startup companies where the entrepreneurs had great technical product ideas but didn’t necessarily have management or leadership skills. If we didn’t help people in these companies, they would go out of business. We needed to protect our investments, so I started coaching about 20 years ago.

In 1972 I started my own company, Technology Development Corporation, and had a consultant help me develop marketing, management, and planning skills. Having gone through that process myself, I realized it is the kind of thing people should go through if they want to develop their leadership skills.

**Q: So, how do you spread the word?**

**A:** I travel quite a bit, giving talks and seminars. I gave a talk to a Purdue engineering ethics class, an MBA class at Kellogg School in Chicago. I’ve talked to undergraduates at Stanford University, the University of Santa Clara, and Morehouse. I’ve given workshops to teachers, administrators, and high school students. I’m developing a yearlong leadership program with the San Francisco Red Cross for student volunteers in disaster preparedness.

Four years ago, I created the GO-Positive Foundation, an educational foundation to develop and provide leadership training and materials. In the next six to 12 months, we’ll have an online version of the leadership course. A year ago, I wrote a book, *Leadership in the NOW: Power and Endurance*, followed this year by the *Success Guide*.

**Q: What exactly is leadership? Does it mean being king of the hill?**

**A:** Everyone has his or her own definition of leadership. Leadership is like a stew; everyone has his or her own recipe. You can’t say that one stew is better than the other; they’re just different. Does a great leader have to be tall and white and ride a white horse?
horse? That’s the common image of a leader in our society, but that leaves out 85 percent of the people. That’s why many people don’t see themselves as having a chance to be a leader.

We define leadership in terms of the work you do as a leader. Leaders start with a vision, get people together, build a strong relationship, and then they execute. This is what I call Vision—Relationships—Execution (VRE). [Former] Purdue president Martin Jischke is an example of an outstanding leader. He started out with a very clear vision—to move Purdue to the status of an elite university was the vision for the capital campaign. Because this was an inspired vision, he was able to get many—approximately 200,000—people connected with the university to support the fundraising; that’s the relationship part. He and the university leadership spent a lot of time working on the campaign; that’s the execution part. Strong leaders always go out and do the work.

Q: What inspired leadership in you as a young man?

A: As a child growing up during World War II, the speeches by President Roosevelt and other leaders were inspiring. It was a very anxiety-prone period, so we looked to the people who were leaders to give us confidence that we were going in the right direction and were going to be taken care of.

I never thought of my father, who was in the Army Corps of Engineers, as a leader when I was a kid, but he was in a lot of ways. He came from the South in the 1930s and got a fellowship to Howard University and went on and got his master’s degree and was a student of Ralph Bunch, the first African American ambassador to the United Nations. That inspired him. It was understood when I was growing up that when you get around such people they raise your whole energy level. They are an inspiration to do something better with your life.

I’ve been a knowledge-seeker my whole life and not afraid to challenge things. I was asked to lead a number of organizations: captain of my high school tennis team, president of the Honor Society, president of my fraternity at Washington University, and deputy commander of the ROTC Corps there. In the 1950s and 1960s, I was also active in student social and human relations organizations in St. Louis.

Q: Why is it essential for today’s students (tomorrow’s engineers) to develop leadership skills?

A: Leadership is the 21st century’s big opportunity in the same sense you might have said the Internet was the big opportunity of the last century. Every company that wants to hire a Purdue engineer wants to hire an engineer who has leadership skills. These companies are all competing in the global market, which means that things are always changing. It’s not the status quo, and folks who know how to successfully manage the challenges to the status quo and take risks, and learn as they go, will thrive in this dynamic situation.

Students can accept that they do have leadership skills when they recognize that it took leadership to achieve what they have in their own lives. Any students at Purdue have strong leadership skills, at least for themselves, and should give themselves a lot of credit for their accomplishments. The question is whether they want to make these leadership skills stronger. We tell them about what the new world looks like, that it’s demanding people with leadership skills; the ones who have them are a lot more successful than the ones who don’t.

Q: How can students develop leadership skills?

A: People who are powerful leaders start with a vision that is clear and inspiring and that people want to be a part of, whether it’s Martin Jischke, Gandhi, Martin Luther King Jr., or the corporate leaders of Toyota and Google. You create a safe environment that supports creativity and risk-taking and innovation, so failure isn’t criticized or ridiculed.

Great leaders must be willing to take on a great challenge with the opportunity to make a significant change. They have a personal belief that they can take on a challenge and succeed. We ask workshop participants to ask themselves, What kind of belief do you have about yourself and what you can do?

We get students and adults to see that there is a systematic way to develop a leadership plan if they want to do it well. The process begins with a series of self-reflection questions, so they can get in touch with factors in their lives and see where they have already been successful. We build a level of consciousness and, out of that, try to help them see how they got where they are today. Out of that, they define a vision, identify relationships that will help them reach that goal, and outline the daily practices they will need to execute the plan and realize their vision. ■ Linda Thomas Terhune
The Tools of His Trade

Dave Meyer engages students with hands-on learning, using everything from toy trains to everyday devices.

“If parents want their kids to become engineers, one of the best gifts would be a toy train set and a sheet of plywood,” Meyer says. He mastered train sets as a youngster and still owns his first, a gift some 50 years ago.

Today, toy trains and other everyday electronic devices are among this Boilermaker’s teaching tools. “I use anything and everything I can get my hands on to make lectures and labs interesting and useful,” says Meyer, who came to Purdue as a freshman in 1969, earned a bachelor’s, two master’s, and a doctorate, then joined the faculty 26 years ago.

“Students like practical, hands-on learning. They want to see things work,” he says. “Building a project from the ground up—that’s when students start to blossom and understand what we’re teaching and why the material is important.”

Meyer’s style is to combine humor and popular icons, such as Sponge Bob, says Brian Moerdyk, who was an assistant teacher under Meyer. “I learned from him that lecture material should never be considered constant. While changes are necessary to keep up with evolving technology, it is also necessary to evolve lectures to keep up with students’ changing needs.”

It’s effective. Meyer has landed 20 teaching awards, some student-selected. They include the Dean A. A. Potter Award, Purdue Book of Great Teachers, andEta Kappa Nu C. Holmes MacDonald Outstanding Teaching Award. He’s been recognized by IEEE, too, with the Undergraduate Teaching Award and Computer Society Undergraduate Teaching Award. And he received ASEE’s Fred Merryfield Design Award for Excellence in Teaching Engineering Design.

What’s the secret to his success? Constantly pursuing new and better ways to teach, he says. “I’m not afraid to try anything once.”

One educational research project under way involves offering two core computer engineering courses in parallel formats—traditional lecture and an inverted structure, with online lectures and directed problem-solving sessions during class time.

“This optimizes the teaching environment for different styles of learners, and it allows students to choose between opposite formats, forcing them to think about how they best learn,” he says.

He’s also using peer-rated, online discussion threads and student response units, known as clickers. And he’s worked on best practices for outcome assessment and capstone design.

Meyer grew up in Indianapolis, the son of an elementary school principal. “Love for education must have been engrained in us, because my sister and I both became teachers,” he says.

This fall, he’ll teach courses at freshman through senior levels, including a new service-learning course involving sound reinforcement system design, his favorite subject. In his spare time, he’ll work on his hobby, creating a computer-controlled model train layout, complete with digital sound effects.

[Photo of Dave Meyer]

Kathy Mayer
Growing up, Kaushik Roy often gathered with others as his father shared physics lessons. While his father’s profession was in the government’s post and telegraph department, education was his passion. “People who were interested came to our place,” Roy recalls. “He was the greatest teacher I had.”

Memories of his father and his high school physics teacher, Anjan Dasgupta, inspire Roy, Purdue’s Roscoe H. George Professor of Electrical and Computer Engineering—in the classroom, in research with his 22 current graduate students, and in creating a family atmosphere for learning.

“He makes the coursework informal, and he engages students in discussion,” says Saibal Mukhopadhyay, who earned his PhD under Roy and is now on the faculty at Georgia Institute of Technology. “He has a huge group of graduate students, but still he makes sure he is available for every student.”

Besides learning subject matter, Mukhopadhyay says, “He helped me develop as a researcher, work with others as a group, and approach a problem. He taught me to not be afraid of failure, and how to present solutions.”

Fascinated with electronic gadgets, Roy earned his bachelor’s in electronics and electrical communication in 1983 at the Indian Institute of Technology and his doctorate in 1990 at the University of Illinois. After three years at Texas Instruments, the IEEE fellow decided to try academics, joining Purdue in 1993.

He teaches beginning and advanced VLSI design. His research focuses on low-energy electronics for computing communications and biomedical applications, modeling of emerging nano-devices, novel thin-film transistors, device modeling, process variations and designing with unreliable components, and memory technology.

“I look for excitement in terms of research—nice, interesting problems,” Roy says. “I tell my students you have to be excited, you have to be interested.”

Roy wants students “to use existing knowledge to create new knowledge, to open their minds.” Most important, “I would like to inspire students to have a constant yearning to know.”

Discussing books over coffee is a pastime. “I love literature,” he says, citing recent reads like Jose Saramago’s Seeing and Orhan Pamuk’s Snow. A cricket player in India, he enjoys tennis and badminton today. And he treasures time with students.

“Working with students is a tremendous experience. I don’t want to give it up for anything. And really they are my friends, my family,” Roy says.

PhD student Kunhyuk Kang appreciates Roy’s teaching and family style. “He motivates us to work on novel things. If we start with a somewhat conventional project, he has us elongate that to some useful technology and then write a paper. He’s a good role model.”

Socially, Kang says, “He holds out-of-lab activities and an occasional party for somebody’s birthday, graduation, or holidays.”

Roy’s extended family of current and former students—which includes 39 PhD and 15 master’s graduates—recently expanded when his first child was born. This may pose a new challenge for the educator, suggests Kang. “The new kid will be different from all of us and won’t listen to him as we do.”  ■ Kathy Mayer
A Mutually Beneficial Relationship

Intel fellowships support higher education and groundbreaking research.

For many students, university-corporate partnerships go a long way toward making higher education possible. Consider Purdue’s longstanding relationship with the Intel Foundation, a key association that rewards exceptional PhD students within such academic programs as electrical and computer engineering.

Intel’s PhD Fellowship Program awards two-year fellowships to select PhD candidates who pursue groundbreaking research related to Intel’s business and research interests. Each year the foundation awards approximately 40 fellowships, which carry numerous perks: a cash award (tuition/fees/stipend), an Intel architecture-based laptop, interaction with an assigned Intel mentor, an invitation to the Fellowship Forum held in October, and the opportunity to complete an Intel internship.

Several ECE students have received these competitive awards through the years and attest to the benefits. Former fellow Zeshan Chishti (PhD ’07), who hails from Pakistan, joined Intel Corporation this past July as a research scientist in Oregon. At Purdue his graduate research focused broadly on computer architecture.

Chishti notes that his fellowship didn’t constrain his choice of research topics. “[My] Intel fellowship enabled me to focus my attention on my graduate research objectives without worrying about educational expenses,” he says. He also enjoyed interacting with other fellows from Purdue, which promoted a healthy exchange of research ideas. In addition, the annual Fellowship Forum provided Chishti with helpful information about the various challenges facing the microprocessor industry. “This knowledge proved vital in deciding my future research directions,” he says.

When Arijit Raychowdhury (PhD ’07) arrived in the United States from India, his first stop was Dallas, Texas, to complete a stint with Texas Instruments. He then made the trek north to West Lafayette, joining ECE’s direct PhD program and receiving his fellowship in 2005.

Raychowdhury calls the award a great honor, especially when he...
considering the extensive talent within Purdue alone. “Going through the process at Purdue is competitive,” he notes. Besides a two-year fellowship, he completed internships with Intel during the summers of 2005 and 2006. “It was very research-oriented,” he notes of the exploratory work he tackled in the circuit research labs. And when he completed ECE’s PhD program this past September, he was off to Oregon, commencing professional employment with Intel.

Siyu Koswatta (MSECE ’04) from Sri Lanka has focused his research on carbon nanotube electronics. He completed his master’s degree in ECE and earns his PhD next year—at which time he plans to seek employment within industry.

Koswatta’s fellowship began in 2006, an honor that impresses him. “It’s a very selective fellowship,” he says. “It’s nice to get this feeling that you’re receiving recognition for the work you do.” His association with Intel has also had an impact closer to home. While Dmitri Nikonov serves as Koswatta’s Intel mentor, he also serves on Koswatta’s PhD committee.

Intel’s impact spans the campus. According to JoZell Johnson, Intel program manager of U.S. higher education programs, the research and product development that occurs through this initiative helps to maintain Intel’s status as an industry leader. “We encourage breakthrough technology that supports Intel and the technology industry as a whole with new innovation and leadership,” she said recently. “Purdue’s role as a leading engineering university is important to us.”

Matt Schnepf

Enrolling in the School of Electrical and Computer Engineering has placed students on the road to Intel fellowships. Here our featured recipients relate their decisions to attend Purdue ECE for graduate studies.

■ Sometimes a campus visit makes all the difference. When Siyu Koswatta was deciding where to pursue his graduate studies, he was also looking at another top institution. However, a visit to West Lafayette played a critical role in his choosing Purdue. “I came here for the ECE open house, and that closed the deal,” he recalls.

■ Familiarity with one of our faculty members inspired one future Intel fellow to choose ECE. Arijit Raychowdhury indicates that he looked forward to collaborating with Kaushik Roy, the Roscoe H. George Professor of Electrical and Computer Engineering (see page 15). “I knew what Kaushik was working on and was interested in working with him,” he says.

■ “The College of Engineering is recognized worldwide for its excellence in education and research,” says Zeshan Chishti. He appreciated how closely his doctoral research goals matched the research interests of ECE’s faculty, and he also received encouragement from students he knew as an undergraduate—other future engineers who have also pursued degrees here.
Open the Doors to Graduate Education

Teaching assistantships and academic fellowships make advanced degrees attainable for ECE students.

With a high standing attributed in part to its graduate programs, the School of Electrical and Computer Engineering places considerable emphasis on recruiting and retaining top scholars. This requires ensuring students have the financial means to pursue their education.

**Teaching Assistantships**

Win-win opportunities, teaching assistantships benefit both ECE and the student recipients. Through these awards, the school is able to recruit top students who in turn assist with undergraduate teaching demands. It’s ideal to have a student spend a year or two as a teaching assistant (TA) before he or she takes on a research assistantship or a fellowship funded by industry, government, or private donors.

Joey Ernst from Leawood, Kansas, served as a TA his first year at Purdue and plans to pursue teaching. “I might really fall in love with something in research and end up out in industry, too, but really that’s the thought that I’d go teach,” says the PhD student. As a TA he assisted with ECE 201, a large class of approximately 400 students and five TAs. Ernst also ran the class’s help room nine hours a week, got to know the students well, and today tutors some of the undergraduates he met.

While TAs support the school’s programs, meeting the TA demand can prove challenging at times due to budget considerations. “I fully support any effort to gain funding for TA positions,” Ernst says, stressing the one-on-one attention made possible by providing a sufficient number of teaching assistantships.

**Top Fellowships**

Securing a fellowship has made advanced education attainable for Michelle Cobb of Detroit, Michigan. She is pursuing her MSEE at Purdue, specializing in automatic controls, and received the GEM fellowship with Motorola as her sponsor. “I interned at Motorola during the summer to pay back the opportunity they allowed me to attend graduate school,” she says. “The experience was amazing. I got to work on important projects that prepared me to transition into the corporate world well.”

The GEM fellowship pays tuition and fees, freeing Cobb to focus on academics instead of employment. “This allows me to excel academically and explore numerous research opportunities,” she notes.

Stephen Cauley of Los Angeles, California, has also benefited from fellowships. He earned his BSECE here and remained in West Lafayette to pursue his PhD in electrical engineering. “The willingness of the faculty at Purdue to spend time interacting with their students was a major part of my decision to stay,” he says. “I felt that the education I would receive at Purdue would be second to none.”

Cauley works in conjunction with the Network for Computational Nanotechnology on distributed computing solutions for the atomistic simulation of nanoscale devices. He has received both the Ross and GAANN (Graduate Assistance in Areas of National Need) fellowships.

The Ross fellowship allowed him to explore different research groups and projects during his first year of study. During his third year he became aware
of the GAANN fellowship for students interested in pursuing academic careers upon graduation. Recipients can assist with both undergraduate and graduate courses, or in the design of experimental courses, and the fellowship lets him balance research and teaching responsibilities. “During the last year I have been able to both publish a portion of my research in the Journal of Applied Physics and spend the summer teaching discrete mathematics to computer engineering students,” he says.

While Cobb plans to enter industry as a research and development engineer, Cauley will channel his talents toward education. “During the upcoming year I plan to graduate and apply for academic positions at top-tier ECE programs.” ■ Matt Schnepf

"Scholarships are important for all schools," states Aelred Kurtenbach (PhD ’68). That’s why he and his wife, Irene, chose to endow a new scholarship in Electrical and Computer Engineering.

The endowment fund will be known as the Aelred and Irene Kurtenbach Graduate Scholarship. Through the 2009-10 academic year ECE will give preference to graduate students pursuing degrees in the wireless systems and applications area who are also involved in the Center for Wireless Systems and Applications.

This gift continues an ongoing relationship with Purdue—and ECE in particular—that dates back to 1965 when Kurtenbach first arrived on campus. Already a husband and father, he came here to pursue his PhD, taking classes in the EE building. Reflecting on those days, he recalls living in married housing and socializing mainly with other student couples. “The biggest event for us was to watch the football games,” he says.

Recognizing his professional achievements, ECE named Kurtenbach an Outstanding Electrical and Computer Engineer in 2001. In March 2006 he received a second honor when the College of Engineering presented him with the Distinguished Engineering Alumni award, noting both his entrepreneurial contributions in visual communication systems and his support of education.

The chairman and co-founder of Daktronics Inc., Kurtenbach also stays connected with Purdue through his professional endeavors. Daktronics designs, manufactures, markets, and services large computer-programmable displays on a global basis. Its most notable works include the Coca-Cola Spectacular in Times Square and the four-sided custom video display in Purdue’s Mackey Arena. “Purdue is a good customer of ours,” he says.

While the Kurtenbachs call South Dakota home, the miles between their residence and West Lafayette haven’t diminished their association with the university. And as this new scholarship demonstrates, their regard for higher education remains as strong as ever. ■ M.S.
George and Jennifer Graves met at Purdue. 

GECO has been growing at about 30 percent for the last few years.

Purdue engineering education not only leads to great jobs; it sometimes results in a terrific marriage. George and Jennifer Graves can attest to that. It was on her 21st birthday that engineering major Jennifer Horodysky (BSCEE ’86) went on her first date with EE361 (Electric and Magnetic Fields) classmate George Graves (BSEE ’86). Now 21 years into marriage, the two have three children, two Bernese Mountain dogs, a company that is booming, and a hectic life. They wouldn’t have it any other way.

First came love, then came marriage—a month after graduation, and then came a career in the aerospace industry. The couple moved to New Mexico, where George worked for Sandia National Laboratories and Jennifer took a position on a hardware design team with Honeywell (Sperry Defense Systems). In 1989 they moved to The Boeing Company in Mesa, Arizona, working as part of the systems engineering team that developed and proposed the avionics systems for the McDonnell Douglas/Bell Helicopter Light Helicopter Experimental (LHX) Army helicopter program.

Jennifer then went on to update the avionics suite for the AH-64A (Apache) program. As part of that, she was involved in a six-year AH-64D prototype program that resulted in six prototype aircraft and hundreds of production aircraft. During that time, she worked second shift while pregnant with the couple’s second child and continued to work through a third pregnancy.

After holding a systems/software engineering consulting position at Honeywell for its Boeing 777
The two Purdue grads were brought together by an engineering interest. They studied hard, but on dates liked to attend football games and ride George's old Honda motorcycle down River Road when Indian summer brought autumn color to life.

Life is a little more hectic now. A typical day finds Jennifer checking e-mail early, getting the kids—ages 17, 15, and 12—ready for school, and then heading to the office. Much of her time there is occupied by process meetings, design reviews, and checking in with engineers and manufacturing staff. She also is lead systems engineer for GECO's new AC-130U Battlefield Management Multifunction Display (BMFD). Then it's home, or maybe on to volunteer at the kids' schools. Business administration tasks are done in the late afternoon and after dinner. "I get to do my homework with my kids," Jennifer says, adding that she has been known to do schematics on a laptop while the children were at karate.

A Solid Background

Without George, Jennifer says she would never have thought of starting a company. Without Purdue, Jennifer would never have met George. The College of Engineering, though, gave the couple more than a marriage. It gave them the skills they needed to compete and work with other bright young engineers when they entered the job market. Experience gained during an internship with Mobil Oil following both her sophomore and junior years helped set her apart from other job candidates, Jennifer says. The hands-on experience is invaluable. GECO recently hired a 2007 Purdue electrical engineering graduate who had interned with the company.

The Graves children, who visit the office frequently, may well end up in engineering. With two parents in the field, and dismantled computers often lying around the house, it would be natural. "We all love technology," Jennifer says. It's a true "techie" love story, jokes a co-worker.

"George and I really complement each other professionally. He's got the big ideas, and I can create the details. He starts things; I finish them," says Jennifer. "We are so lucky. We have a great marriage and healthy, smart, interesting children, and we love our careers."

Linda Thomas Terhune
Five ECE alumni receive the school’s top accolade for professional achievement, the Outstanding Electrical and Computer Engineer (OECE) award.

Elizabeth Klimes
Vice President, Six Sigma, Eli Lilly & Company

Elizabeth Klimes (BSEE ’79) was named in 2004 to develop and lead Eli Lilly’s deployment of Six Sigma, and is also a member of the company’s senior management forum, a group of top executives who implement corporate strategies, ensure corporate performance, and identify corporate issues and opportunities. She had been president of Specialty Care Products since December 2002.

An Indiana native now residing in Greenwood, Klimes is also a graduate of Indiana University where she earned her MBA. She joined Lilly in 1982 as a design engineer in process automation and subsequently worked in manufacturing facility and capacity planning before becoming manager of manufacturing strategy development in 1989. Her various other positions with the company have included executive director and chief procurement officer, as well as general manager of Lilly Deutschland GmbH. She is a member of the board of trustees at Rose-Hulman Institute of Technology and serves on the advisory board for the School of Electrical and Computer Engineering at Purdue.

Thomas Mason
Co-Founder, President, and Director, POWER

Thomas Mason (BSEE ’66) of Danville, California, is a recognized expert in power generation and gas turbine technology. During his 40-year career he has assumed responsibility for the operation and maintenance of the world’s largest fleet of gas-fired power plants and the nation’s largest geothermal facility.

Among his professional achievements, Mason spent eight years with CalEnergy (now MidAmerican Energy), where he rose to the position of president and COO. He was executive vice president of Calpine Corp. and president of Calpine Power Company. While serving that enterprise, he managed profit and loss (P&L) for 92 gas-fired and geothermal power plants. He also created a turbine component development and manufacturing subsidiary and managed Calpine Natural Gas Company. After leaving Calpine, Mason partnered with Pete Cartwright, founder and past CEO of Calpine, to develop the concept of a new power company that became POWER. In addition to his Purdue degree, he holds an MBA from the University of Chicago.

Rich Niemiec
CEO, TUSC

Rich Niemiec (BSEE ’87) of Oswego, Illinois, is CEO and co-founder of TUSC. An “Inc. 500,” Chicago-based systems integrator of Oracle-based business solutions, TUSC was the Oracle Partner of the Year in 2002 and 2004. Niemiec is past president of the International Oracle Users Group (IOUG) and the current president of the Midwest Oracle Users Group (MOUG), in addition to being one of six originally honored worldwide Oracle Certified Masters.

In 1999 Niemiec authored the Oracle best-seller Oracle Performance Tuning Tips & Techniques and in 2003 authored Oracle9i Performance Tuning Tips & Techniques. The Oracle10g Tuning book came out in July 2007. Niemiec has been IOUG’s top speaker six times and MOUG’s top speaker 12 times. Along with TUSC co-founders Brad Brown and Joe Trezzo, Niemiec won the Ernst & Young Entrepreneur of
Bloor Redding Jr.
Vice President and Assistant General Counsel (Retired), Hewlett-Packard Company

Bloor Redding (BSEE ’79) launched his career with Hewlett-Packard in 1979 as an R&D engineer and began shortly thereafter to attend the University of Denver College of Law in the evenings, earning his JD degree in 1984. Now retired and living in Vancouver, Washington, he is an educator and consultant. Prior to his retirement in 2007, Redding was a vice president and assistant general counsel for Hewlett-Packard. During his tenure with the company he educated employees and business managers throughout the world on various legal topics, advised management on the development of business plans, and managed a team of more than 30 attorneys and administrative assistants supporting a $20 billion printing business.

Through the years, he has gained extensive industry experience helping businesses with Intellectual Property strategy and execution. His broad business experience in law includes developing Intellectual Property management programs, managing patent prosecution and litigation, and negotiating and structuring licenses and business transactions.

Patricia Redding
Director of Engineering (Retired), Hewlett-Packard Company

Patricia Redding (BSEE ’79) of Vancouver, Washington, is a high-tech engineering professional with more than 20 years of management experience. She has managed teams of up to 90 engineers and technicians, and her responsibilities have included overseeing product and process developments, managing product portfolio planning, leading a $50 million automation program, and administering a $450 million efficiency and effectiveness improvement program.

Redding began her career in 1979 with Hewlett-Packard in Colorado as an R&D engineer. While there, she also earned her MSEE degree in 1984 from Colorado State University. After moving to Vancouver, Washington, in 1987, she worked for Hewlett-Packard’s inkjet printing business in various R&D and manufacturing engineering management positions, ultimately becoming a director of engineering in 2002. Retired from Hewlett-Packard since 2005, she now takes classes at Washington State University Vancouver and volunteers in the community assisting with math and science education.

Alumnus Named IEEE Division Director

John McDonald (BSEE ’73, MSEE ’74) will serve the Institute of Electrical and Electronics Engineers (IEEE) as Division VII director for 2008-09; he was director-elect in 2007. McDonald is vice president of automation (power system automation) for KEMA, Inc.

An IEEE fellow, he received the IEEE Millennium Medal in 2000, the IEEE Power Engineering Society (PES) Excellence in Power Distribution Engineering Award in 2002, and the IEEE PES Substations Committee Distinguished Service Award in 2003. He is president of the IEEE PES and past chair of the IEEE PES Substations Committee.
This is an image of a quantum dot produced by a simulation using the nanoHUB, a Web site created by the Purdue-based Network for Computational Nanotechnology. NanoHUB is used by more than 3,000 national and international researchers and educators each month. This image shows the computed second excited electron state of a quantum dot nanodevice in which electrons resonate and emit pure bright light. Quantum dots are the basis of the new, energy-efficient, long-lasting, ultrabright light-emitting diodes (LEDs) that are becoming widely used in highway traffic signals.