Holistic learning in Honduras: Undergrads design water systems for villages

Meet Simon Rogers, our newest faculty member

Alumni profile: Gary Renola: From plant manager with ExxonMobil to Texas mayor

David Boger, PhD ’66, reflects on his pioneering work with the mining industry in waste minimization
Dear Alumni and Friends,

Greetings from Illinois! Most of the fall semester has already passed, and by the time you read this our students will be preparing for final exams and wrapping up semester-long research and design projects. This fall about 2000 freshmen and transfer students joined us, keeping our total number of undergraduates close to 700. Of incoming freshmen, 12 percent are minorities and 18 percent come from outside the U.S., quite a difference from 25 years ago when international students accounted for only 2 percent of chemical engineering undergraduates, and African Americans and Hispanics made up 5 percent. The chemical engineering degree continues to be in high demand, as evidenced by the high-quality students who are applying to our program. The average ACT score for incoming freshmen was 31.4. At the campus level, we unfortunately saw Chancellor Phyllis Wise resign from her position in August. Our own Dean of the College of Liberal Arts and Sciences, Barbara Wilson, stepped in as Acting Chancellor. Wilson has a wealth of experience in higher education and is a strong advocate for the campus. A search for a permanent chancellor has begun.

This fall semester we were pleased to welcome back to campus several notable alumni. In September, John George – B.S. ’51, former CEO of International Paper – was inducted into the College of Engineering Hall of Fame. In early October, David Roger – PhD ’66, with James Westwater, Engineering Professor at Monash University in Australia – came back to deliver our Distinguished Alumni Lecture, sharing insight with us about the development of “Boger Fluids” and his work on how to better contain waste from mines. Furthermore, Darsh Wason – B.S. ’90, Distinguished Motorola Professor of Chemical Engineering and Vice President for International Affairs at Illinois Institute of Technology in Chicago – returned to campus to be honored with one of the College of LAS Alumni Achievement Awards. We also enjoyed visiting with friends and alumni at the Homecoming tailgate, and connecting with many alumni at three events in the Chicago area: an evening at the Ravinia Festival, the School of Chemical Sciences reception at Cliff Dwellers, and the State of the Campus luncheon in downtown Chicago.

The department is proud of its many alumni who have had remarkable careers and life stories we love to highlight in the newsletter. For example, in this issue we learn about Gary Renola, PhD ’79, his Holing career at ExxonMobil, and how he became the mayor of a Texas town. Also, you will find inside a Q&A with College of Engineering Hall of Fame inductee John George. Also available as a video on our website, chbe.illinois.edu! We also learn about why graduate Jim Morris, BS ’81, created a faculty scholar position in the department named after his parents. This fall we also held the investitures for Dr. Hong Yang as the inaugural Richard C. Alkire Professor in Chemical Engineering, created by alumni donations in honor of Dick Alkire, the Charles and Dorothy Prizer Chair Emeritus who continues to be very active in our department despite having formally retired.

In this issue we introduce our newest Assistant Professor, Simon Rogers, who joined our department in August. We feature a group of undergraduates who participated in the “Honduras Water Project,” a year-long class that takes them to rural Honduras working in water systems alongside students from civil and environmental engineering as well as public health. In this class the students act as consultants to the community and a non-governmental organization there. As you will see, activities like these complement our program’s regular coursework including Process Design, and prepare our students for working in a chemical plant setting with people from a variety of different backgrounds.

Last but not least, let me also explicitly thank the many alumni who give back to the department, be it through scholarships, fellowships, named professorships, or through unrestricted gifts. Inside you will find an article about some of the activities we support with unrestricted gifts. We greatly appreciate the generosity of our alumni and friends, especially in financially challenging times like these.

Please continue to connect with the department via Facebook (we now have over 600 followers!), Twitter (our handle is @CHBE_Illinois), and the School of Chemical Sciences LinkedIn group. And keep sending us your updates, photos, and stories so we can feature them in future newsletters!

I wish you happy holidays, and hope to see many of you back on campus or on the road.

Best Regards,

Paul J. A. Kenis
Department Head

 трудностям, которые связаны с восприятием и пониманием текста.

Dr. Hong Yang invested as Richard C. Alkire Professor in Chemical Engineering

As a young middle school student in Taiyuan, China, Hong Yang fell in love with chemical sciences when his teacher demonstrated the carbonization of sugar with sulfuric acid. As the black column of carbon foam emerged, he was hooked.

Today Professor Yang is recognized around the world for his work in the field of nanotechnology, particularly in the synthesis of nanomaterials of well-defined structure and composition. He is a leader in the synthesis of bi- and multi-metallic Pt-based nanostructures, which are being evaluated for a range of catalytic applications including fuel cells.

This fall the University of Illinois celebrated the investiture of Dr. Hong Yang as the Richard C. Alkire Professor in Chemical Engineering. Investiture as a named chair or professorship is one of the highest honors a faculty member can receive.

Dr. Yang’s accomplishments “help realize the land grant mission of the university, translating knowledge into action and impact on the world,” said Interim Provost Edward Feser.

Hong Yang thanked his family, wife, Xinhong Lu, daughter, Chloe J. Yang, and son, Dan Z. Yang, for their support as well as his current and former students, colleagues and department leaders. Professor Yang also said he owed a great deal of his success to his grandmother, who lived with his family when he was a young boy.

“She passed on to me not only her confidence and love, but also her strong belief in the power of knowledge,” Yang said.

Professor Yang received his B.S. degree in Chemistry from Tsinghua University, and his Ph.D. degree in Chemistry from the University of Toronto. For his thesis...
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Paul J. A. Kenis
Department Head

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Mass Transfer
Department of Chemical and Biomolecular Engineering

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Department Head

Mass Transfer Editor
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Department News
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Faculty Feature
Alumni Giving
Class Notes
In Memoriam
Remember When

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Dr. Hong Yang
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M.S.: University of Victoria
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Joined department in 2012
Uses material chemistry approaches to design nanostructures for energy and biological applications.

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In 2012, he joined the Department of Chemical and Biomolecular Engineering at Illinois. He is a National Science Foundation CAREER Award recipient, a Fellow of the American Association for the Advancement of Science, a section editor on Nanotechnology for Current Opinion in Chemical Engineering and serves on the editorial board of Nano Today and other journals.

“I am also very grateful to the anonymous donor whose generosity makes this professorship possible,” he said.

Given recent budget challenges on the state and federal level, such gifts have become especially critical to building a strong faculty at Illinois, Yang said.

School of Chemical Sciences
Director
Jonathan Sweedler, CBE Department Head
Head Paul Kenis, Richard C. Alkire
Professor in Chemical Engineering
Hong Yang, Interim Provost Edward Feser,
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“Spanning from scholarship to administration to music, you’re a great asset to our community,” Dr. Jonathan Sweedler, director of the School of Chemical Sciences, told Alkire.

Professor Alkire expressed gratitude for the support alumni have given the department throughout the years.

“The support they contribute today carries with it a DNA that goes back many decades,” Alkire said. “To a time when a great faculty member did something very important. Regardless of what they say in the movies, education is personal, not business,” he said.

The department’s activities today continue to be “at the edge,” Alkire said. “Research is especially critical to building a strong faculty at Illinois, Yang said.

“Microenvironments Fit for Protocols.” E. Leckband and M. Gruebele received a National Science Foundation award to develop new experimental methodology for decoding how material properties at the nanoscale preserve or shut down biological function.

The effort will use tools previously developed to study ecological and economic sustainability in fishery and other wildlife population management questions to examine the dynamics of stem cell manufacturing.

Two faculty promoted

Christopher V. Rao, who joined the Chemical and Biomolecular Engineering faculty in 2004, has been named a full Professor in the department. He applies systems engineering approaches to study biological problems associated with bacterial pathogenesis, inflammation, and biofuel production. Rao also holds the title of the Robert W. Schaefer Scholar. He earned his B.S. degree from Carnegie Mellon University and his Ph.D. from the University of Wisconsin.

Brendan A. Harley, who joined the Chemical and Biomolecular Engineering faculty in 2008, achieved tenure and has been named an Associate Professor in the department. Harley, who also holds the title of the I.C. Gunsalus Scholar, pursues the fabrication and characterization and testing of scaffold-base systems for in vivo, and in vitro tissue engineering. Professor Harley earned his S.B. degree from Harvard University and his M.S./Ph.D. from MIT.

Excellence in Teaching

Congratulations to faculty who have been recognized by the School of Chemical Sciences for their teaching excellence in the 2014-2015 academic year. Those receiving awards in Chemical and Biomolecular Engineering include:

Professor Mary L. Kraft, Assistant Professor David W. Flaherty and Lecturer Troy J. Vogel.

"The award recognizes the entire scope of our educational efforts, from course development to in-class instruction. Excellence in teaching is not only intellectually satisfying, but our instructional efforts immesurably strengthen our research mission," said Professor Jonathan Sweedler, director of the School of Chemical Sciences.

NSF grants awarded

Associate Professor Brendan Harley has received a two-year grant from the National Science Foundation for “EAGER: Biomimicking the Hematopoietic Stem Cell Niche.”

Working with Professor Bruce Hamon of the University of Illinois Department of Geography and Geographic Information Science, the project will demonstrate approaches that integrate traditional experimental tools with in silico models to design a stem cell biomanufacturing platform to selectively expand donor hematopoietic stem cells. The objective of the project is to demonstrate a new paradigm for advanced stem cell manufacturing.

Hematopoiesis is the process where the body’s blood and immune cells are generated from a small number of hematopoietic stem cells (HSCs) whose behavior is regulated by regions of the bone marrow termed niches. There is an unmet clinical need for stem cell biomanufacturing approaches to selectively expand donor HSCs while also priming them for HSC transplants used to treat a wide range of hematologic diseases.

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Chemical and Biomolecular Engineering Professor Deborah E. Leckband and Chemistry Professor Martin Gruebele received a National Science Foundation award to develop new experimental methodology for decoding how material properties at the nanoscale preserve or shut down the function of immobilized proteins.

The title of the grant is “Microenvironments Fit for Proteins.” Leckband is the Reid T. Millner Professor of Chemical and Biomolecular Engineering and Martin Gruebele is the James R. Eizember endowed Chair in Chemistry. Proteins are coupled to synthetic materials in a wide range of applications from targeted drug delivery to sensors.

Leckband and Gruebele will develop novel experimental approaches that identify nanoscale design rules for materials that preserve immobilized proteins.

ChBE * research is focused on transforming a small gold-mine of scientific understanding at the atomic scale into a big gold-mine of well-engineered products that work.*

Richard Alkire
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ChBE @ Illinois
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The department’s activities today continue to be “at the edge,” Alkire said. “Research is focused on transforming a small gold-mine of scientific understanding at the atomic scale into a big gold-mine of well-engineered products that work. The educational challenge is to re-invent a curriculum that provides routine engineering methodologies for design and quality control at the molecular scale. This task will take a few decades, and is in its infancy. I envision today’s students returning 50 years hence, and citing words and experiences—perhaps ones that happen tomorrow morning—that inspired them to do what we think today is impossible.”

“Professor Yang represents a superb example of this next-generation of engineering—the manipulation of atomic-scale distributions of elements on catalytic surfaces to optimize their catalytic activity and stability for reducing oxygen—one of the most important chemical reactions of them all,” Alkire said.
Mass Transfer: Fall/Winter 2015

**Mass Transfer: Fall/Winter 2015**

**Troy J. Vogel**
**Deborah E. Leckband**
**Kenneth S. Schweizer**

Mathematics, Engineering, and Science.

of GAMES Camp, or Girls’ Adventures in the summer learning about Chemical and High school students spent a week during Fall/Winter 2015 liquid crystals. A member of the Illinois materials, such as colloids, polymers, and dynamical phenomena in soft mathematical theories to understand equilibrium the University of Illinois. Schweizer de-

Materials Science and Engineering at Margaret H. Morris Professor of Schweizer is the G. Ronald and ExxonMobil.

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The annual award, established in 1980, recognizes distinguished contributions to the understanding of the chemistry and physics of liquids. It’s named after ACS Past President Joel H. Hildebrand and is sponsored by ExxonMobil.

Schweizer is the G. Ronald and Margaret H. Morris Professor of Materials Science and Engineering at the University of Illinois. Schweizer develops and applies statistical mechanical theories to understand equilibrium and dynamical phenomena in soft materials, such as colloids, polymers, and liquid crystals. A member of the Illinois faculty since 1991, he has appointments in the Departments of Materials Science, Chemistry, and Chemical and Biomolecular Engineering.

**Proof of Concept Awards**

**Professors Brendan A. Harley and Rohit Bhargava.** Professor of Bioengineering and Bliss Faculty Scholar and an affiliate professor in ChBE, were among the researchers awarded with 2015 Illinois Proof-of-Concept Funds through the university’s Office of Technology Management. Proof-of-Concept funding has helped to enable the formation of startup companies, attract venture and angel funding, and advance applications for federal SBIR/STTR (Small Business Technology Transfer and Small Business Innovation Research) funding.

**Congratulations to Professor Kenneth S. Schweizer,** recipient of the Joel Henry Hildebrand Award in the Theoretical and Experimental Chemistry of Liquids from the American Chemical Society.

**ACSM honors Schweizer**

**Rohit Bhargava**

High school students spent a week during the summer learning about Chemical and Biomolecular Engineering at Illinois as part of GAMES Camp, or Girls’ Adventures in Mathematics, Engineering, and Science.

**Campus News**

**Leadership changes: Wilson named interim chancellor**

Barbara Wilson, who has nearly three decades of experience in public higher education, including 15 years as a faculty member and administrator at the University of Illinois, has been named the interim chancellor of the Urbana-Champaign campus following the resignation of Phyllis Wise.

“My job now is to work with the entire campus community and with our alumni and friends to guide this leadership transition in ways that are collaborative and collegial and that reinforce the traditions of shared governance that are Illinois hallmarks,” Wilson said. “Together, I hope we can ensure that this year is one that carries our momentum of accomplishments and innovations forward.”

Wilson has most recently been dean of the College of Liberal Arts & Sciences and plans to return to that role once a permanent chancellor has been chosen.

“The University of Illinois at Urbana-Champaign has never been about a single individual. Our presidents, chancellors, provosts and deans have changed over the years, but what has never wavered is the record of world-changing discoveries and educational excellence that are the hallmarks of this incredible university,” said University President Timothy Killian. “We were founded with a spirit of optimism and the promise that a college education would be accessible to anyone who had the determination to learn,” he said.

Wise has returned to the faculty and plans to teach a course in Spring 2016 in the Department of Molecular and Integrative Physiology. Planning for the new College of Medicine, a project for which Wise has championed, continues.

**New home at Illinois for wounded vets**

This fall the campus celebrated the opening of the Chez Family Foundation Center for Wounded Veterans in Higher Education. The state-of-the-art facility, 908 W. Nevada St., combines 24-hour comprehensive support with academic programming to prepare wounded veterans to live independently and to successfully pursue their educational and career aspirations. The center offers health and life skills management training, facilitated peer mentorship, academic tutoring, psychological and career counseling, rehabilitative services and employment services to injured warriors returning from conflicts.

**Record number of students this fall**

One in five freshmen are first-generation college students

The University of Illinois enrolled a record 76,166 students on its three campuses this fall, including its largest freshman class ever and increased enrollment of African-American and Latino students.

In Urbana, on-campus enrollment increased 11 percent, from 43,602 to 44,087. Freshman enrollment was up 9 percent, from 6,937 to 7,665. One in five freshmen are first-generation college students. Of the 7,665, 5,500 hail from Illinois and 1,100 are international students. African-American enrollment increased 2.4 percent, from 1,744 to 1,786, and Latino enrollment rose 10.2 percent, from 2,821 to 3,110 over the prior fall.

The freshman class in Urbana is also among the most academically talented in the nation. The average ACT score is 28.5 and the average SAT is 1,564. In ChBE, 200 freshmen and transfers joined us, bringing the total number of undergraduates to nearly 700. The average ACT of incoming freshmen in ChBE was 31.4.

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The freshman class in Urbana is also among the most academically talented college students.

This fall, the campus celebrated the opening of the Chez Family Foundation Center for Wounded Veterans in Higher Education. The state-of-the-art facility, 908 W. Nevada St., combines 24-hour comprehensive support with academic programming to prepare wounded veterans to live independently and to successfully pursue their educational and career aspirations. The center offers health and life skills management training, facilitated peer mentorship, academic tutoring, psychological and career counseling, rehabilitative services and employment services to injured warriors returning from conflicts.

Leadership changes: Wilson named interim chancellor

Barbara Wilson, who has nearly three decades of experience in public higher education, including 15 years as a faculty member and administrator at the University of Illinois, has been named the interim chancellor of the Urbana-Champaign campus following the resignation of Phyllis Wise.

"My job now is to work with the entire campus community and with our alumni and friends to navigate this leadership transition in ways that are collaborative and collegial and that reinforce the traditions of shared governance that are Illinois hallmarks," Wilson said. "Together, I hope we can ensure that this year is one that carries our momentum of accomplishments and innovations forward."

Wilson has most recently been dean of the College of Liberal Arts & Sciences and plans to return to that role once a permanent chancellor has been chosen.

"The University of Illinois at Urbana-Champaign has never been about a single individual. Our presidents, chancellors, provosts and deans have changed over the years, but what has never wavered is the record of world-changing discoveries and educational excellence that are the hallmarks of this incredible university," said University President Timothy Killeen. "We were founded with a spirit of optimism and the promise that a college education would be accessible to anyone who had the determination to learn," he said.

Wise has returned to the faculty and plans to teach a course in Spring 2016 in the Department of Molecular and Integrative Physiology. Planning for the new College of Medicine, a project for which Wise has championed, continues.

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**Undergraduate Education**

**HOLISTIC LEARNING IN HONDURAS**

**STUDENTS JOIN WITH OTHER UNDERGRADS TO DESIGN WATER SYSTEMS FOR RURAL COMMUNITIES**

During the two-semester course, students design and implement a water distribution system in a rural community in Honduras.

In August 2013, a week before classes began, chemical engineering student Bob Michalowski decided on a whim to check out a new engineering design class he had never heard of before. If he didn’t like it, he’d drop the class immediately, he told himself.

“It only took one class to rope me in, and to this day, it remains in the top tier of my list of the most enjoyable classes throughout my entire curriculum,” he said.

Now a process engineer at Koppers, Michalowski is still involved with the class—ENG 398: Real World Design: The Honduras Water Project. Since graduating with a bachelor’s degree in chemical engineering in May 2014, he has been a mentor for the technical design portion of the course.

Now in its third year, the course was established by College of Engineering teaching associate Ann-Penny Witmer, a professional engineer who has worked with nongovernmental organizations such as Wisconsin Water for the World and Engineers Without Borders, and then-graduate students Eileen Walz and Keilin Jahnke (now a co-instructor), with support from an assistant dean in the college at the time.

During the two-semester course, students design and implement a water distribution system in a rural community in Honduras. Students come from a variety of engineering disciplines—chemical, civil, mechanical, electrical, and agricultural engineering—as well as community health, nutritional sciences, Latin American Studies, and more. The class is open to undergraduate and graduate students.

In the beginning, Witmer tries to break down any preconceptions about service projects or service trips for students, many of whom have gone on such trips before. The approach is not travel, build, leave.

Residents of rural communities in developing countries like Honduras “need consultation, not a hand,” Witmer said. Students should act as consultants, she said.

She has outlined several principles to ensure community ownership of the project: long-term sustainability, mutual benefit, local expert involvement, and investment from all involved parties.

Aiming for “a holistic-type of learning” experience for students, Witmer has the students arrange themselves into teams or groups, which helps them learn about their own strengths and contributions. Each group has a different focus: technical support (such as water collection and treatment), social support (health education, community impact), and political (governance, water rights, land ownership).

By the end of the first semester the class has a preliminary plan and delivers a presentation to their professional mentors and staff from the nongovernmental organization ADEC, or Agua y Desarrollo Comunitario, the NGO that works in water, sanitation, health, and hygiene issues in rural Honduras.

“Real-life projects”

The plan is further revised based on feedback and additional information. For the first two years of the class, students traveled to Honduras during Spring Break. This year, the class will travel to the country during the winter break. Once there, the students meet community leaders, and go from house to house to talk with residents to find out how they use water and what they expect from the water delivery system.

In the mountainous areas where they have worked, natural springs provide water for residents. The water tends to be distributed to homes via black rubber hoses that crisscross the land and it is generally not disinfected.

Students often encounter an array of challenges, such as landownership disputes, geographic and climate challenges or cultural beliefs about water that may prevent some residents from, for example, wanting to treat water with chlorine.

“The cornerstone of success is having strong support on the ground,” Witmer said.

The projects, which vary depending on the community where they work, are not ones that are built and installed over a week, but ones that tend to be built by the community. While the comprehensive water systems are built by the communities themselves, the students try to provide new ideas and techniques to address specific issues within the communities they serve. In the first two years, students taught Honduran masons a new

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technique for building a ferrocement tank in Las Queceras and pilot-tested a pesticide-removing filter made from a large garbage can and charred coconut shells for Fatima, both near Marcala. This year the students will be working in Montana Verde and unlike past years, they will be working with surface water from a nearby river. These are “real-life projects” that will influence the lives of others, “but you also get to develop it in person and throughout a long period of time, which thus constantly brings what you’ve learned in a classroom to a real-life scenario, making everything more interesting,” said Francisco Battiti, a sophomore studying chemical engineering. He took the course his freshman year.

“Staying in the community is a certain extent, to live the life lived by the villagers,” he said.

Battiti said, “very limited supply of information,” develop and derive solutions with a in the shoes of others, to work and thinking skills. It forces you to step forced to think differently. It enhances encourages you, but you find yourself (about the course) is that it not only course his freshman year.

For Michalowski, the experience put “my education pedal to the metal,” and brought together ChBE course material into “one solid foundation of understanding.” He found the class complimentary to ChBE 431, “Process Design,” particularly with learning how to “zoom out and look at the big picture without getting caught up in the smaller details.” The course also helped him learn how to overcome challenges related to communication and cultural understanding.

“I’ve found that in a chemical plant setting, there are many non-engineering personnel who have a certain way of doing their work, and if you come along with a change in the process or a change in the work routine, it’s often met with confrontation and contempt, even if it is an improvement in process safety. This class gave me the skill set to deal with these scenarios;” he said.

Funding for the project construction has been provided by a grant from ARCO/Murray of Downers Grove, Illinois.
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“What I found most challenging about the course is that it not only encourages you, but you find yourself forced to think differently. It enhances your problem solving and critical thinking skills. It forces you to step in the shoes of others, to work and develop and derive solutions with a very limited supply of information,” Battiti said.

Participating in the class and traveling to the town of Marcala has had a profound effect on him by setting the trajectory of the career he hopes to develop one day, Battiti said.

“It made me aware of the world-wide problem of the lack of access to clean water around the world. As a ChemE, I want to fight this problem, perhaps not always by building new water systems for communities, but by finding new and better ways to clean and purify water that communities around the world may access,” he said.

Born in Argentina and raised in Honduras, Battiti thought he knew all about his country. But he had never been to Marcala before and even when he participated in the Medical Brigades, a program aimed at bringing aid to rural villages, the group stayed in a nearby hotel and drove to the villages every morning.

“Staying in the community is a completely different and much more gratifying experience. I got, to a certain extent, to live the life lived by the villagers,” he said.

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Fourteenth annual
GRADUATE RESEARCH SYMPOSIUM

Graduate students in the Department of Chemical and Biomorphical Engineering and members of the Graduate Student Advisory Council held another successful research symposium this fall. The 14th annual event took place on Oct. 23 as part of Homecoming weekend.

The symposium allows graduate students to present their work in the form of either a poster or an oral presentation. Research areas include a range of topics, such as nanotechnology, biotechnology, computational science, and energy applications.

Invited judges are typically Illinois alumni from industry and academia. The symposium also provides students with one-on-one opportunities to network with the judges.

This year’s presentations were judged by Dr. Josh Gray (PhD ’04, Allaire), Program Manager with Boeing’s Surface and Analyzing Lab; Dr. Ibrahim Sendjarevic (PhD ’02, McHugh), Business Development Manager with Troy Polymers; Dr. Anastasia Vai (PhD ’03, Sehinidis), PTA Process Optimization Manager with BP; and Dr. Yongbo Yuan (former Illinois ChBE postdoc) with ADM.

CONGRATULATIONS TO THIS YEAR’S WINNERS.

POSTER PRESENTATIONS

FIRST PLACE:
Katelyn Dahlke, part of Assistant Professor Charles Sing’s research group, with “Kinetics of DNA-binding Dimeric Proteins.”

SECOND PLACE:
Siwei Chang from Assistant Professor David Flaherty’s group with his poster, “Deconvoluting the Effects of Solvation and Acid Strength on Zeolite Catalysis: Model Systems for Complex Materials.”

THIRD PLACE (tie):
Sumit Verma from Professor Paul Kenis’ research group with “Electrochemical Reduction of CO2 to Value Added C1-C2 Chemicals and Fuels” and Kai-Chieh Tsao from Professor Hong Yang’s Research Group and his poster, “Continuous Production of Uniform Carbon-Supported Catalysts of Metal Nanocubes and Nanooctahedra Using Carbon Monoxide-Mediated Processes.”

ORAL PRESENTATIONS

FIRST PLACE:
Danielle Mai of Associate Professor Charles Schroeder’s group with, “Simple Molecular Dynamics of Branched DNA Polymers.”

SECOND PLACE:
Ran Chao of Professor Hurnmin Zhao’s group with “Building “BioFAB” for automated synthetic biology.”

THIRD PLACE:
Neil Wilson of Assistant Professor David Flaherty’s group for “Mechanism and Factors that Determine Selectivity for H2O2 Formation on Pd and AuPd clusters via Direct Synthesis.”

Other graduate students participating in the 14th Annual Graduate Research Symposium included the following: Zehua Bao, Nicholas Clay, Akshay Turkar, Todd Freestone, Kandis Gillard, Kai-Wen Hsiao, Jiazhang Lian, Sam Hamedi Rad, Ankur Taneja, and Megan Witzke.

2015-2016 Graduate Fellowships

SM
Engniad Behnam
Malek Ibrahim
Geethika Yalamanchili

HARRY G. DRICKAMER
Yelena Il

DOW CHEMICAL COMPANY
Kai-Wen Hsiao
Vivek Kumar
Heng Li
Erfan Mohammadi
Abiodun Fatai Oki
Yung-Tin (Frank) Pan
Sumit Verma
Dylan Walsh
Yajie Wang
Neil Wilson

DUPONT SCIENCE AND ENGINEERING FELLOWSHIP
Nicholas Clay

DUPRE SCIENCE AND ENGINEERING FELLOWSHIP
Nicholas Clay

PARR FELLOWSHIP
Daniel Iregante
Marjoie Bridgewater
Jinghuan Xiang
Evan Lloyd
Mai Ngo
Sichong Pei

GLENN E. AND BARBARA R. ULLYOT FELLOWSHIP
Joe Whittenberg

COLLEGE OF ENGINEERING

SURGE (Support for Underrepresented Groups in Engineering)
Laura Mocdzan

UNIVERSITY OF ILLINOIS GRADUATE COLLEGE BLOCK GRANT
Syeda Ahmed
Shivani Patel
John Schultz

NATIONAL INSTITUTES OF HEALTH, CHEMISTRY/BIOLOGY INTERFACE TRAINING PROGRAM
Katelyn Dahlke
William Grier

NATIONAL SCIENCE FOUNDATION GRADUATE FELLOWSHIP
Elizabeth Hoistman
Danielle Mai
Hao Ha Ngo

A. T. WIDIGER CHEMICAL ENGINEERING GRADUATE FELLOWSHIP
Daniel T. Reilly

SCHOOL OF CHEMICAL SCIENCES CHIA-CHEN CHU FELLOWSHIP
Lining Miao

Professor Hong Yang and symposium judge Anastasia Vai pose with this year’s winners.
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Congratulations to Danielle Mai, who was recently recognized with a Lam Outstanding Graduate Student Award. Mai is a graduate student in Associate Professor Charles Schroeder’s research group, where she started a new line of research by extending single molecule techniques to study the dynamics of branched polymers. Her approach holds the potential to fundamentally change our understanding of the response of branched polymers, which exhibit strikingly different behavior compared to linear polymers. Ongoing work by Danielle and other members of the Schroeder group will advance the large-scale production of polymers for commodity and energy applications.

The Lam awards are presented to talented graduate students who are enrolled in the departments of Chemical and Biomolecular Engineering, Electrical and Computer Engineering, Materials Science and Engineering, Mechanical Science and Engineering, or Physics. Each recipient receives $5,000.

Lam Research Corporation of Fremont, Calif., is a major supplier of wafer fabrication equipment and services to the worldwide semiconductor industry. The company has been advancing semiconductor manufacturing for more than 30 years.

Congratulations to graduate students recognized by the School of Chemical Sciences for their teaching excellence in the 2014-2015 academic year. Chemical and Biomolecular Engineering graduate students who received the award include Qilong Huang and Vahid Mirshafiee.

Dr. Jooyeon Park, a postdoctoral researcher in Associate Professor Hyunjoon Kong’s group, was presented with the “Next Gen” Investigator Award from the University of Illinois at Chicago at the Center for Wound Healing and Tissue Regeneration’s Research Day on Sept. 25, 2015.

Bhushan Mahadik, a postdoctoral researcher in Associate Professor Brendan Harley’s research group, won first place in the Student and Young Investigator (SYIS) Outstanding Poster Award competition at the TERMIS World Congress in Boston. His poster was entitled, “Instructive Biomaterial Platform to Engineer Hematopoietic Stem Cell Activity.” Before the conference he was selected as one of the top 25 poster abstracts by SYIS; he then took part in a formal on-site poster competition at the TERMIS World Congress.

“I have always been interested in big picture-type of problems, such as the nature of time ... What is time, where does it go, and how is it another dimension, like space?” Rogers said.
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**Thao Ngo**, a third year graduate student in Professor Hong Yang’s research group, received an EAPSII Award from the NSF this past summer. Through the EAPSII, or East Asia and Pacific Summer Institutes for U.S. Graduate Students, Ngo spent 10 weeks at Shanghai Jiao Tong University in China. She worked with Professor Jianbo Wu studying the durability and stability of platinum-based fuel cell electrocatalysts using a liquid flow cell for in-situ Transmission Electron Microscopy.

**MEET SIMON ROGERS**

This fall Assistant Professor Simon Rogers joined the Department of Chemical and Biomolecular Engineering, bringing the total number of faculty to 19, the highest it’s ever been. Professor Rogers comes to the University of Illinois from New Zealand—by way of Delaware, Germany, and Greece.

A native New Zealander, Rogers hails from Upper Hutt, a city just north of the capital city of Wellington, and received his undergraduate and graduate degrees from Victoria University of Wellington.

“I have always been interested in big picture-type of problems, such as the nature of time... What is time, where does it go, and how is it another dimension, like space?” Rogers said.
Early on in college, Rogers considered focusing on astronomy and astrophysics, but as he continued his studies, his interests shifted from the largest scale to the smallest scale and how time is manifested in that realm. Rogers investigates how soft materials respond to deformation. In other words, what happens when you poke something, he said.

“The mathematics we use to describe how things respond to being poked hasn’t really changed since we started poking things. I’m interested in bringing in a new way of thinking about these things and a new way of describing these responses,” he said.

With a Ph.D. in physics, Rogers admits he may not have “a traditional chemical engineering background,” but he views that as a positive.

“It bring a different way of looking at traditional problems,” he said.

Rogers, who describes himself as a visual person, said his drive to visualize things has pushed his mathematical curiosity. By using insights from “visual” fields such as geometry, he says his research has provided new ways to look at old problems.

In addition to rheology, Rogers’s research has used neutron scattering, which involves firing beams of neutrons at soft materials, resulting in beautiful, brightly-colored pictures. The results show pulses, flares, and shapes which can inform researchers about how the materials respond on their smallest length scale.

After receiving his Ph.D. in 2011, Rogers held three different postdoctoral research positions. First, he joined the Foundation for Research and Technology in Crete, where he was part of the Institute of Electronic Structure and Laser. Followed by the Julich Research Center in Germany, where he was with the Institute of Complex Systems’ Soft Condensed Matter group. Prior to joining the Illinois faculty, he worked with Professor Norman Wagner at the University Delaware and the Center for Neutron Research.

His motivation for working at different locations around the world was prompted by his interest in seeing the world and gaining a broader understanding of the human condition, “and I feel I am a much more well-rounded person because of those experiences,” Rogers said.

This fall he is team-teaching CHBE 221 “Principles of Chemical Engineering” with Professor Jonathan Higdon. Rogers is also passionate about the importance of disseminating information, including research about some of the most complex problems we face, to the general population in order to build a more scientifically literate community. Back in New Zealand he visited a number of primary schools showing how much fun can be had when working in STEM.

“What a scientist doesn’t have to be the nerd like someone you see on ‘The Big Bang Theory’ or Albert Einstein, an old white guy with crazy hair in a lab coat. Anybody can do science. You just have to be interested enough to ask the questions,” Rogers said.

As for his life outside the lab, Rogers can often be found on a softball field, which is how he and his wife Krista met. They have a daughter who will turn 3 this Christmas, and enjoy spending time outdoors and cheering on teams like the Toronto Blue Jays and New Zealand’s rugby team, the All Blacks.

During the summers Rogers cooks and plays in the outfield for elite men’s fastpitch softball teams. His team this season had quite the international lineup, with players coming from the United States, Venezuela, the Dominican Republic, New Zealand, and Argentina. The team competed in the ASA Men’s Major Championship in Ashland, Ohio, and the ISC World Tournament, in South Bend, Indiana in August.

By applying a novel analysis based on differential geometry concepts (left), the nonlinear oscillatory rheological response of a soft colloidal glass (center) can be understood in terms of time and amplitude-dependent material parameters (right).

Assistant Professor Simon A. Rogers
Early on in college, Rogers considered focusing on astronomy and astrophysics, but as he continued his studies, his interests shifted from the largest scale to the smallest scale and how time is manifested in that realm.

Rogers investigates how soft materials respond to deformation. In other words, what happens when you poke something, he said.

“The mathematics we use to describe how things respond to being poked hasn’t really changed since we started poking things. I’m interested in bringing in a new way of thinking about these things and a new way of describing these responses,” he said.

With a Ph.D. in physics, Rogers admits he may not have “a traditional chemical engineering background,” but he views that as a positive.

“It bring a different way of looking at traditional problems,” he said.

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His appointments in Germany and Greece were in research-intensive environments, but it wasn’t until he was at the University of Delaware that Rogers was able to interact closely with students at the graduate and undergraduate levels. That solidified his decision to become an academic faculty member.

“I really enjoy research, but I love the opportunity to teach young people,” he said.

Rogers comes from a family of educators. His mother, now retired, was a longtime teacher and principal in the Upper Hutt community. His brother is a high school science teacher.

What drew Rogers to Illinois, he said, was the strength of soft matter research here and the number of excellent researchers at different stages in their careers—young researchers, mid-career researchers, and well-established, world-renowned experts.

“That shows that not only can you be successful here, but you can become successful here and have a great career in one place,” Rogers said.

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A new, novel experimental device (first image, left) allows for neutron scattering to be performed on material under shear, allowing researchers to gain information previously inaccessible. The device can be used to obtain scattering patterns like that shown on the right. This data is of a worm-like micelle solution under shear, from which researchers can determine how much, and in which direction, the micelles align.

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By applying a novel analysis based on differential geometry concepts (left), the nonlinear oscillatory rheological response of a soft colloidal glass (center) can be understood in terms of time and amplitude-dependent material parameters (right).

ChBE @ Illinois 17

ChBE @ Illinois

Simon A. Rogers
BSc, PhD. Victoria University of Wellington, New Zealand

Research interests: colloidal suspensions, polymers, complex fluids, nonlinear rheology, hybrid neutron scattering techniques
Darsh Wasan was only eight years old when his family escaped possible death and reached the refugee camps of Bombay, India.

A Muslim friend warned his parents that they should escape on the next train because, as a Hindu minority in their village, they were targeted to be killed. This was in 1947, when India was being divided into three parts—West and East Pakistan, which were mostly Muslim, and India, which was predominantly Hindu.

His family boarded a train, and Wasan says he vividly remembers seeing dead bodies on train platforms that they passed on the way to the border.

In India, Wasan says their house had no electricity, in high school he would study under the streetlights. But this passion for learning served him well, bringing him to the United States where he received his bachelor’s degree in chemical engineering from the University of Illinois in 1960 and then blossomed as both a researcher and administrator at the Illinois Institute of Technology in Chicago. Currently, he is Vice President of International Affairs at IIT and Distinguished Motorola Professor of Chemical Engineering.

In honor of his incredible journey, Wasan, an inductee into the National Academy of Engineering, is one of the 2015 winners of the LAS Alumni Achievement Award.

Wasan says his first role model was Mandanlal, his oldest brother out of eight siblings. His studious brother was the first to come to U of I, receiving his Ph.D. in statistics in 1960. Mandanlal encouraged him to also come to Illinois, and he arrived in Champaign-Urbana with only $4 in his pocket.

Wasan’s brother even chose his major for him.

“I ended up at Illinois in chemical engineering without even knowing what chemical engineering was all about,” he says.

At Illinois, Wasan worked in the laboratory of Harold Johnston, who set him on his career’s research path. He worked on “colloids,” which are microscopic or nano-sized particles.

After receiving his bachelor’s degree at the U of I, he went on to finish his Ph.D. work in chemical engineering in 1964 at the University of California, Berkeley—although the Ph.D. was not officially awarded until the spring of ’65. In 1964, he also landed his professorship at IIT, where he has spent his entire career.

Wasan has had numerous breakthroughs at IIT, but ironically the greatest one of his career was inspired by his grandmother, who would clean clothes by wetting them and pounding them against rocks—one of the oldest forms of cleaning.

Wasan discovered that unbeknownst to his grandmother, she was using nanotechnology.

“As she banged those clothes against the rocks, she was releasing very tiny pieces of stone,” he says. “These were nano-sized particles, and they were actually cleaning the clothes.”

This discovery, published in the journal Nature in 2003, led to innovative new techniques for oil recovery. His idea was to use ground stone—nano-sized particles of silica dioxide—to recover oil from rock. He points out that with primary oil recovery methods, only about 20 percent of the oil gushes out; therefore, you need to get at the additional oil locked inside the rock using secondary methods, such as his idea of pumping silica dioxide particles into water to extract oil.

Wasan also found ways to use silica dioxide to clean surfaces, including the surfaces of semiconductors. Wasan’s colloidal research even touches on food safety issues, and he established what is now known as IIT’s Institute of Food Safety and Health, an operation that brings together IIT scientists, researchers with the Food and Drug Administration, and 75 member companies to work together on food safety.

“I like to attack the problems that need to be solved rather than choose a problem that can be solved,” he says.

In addition to his research, Wasan moved up the administrative ranks at IIT, becoming chair of the chemical engineering department in 1971, interim dean of engineering twice, vice president of research and technology in 1988, and later vice president for academic affairs, provost, and vice president for international affairs. On top of all of that, he served as editor of the Journal of Colloid and Interface Science for 22 years.

But through it all, his involvement with students remains paramount. In fact, Wasan says the reason he chose IIT over MIT was because he noticed that research papers coming from MIT always listed the professor’s name first and the students’ names last. But at IIT, the students, who usually did most of the work, were listed first.

“If my students have success, then I know I am successful,” he says. “That’s my driving goal.”

In 1995, as provost, he started a program to recruit more international students, increasing the percentage of foreign students at IIT from 15 to 48 percent. Since 1997, IIT has also been offering 10 different online master’s programs to working professionals in India, thanks to his efforts.

Wasan has worked at IIT for 51 years now, and he recently celebrated his 49th wedding anniversary—a marriage arranged by his parents. But much of what drives him goes back to his days in India, when his family lived with tens of thousands of other people in the refugee camp in Bombay. When he arrived in the camp, there was no building for their school, so the students helped to build a school as part of their physical education class.

When the school was finally constructed, Wasan recalls that the motto posted on the front door said: “Come in to learn and go out to serve.”

“That has become the motto of my life,” he says.

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By Doug Peterson, for the College of LAS Office of Communications and Marketing

Darsh Wasan and his wife Usha Wasan.
Darsh Wasan, B.S. ’60, Recipient, 2015
College of LAS Alumni Achievement Award

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Renola’s approach to leadership is to learn quickly, appreciate volunteers and the diversity of skills they bring, and honor the mission of the organization. And he gets right to work on solving problems—even when that problem comes in the form of a Category 4 hurricane.

“My general approach is to get in at the ground level, work as hard as I can, and suggest the next steps to improve the organization. When you understand an organization from the ground up, then you can do a good job of leading,” Renola says.

Always learning
Born in Fort Worth, Texas, Renola moved to Maryland, followed by suburban Philadelphia as a young student. As an undergraduate at Penn State, he majored in chemical engineering, and enjoyed reaction engineering and the complexity of multiphase systems. When he came to consider graduate schools, Penn State professor and UI alumnus Robert L. Kabel (BS ’55) recommended the University of Illinois. Renola was drawn to Illinois for its combination of hands-on learning and classroom time.

While in Champaign-Urbana, he and his wife Elaine became active in the tennis community, often playing on campus. During lunch breaks, he and other fellow chemical engineering graduate students would play dart and on Saturday mornings, they often played basketball.

After finishing his Ph.D. work in late 1978, Renola joined Exxon’s synthetic fuels division, working at the company’s coal gasification pilot plant in Baytown, Texas. At the time, synthetic fuel “was going to be the end-all, be-all. This was when oil was expected to be $100 a barrel,” he recalls. But those price expectations did not materialize (at least not for several decades) and within a few years, funding for synthetic fuels started drying up and energy companies began shutting down their synthetic fuel programs.

Renola would stay with Exxon but transfer into polymer research and development, in areas such as blow molding and catalyst development (and co-authoring several catalyst patents).

“Scaling up reaction processes was fun and extremely challenging. There are things you can’t mimic at a small scale. Problems you can’t see until you demonstrate on a larger scale,” he says.

Renola also spent time in the technical department of its commercial polyethylene plant, addressing customer complaints, problem solving process problems, and working in project management.

The last 13 years of his career were in the plant leadership group at the ExxonMobil Mont Belvieu Plastics Plant. He was responsible for capital projects, some with $50 million to $100 million budgets.

“My career has not been a typical career. Many engineers focus on one particular area. My focus was one of breadth, developing a broad skill mix. I made a career of learning new things,” Renola says.

Community Service
While at the Mont Belvieu plant, Renola started becoming more active in volunteer work. In 1996 he started mentoring at a local elementary school and a year later he started mentoring through Big Brothers Big Sisters of Greater Houston. He has been a Big Brother to three different young men, his current Little Brother is a senior in high school. Renola would go on to join the organization’s local advisory group and he has served on the board of directors of Big Brothers Big Sisters of Greater Houston.

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“I was looking for the opportunity to further serve the community. I really enjoy the challenges of new organizations and new processes,” Renola says.

Several months into his term as mayor, he would face quite the challenge.

In September 2008, the region was hit by Hurricane Ike. In the storm’s aftermath, he and the city’s team faced power outages, gas leaks, flooded streets and residences, and some homes on the bay were washed away.

Any goals he had for his mayoral tenure went to the wayside. Instead, he focused on “how can we recover, how can we take a bad situation and make it better, how can we make sure citizens get what they need.”

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GARY RENOLA
Ph.D. Chemical Engineering, 1979
Advisor, Roger Schmitz

Employment history
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Family
Wife, Elaine Renola

Residence
Seabrook, Texas

Current involvement
Big Brothers Big Sisters Lone Star Chair of the Clear Creek Education Foundation Board of Directors International Space Center Rotary City of Seabrook Master Plan Commission
Gary Renola: MANAGER, MAYOR, MENTOR

As an Illinois chemical engineering graduate student in the 1970s, Gary Renola recalls one evening when he was struggling with a combustion research project and the reactor blew up, the remains of the project crumpled in the sand bath.

The next day, the frustrated graduate student met with his advisor, the late Professor Roger Schmitz, who told him, “I think we’re beating a dead horse. Let’s change directions.”

“I’ve probably used that expression a thousand times in my life when we’ve had to shift directions,” says Renola, who retired in 2010 after a long, varied career at ExxonMobil.

Another phrase of Schmitz’s that resonated with Renola: “You make your own luck.”

As a graduate student at Illinois, Renola learned to become an expert in a specific technical area—chaotic oscillations. But he also received valuable training in how to solve problems and how to use information to solve problems, he says.

“It became the backbone of my skill mix in my professional career and volunteer activities,” Renola says.

The 1979 Ph.D. graduate has made a career of continually learning new things and changing directions when needed. Rather than specialize in one area of research within a company, Renola navigated a variety of arenas in his career, from polymer production and process development to new catalysts to project capital management. He is an active volunteer in southeast Texas and has been involved in Big Brothers Big Sisters of Greater Houston, the Seabrook Economic Development Corporation, the Seabrook City Council, and other community organizations.

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After graduating from Illinois in 1951, Georges said, “today as it was back when I went engineering department have evolved. university and the chemical impact day, a celebration of the impact leader in forest and paper products. Paper Company to become a world innovation of great impact to society. Hall of Fame inductees are chosen among five alumni inducted into the University of Illinois College of Engineering’s Hall of Fame this fall. In 1979, Georges was tapped by Frederick) Smith, (Worth) Rodebush. … All these men were giants.” As a chemical engineer at DuPont, Georges worked to improve products, lower costs, and improve yields. Over the next 15 years, he worked on sulfuric acid, hydrochloric acid, and a variety of insecticides, herbicides, and fungicides.

An Illinois chemical engineering education “really was everything. What I learned, in terms of chemical engineering principles, is what I had to practice and what was expected of me. I couldn’t get there without it. I was always a chemical engineer at heart, no matter what activity I was involved in.”

Tell us about what you’re doing now.

“The most important thing I do now is private equity, and I’ve been doing that for about 15-plus years. … My background in chemical engineering is a great asset to have. I’m involved in process industries—steel, paper, chemical or petroleum companies, that’s my bailiwick. We’re looking for companies that have some potential for a change in improvement. If you can buy one of these companies that has solid product lineup, solid technology, we can go to work on that. It’s amazing what we can do to bring fresh insights and bring fresh people to it. We can set it back on the growth path, and therefore make a profit. It’s pretty exciting. You walk through a lot of plants. You gather a lot of insights about what the company is about, what problems they’ve had, and what you can do to reidentify it. I really enjoy doing it.”

Other Hall of Fame inductees this year included Martin F. Eberhard, co-founder of Tesla Motors, for entrepreneurship and pioneering contributions to electric vehicles, Robert D. Kern, for entrepreneurial tenacity in building Generac to a leader in lightweight portable generators and his philanthropic spirit in helping shape the next generation of engineers, David J. Kuck, for significant contributions in both research and development through industry to productivity tools in parallel computing, and Illinois Physics Professor Sir Anthony J. Leggett for global contributions to low-temperature physics, which earned him the 2003 Nobel Prize.

To watch an excerpt of a video interview with John Georges, visit cbhe.illinois.edu.
After graduating from Illinois in 1951, Georges joined DuPont, where he transferred to Illinois. On campus he lived at the Alpha Chi Sigma house, where he interacted with Ph.D. students in chemistry, some of them World War II veterans in their 30s. To help pay his way through school, he cooked hamburgers at Kam’s and worked the midnight shift in the lab of a Champagn Metal parts company. He was among the first group of students to be in Roger Adams Laboratory, which was built in 1950.

What do you remember most about your time here? How did your degree in chemical engineering and your Illinois education prepare you for your career?

“I had a group of professors that were really exceptional. … Dr. (Harry) Drickamer, Dr. (James) Westwater. (Frazier) Johnstone, (Harold) Snyder, (G. Frederick) Smith, (Worth) Rediebush. … All these men were giants.”

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Fifteen years in, he was asked to go into sales at DuPont, and later expanded his involvement, working in areas such as planning, manufacturing, and general management. He attended night school and earned an MBA from Drexel University. In his late 40s, he became an executive vice president at International Paper. During his tenure there, International Paper’s sales grew from $1.2 billion to $20 billion.

Tell us about what you’re doing now.

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What advice do you have for current students?

“Don’t get too caught up with where you might be in 10, 15 years. For your first job, you’ve got to concentrate on how you do that well. How do you satisfy both the people you’re working with, particularly those above you, can you get an assignment done, and how can you bring something special to it and really make a contribution? The rest will take care of itself in corporations, managers are looking for people to perform. They will notice whether you perform or not. They will know if you are making significant contributions or not.”

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David Boger, Ph.D. ’66
DISTINGUISHED ALUMNI LECTURE

When reflecting on the impact he’s had in his 50-year career in chemical engineering, David Boger does not point to his research that started in the 1970s about the fluids that now bear his name.

Instead, it’s red mud.

Specifically, his ongoing work with mining companies on how they could tackle red mud and their massive waste problems.

As a longtime chemical engineering professor, Boger is passionate about the role higher education should play in helping industry solve problems.

“I think there has to be a close association with some of the research (in academia) with industry,” he said.

In academia, he said, a faculty member’s performance evaluation is too dependent on publication citations or grant funding, and less so on interaction with industry or the good they do for communities through industrial involvement. In recent years, however, Boger has seen more of a shift among departments toward closer associations with industry. He views that as a positive.

A Pennsylvania native, Boger graduated from Bucknell University with a bachelor’s degree in chemical engineering before pursuing a graduate degree at Illinois. After obtaining his Ph.D. in 1965, he moved to Australia where he joined the faculty at Monash University, which was just getting established.

As a graduate student at Illinois, he focused on heat transfer research and photographing phenomena. But at Monash, he was encouraged to become involved in rheology, a field he confessed he knew nothing about at the time.

“I was lucky if I knew what Non-Newtonian fluids were,” he recalled.

Looking back on his time at Illinois and specifically his education in chemical engineering, Boger said the program’s lasting impact came from the strong work ethic and valuable photographic techniques he picked up from working alongside James Westwater, as well as how to be an experimentalist. Westwater was an experimentalist, and so was he, Boger said.

Currently an engineering professor at Monash, David Boger was Laureate Professor and Professor of Chemical Engineering at The University of Melbourne and has held visiting positions at universities around the world. He’s consulted for over 90 companies from 3M Corporation to Tata Research and Development Centre in India and has been an expert witness in several international court cases.

Boger also has received numerous honors and awards, including the 2005 Prime Minister’s Prize for Science, and was elected a Fellow of the Royal Society in 2007.

“We took a whole science to that industry and helped them to try and solve a big, big problem. I probably had more of an impact with this work with the minerals industry than we have with the Boger Fluids stuff.”

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David Boger
HONORING HIS
Mother and Father

Growing up on a farm in northern Illinois, the son of a carpenter and a homemaker, Jim Morris didn’t leave the state until his late teens. Now a facilities engineer with ExxonMobil, he’s lived and worked throughout the Gulf Coast and abroad in Nigeria and Qatar.

“What stood out to me was the fact that he would always push us to think,” Morris said.

After graduating from Illinois with his bachelor’s degree in 1981, he joined Exxon and he and his wife Karen moved to Houston. Morris has been involved in a number of areas of ExxonMobil over the years, working throughout the Gulf Coast and overseas, including four years in Nigeria, where he was the engineering manager for offshore production operations and four years in Qatar, where he worked on a large liquefied natural gas project. As chief facilities engineer for ExxonMobil Upstream, he is responsible for the global application of facilities technologies, career development for engineers, and planning key strategic initiatives.

One of the highlights of his career was meeting on a regular basis with a Qatari sheikh—it was quite an experience for a farm boy from Illinois, he recalled.

After living and working abroad, Morris returned to the U.S. and reconnected with his alma mater. He and his wife Karen decided, given the challenges facing the university, including deductions in state funding, they would fund the faculty scholar position, ultimately paying the way for Hammack to further educate and enlighten budding engineers. And they would honor Morris’ parents by naming it after them. His father died in 1985 and his mother passed away in 2006.

“Their real story is that they really did come from humble beginnings. They worked hard. They sacrificed a lot to give me the opportunity (to go to the U of I),” Morris said.

“President Philomena Hannity once told us that he would always push us to think, and he and the challenges facing the university, including deductions in state funding, they would fund the faculty scholar position, ultimately paying the way for Hammack to further educate and enlighten budding engineers. And they would honor Morris’ parents by naming it after them. His father died in 1985 and his mother passed away in 2006.

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- Jim Morris, BS ’81

For those opportunities, he credits his parents, Donald and Dolores Morris, and their emphasis on the importance of a college education.

On university and college campuses, it’s not uncommon to find outstanding faculty who have been recognized by their departments with named professorships, endowed chairs, and faculty scholar titles. Funded by generous donors, these programs help retain and attract brilliant faculty and provide resources for their teaching, research, and outreach.

This is the story behind one of those named positions.

Professor Bill Hammack, known around the world as the Engineer Guy for his entertaining and educational videos about engineering, is the Donald and Dolores Morris Faculty Scholar. Established by James M. Morris of Houston, the position honors his late parents.

“I’ve had opportunities to see a good part of the world. It’s been a fascinating career,” he said.

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Given those backgrounds, “the single-most important objective for them was for us three children to go to college. That was their dream,” Morris said.

It wasn’t until many years later that Morris learned his father sold half the family’s farmland while he was in high school in order to cover the costs of sending their children to college.

His older brother went first, graduating from the University of Illinois with a degree in civil engineering. Several years later, he also chose the U of I because it was in-state, affordable, and a highly-rated school, Morris recalled.

Initially a pre-dental student, Morris switched to chemical engineering in his sophomore year because he enjoyed studying chemistry and engineering. Professor Thomas Hanratty, with whom he studied thermodynamics and mass transfer, made quite the impression on Morris.

“They really did come from humble beginnings. They worked hard. They sacrificed a lot to give me the opportunity (to go to the U of I),” Morris said.

When some students complained of facing test questions they hadn’t seen before, Hanratty replied that when they entered industry, not everything they’d encounter would be a problem. They already knew how to solve. He wanted them to apply their thinking and judgement skills to a problem, rather than memorize text or reiterate content found in a book, Morris said.

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“Thats philosophy—thinking on your feet—stuck with me,” Morris said.

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Today the rural homestead remains in his family. Morris’ sister, an MRI technician, and her family live there, and he and Karen often return to the farm for visits.
Giving to Chemical and Biomolecular Engineering Impact

You can make a gift to the department online, by phone, or using the enclosed envelope in this newsletter. Your funds may be used toward specific areas and programs within the department including professorships, graduate fellowships, scholarships, and upgrades to teaching and research facilities. Your gift continues to support the department’s education, teaching, and excellence.

Unrestricted Funding: Flexible donations make a great impact

The Department of Chemical and Biomolecular Engineering has a proud tradition of delivering excellence in education and of being pioneers in science and engineering research. We are committed to continuing that legacy in the face of daunting state and federal budget challenges that affect departmental resources.

Like other academic programs across campus, our department is funded by a variety of sources, including state appropriations, student tuition, generous gifts from alumni, friends and corporations, endowment income, and institutional funds, which come mostly from state or federally sponsored research grants to faculty. Each funding category contributes to the department’s fiscal health. As the state’s portion has continued to decline over the years, the need for private giving, and especially unrestricted donations, has become even more urgent.

“Unrestricted funding is critically important because the funds are available for immediate needs of all kinds, from startup packages for new faculty hires to supporting teaching assistants and tutors” said Dr. Paul Kenis, William H. and Janet G. Lycan Professor and Department Head.

Despite ongoing state budget uncertainty, the department must not only sustain its education, research and outreach activities, but also remain competitive with peer institutions in the recruiting of top faculty. Startup packages for junior and senior faculty hires help them to get their research programs started, by providing funds for items such as equipment, computers and supplies for their new labs, to cover fees for fabrication, characterization or computational facilities, for graduate student stipends, and for the salary of postdoctoral fellows.

With the expansion of the undergraduate student body and hiring of additional faculty, the department has experienced an increase of demand on space, from offices to laboratories, in the 65-year-old Roger Adams Laboratory. Unrestricted donations help alleviate that pressure for updating current space or creating additional space.

Unrestricted donations also help cover the costs of a variety of activities, such as support for student organizations and their professional development events. They also assist in hosting guest lecturers and potential faculty and recruiting the best graduate students.

The Partners Fund is where the department maintains donations that come with no restrictions. Many corporations generously match their employees’ donations and those funds are combined with the employees’ gifts to the department.

“Unrestricted funds have a powerful and lasting impact on the department. By giving to the Partners Fund, alumni and friends are investing in the future of Chemical and Biomolecular Engineering at Illinois,” Kenis said.

So how can you make a difference? Your gift—no matter its size—can help support the following initiatives:

• Meet the needs of graduate students and faculty members through scholarships, fellowships, and hiring packages for junior and senior faculty.
• Help provide the skills and tools they need to become leaders in industry and academia.
• Support the Legacy Fellowships Fund to: • Honor the legacy of a faculty member/your research advisor.
• Create your legacy at Illinois.
• Bring the best and brightest graduate students to Illinois.
• Sustain excellent graduate and undergraduate education at Illinois.

Class Notes

John L. Anderson

PhD ’71, recently returned to the faculty of Illinois Institute of Technology after serving as its president since 2007. As president, he was credited with bringing back financial stability to the university and establishing a rich environment for research, teaching, and scholarship. This spring Anderson was elected as a member of the National Academy of Engineering’s governing council and he received an honorary Doctor of Humane Letters degree from Shimer College in Chicago.

Kim Khamami, PhD ’87, was elected as a fellow to the American Institute of Chemical Engineers. He was formally inducted at the group’s November meeting in Salt Lake City. Khamami earned his PhD at Illinois under the guidance of Professor Anthony McHugh. He leads the Tennessee State Department of Chemical and Biomolecular Engineering and is the Armour T. Granger and Alvin and Sally Beamam Distinguished University Professor. He also has been director of the university’s Sustainable Energy and Research Center since 2008.

The Walter Payton Liver Center, a medical and surgical unit of the University of Illinois Hospital, opened this summer under the direction of Sean Koppe. BS ’97. After receiving his chemical engineering degree from Illinois, he earned a medical degree from the University of Illinois College of Medicine and completed his Internal Medicine Residency and Gastroenterology and Hepatology Fellowship at Northwestern University. His clinical interest include care of patients with cirrhosis, post-liver transplant care, hepatocellular carcinoma, and Hepatology. Koppe is a recipient of the American Gastroenterology Association Research Scholar Award for his research on the role of trans-fatty acids in nonalcoholic fatty liver disease.

Theodore Tsotsis, PhD ’78, the Robert E. Lyle Professor of Chemical Engineering and Materials Sciences at the University of Southern California, joined the executive advisory committee of General Steel Holdings, a steel producer in China.

Visiting Chbe Illinois.edu/Alumni-and-Friends/Giving

Honor Your Mentor. Leave a Legacy.

The Legacy Fellowships Fund

The Department of Chemical and Biomolecular Engineering at Illinois has a 100-year tradition of providing outstanding graduate education through world-class research supervised by its excellent faculty serving at a time of dwindling state support and rising costs of recruiting and retaining top faculty and maintaining facilities. Your support of graduate education is critical to ensuring the tradition of excellence continues. As federal funding for research becomes more uncertain we need internal resources to sustain our outstanding research portfolio and maximize our global impact.

Competition for the best graduate students is fierce, and it is vital we bring the best to Illinois. Your investment will help provide them with the skills and tools they need to become leaders in industry and academia.

Establishing the Legacy Fellowship endowment for graduate students offers alumni like yourself a wonderful opportunity to honor the legacy of your advisor or to establish your personal legacy to celebrate your time at Illinois.

Support the Legacy Fellowships Fund to:

• Honor the legacy of a faculty member/your research advisor.
• Create your legacy at Illinois.
• Bring the best and brightest graduate students to Illinois.
• Sustain excellent graduate and undergraduate education at Illinois.

Contact us today to arrange your gift or pledge a future gift.

Share your news with fellow alumni! Email us at chbealumni@illinois.edu, fill out the online form at ge.illinois.edu/chbe_alumni_form or mail us the enclosed card.
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The Chemical and Biomolecular Engineering Legacy Fellowships program seeks to raise a $10 million endowment to attract the nation’s top students and to provide them with fellowships during their first year of study.

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In Memoriam

Donald L. Blanke, 50 BS, died July 1, 2015, in Lacey, Wash. Born in Chicago, he served in the U.S. Army Air Force during World War II. He attended the University of Illinois on the GI Bill and graduated with a bachelor’s degree in chemical engineering. He spent 30 years with Standard Oil of Indiana, retiring from the company in 1987.

Kenneth R. Brandenburg, 54 BS, died Oct. 9, 2015, at 91 years old. Formerly of Dallas, he recently relocated to Commerce, Texas. Born and raised in Casey, Illinois, Mr. Brandenburg served in the U.S. Navy. He spent his entire 35-year professional career with Atlantic Richfield Company in Dallas.

Michael L. Graska, ’87 MS, died April 17, 2015, in Greenfield Center, NY, at age 52. After graduating from Griswold High School in Jewett City, Conn., he attended Clarkson University, graduating in 1984 with a bachelor’s degree in chemical engineering. He went on to earn his MS in chemical engineering at Illinois under James Westwater. Self-employed for most of his working life, Mr. Graska later worked in Information Technology for Gary Posner, Inc. His hobbies included breeding and selling champion Bullmastiff dogs, riding his Harley motorcycle, and gardening.

George E. Johnston, 58 BS, died June 20, 2015, in Marietta, Ga., at age 90. Mr. Johnston graduated from Illinois with a bachelor’s degree in 1948 and served in the U.S. Navy. He was a former executive with the Amoco Chemical Corporation in Chicago.

Edward M. Kern, ’58 BS, died Nov. 16, 2014. After graduating from Illinois, Mr. Kern received his master’s degree from Washington University. A 34-year employee of McDonnell-Douglas, Mr. Kern and two other engineers were responsible for the heat shield on the 1996 Gemini. The shield protected the spacecraft from intense heat upon reentry into the earth’s atmosphere.

Robert E. Moore, ’49 BS, died Aug. 18, 2015. Raised in Mattoon, Illinois, Mr. Moore served in the Army Air Corps before enrolling at the UI. He was a member of Tau Kappa Epsilon. After graduating with a bachelor’s degree, he joined Shell Chemical in Houston. In 1958, he joined Rawson & Co. and remained there until 1997, when he retired as CEO. Mr. Moore earned a number of awards throughout his life, including the Houston Engineering and Scientific Society and Instrument Society of America. He was active in Scouting, his church, and enjoyed playing tennis, golf, and traveling.


Harry Triebel, ’51 BS, died Sept. 26, 2015, in Beaumont, Texas. Born in Flossmoor, Illinois, Mr. Triebel graduated from Illinois with a chemical engineering degree in 1951. After graduation he worked at Texaco/Star Enterprise in Port Arthur and remained with the company until his retirement from the process engineering department in 1993. He traveled with Caltex, a subsidiary of Texaco. After World War II, he served with the U.S. Army Signal Corps in Japan. He also was an instructor with the Port Arthur Water Safety Corps of the American Red Cross from 1951 to 1980.

John T. Ward, ’45 BS, died June 26, 2015, at age 94. The Hyde Park, Del. resident received his bachelor’s degree in chemical engineering from Illinois in 1943. A chemical engineer at DuPont in Wilmington for 36 years, Mr. Ward retired in 1985 as design project manager in the engineering department. He was a charter member and senior fellow, past director and associate director of the Instrument Society of America and a past president of the Wilmington section. Mr. Ward was an avid sailor and enjoyed woodworking.

Leonard J. Winchester, ’43 BS, died June 20, 2015, at age 91. Born in Germany, he moved to the U.S. as a teen. After graduating from Illinois with a bachelor’s degree in chemical engineering, he joined the U.S. Army and returned to Europe to serve with the occupying forces. He later earned his master’s degree at Yale University and worked as a chemical engineer in Pakistan and Japan before settling in Cincinnati, Ohio.

Remember When

TOP IMAGE: Construction on Roger Adams Laboratory began in 1947 and the building was officially dedicated on March 30, 1968. The lab was established under the leadership of H. Fraser Johnstone, who emphasized graduate education and brought in new faculty. Originally known as the East Annex because of its location east of the two chemistry buildings, it was later called the Chemistry and Chemical Engineering Building before being renamed in honor of Roger Adams. Roger Adams’ career with the university began in 1916 and continued until his death in 1971. He started as an assistant professor and was head of the Department of Chemistry and Chemical Engineering for 28 years.

MIDDLE IMAGE: Professor Thomas Hanratty and Chemical Engineering students William Stubby, MS ’86 (on Hanratty’s right) and Gavin Schmidt, BS ’97 (on his left), examine a wavy surface to be used in the turbulent flow facility in the background.

BOTTOM IMAGE: Professor Richard C. Alkire and his research group and their families in 1978 pose for a photo in his home. Two of the group members, Po-Yen Lu, PhD ’92, and Edward Yung, PhD ’85, returned to Illinois recently to visit with Dr. Alkire, Professor and Department Head Dr. Paul Kenis, and other faculty. Dr. Lu is a partner at The CID Group in Taiwan and Dr. Yung is retired from Kopin Corporation.
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Chemical and Biomolecular Engineering alumni, family, graduate students, and friends celebrate Homecoming 2015 in Grange Grove, the new tailgating section west of Memorial Stadium.

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