Sunny Outlook

Symposium looks to the future

PURDUE **CHEMICAL**

ENGINEERING IMPACT

SPRING 2010

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up front

On My Mind

Welcome to the Spring 2010 issue of *ChE Impact* magazine. This time we explore risk taking and its implications. On page 5, you can read more about how chemical engineers handle this subject, from one of our alumni who made a successful career by seeing the opportunities beyond the risk.

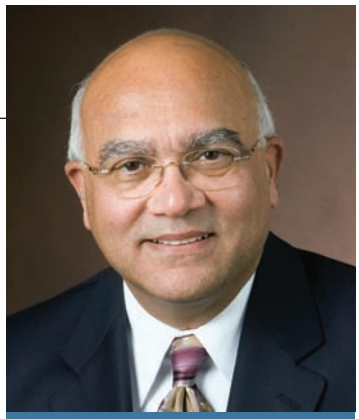
In Fall 2009, we were fortunate to attract three new assistant professors: Raj Chakrabarti (PhD '02, Princeton), Yue Wu (PhD '06, Harvard), and Chongli Yuan (PhD '07, Cornell). These new faculty members bring excitement, new energy, innovative ideas, and promising talent to our school. You can read more about them on page 6.

This year, we received several new, multi-year, major research and education grants. Starting with July 2009, Purdue ChE faculty members are lead principal investigators for eight major federal research grants, ranging from $650,000 to $6.1 million. In addition, Purdue ChE faculty members are co-principal investigators in two other major federal grants, one for $3 million and the other for $22.2 million. These grants will continue our trajectory as leaders in fields important to society, such as solar energy, electric batteries, biofuels, and pharmaceutical engineering.

Last September, our school hosted the Chemical Engineering of the Future Symposium. Our faculty, staff, and students were honored to host more than 25 academic leaders of U.S. ChE programs, numerous industry representatives including the school's Industrial Advisory Council, and the School of ChE Ambassadors. The presented issues generated creative debate and inspired researchers, educators, and industrial leaders to consider novel approaches to solving current and long-term challenges facing society. We were honored to host such a diverse, vibrant, and refreshing meeting of the minds. The feedback from the attendees was overwhelmingly positive and we thank all participants for contributing to the success of this symposium. You can read more details about this event on page 2.

Hail Purdue!

Arvind Varma
R. Games Slayter Distinguished Professor and Head



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Share your Purdue memories, react to a story, or let us know your thoughts about a particular issue. Write to us at peimpact@purdue.edu. In doing so, you grant us permission to publish your letter in part or in whole in an upcoming issue. We reserve the right to edit letters for length and/or clarity.

Important Message!

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If you want to continue to receive this magazine, please share your email address by sending a message to **chealumni@ecn.purdue.edu**. As future issues appear, we will send you the link by email.

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COLLEGE OF ENGINEERING

School of Chemical Engineering

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Awards and Honors

Faculty

Hugh Hillhouse, associate professor, received the school's Shreve Teaching Award for Excellence for 2009-10.

Neal Houze, professor, was selected as one of 10 U.S. faculty to receive the ConocoPhillips Faculty Sponsorship award for 2009-10. This includes a $25,000 award to be used in support of teaching objectives, learning opportunities, involvement with student programs, expenses for research and lab work.

James Litster, professor and director of graduate studies, received the Achievement Award at the 9th International Agglomeration Symposium/4th International Granulation Workshop, UK (2009).

Doraiswami "Ramki" Ramkrishna, Harry Creighton Peffer Distinguished Professor of Chemical Engineering, was honored with a Special Issue, Chemical Engineering Science, Vol. 64, No. 4 (2009).

Venkat Venkatasubramanian, professor, received the Computing in ChE Award from the Cast Division, AIChE (2009).

Staff

Larry Campbell, shipping and receiving clerk, honored by the university for 40 years of service (31 years in ChE), also received the 2009 Professional Achievement Award, College of Engineering. (For more on Campbell, see page 8.)

Karen Heide, secretary, honored by the university for 35 years of service (27 years in ChE).

Sandy Hendryx, secretary, honored by the school for 15 years of service.

Marcella Maynard, secretary, honored by the school for 10 years of service.

Rick McGlothlin, laboratory associate, honored by the school for 10 years of service.

David Taylor, electronics shop coordinator, honored by the school for 30 years of service.

Andrea Sills, business manager, received the 2009 Professional Service with Pride Award (PSP), College of Engineering Business Services, Purdue.

Jeff Valley, building deputy, honored by the school for 15 years of service.

Students

Grayson Ford, graduate student, received the ConocoPhillips Graduate Fellowship for 2009-10.

Tyler Teykl, junior, was elected Purdue Student Trustee. (For more on Teykl, see page 7.)

Ashley Wenger, senior, selected as Student Responder for the August 2009 Commencement Ceremony.

From left to right: graduate students Maria Elisa Luque, Sara Yohe, Saurabh Chaugule, faculty advisor Raj Chakrabarti, post doctoral research associate Kris Villez, graduate students Piotr Gawecki and Aviral Shukla, administrative director Cristina Farmus, and graduate student Jorge Pazmino.

Events and News

CHE 2010-14 STRATEGIC PLAN

In December 2009 the School of Chemical Engineering unveiled the 2010-2014 Strategic Plan. A committee of 14 faculty members, staff, students, alumni and industry advisors worked for seven months to formulate the guide for the next five years. The plan reflects the areas all members of the school will focus on to reach our vision.

Vision: Be widely recognized among the premier ranks of chemical engineering programs in the world.

Mission: Provide students with a rigorous and relevant education, conduct field-defining research, and enhance the school's global impact.

Values: Leadership, excellence and innovation, relevance and impact, commitment and responsibility, teamwork and partnership, diversity and respect, safety and sustainability.

For the full text, visit our website at https://engineering.purdue.edu/ChE/index.html.

The School of Chemical Engineering has a new student organization, the Purdue ChE Sustainability Initiative (CSI). Thanks to their efforts, the ChE Graduate Symposium has been certified as a Green Event by the Green Standards for Events group in Lafayette. This is the first Go Greener certified event at Purdue.

The 18th Graduate Student Symposium took place on August 19 - 20, 2009. Dr. Montgomery "Monty" Alger, vice president and CTO, Air Products, delivered the keynote address.

Sunny Outlook

Symposium looks to the future

Did you know that each year 1.2 billion barrels of oil, 179 trillion cubic feet of natural gas, and 900 billion tons of coal are consumed worldwide? Beyond the costs of production and delivery, each of these fuels also carries with it a heavy social burden of either dwindling supply or harmful impact on health or the environment. Likewise, to take a drug from molecule to market may cost $1.2 billion, but more than half of those dollars are used up in unsuccessful testing. Health care may be a buzz word in the news these days, but overall the pharmaceutical industry is faltering. In many cases, biotech products and vaccines are keeping the industry afloat. How do we address these problems in a candid and responsible manner? More specifically, what are the roles for us as chemical engineers in all this? And how do we train our pipeline of students to work in such diverse areas?

By Frank Oreovicz

ChE leads the call

In response to these emerging issues, the Chemical Engineering of the Future Symposium, held at Purdue during September 24-25, 2009, sought to explore and define some elements of the future of chemical engineering. With new directions rising in renewable energy, health care, and nanotechnology, the symposium covered the partnership of industry, research, and education to look for feasible and successful solutions to these critical issues. The core issues quickly became clear as Arvind Varma, head of the school, divided the historical development of chemical engineering into three paradigms, from an initial emphasis on unit operations to today's emphasis on molecular scale simulation and a wider view of systems-level engineering.

"As educational institutions, we need to understand how to adjust our teaching methods, curriculum, and approach to continue to educate chemical engineers with the relevant knowledge and skills to be productive and successful in this changing landscape," Varma said. "As research institutions, we need to determine where our creative efforts will have the most impact in satisfying the needs of society, while living in harmony with the environment."

Energy solutions for the future

The first of three focal points for discussion, energy concerns require an emphasis on finding sustainable, cost-effective and efficient solutions to the energy problem. This involves issues associated with production, transformation and use of various forms of energy including biomass, solar fossil fuels.

At the fall symposium, Maureen McCann, director of the Center for Direct Catalytic Conversion of Biomass to Biofuels (C3Bio) and associate professor and assistant head of biological science at Purdue, stressed the need for a "tremendous interdisciplinary approach" to confront the perfect storm of the year 2030 when the world's population will be close to 8 billion people and the energy demand has increased by 50 percent — renaissance men and women will indeed be needed. According to McCann, they will need to "design and control the fundamental properties of matter as a way to respond to the energy crisis … to increase dramatically the carbon and energy efficiency of biofuel products." Looking at a similar time frame, Andrew Gellman, Lord Professor of Chemical Engineering and head of the department of chemical engineering at Carnegie Mellon, discussed energy and catalysis, seeing the need for sustainability tied, ideally, to zero population growth, but saw great challenges ahead.

Edmund Seebauer, Westwater Professor and Head, Department of Chemical and Biomolecular Engineering at the University of Illinois, spoke to the issue of sustainable energy. He described the upcoming challenges associated with an aging workforce in the U.S. industry and the need to educate more engineers in the near future particularly with interests in the energy related subjects.

Envisioning "emerald forests" from the growth of algae, Fouad Teymour, the Johnson Polymer Professor of Chemical and Biological Engineering at the Illinois Institute of Technology, also sees biofuel from marine algae coupled with desert farms to "integrate biomass products with a living community and getting all of its needs from sustainable sources." For Teymour, "sustainability is inextricably connected to energy."

Health care on the leading edge

With health care so much in the news, how do we confront the continuing rise in total health care expenditures — from professional services, hospital and clinical services, to medical diagnostics, devices and medicines? Instead of limiting rising costs by restricting treatment and services, the preferable approach is to increase efficiency, improve delivery and reduce the cost of the devices and medicines used in treating patients through engineering innovations. Chemical engineers already play important roles in the design, development and manufacture of novel medical devices, materials and drugs, as well as in the invention and development of diagnostic aids and instrumentation used in monitoring and assessing patient medical condition. But to be

(Left to right) Chongli Yuan (Purdue), Julie Liu (Purdue), Ramesh Chawla (Howard University), Robert Hesketh (Rowan University), Pierre LaMere (3M).

Keynote thoughts

The challenge we face is how to switch 85M oil bbl/day to alternative fuels? Today, renewables are still only a small percentage, and even by 2030 will still only be about 10% of transportation fuel. Power generation is mostly coal, which is the worst CO_2 generator of the fuels, and by 2030 coal use/demand will grow by 50 percent (especially in China). No biofuel can substitute for that. "What we face is more than a five- or 15-year problem, it's well beyond the 20-year horizon."

"Meeting this anticipated growth in energy demand will require refiners and chemical processors to address continuing challenges as they work to balance feedstocks of varying qualities to make end products that meet a wide range of environmental regulations. Technology will play a critical role in finding answers to many of these issues by developing innovative processes to turn heavy oils, coal, natural gas and renewables into high-performing products that meet regulatory requirements."

Educationally, how do we meet these needs in preparing graduates for future challenges? First, we need an understanding of economics, improved quality of processes (the U.S. has good, low sulfur fuel but 40% of world still burns high sulfur fuel); an understanding of regulatory timing and rules; an appreciation of risk (anticipating and meeting oil price fluctuations and their unpredictability), and finally the demographic challenge of replacing an aging workforce (average age at UOP is 52.8 years). The skills for achieving these ends will include learning how to think, how to frame a problem, and how to take a systems engineering approach.

by Rajeev Gautam,
President and CEO, UOP LLC

effective, chemical engineers need to work with pharmaceutical and medical scientists and the other engineering disciplines in this inherently interdisciplinary area.

In this area, Elizabeth Topp, department head and Dane O. Kildsig Professor of Industrial Pharmacy and Pharmaceutics at Purdue, sees opportunities in pharmaceutical manufacturing, packaging, devices and formulations. Meanwhile, Joseph Pekny, professor of chemical engineering and interim head of industrial engineering at Purdue, sees the health care crisis as a systems engineering problem-interlocking issue, where engineers not only can help in the modeling, optimizing and managing of processes, but also in helping to bridge the gap between research and the doctors in the field.

Providing a view from industry, Arindam Bose, executive director of biologics strategy and outsourcing at Pfizer Global R&D, spoke at the symposium about how the pharmaceutical industry is "ailing badly." With the growth of small molecules shrinking, the biotech products and vaccines are keeping the industry afloat. He sees the shortage of manufacturing capacity providing opportunities for chemical engineers in the production process.

A research perspective was given by Surya Mallapragada, professor and department chair of chemical and biological engineering at Iowa State, who focused on areas that ChE's can impact, such as drug delivery, gene delivery, and tissue engineering. The growth areas include therapeutic vaccines on the adjuvant side (additions to vaccines that enhance the number of people who can be vaccinated). To educate such engineers she recommended multidisciplinary problem based learning labs.

A new education model

Accommodating the needs of the new paradigm will certainly require a shift in education, in how we train future chemical engineers. Yet how do we add important topics such as product engineering and molecular engineering, while increasing the innovative ability and professional skills of graduates? How do we accommodate these additional topics and skills into an already overcrowded curriculum without discarding necessary or useful items?

Joseph McCarthy, associate professor and William Kepler Whiteford Faculty Fellow in the Department of Chemical and Petroleum Engineering at the University of Pittsburgh, described the innovative "pillars" program at Pitt, the goal of which is to get the curriculum away from compartmentalization toward more holistic and accommodating diverse learning styles, a more hands-on approach. Developed as part of NSF's program for Department-Level Reform of Engineering Curricula (2002), it is the basis for the larger implementation project currently underway.

Edward Cussler, professor of chemical engineering at the University of Minnesota, gave a spirited account of the more traditional, but highly successful, approach at Minnesota. He named three areas where changes can be made: product design, the bio area, and transport, and stated that the "growth of chemical engineering will not come from small molecules but from products of larger-scale engineering."

In focusing on education, Pedro Arce, professor and chair of chemical engineering at Tennessee Tech University, put the emphasis on the novice rather than the expert: "Forget about teaching, it's all about learning." We should be training engineers to be "masters of scaling." He encourages a progressive approach, with students starting at point zero to becoming a master of scaling.

David Dibiasio, associate professor and head of Chemical Engineering at Worcester Polytechnic Institute, described the benefits of a global approach in order to reach many of the goals of ChE education. In the past 35 years, WPI has sent more students to overseas work/study than any other institution.

Keynote Speaker:
Rajeev Gautam, President and CEO, UOP LLC

Topic: Energy
Moderator: Rakesh Agrawal, Purdue University
Speaker: Maureen McCann, Purdue University
Panel: Andrew Gellman, Carnegie Mellon University
Edmund G. Seebauer, University of Illinois at Urbana-Champaign
Fouad Teymour, Illinois Institute of Technology

Topic: Pharmaceutical and Health Care Engineering
Moderator: Gintaras V. Reklaitis, Purdue University
Speaker: Elizabeth Topp, Purdue University
Panel: Arindam Bose, Pfizer
Surya Mallapragada, Iowa State University
Joseph Pekny, Purdue University

Topic: Education
Moderator: Phillip Wankat, Purdue University
Speaker: Joseph McCarthy, University of Pittsburgh
Panel: Pedro Arce, Tennessee Tech University
Edward Cussler, University of Minnesota
David DiBiasio, Worcester Polytechnic Institute

Maureen McCann (Purdue), Edmund Seebauer (University of Illinois at Urbana-Champaign), Andrew Gellman (Carnegie Melon University), and Fouad Teymour (Illinois Institute of Technology).

"Students need to understand their place in the world and how others function in their place in the world," he says. With this experience, students "understand engineering in global society, open-ended problem solving/critical thinking, understanding ambiguity, project management, all the communication skills, multi-disciplinary teaming, and policy issues, with no sacrifice of content."

Life, Liberty, and the Pursuit of Risk

Risk is often seen as negative: a hazard, an uncertain danger, a gamble. Yet every day we live with risk: technical risk, financial risk, business risk, health risk, personal risk. We take "necessary" risks when we get into a car and live our daily lives. Clearly all risks are not equal. In my view, we should know when and how to take thoughtful, intelligent risks.

As an engineer, I have been trained to expose and evaluate unnecessary risk: to reduce it, consider alternatives, calculate probabilities, and develop contingency plans. As a CEO, I have learned to weigh the risks of making a decision as well as the risks of not making a decision. As an entrepreneur, I look for risk all the time. In thoughtful, intelligent risk-taking, the goal is to assess the upside potential while evaluating and limiting the downside potential. Here I'll share some lessons I've learned over the years.

"There are risks and costs to a program of action. But they are far less than the long-range risks and costs of comfortable inaction."

– JOHN F. KENNEDY

Consider both the worst and best possible outcomes.
Sometimes the worst possible outcome isn't all that bad, or the best possible one isn't all that good. Find ways to mitigate the worst and improve the best potential outcome. In an energy generation business, revenue depended on the relative cost of natural gas and oil. We got ourselves in a feast or famine mindset, which was not productive. When we were able to think through how our business could respond to extreme changes in oil and gas prices, we were able to address the range of outcomes through product development and services.

Distinguish between fact and opinion presented as fact.
Question conventional wisdom; wrestle with paradoxes; engage diverse points of view in the conversation about risk; revisit past failures and successes. In a computer peripherals business, we had a successful components business, with a growing customer desire toward systems. We were comfortable with the components business and were very concerned with the low margins and big competitors involved in systems. By adding systems design and marketing experience to the team, we were able to challenge firmly held beliefs and fundamentally re-think our approach to the business and technologies, becoming a successful systems solutions provider.

Think about both short-term and long-term outcomes.
Consider how the risk might change over time. Anticipate possible unintended consequences and how to pro-actively address them. In a new technology business, we had been working with a direct sales force, which would be expensive to scale with the business. Yet we were concerned about loss of control with adding a distribution sales force. By thinking through a ten-year vision of the business, we were able to move beyond the short-term complications of new sales channels and evaluate the longer-term opportunities of Internet sales and order fulfillment opportunities.

Alumna Emily Liggett, CEO of NovaTorque Inc., was the recipient of the Outstanding Chemical Engineer Award in 1999 and the Distinguished Engineering Award in 2004.

Lean into risk, recognize it as your friend.
If you can't identify big risks, you may have become complacent, a risk in itself. Don't let the fear of failure keep you from taking an intelligent, thoughtful risk. Reluctance to change and fear of failure come out in many different ways. Often as we explored what was keeping us from trying something different, we saw that finding and naming the resistance helped remove the obstacle.

Create a culture where thoughtful risk-taking is encouraged and playing it safe is not.
Treat your work seriously, but don't take yourself seriously. Reward and celebrate intelligent risk-taking regardless of the outcome. When it's time for promotions, increases and bonuses, make sure you are recognizing people willing to stick their neck out and take considered risks.

Risk is an opportunity. When properly embraced and understood, risk can optimize the potential rather than minimize the options. Seize it.

■ **Emily Liggett (BSChE, '77)**

New Faces, New Ideas

Incoming faculty bring diverse interests to ChE


Raj Chakrabarti


Yue Wu


Chongli Yuan

In the fall of 2009, ChE welcomed three new faculty members, Raj Chakrabarti, Yue Wu and Chongli Yuan. The school is excited by the diversity of knowledge and interest areas each brings, and looks forward to watching their expertise and teaching acumen take root in its classrooms and labs.

Chakrabarti graduated from Harvard, magna cum laude, with a degree in chemistry and earned his PhD from Princeton before arriving at Purdue. In his research, which focuses on molecular-scale design and control, he is currently pursuing quantum computing — the design of next generation computers — and rational protein design.

Both of Chakrabarti's areas of research involve the extension of engineering principles into the domain of the ultra-small. Chakrabarti attributes all aspects of his education in allowing him to pursue these fields.

"My undergraduate background in chemistry and physics at Harvard prepared me for the quantitative side of the field," Chakrabarti says. "Later, while working on biophysics projects at Princeton, I became interested in the extension of these physical principles to complex molecular systems and obtained hands-on experimental expertise.

"As a post-doc at MIT and Columbia, I obtained more extensive experience with computational techniques that are necessary to bridge the gap between theory and experiment. Purdue provides an impressive infrastructure for the scale-up of cutting-edge engineering techniques from the drawing board to real-world applications "

Wu's research, on the applications of nanostructured materials in renewable energy, focuses on three components: energy generation through photovoltaic solar cells, energy storage through lithium batteries and supercapacitors, and energy conversion through catalysis and thermoelectrics.

Wu comes to Purdue after receiving his undergraduate degree from the University of Science and Technology of China, a PhD in chemistry from Harvard, and postdoctoral training at the University of California-Berkeley. Wue said he was attracted to the field by "the fascinating properties of nanomaterials.

"The key challenge for nanotechnology is how we can engineer nanomaterials in the exact way we want, which include electronic, optic, magnetic, catalytic properties and surface/interfacial phenomenon," says Wu.

"I hope I will be able to establish a dynamic research program here to explore the wonders of nanotechnology and eventually find an economical and environmentally friendly solution to meet the energy requirements for sustainable development."

Yuan has roots in East China University of Science and Technology and Cornell where she earned a bachelors and PhD in chemical engineering. Her research uses an engineering approach to explore important biological phenomena.

Currently, Yuan is interested in understanding the epigenetic gene regulation using biophysical methods and designing biomimetic nanoparticles for detection of epigenetic modifications.

"I was stunned by how many opportunities a chemical engineer has in the biomedical field." Yuan says. "With our unique ability and perspective as engineers, we are capable of combining techniques from different fields to address biological problems.

"I worked as a postdoc researcher at the Institute of Molecular Biology and Biophyiscs in Zurich, Switzerland, for two years before joining Purdue. It was during this time that I came across the epigenetic problem. Amazed by its potential to resolve the cancer mystery, I decided this is the field I wanted to focus on and contribute to."

While Chakrabarti, Wu and Yuan emphasize very different research areas, all three agreed that one of the most exciting things about being a professor is the freedom they are allotted.

"The most exciting thing about being a professor is that you have the freedom to explore the topics you are interested in, share the up-and-down in the journey with your students, and help them to establish their own careers," says Wu. ■ **Rusty Barnes**

AGEP scholar and ChE graduate student Dana Gary, preparing to use the glove box.

Chemical engineering students Dana Gary, now completing a doctorate, and Tyler Teykl, a junior, are serving Purdue University in two high-profile posts.

Seize the Day

Students earn key university spots

Gary an AGEP scholar

"Give and take" define Dana Gary's role as a scholar in the Midwest Crossroads Alliance for Graduate Education and Professoriate (AGEP).

She gives by mentoring new graduate students, tutoring, and leading workshops and study tables. In return, she gains access to resource materials, enrichment workshops, professional conferences, faculty mentors and a financial stipend each semester.

Fall 2009 was Gary's third semester in AGEP. She is one of 19 and the only one from engineering. "It's a way to give back," the 2005 Carnegie Mellon University graduate says of her commitment.

"It's a privilege to be selected. Besides the financial benefit, it's an opportunity to meet a lot of people outside of my discipline," she says, "and an opportunity to give back to the types of programs that helped me get where I am today."

The Pittsburgh native learned early to take advantage of available help. "I didn't use a lot of tutors, but I would always be at office hours. That was advantageous, even if I didn't think I needed help."

One way she's given back is by presenting an interviewing workshop. "Be as prepared as you possibly can," she tells students. "Do your homework about the company, prepare questions, and sound interested."

Studies complete, this summer Gary will join Exxon Mobil's products research and technology group. "I always planned to take my education to industry and to work on my practical skills," she says.

Teykl named to Board of Trustees

Student representative to the Purdue Board of Trustees, ChE junior Tyler Teykl.

Parents who modeled involvement and his own high school leadership posts likely contributed to Tyler Teykl's being named last summer to a two-year term on the Purdue University Board of Trustees.

"They instilled a sense of getting involved, focusing academically and extracurricularly," Teykl says of his parents, both administrators at Terry High School in Rosenberg, Texas, where he graduated as valedictorian. "They pushed me on the right path."

He did his part by serving as captain of the football team and president of the student council. As a Purdue freshman earning a Trustees Scholarship, he was selected for the President's Leadership Class, where he learned of the trustee opening.

He applied, was one of 30 interviewed on campus, 10 recommended to Indiana Governor Mitch Daniels and four finalists. "I did my interview with the governor's office by video conference from Texas." When he was appointed July 1, "I was pretty ecstatic."

Now, he's committed to seven two-day meetings a year, an off-site retreat, commencements, dedications and other Purdue events.

Despite being nervous his first meeting, "The trustees welcomed me. They are definitely one of the most open, easy-to-talk-to groups of people," Teykl says. "I'm the only one on campus regularly, and they definitely take that into consideration and want to hear me."

After graduation, Teykl hopes to put his education to work in the sustainability and energy sectors. "I'm interested in cleaner, more efficient fuel—gasoline or fuel cells—for private transportation." ■ **Kathy Mayer**

Delivering Hard Work and Dedication

Forney shipping and receiving clerk Larry Campbell was recently recognized with the COE Professional Achievement Award.

FIRST CLASS

For each professor and student who achieves greatness in the classrooms and labs of Purdue, there is a crew of staff members working behind the scenes to make those victories possible. They move and assemble equipment, ready classrooms, help set up experiments and deliver the mail. Trying to run Purdue without these individuals would be like trying to drive a car without any cylinders. It cannot be done. At the School of Chemical Engineering one of the most important cylinders is Larry Campbell and he's been operating at full speed for 31 years.

The lion's share of Campbell's 40 years at Purdue have been spent as shipping and receiving clerk at Chemical Engineering where he has worked with generations of students and faculty. His primary responsibility is for the school's mail and its distribution. Campbell also runs the copy and supply rooms. "Without the mail, everything stops," said Campbell. Campbell often goes above and beyond to make sure sensitive packages are delivered. He's also learned over the years to handle hazardous chemicals and temperature-sensitive deliveries. Campbell is currently working on implementing a bar-code scanning system to keep track of all the deliveries. A smart move considering that the school receives over a hundred packages a week.

His other domain is the copy room. Over his long career, Campbell has kept up with the ever-changing technology of copying. He started out with an offset press and has literally made millions of copies. Through his work, more than half of our 10,000 graduates were able to read their syllabus, prepare homework, take tests, complete exams, and present posters at conferences. He also described himself as kind of a "handyman" who volunteers for extra jobs and helps out wherever he is needed. He gets help from other staff members and the student worker who assists him. "Without their help, I'd be in trouble. They make me what I am," said Campbell.

"Without the mail, everything stops."

Campbell was recognized by Purdue and his peers recently with the 2009 College of Engineering Professional Achievement Award. He was nominated for his continuous outstanding work. Many professors, staff and graduate students at Forney echoed this nomination with their own letters of recommendation, filled with stories of Campbell going above and beyond the requirements of his job for them. Helping out the faculty, staff, and students wherever and whenever he could, examples of his work prowess and efficiency were coupled with tales of his kindness, great attitude and how he is always willing to lend a hand or an ear to anyone who needs it. One PhD student described Campbell as the, "friendly neighbor who never fails to provide a cup of sugar or a warm smile."

Surprised, humble and grateful would be the best way to describe Campbell's reaction to the nomination and award: "I was wondering what I did that was so special. I was just doing my job the best I could."

When he's not at work, Campbell enjoys spending time with his family, church activities, reading and Colts football. After 40 years at Purdue, he's still going strong and is quite happy with his career. "I'm just thankful I had my experience at Purdue." ■ **Joseph Fowler**

Outstanding Achievement

Alumni set the bar high

Outstanding Chemical Engineer Henry Sampson poses with students following the award ceremony.

Renowned. Eminent. Celebrated. These are just a few words one could use to describe the recipients of the 2009 Outstanding Chemical Engineer award. Used to recognize and honor alumni who have achieved distinction as leaders in their careers and who have shaped the chemical engineering profession, this prestigious award has only been given to 121 of the school's 9,000 alumni.

The 2009 recipients, honored in October, are Henry Sampson, retired director of mission development and operations of the space test program at Aerospace Corporation, and Mary Ellen Weber, vice president of governmental affairs and policy at the University of Texas' Southwestern Medical Center.

Sampson (BSChE '56) was raised in Jackson, Mississippi, and attended Morehouse College in Atlanta before transferring to Purdue, where he was a member of Omega Psi Phi fraternity. Upon graduation, Sampson worked as a research chemical engineer at the U.S. Naval Weapons Center in China Lake, California, before receiving his master's degree and PhD at the University of Illinois at Urbana-Champaign, in 1965 and 1967, respectively.

Sampson's career then took him to the Aerospace Corporation in El Segundo, California, where he served in many roles. He has written a number of papers on rocket propulsion, direct conversion of nuclear energy to electricity, and computer simulation of electrical systems. He was the coinventer in 1971 of the gamma-electric cell that made it possible to send and receive audio signals via radio waves without wires.

A writer, film historian, and documentary film producer, Sampson focuses on the African American presence in the film and entertainment industries. He has written five books about the portrayal of African Americans in movies, cartoons, and on radio.

Mary Ellen Weber (BSChE '84), at the University of Texas Southwestern Medical Center in Dallas, focuses on analytical approaches to legislative issues and strategic communications. In addition to her Purdue degree, Weber holds a PhD in physical chemistry from the University of California, Berkeley, and a master's degree in business administration from Southern Methodist University. Her doctoral work explored the physics of gas-phase chemical reactions involving silicon. She has recieved one patent and published several papers in scientific journals.

In 1992, Weber was selected by NASA in the 14th group of astronauts and subsequently flew on STS-70 (Discovery, 1995) and STS-101 (Atlantis, 2000), logging more than 450 hours in space. She is among the youngest astronauts to fly in space. At NASA, Weber held assignments in technology commercialization,

Outstanding Chemical Engineer Mary Ellen Weber (center) is presented with the award by Chongli Yuan, assistant professor of chemical engineering, and Arvind Varma, school head.

as a legislative affairs liaison, and as chairman of the procurement board for the biotechnology program contractor. She is a recipient of the NASA Exceptional Service Medal.

Weber, a 1998 Purdue University Old Master, was a Dean's Engineering Scholar while at Purdue, as well as a member of Phi Mu social sorority and a Grand Prix participant. Weber is a skydiver and has earned 12 silver and bronze medals at the U.S. National Skydiving Championships.

During their visit in the School of Chemical Engineering, the honorees had the opportunity to meet with faculty, staff, undergraduate and graduate students. They listened to presentations covering update of activities and initiatives in our School and interacted closely with recently hired faculty members. They were honored at a reception and each of them gave a talk about their careers and endeavors, and how these were helped by their Purdue ChE education. The day concluded with a dinner where they were presented OChE plaques by their faculty hosts and the School Head.

■ **Barbara Leonard**

1960-69

Robert E. Nagy, BSChE '65, retired in 2009 from Collins Consulting, Inc. (Little Rock, AR), where he held the position of VP manufacturing consulting (Strategic Planning and Profit Improvement).

Joseph Alford, BSChE '66, received a 2009 International Society of Automation (ISA) "Standards and Practices" award. Alford has been appointed as a visiting professor in the School of Chemical Engineering at Purdue for the Spring 2010 semester. He was recently also elected by his peers to the Process Automation Hall of Fame.

Donald F. Haas, BSChE '67, retired effective January 2010.

C. Locke Scripps, BSChE '68, retired in 2008 after 20 years with Procter & Gamble and 20 years with Total SA. He is currently serving on the board for the Carolinas Concert Association and the River Run Country Club.

1970-79

Thomas L. Wood, BSChE '70, retired from Valspar in 2007, started a consulting business in 2008, and joined National Capital as an investment banker in June 2009.

Michael Lappa, BSChE '71, retired from the position of VP-Sales & Marketing for Potlatch Pulp & Paperboard in April, 2008, after a 37 year career in the Paper and Packaging industries. In April 2009, he founded *Professional Transitions*, a career transition services business for professionals. He also serves as a member of the board of directors for area non-profit organizations.

Mark G. White, MSChE '73, retired from Mississippi State University after 32.5 years of service. His position before retiring was director and Earnest W. Deavenport, Jr. Endowed Chair.

Thomas Maliszewski, BSChE '73, was appointed adjunct professor in the School of Chemical Engineering at Purdue. He has been involved in the Senior Design Project for several years.

Abbie Griffin, BSChE '74, at the 2009 Product Development and Management Association (PDMA) International Conference, was awarded the Crawford Fellow for her research contributions in the area of product innovation management. Griffin holds the Royal L. Garff Presidential Chair in Marketing at the University of Utah's David Eccles School of Business.

Robert Diekman, BSChE '75, retired in May 2009 after 34 years in the refining and chemicals industry. His last role was with BP as manager, aromatics engineering.

Deborah L. Grubbe, BSChE '77, has been named the chair of AIChE's Institute for Sustainability. She is also serving as a member of the National Research Council's Closure Committee for the Demilitarization of the US Chemical Weapons Stockpile.

Spencer A. Jeffries, BSChE '79, retired in October 2009 after 11.5 years as a network engineer with B&V Technology in Houston. He previously worked 15.5 years for Jefferson/Texaco/Huntsman Chemical at the Conroe specialty chemical plant near Houston, TX.

1980-89

Arindam Bose, PhD '80, was elected a Fellow of the American Chemical Society in 2009.

William O. Carter, III, BSChE '80, was promoted to process manager at Anvil Corporation in Bellingham, WA in April 2009. He and Teri Carter (Nagel, BSChE '81) have lived in Ferndale, WA for the past 12 years.

David Kenneth Jones, BSChE '82, recently joined MBI as senior VP after 24 years with Ashland Chemical. MBI is an industrial botechnology organization working on new ways to make biofuels and biochemicals.

Brian E. Stutts, PhD '83, was recently named director of process engineering for Corning Incorporated. He has been with the company for 26 years. He is continuing to represent the company on the Engineering Education Industrial Advisory Board at Purdue.

Rock R. Kaiser, BSChE '86, received Qualified Steam Specialist certification from Department of Energy in 2006. In 2009 he started Sustainable Steam & Water Solutions Inc. to provide energy and water system consulting services focused on energy, emission and water reduction projects to the food & beverage, manufacturing, and health care industries.

David Rockstraw, BSChE '86, was elected to chair the Professional Engineers in Higher Education (PEHE) interest group for 2010-11. He is currently serving as the chair elect.

Rob Krantz, BSChE 87, was recently promoted to director, professional services for Rockwell Software, a business unit of Rockwell Automation.

Chris Bowman, BSChE'88, PhD'91, received the Charles M. A. Stine Award, AIChE, 2009. He is the Patten Professor of Chemical and Biological Engineering at University of Colorado.

Antonios Mikos, PhD '88, received the ChE Lectureship Award, ASEE, 2009, and was elected fellow, Biomedical Engineering Society. He is the J. W. Cox Professor of Chemical and Bioemolecular Engineering at Rice University.

Shawn Spera, BSChE '89, was recently promoted to global product manager within the STERIS Corporation, an International provider of contamination control and sterilization solutions for both life sciences industries and health care markets.

1990-99

Majella Sosa Doneza Stevenson, BSChE '90, (Lt. Commander) completed successful deployment in the Middle East in February. She will retire from the U.S. Navy in March 2010 after 20 years of service.

Kristi Anseth, BSChE '92, received the Professional Progress Award, AIChE, 2009, and was elected to the National Academy's Institute of Medicine. She is the Tisone Distinguished Professor of Chemical and Biological Engineering and Associate Professor of Surgery at the University of Colorado.

Eric E. Brooks, BSChE '92, earned Professional Engineer license in Indiana. He recently completed Boiler Room expansion project for the Dannon Company in Minster, OH.

Theodore W. Pirog, MS '95 and PhD '98, was assigned the job of reservoir and subsurface engineering supervisor for equatorial Guinea with ExxonMobil effective June 1, 2009.

Surya Mallapragada, PhD '96, was elected Fellow, AAAS, and was honored with the Distinguished Service Award, FPB Division, AIChE, 2009. She is the Richard Stanley Chair in Interdisciplinary Engineering and Head, Department of Chemical and Biological Engineering, Iowa State University.

2000-2009

Roger Hoover, BSChE 2000, after working for 3 years at E*Trade Financial as a software architect on core infrastructure projects, was the youngest engineer to be promoted to principal software engineering. In 2007, he joined a mobile marketing startup, called Mozes, and built a scalable infrastructure in highly productive dynamic languages. In 2009, he was promoted to Director of Engineering.

Adith Sujan, BSChE 2002, also holds a master's in Engineering Management & Organizational Behavior. He currently works for Rogers Corporation as product development engineer.

Brad Taylor, PhD 2005, was awarded the 2009 ConocoPhillips Outstanding Young Scientist Award for his work on reducing the benzene content of gasoline.

Daniel Siderius, PhD 2007, completed a postdoctoral research associateship at Washington University in St. Louis and has recently begun a fellowship hosted by NIST in Gaithersburg, MD where he will continue his computational chemistry and physics research.

Send your updates to **chealumni@ecn.purdue.edu**. News from the most recent six months will be included in the next issue of *Impact*. Any other updates will be listed on the ChE alumni Web site at **engineering.purdue.edu/ChE/People/Alumni**.

aperture

A scanning electron microscope picture of nacre, also known as mother-of-pearl, a biomineralized composite that is known for its strength and resilience. The image is from civil engineering's Computational Multi-Scale Materials Modeling Group, led by Pablo Zavattieri. He has paired with David Kisailus, assistant professor of chemical and environmental engineering at the University of California, Riverside, to study the structure-mechanical property relationships of composites in order to develop new materials and structures that will offer a new combination of low weight, high strength/toughness and multifunctionality. The materials could have applications in the auto, energy, shipbuilding and defense industries, as well as widespread use in civil and aerospace engineering.