

ACTIVEsite

Department of Chemical and Biological Engineering

FALL 2009 | Issue Number 20



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Letter from the Chair



Dear Colleagues:

This is an exciting time to be part of the Department of Chemical and Biological Engineering. We are grateful to **Jim Hill** for the excellent leadership he provided during his tenure as chair. Jim and those who preceded him have helped the department develop a solid foundation on which we continue to build.

I am pleased to share with you some highlights of the past few months.

CBE's undergraduate enrollment continues to grow with 433 students registered this fall. That is up 31 students over last year. The College of Engineering enrollment of 5,086 is a 25-year high, and the second highest ever. These increases can be attributed to rigorous recruitment efforts and special programs aimed at recruiting more women and underrepresented groups to the college. CBE Professor **Derrick Rollins** is leading a number of these efforts as assistant dean for diversity.

Professor **Eric Cochran** (BSChE'98) received an NSF CAREER Award for his research "Block Copolymer Layered Silicate Nanocomposites: Thermodynamics, Dynamics, and Structure Property Relationships." NSF CAREER Awards are a significant accomplishment for young faculty members, and we are very pleased Eric has received this recognition.

Jackie Shanks (BSChE'83), Iowa State's Manley R. Hoppe Professor of Chemical Engineering, and her team of researchers have received a four-year \$2 million NSF grant to explore biofuel technology based on plant and algae hydrocarbons.

In November we unveiled a display case as a tribute to **Manley R. Hoppe** (BSChE'32/MSCHE'35), a former faculty member in the department who went on to become president and chairman of the board of directors of Parr Instrument Company in Moline, Illinois. He was a lifelong friend of the department and had established numerous scholarships for undergraduates. A professorship—the Manley R. Hoppe Professor of Chemical Engineering—was established through Hoppe's estate this past spring. We are most appreciative also to Manley's daughter **Jean Steffenson** and her husband **Michael Steffenson** (BSChE'59) for their very generous support of the department.

The National Science Foundation (NSF) Engineering Research Center for Biorenewable Chemicals (CBiRC) marked its first anniversary in September. Established with a five-year \$18.5 million grant from the NSF, the interdisciplinary center is led by Professor **Brent Shanks** (BSChE'83). So far, CBiRC has passed an NSF evaluation and assembled a team of 24 researchers from nine academic institutions who are working with 70 graduate students and postdoctoral researchers and more than 20 undergraduate students. In addition, the center is working with 14 high school and middle school teachers, has signed on five industrial partners, and is working with the Iowa Department of Economic Development to bring in more partners.

Our students excel in the classroom, in leadership positions, and in athletics. You can read about some of their activities in this newsletter. Also, note the list of our scholarship recipients—more than 25% of our students received scholarships this year. That is in large part due to the generosity and support of you, our alumni.

We are very proud of the many accomplishments of our alumni. Two ChE alumni received college awards for their exceptional accomplishments at Iowa State's 2009 Homecoming festivities. **G. Paul Willhite** (BSChE'59), the Ross H. Forney Distinguished Professor of Chemical and Petroleum Engineering at the University of Kansas, received the Anson Marston Medal; and **Gayle A. Roberts** (BSChE'81), president and chief operating officer of Stanley Consultants in Muscatine, Iowa, received a Professional Achievement Citation in Engineering.

The contributions you are making in your careers and in your communities help the department continue to build its outstanding reputation. Please keep us informed about your career news (see form on page 18), and we invite you to stay in touch with what is happening in the department by visiting www.cbe.iastate.edu.

We appreciate your continued support and interest.

With best regards,

Surya K. Mallapragada

On the cover:

CBE Assistant Professor Eric Cochran (right) looks on as graduate student Brandon Franck purifies a catalyst for use in an atom transfer radical polymerization reaction. See article on page 3.

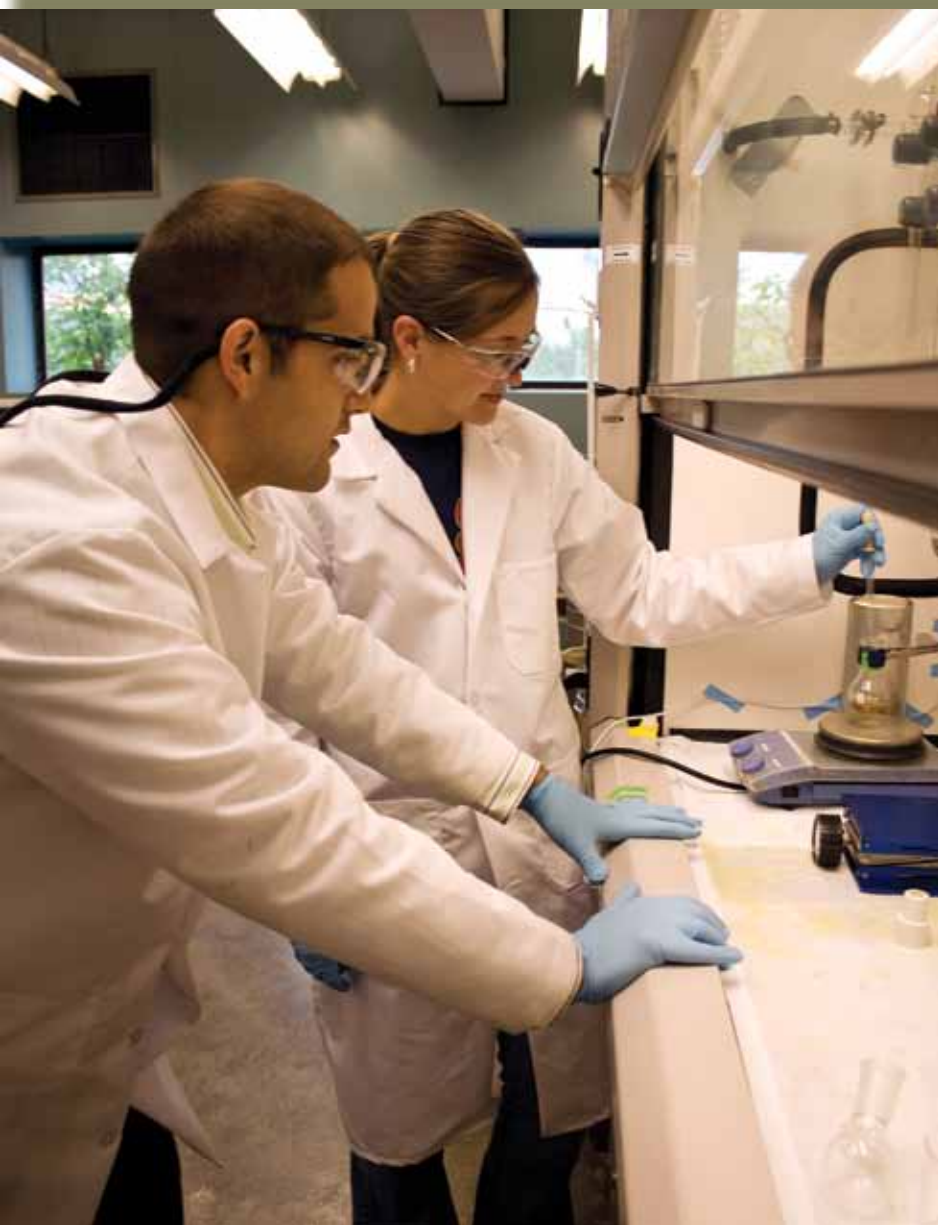
NSF CAREER Award carved from copolymers and clay

To develop an understanding of how a composite influences structure, **Eric Cochran** is attaching block copolymers to a material that has extremely high surface area particles—clay. His work will help identify important parameters and adjustments for researchers as they work to create certain structures using different polymer properties.

Unlike traditional studies of composites, however, Cochran is working at the nanoscopic level. At this level, small property changes can have a large impact due to the high surface-to-volume ratio of nanocomposites. His research has the potential to improve the process scientists and engineers use to develop structures.

Cochran, a CBE assistant professor, received a prestigious National Science Foundation (NSF) CAREER Award to support the project “Block Copolymer Layered Silicate Nanocomposites: Thermodynamics, Dynamics, and Structure Property Relationships.” The CAREER program is an NSF-wide activity that is one of the most highly competitive awards given in support of junior faculty who exemplify the role of teacher-scholars through outstanding research, excellent education, and the integration of education and research within the context of the mission of their organizations. Over the last four years only about 20 percent of applicants received CAREER awards.

Brandy Staade is pictured in the laboratory with Eric Cochran



“Receiving a CAREER award is an honor and a privilege,” Cochran says. “I’m excited about this work. It’s not often that you can find something new to research in engineering, and this project will help build the foundation for future research projects.”

Underlying Cochran’s experience as a researcher is an interest in block copolymers, or what he calls the building blocks of new materials. “I uncover the basic mechanisms that cause polymer chains to change and react,” he says. “Knowing this fundamental science is important for more advanced applications.”

His newest project takes water that is naturally stuck to the surface of clay particles and replaces it with chemical groups that can cause polymers to form, essentially growing block copolymers directly from the surfaces of the clay.

The tough chemical structure of clay makes it a good candidate to begin research in this area. “The strength of the material can be imparted to the polymers, which will wrap each clay particle,” Cochran says. “Since block copolymers tend to self-organize, the clay particles will move with it, allowing us to precisely engineer where clay goes using synthetic techniques.”

Cochran, who earned his BS in chemical engineering at Iowa State in 1998, began engineering research as an undergraduate, working on a composites project with a materials science faculty member. This work led him to a summer REU (Research Experience for Undergraduates) at MIT, which also focused on polymers.

He did his graduate work at the University of Minnesota, where he began building a foundation of theory to expand his research efforts, while also incorporating practical applications into his thesis project.

“I really enjoyed combining polymers to develop structures during experiments, but I was looking for something to complement this work,” he says. “That’s when I gained an appreciation for the theory behind the research, and I began balancing the two aspects of my work.”

Next up for Cochran’s career was a two-year postdoctoral position at the University of California at Santa Barbara working under Glenn Fredrickson, one of the world’s top polymer theorists. During this experience he concentrated more on learning the theoretical aspects of polymers, which influenced his current research direction.

With a long-time interest pushing him to new boundaries in polymer research, Cochran’s NSF-funded project will help establish what types of structures are optimal for specific applications.

“First we will build an understanding of how molecular design leads to a certain structure,” he explains. “Then from the other side, we look at what properties we want a structure to have. The entire process is like a feedback loop, with each step informing the next and impacting how we approach the design for the final material.”

One area that could benefit from this work is the packaging industry. Cochran’s research could lead to a cheaper material that adequately meets the packaging requirements of sensitive products such as electronics and medical devices.

CBE alumni honored at Iowa State Homecoming ceremony

G. Paul Willhite (BSChE'59) and **Gayle A. Roberts** (BSChE'81) received College of Engineering awards at the 2009 Iowa State University Alumni Association Honors and Awards Ceremony on October 16. Willhite received the Anson Marston Medal, and Roberts received a Professional Achievement Citation in Engineering (PACE).

Established in 1938, the Anson Marston Medal is awarded in recognition of outstanding achievement in advancing engineering science, technology, or policy having national and international impact in academics, industry, public service, government, or other venues.

Willhite, who has been a member of the University of Kansas faculty since 1969, is the Ross H. Forney Distinguished Professor of Chemical and Petroleum Engineering. He served as chair of the department from 1988 to 1996 and as interim chair from 2003 to 2004.

In 1974, Willhite cofounded the Tertiary Oil Recovery Project and served as the program's codirector from 1974 to 2009. From 1962 to 1969, he worked in the production research division of Continental Oil Company in Ponca City, Oklahoma. A distinguished member of the Society of Petroleum Engineers (SPE), Willhite is the author of the 1986 SPE textbook *Waterflooding* and coauthor of the SPE textbook *Enhanced Oil Recovery* published in 1998.

Throughout his career Willhite has received many awards including the Distinguished Achievement Award for Petroleum Engineering Faculty in 1981, the Lester C. Uren Award in 1986, the John Franklin Carl Award from the Society of Petroleum Engineers in 2001, the Iowa State University PACE award in 1995, and the IOR Pioneer Award from the SPE/DOE Improved Oil Recovery Symposium in 2004. He was elected to the National Academy of Engineering in 2006.

In addition to his Iowa State degree, Willhite has a PhD in chemical engineering from Northwestern University. He and his wife, Jewell, who earned her BS in home economics education, are life members of the Iowa State University Alumni Association.



Gayle A. Roberts



G. Paul Willhite

The PACE award was established in 1968 to recognize superior technical or professional accomplishments in research, development, administration, education, and other engineering activities. It recognizes alumni/alumnae eminently known for their professional competence and creativity.

Roberts is president and chief operating officer of Stanley Consultants, a worldwide provider of engineering, environmental, and construction services. She has the distinction of being the only female president of a major international engineering firm in the United States.

Joining Stanley Consultants in 1981 after graduating from Iowa State, Roberts has 28 years of experience in the engineering and construction industry. Her career path in consulting engineering has included positions as business leader, project manager, resident engineer, industrial market leader, and business development manager. She is a licensed professional engineer in seven states and Puerto Rico. In addition to her Iowa State degree, Roberts earned an MBA at St. Ambrose University in 1991.

Throughout her career, Roberts has been active in professional, community, and university organizations. She is a board member of the Iowa State Engineering Policy and Leadership Institute, the St. Ambrose University College of Business Advisory Board, and the American Council of Engineering Companies (ACEC) of Iowa. In addition, she is a member of the ACEC Engineering Excellence Awards Committee and Rotary International and is a former member of the Greater Muscatine Chamber of Commerce and Industry Board of Directors and the Iowa State University Department of Chemical and Biological Engineering Advisory Council.

Roberts, who is a life member of the Iowa State University Alumni Association, has received a variety of awards throughout her career. Recent honors include the 2009 Voice of the Engineer Award presented by the Iowa Engineering Society, the 2008 Women of Influence Award presented by the *Business Corridor Journal*, and the 2008 Women of Innovation Award presented by the Technology Association of Iowa.



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Education is key element in CBiRC

One student came from Puerto Rico, another from Maryland, and one from Michigan. They joined with a University of Iowa student, two Iowa State students, and a high school student preparing to enter Iowa State to compose the first REU (Research Experiences for Undergraduates) cohort in the NSF Research Center for Biorenewable Chemicals (CBiRC).

CBiRC was created in the fall of 2008 with a five-year \$18.5 million grant from the National Science Foundation. The center is based at Iowa State and has nine academic partners. CBE Professor **Brent Shanks** is the director. Other CBE faculty affiliated with the center include **Laura Jarboe**, **Peter Reilly**, **Derrick Rollins**, and **Jackie Shanks**.

With the goal of transforming today's petroleum-based chemical industry into an industry based on plant-derived biorenewables, incorporating students into the research and other center activities is a vital part of CBiRC's mission.

The REU is a primary component of CBiRC's University Education Program, according to Raj Raman, director of the program and associate professor of agricultural and biosystems engineering.

Specific objectives for the REU include deepening the students' understanding of fundamental principles of engineering, chemistry, and biochemistry; engaging students in cross-disciplinary education and experiential learning; advancing students' knowledge of economic and environmental constraints central to the practice of engineering; and integrating students into the CBiRC community.

The 10-week summer program consisted of orientation, lab work, field trips, lab tours, weekly lunches with program coordinators, and team-building events. In addition, lectures by faculty provided a CBiRC overview and discussion of biorenewables, bioethics, and life cycle analysis; and workshops covered such topics as communications, technical writing, graduate school, virtual reality experience, and engineering in the bioeconomy. An REU poster session was the culminating event of the program.

For Yadi Lopez-Ferrer, a ChE major from the University of Puerto Rico, the CBiRC REU was a perfect match with her interest in and concern for the environment. "I want to be a chemical engineer so that I can help the environment and make things more efficient," she explains, "and that is what CBiRC is promoting by creating biorenewable chemicals. I learned a lot working in the lab and interacting with other students who have similar concerns; but best of all was the excitement of being part of this program. They made me feel like one of their own."

Jennifer Au, a ChE major at the University of Maryland, liked the interdisciplinary nature—biology, chemistry, and chemical engineering—of the research at CBiRC. "This program gave me a very valuable experience in the lab. It was great to see people from so many different fields and backgrounds work on one common goal," she says. "Also the location, Iowa State's proximity to ethanol plants and biomass conversion centers, was a great plus to the program."

While the 2009 program received a lot of positive feedback from students and mentors, Raman notes that a detailed evaluation will be used to improve the program for 2010. The goal, he says, is to bring in 12–15

students next summer. The application deadline is March 1, 2010, and the tentative program dates are June 2–August 6. More details are available at www.cbirc.iastate.edu/nsfreu_overview.asp.

Students also have several opportunities for international REUs with some of CBiRC's academic partners. "We will probably give preference to students who have done our REU or another REU in the United States," Raman says. "Doing independent research for the first time is challenging, so we would like them to have the experience here first."

Research opportunities are also available to students during the academic year. Twelve undergraduates are currently working on

CBiRC projects. As part of the CBiRC team these students are encouraged to participate in CBiRC activities including seminars, centerwide meetings, and the annual meeting, which brings in participants from the partner institutions.

Several new courses that are being developed will provide a way to reach a broad spectrum of students. These include a three-credit course on chemical and biological catalysis and a one-credit course, *The Evolving Chemical Industry*. Raman expects the courses to be offered spring or fall of 2010. The one-credit course will be offered as a short course and be available via distance education.

Another major component of the CBiRC Education Program is an interdepartmental graduate minor in biorenewable chemicals. "For the minor, students must take at least one course from two of the three thrust areas—new biocatalysts for pathway engineering, microbial metabolic engineering, and chemical catalyst design—within CBiRC plus the chemical industry course, the chemical and biological catalysis course, and fundamentals of biorenewables," Raman says.

The proposal for the minor is currently going through the university approval process.

More information about CBiRC is available at www.cbirc.iastate.edu/.



CBiRC REU program—Front row, from left: Jennifer Au (University of Maryland, College Park), Yadi Lopez (University of Puerto Rico, Mayaguez), and Sumira Stein (Michigan State University); back row, from left: Luke Prest (University of Iowa), Nick Evans (University of Iowa, SPEED program), Mike Kalkhoff (Iowa State University), Travis Cordes (Iowa State University), and D. Raj Raman (director of CBiRC's university education program).

Display case honors ChE alum and commemorates professorship

Family and friends of **Manley R. Hoppe** joined CBE faculty in Sweeney Hall on November 6, 2009, for the unveiling of a display case honoring the chemical engineering alum and former instructor. Hoppe earned his BS degree in 1932 and his MS degree in 1935 and was an instructor in the department from 1935 to 1936.

After leaving Iowa State, Hoppe went on to have a distinguished career with Parr Instrument Company in Moline, Illinois. He joined the company in 1936 as a chemical engineer. After serving in the U.S. Army from 1942 to 1946, Hoppe returned to Parr Instrument as vice president in 1946. He became president in 1957, became chairman of the board of directors in 1974, and was chairman emeritus from 2003 to 2007. Hoppe passed away in October of 2007 at the age of 96.

The Manley R. Hoppe Professorship in Chemical Engineering, which was announced in May of 2009, was established through Hoppe's estate with the support of his daughter and son-in-law, **Jean** and **Mike** (BSChE'59) **Steffenson**. In addition to the professorship, Hoppe and his late wife, **Lois**, established numerous scholarships for undergraduate chemical engineering students.

Hoppe received many honors and recognitions throughout his life. In 1983, he received the SAMA Award, which is the scientific instrument industry's highest award given in recognition of leadership, vision, and devotion of time and energy to the growth of the entire industry. Iowa State University presented the Alumni Merit Award to Hoppe in 1969, and in 2007 he was inducted into the Quad Cities Area Business Hall of Fame.

Manley R. Hoppe Professorship in Chemical Engineering

IOWA STATE UNIVERSITY
College of Engineering



Manley R. Hoppe
BSChE'32, MSChE'35



Chairman Emeritus,
Parr Instrument Company

"Manley R. Hoppe was accomplished in his field, in his community, and in his life."



Mike Steffenson, children Sandy and Doug, Manley and his wife Lois, and Jean Steffenson.



Manley with his family—including seven Iowa State alumni.

"What struck me most about Hoppe... he treated everyone so respectfully and was such a gentleman. That's the thing you walked away with when you got to know Hoppe. If you treated people the way Hoppe treated people, you'd be successful today."

—In tribute to Manley R. Hoppe

Shanks leads research team looking for catalyst that allows plants to produce hydrocarbons

Plants and algae may be a source of green, renewable hydrocarbons that could replace the ancient, finite hydrocarbons in fossil fuels, according to a multidisciplinary team of researchers led by CBE Professor **Jackie Shanks**.

Shanks, the Manley R. Hoppe Professor of Chemical Engineering, says some plants and algae produce hydrocarbons as a way to store carbon and energy. And those hydrocarbons could be used to create second-generation biofuels.

"These plants are capturing solar energy and creating something that's chemically identical to petroleum," Shanks says. But, she adds, researchers don't know the exact structures, mechanisms, genetics, and metabolism of that conversion.

Shanks and a team of researchers recently won a four-year, \$2 million grant from the National Science Foundation's Office of Emerging Frontiers in Research and Innovation to study the production of biological hydrocarbons.

The research team includes Basil Nikolau, Iowa State's Frances M. Craig Professor in the Departments of Biochemistry, Biophysics and Molecular Biology and Food Science and Human Nutrition, who is also the deputy director of the NSF Engineering Research Center for Biorenewable Chemicals based at Iowa State; Thomas Bobik, an Iowa State associate professor of biochemistry, biophysics and molecular biology; Gordon Wolfe,

an associate professor of biological sciences at California State University, Chico; and Govind Nadathur, a professor of marine sciences at the University of Puerto Rico. The project will also support the research, training, and education of a number of postdoctoral researchers, graduate students, and undergraduate students and provide these young researchers with an opportunity to broaden their training experience with national and international collaborations.

Shanks says the researchers' specific task is to isolate, characterize, and bioengineer a catalyst that creates the biological hydrocarbons.

Nikolau says the current project will not address which plants or algae are the best producers of biological hydrocarbons or how the biological process can best be exploited. Those studies, he says, would build on the discoveries of the current project.



Jackie Shanks and Mike and Jean Steffenson (son-in-law and daughter of Manley R. Hoppe) pose with CBE Chair Surya Mallapragada following the unveiling of the display case honoring Hoppe and the professorship.

Shanks installed as first Hoppe Professor

Iowa State President Gregory L. Geoffroy and College of Engineering Dean Jonathan Wickert hosted a special installation ceremony on November 5, 2009, honoring CBE Professor **Jacqueline Shanks** as the first recipient of the Manley R. Hoppe Professorship in Chemical Engineering.

Shanks, who earned her BS in chemical engineering at Iowa State in 1983 and PhD in 1989 from the California Institute of Technology, joined the Iowa State faculty in 1999. She leads interdisciplinary research on plant metabolic engineering and is coleader of Thrust 2 (Metabolic Engineering) for the National Science Foundation Center for Biorenewable Chemicals at Iowa State.

"I am deeply honored and very grateful to receive this professorship in honor of Manley R. Hoppe," Shanks said. "He is a prime example of Iowa State's rich tradition in educating student leaders in engineering that go on to make substantial contributions to our world, and I will proudly continue to educate student leaders at Iowa State at the undergraduate and graduate levels."

But can plants directly produce hydrocarbons for biofuels? Is that too good to be true?

Shanks says the research could lead to technologies that transform how liquid fuels are produced. And that is the kind of project the science foundation's Office of Emerging Frontiers in Research and Innovation is supporting.

According to the foundation, the office's goal is to support "transformative opportunities potentially leading to: new research areas . . . ; new industries or capabilities that result in a leadership position for the country; and/or significant progress on a recognized national need or grand challenge."

A new, sustainable source of hydrocarbons could lead to all of that: "The production of renewable hydrocarbons that would integrate directly into the existing fossil-carbon infrastructure would represent an important advance in biofuels technology," the researchers wrote in their project proposal. "Transforming this existing industry to a biobased carbon feed-source is a grand challenge that will need to integrate unique and proficient biological solutions with new engineering efficiencies."



Hebert's work in film growth featured in *Nature* publication

CBE Professor **Kurt Hebert** is working to understand the growth of self-ordered porous aluminum oxide films. The regular arrangement of the pores and very large surface area of the oxides make these films advantageous for such applications as solar cells and sensors. A better understanding of the growth mechanism will help researchers learn how to manipulate the geometry and tailor the properties for these kinds of specific applications.

Hebert and recent PhD graduate **Jerrod Houser** reported on their work examining what happens during the growth of the films in the April 12 online edition of *Nature Materials*. In a brand new approach, the researchers developed a model integrating transport of ions due to both mechanical stress and electric fields. In the model, stress causes the solid oxide material to flow according to the same physical laws that govern the flow of liquid water, but with a much larger viscosity. The results were in detailed agreement with the experimental findings from earlier research conducted in England.



Hebert and Houser's article, "The role of viscous flow of oxide in the growth of self-ordered porous anodic alumina films," can be found on the *Nature Materials* Web site at www.nature.com/nmat/journal/v8/n5/full/nmat2423.html.

CBE takes participatory role in ISU ADVANCE

Iowa State is working to increase the number of women faculty members in science, technology, engineering, and mathematics (STEM) fields through a special program called ISU ADVANCE. The program, which started in 2006, is funded through a five-year grant from the National Science Foundation.

"Our approach is to transform the culture, practices, and structures of the university to aid in the successful recruitment, retention, and promotion of faculty," says **Charles Glatz**, CBE professor. "The desired outcome is to provide an environment where all faculty, in the midst of the high work expectations, can succeed and still have a work/life balance that encourages them to stay in academia."

Glatz, who first became involved in ISU ADVANCE as department chair when the proposal was being written, served as an ADVANCE equity adviser for the College of Engineering for two years and is now an ADVANCE professor with the role of coordinating activities within the department.

CBE is one of nine departments from three colleges—Agriculture and Life Sciences, Engineering, and Liberal Arts and Sciences—identified as focal departments. Over the course of the grant, research is being conducted within each department to help determine policies and practices that will contribute to the recruitment and retention of women faculty in the STEM fields.

This fall, an outside researcher is conducting in-depth interviews with CBE faculty by rank, either individually or in focus groups, to find out what the department does that helps faculty be successful as well as what impedes success. The goal is to get a variety of viewpoints and perspectives that will then be compiled into a written document and analyzed by social scientists to identify common concerns.

The department will then decide which of those concerns to address and how to address them. "This is the bottom-up approach," Glatz explains. "We will drive the decision of what we want to accomplish." During the spring semester, a faculty committee will be formed to draft an action plan to take to the full faculty in the fall of 2010.

Meanwhile, ISU ADVANCE will be looking at the research results from all of the focal departments to plan workshops and develop tools to support the departments in their recruitment and retention efforts.

Faculty/staff/student awards and retirement



Surya Mallapragada, the Richard Stanley Chair in Interdisciplinary Engineering and CBE professor and chair, received the Distinguished Service Award presented by the Food, Pharmaceutical, and Bioengineering Division of the American Institute of Chemical Engineers (AIChE) at the 2009 AIChE annual meeting.



Eric Cochran, CBE assistant professor, received an NSF CAREER Award to support the project "Block Copolymer Layered Silicate Nanocomposites: Thermodynamics, Dynamics, and Structure Property Relationships."



Jody Danielson, CBE program coordinator, received a 2009 Iowa State University Professional and Scientific Excellence Award.



Kathy Law, secretary in the CBE department since 2000, is retiring January 29, 2010.



Bret Ulery, ChE graduate student, won first place in the Bionanotechnology Graduate Student Award Session at the 2009 AIChE annual meeting.

ChE student gets a head start on her college career

Lizette Jimenez is a first-year chemical engineering student. Ordinarily the first few weeks of fall classes are a time of transition for incoming students, but Jimenez and 21 other Iowa State freshman engineering students got a head start on transitioning to college life in June and July. They participated in the Summer Program to Enhance Engineering Development (SPEED) offered by the Engineering Diversity Affairs office.

"SPEED is designed to be an intensive boot camp to help students from inner-city schools as well as from smaller schools in Iowa to compete and succeed in engineering," says **Derrick Rollins**, assistant dean for diversity in the College of Engineering and CBE professor. "Our goal as a college is to help prepare these students for the engineering curriculum."

The program offers an academic and a research track and also includes a variety of team-building activities, seminars, and field trips. Students in the academic track take classes to prepare them for advanced-level math and physics courses and work on developing their study habits. Participants in the research track are assigned a research mentor and gain hands-on experience working in a research lab.

Jimenez, who chose chemical engineering as her major because it is a broad field with options in industry and the medical field, says the opportunity to participate in SPEED played a big part in her decision to attend Iowa State.

"I looked at other schools, but really liked what SPEED had to offer," says the Chicago native. She worked about 30 hours a week for **Jennifer O'Donnell**, CBE assistant professor. "It was intimidating at first seeing all of the lab equipment, but I got experience using a lot of different equipment and learned a lot from being around Dr. O'Donnell and the graduate students. I have been able to continue working in the lab during the school year, and that is a real benefit too."

When the students weren't doing research or taking classes, they were participating in team-building activities, attending seminars presented by faculty and industrial representatives, going on field trips, and interacting with each other. In looking back at her summer experience, Jimenez says the biggest thing she gained was new friends, and they are helping each other in the adjustment to college life.



Lizette Jimenez



Senior lecturer **Stephanie Loveland** (center) with ChE seniors **Donovan Layton** (left) and **Corey Schommer** in the Unit Operations Laboratory.

Alumni gift supports undergraduate education

Thanks to the generosity of **Jean and Mike** (BSChE'59) **Steffenson** of Davenport, Iowa, undergraduate laboratories in Sweeney Hall will be upgraded.

Senior lecturer **Stephanie Loveland** says that the gift will allow essential improvements to be made in the labs. These include adding equipment to support studying the reaction that converts soybean oil into biodiesel, heat exchange experiments, and other new experiments that incorporate biotechnology. In addition, Loveland plans to replace old equipment that cannot be repaired or frequently breaks down, causing a lot of frustration as students work to complete their assignments on time.

A primary benefit of the upgrades is the ability to accommodate more students. "Our enrollment is increasing, and that means more students need to get into the labs in order to graduate on time," Loveland says. "The additional experiments will let us do that." The Steffensons' gift will also support the senior lecturer position and undergraduate scholarships.

Jean and Mike Steffenson have a long-time relationship with the CBE department. Jean, who is also an Iowa State alum, having earned her BS in zoology in 1960, is the daughter of **Manley R. Hoppe**, for whom the Manley R. Hoppe Professorship in Chemical Engineering is named (see article on page 7).

Support AIChE!

A reminder, once again, that all of us need to help keep AIChE strong. Don't forget to pay your 2009 AIChE dues, or to rejoin and volunteer if you've been inactive. Visit the AIChE at www.aiche.org or call 800 242-4363 today!

CBE Faculty Update

Professor **Robert C. Brown** was named Anson Marston Distinguished Professor in Engineering this past spring. He has received two new contracts from the U.S. Department of Energy. The first supports the design and construction of a process development unit for the production of bio-oils. The second supports gas-cleaning studies in the production of synfuels.



Distinguished Professor **George Burnet** has been retired since 1995 and continues to live in Ames, remaining active on the campus and in the community. His work at the university deals primarily with alumni relations and development. On the technical side, he is pleased by the continuing interest from the United States and beyond in the work done in his group at the Ames Lab beginning in about 1980 on the utilization of coal solid wastes, especially development of the Ames lime soda sinter process. He welcomes hearing from former students and colleagues.

Aaron Clapp, assistant professor, works on biofunctional quantum dots. He is currently assisting the AIChE student chapter in organizing the upcoming Mid-America Regional Conference to be held on campus in April. He presented two talks at this year's AIChE annual meeting in Nashville.



Eric Cochran, assistant professor, has recently been recognized with an NSF CAREER Award supporting his research with block copolymer/layered silicate nanocomposites. He will give an invited talk at the spring 2010 ACS meeting in San Francisco related to this work. Other emergent areas of interest include stimuli responsive colloids and catalytically active polymer nanowires for energy applications (with **Kurt Hebert**). In collaboration with Glenn Fredrickson (UCSB) and Accelrys, he continues to develop the Mesotek module of Materials Studio for field theoretic simulations of complex polymer formulations.

Liang Dong, assistant professor, has continued his research with nanophotonic and plasmonic chemical and biological sensors, smart drug delivery devices, microfluidics, light-emitting nanofibers, solar cells, and MEMS.



Professor **Rodney Fox** is an elected fellow of the American Physical Society and received the Iowa State University Award for Outstanding Career Achievement in Research.

After last year's year of many new things, Professor **Chuck Glatz** had a year of not a whole lot new. On the teaching side, he continued with Bio-version of the Unit Ops Lab. He took on one new research student while the continuing students have moved closer to completion with several publications. He presented some of those results in a keynote presentation at the International Conference on Biopartitioning at Brunel University in England. That gave him an opportunity to visit old colleagues from the days of the summer laboratory program in London as well as meeting with his current partners in the academic year exchange program with the Departments of Chemical Engineering and Biochemical Engineering at University College London.



Larry Hanneman, adjunct associate professor and director of the Engineering Career Services office, was recently named to the Collegiate Employment Research Institute Advisory Board. He continues his research efforts related to competency- and ability-based employer expectations of entry-level and early-career professionals in the STEM (science, technology, engineering, and mathematics) workforce. The Iowa State Engineering Career Services office continues to deliver the largest career fairs in engineering education and supports the experiential education experiences of 600–800 engineering students at over 250 employers annually.

Professor **Kurt Hebert** is actively engaged in teaching transport courses, in his duties as associate chair, and in his research on electrochemical materials science. Specifically, his research focuses on the fundamental surface chemistry processes controlling degradation and corrosion of metal structures and on the formation of self-ordered nanoporous metal oxide layers.



University Professor **Jim Hill** has stepped down as department chair but continues to be involved with AIChE at the national level, serves as district director for Tau Beta Pi, continues research in fluid mechanics and turbulence, and still advises the solar car team. In November he received the F. J. and Dorothy Van Antwerpen Award from the AIChE Board of Directors for service to the institute.



Andy Hillier is associate professor of chemical engineering and director of the W. M. Keck Laboratory for High Throughput and Atom-Scale Analysis. He is currently teaching Chemical Engineering Thermodynamics and has received two new research contracts from the National Institutes of Health and the Department of Energy to support his research activities in optical sensors and electrochemical catalysis.

Laura Jarboe, assistant professor, is establishing a research program in biorenewable chemical production. She recently returned to her undergraduate institution, the University of Kentucky, to present a research seminar.



Professor **Kenneth Jolls** is interested in visual representation of ideas in chemical science, especially in



thermodynamics. He has created and distributed computer software for generating displays of thermodynamic functions, both for teaching and research. His work has been reviewed by *Science Magazine*, and a recent paper (with co-author and Iowa State PhD **Daniel Coy**) was featured in a Festschrift issue of *Industrial and Engineering Chemistry*

Research. Jolls is an enthusiastic advocate of sound, computer-assisted teaching in engineering and has written frequently on that subject in the national press. He has also been a prime mover in the CBE department's summer unit operations program at the University of Oviedo in Spain. His interest in laboratory work has motivated him to organize plant trips for students in his classes.

Monica Lamm, assistant professor, is leading a five-member team that received a petascale computing resource allocation on the NSF-funded computing system Blue Waters, which will go online in 2011. Lamm will use the allocation to study how dendritic polymers bind water contaminants. Lamm and Professor **Balaji Narasimhan** are codirecting an NSF Research Experiences for Undergraduates site with the theme Biological Materials and Processes (BioMaP).



Stephanie Loveland, senior lecturer, continues to teach the undergraduate laboratory courses in the department. She also teaches one or two other courses each semester as needed. She is cochair of the department's safety committee and is a member of the curriculum committee for this academic year as well. She and

her husband, Brian, are the parents of four-year-old twin boys and a two-year-old girl.



Surya Mallapragada took on a new role as chair of the Department of Chemical and Biological Engineering and was named Stanley Chair of Interdisciplinary Engineering. She was elected fellow of the American Association for the Advancement of Science and received the Distinguished Service Award this year from the AIChE Food, Pharmaceutical, and Bioengineering Division.



Professor **Balaji Narasimhan**, who serves as associate dean of research and graduate studies for the College of Engineering, received new grants from NSF, the U.S. Army, and the Office of Naval Research for his work on biodefense vaccines, nanotechnology, and designer materials. He continues to lead the NSF Biological Materials and Processes (BioMaP) REU program, which was renewed in 2009. This past summer, the BioMaP program provided research experiences for fifteen students.



In the past year, **Jen O'Donnell**, assistant professor, has welcomed three new graduate and three new undergraduate students to the lab to study controlled polymerizations in microemulsions, emulsified microemulsions, dispersed liquid crystals, and the self-assembly of amphiphilic block copolymers. She received seed funding from the Ames Laboratory to investigate the synthesis and self-assembly of lithium ion-conducting block copolymers for use as battery membranes, in collaboration with Dr. Thomas Epps at the University of Delaware. She also recently completed an invited book chapter on controlled microemulsion polymerizations with her doctoral adviser, Eric Kaler.



Michael Olsen, an associate professor in mechanical engineering, has a courtesy appointment in CBE. Olsen is collaborating with Professor **Rodney Fox** on a project to make measurements of fluid dynamics inside microreactors. The project is funded by a three-year National Science Foundation grant that was awarded in September 2007.



Distinguished Professor **Pete Reilly's** group has continued to work on enzyme structure and function, especially on enzymes that attack cellulose and hemicellulose. This includes research to find three-dimensional structures and kinetics of two members of a cellulase family as well as quantum mechanics computation to determine reaction pathways of other enzymes. His group also is constructing a major database of amino acid sequences and three-dimensional structures of the enzymes involved in synthesizing fatty acids, as part of the National Science Foundation Engineering Research Center for Biorenewable Chemicals.



Reilly continues to coordinate Iowa State's exchange program with the Swiss Federal Institute of Technology—Lausanne and the University of Lausanne in Switzerland, as well as chairing Iowa State's Committee on Honorary Degrees and Library Advisory Committee and coordinating the College of Engineering's new bioengineering minor.

Derrick Rollins serves as the College of Engineering assistant dean for diversity and is professor of chemical and biological engineering and of statistics. He initiated a new program called SPEED in the College of Engineering to increase the pipeline of underrepresented minority students in the undergraduate program. He also serves as diversity director for the NSF Engineering Research Center for Biorenewable Chemicals.



Ian Schneider, assistant professor, joined the department in January after finishing an appointment as a Damon Runyon Cancer Research Foundation postdoctoral trainee at the Scripps Research Institute. He is currently directing two graduate students and two undergraduate students in projects related to understanding how cancer cells sense environmental cues and how these cues regulate intracellular dynamics during cell migration.

Distinguished Professor Emeritus **Richard C. Seagrave** received ABET's highest honor during the 2008 annual meeting—the Linton E. Grinter Distinguished Service Award—"for his outstanding, sustained, distinguished, and innovative leadership of first the Engineering Accreditation Commission and then the ABET Board of Directors at a time of radical change . . . ; his committed and diplomatic style assured an orderly transition to a performance-, quality assurance-based method of accreditation."



Professor **Brent Shanks** serves as director of the National Science Foundation Engineering Research Center for Biorenewable Chemicals (CBiRC), which has completed its first year of operation. While not yet fully staffed, CBiRC supports more than 60 graduate students and 15 postdoctoral scholars. Shanks has been invited to give a plenary lecture on catalysis for biorenewables at the 21st International Symposium on Chemical Reaction Engineering in Philadelphia.

Professor **Jackie Shanks** was named the Manley R. Hoppe Professor last spring. She received the Women of Innovation Award for Research Innovation and Leadership by the Technology Association of Iowa. She continues as coleader for the Microbial Metabolic Engineering effort in CBiRC. Shanks is also the lead investigator for a team of researchers that recently won a four-year, \$2 million grant from the National Science Foundation's Office of Emerging Frontiers in Research and Innovation to study the production of biological hydrocarbons. The research team members are from Iowa State; California State University, Chico; and the University of Puerto Rico.



Cory Stiehl continues to serve as lecturer in the department, teaching Engineering 160 and ChE undergraduate courses.

Dennis Vigil, associate professor, and **L. K. Doraiswamy**, emeritus professor, have signed a contract with publishers Taylor and Francis to write a graduate-level textbook entitled *Chemical Reaction Engineering: Beyond the Fundamentals*.



As an emeritus member of the faculty, **Thomas Wheelock** serves on the Department Honors and Awards Committee and continues to guide research on the development of a unique material for reforming methane to produce hydrogen. Wheelock also enjoys serving on the advisory council and several committees for the Green Hills Retirement Community where he and his wife, Edra, reside.

Diversity of research draws student to CBE

When **James Bergman's** adviser at Clemson University suggested he consider Iowa State for graduate school, Bergman's response was frank. "No way am I moving to Iowa," he recalls thinking. Bergman, who grew up in South Carolina, just could not see himself in a place where snow, ice, and wind chill indexes are common terms in winter weather forecasts.

In spite of his misgivings, Bergman began looking at what Iowa State and the CBE department had to offer. The diversity of research opportunities convinced him to come to Ames. He had majored in chemical engineering as an undergraduate at Clemson because he loved chemistry and calculus but then had become interested in the biological sciences and added biology as a minor. CBE offered a range of research projects in each area.



Now in the second year of his PhD program, Bergman is part of CBE Assistant Professor **Jennifer O'Donnell's** research team. His research focuses on short chain amphiphilic polymers. These are polymers that have both a hydrophilic (dissolves in water) part and hydrophobic (repels water) part.

"Our goal is to be able to dissolve these polymers in such a way that we can dictate the long range structures that will form," Bergman explains.

The high-impact applications include things like drug delivery. "You would be able to swell the polymer with certain types of drugs," he says, "and then, because of the molecular architecture, there would be fairly consistent diffusion into the body."

Bergman, who works in the lab about 30 hours a week, estimates it will take him about five years to complete his PhD. He is undecided as to whether he then will pursue an academic career or a career in industry. He is, however, sure that chemical engineering will play a big role in saving the world, and he wants to be part of that.

2009–2010 Upperclass

Oreoluwa Adebara	Manley R. Hoppe
Michael Alexander	Floyd Herman Cook
Derek Arnold	Lois and Manley Hoppe
Anthony Barthel	Dow Chemical Company
	Engineering Undergraduate Merit
Christine Bauer	Deere & Company
Jenae Baumert	Ralph S. Millhone
Samantha Beary	Lyle J. and Marcia L. Higgins
Meredith Breton	L. C. "Doc" and Lina Allen
Diane Brown	Ralph S. Millhone
Veronica Bryant	A. Douglas and Helen Steffenson
	Nicholas L. Reding/Monsanto Scholarship in Engineering
Joseph Burkemper	Roderick Seward, Flossie Ratcliffe,
	and Helen M. Galloway
Joshua Buyert	Lyle J. and Marcia L. Higgins
Melissa Cali	Engineering Leadership Program
Samantha Chalfant	Engineering Undergraduate Merit
Anna Clark	Kenneth and Mary Heilman
	Roderick Seward, Flossie Ratcliffe, and Helen M. Galloway
Timothy Clayton	Manley R. Hoppe
Austin Cociolone	Marion and Andrew Pontius
Anthony Colombari	Skogen-Hagenson
Elliott Combs	Ralph S. Millhone
Stacey Countryman	Robert O. and Marie E. Dierks
Courtney Crego	Lyle J. and Marcia L. Higgins
Anna daSilva	Barbara L. Ferree
Emily Davenport	Roderick Seward, Flossie Ratcliffe,
	and Helen M. Galloway
Holly Davis	Lois and Manley Hoppe
Naomi Demmon	Manley R. Hoppe
	Roderick Seward, Flossie Ratcliffe,
	and Helen M. Galloway
Martin Dufficy	Jerrold S. and Mary R. Ferree
	Engineering Undergraduate Merit
William Edwards	Roderick Seward, Flossie Ratcliffe,
	and Helen M. Galloway
Lars Ellingson	William Cantrell Miller
Jeffrey Emrich	Donald H. Beisner in honor of Dr. Morton Smutz
Jacob Epstein	Ralph S. Millhone
Daniel Erickson	Manley R. Hoppe
	Engineering Undergraduate Merit
Matthew Erickson	Manley R. Hoppe
Maria Fabiosa	Engineering Undergraduate Merit
Anthony Fischels	Kathy and Gen Garrett
Michael Forrester	Lois and Manley Hoppe
	Engineering Leadership Program
Nathan Fowler	Ralph S. Millhone
Debanjan Ghosh	A. Douglas and Helen Steffenson
	Engineering Leadership Program
Meredith Gibson	Tau Beta Pi Scholars Program
	Stuart M. Totty
	Engineering Leadership Program

ChE seniors in college leadership roles

Jessica Tobelmann and **Julia Wiggen** had a lot on their minds in September, and it wasn't just their chemical engineering classes.



Tobelmann, a senior from Plymouth, Minnesota, served as general cochair for Engineers' Week 2009. For the year preceding the celebration, she and fellow cochair Adam Weaver, senior in civil engineering, oversaw the efforts of five subcommittees and more than 50 committee members

as a variety of major events transitioned from drawing board to reality. The events included Senior Visitation Day; campus lunches for faculty, staff, and students; golf tournaments; career seminars; intramurals; a charity ball; and a university lecture by Apollo 13 astronaut Fred Haise. The career fair on September 22 marked the official end of E-Week activities.

When asked what it takes to successfully cochair E-Week, Tobelmann says it is dedication to making a difference "I've worked on E-Week since my freshman year, and I am passionate about wanting to see it succeed and continue into the future."

The keys to a successful E-Week, Tobelmann says, are leadership—getting people to work together as a team toward a common goal—and communication between team members, subcommittees, and the cochairs.

Scholarships

Jake Gillilan Engineering Undergraduate Merit
 Ann Gleason Devin and Indra Shepard Scholarship
 Engineering Undergraduate Merit
 Breanna Gordon Roderick Seward, Flossie Ratcliffe,
 and Helen M. Galloway
 Nicholas L. Reding/Monsanto Scholarship in Engineering
 Christopher Grace Hans Buehler
 Engineering Undergraduate Merit
 Christopher Griffin Erwin and DeLoris Whitney
 Derek Grygiel Ralph Luebbers
 Engineering Undergraduate Merit
 Michael Gustafson Dow Chemical Company
 Engineering Undergraduate Merit
 Jason Haase Robert Fields
 Engineering Undergraduate Merit
 Robert Hable Marion and Andrew Pontius
 Nathan Hartman Engineering Undergraduate Merit
 Jacob Hemberger Donald H. Beisner in honor of Dr. Morton Smutz
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Kelsey Moore Caterpillar Foundation
 Stephanie Mulder Manley R. Hoppe
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 Lisa Nelson Lois and Manley Hoppe
 Nicholas L. Reding/Monsanto Scholarship in Engineering
 Michael Nepple Lois and Manley Hoppe
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 George W. Catt
 Chika Okano Skogen-Hagenson
 Timothy Ouverson Engineering Undergraduate Merit
 Angela Peet Manley R. Hoppe
 Engineering Undergraduate Merit
 Paul Perkins-Mcintosh Edwin John Hull
 Engineering Undergraduate Merit
 Vadim Petruk Skogen-Hagenson
 Tyler Platt Robert O. and Marie E. Dierks
 Krista Popp Lois and Manley Hoppe
 Meredith Ritter Skogen-Hagenson
 Engineering Undergraduate Merit
 Luke Roling Ralph S. Millhone
 Vania Romay Tau Beta Pi Scholars Program
 Hans Buehler
 Lyle J. and Marcia L. Higgins
 Chelsea Sackett Ralph S. Millhone
 Jennifer Schoborg Griffen Family
 Engineering Undergraduate Merit
 Rebecca Shaw Stuart M. Totty
 Engineering Undergraduate Merit
 Ryan Slinger Ralph S. Millhone
 Justin Smith Don Delahunt
 Nicholas L. Reding/Monsanto Scholarship in Engineering
 Blake Stalder Engineering Undergraduate Merit
 Elizabeth Staloch Ralph S. Millhone
 Matthew Stebbins Devin and Indra Shepard
 Cheryl Tebben Clifford A. Shillinglaw
 Engineering Undergraduate Merit
 Stephanie Thompson Kent and Anne Floy
 Todd Thorson Skogen-Hagenson
 Jessica Tobelmann Engineering Leadership Program
 Christian Tormos Caterpillar Foundation
 Samantha Ulrich Nicholas L. Reding/
 Monsanto Scholarship in Engineering
 Maria Wahl Tau Beta Pi Scholars Program
 Kenneth and Mary Heilman
 Nicholas L. Reding/Monsanto Scholarship in Engineering
 Katharine Walz Ralph S. Millhone
 Bryce Williams Alpha Chi Sigma
 Engineering Undergraduate Merit
 Ashley Yeager Skogen-Hagenson



ChE track athlete

As a freshman in 2008–2009, **Kianna Elahi** was sixteen-hundredths of a second away from qualifying for the NCAA track and field championships, finishing sixth in the 400-meter hurdles with a personal time of 58.87. Elahi's time bettered her previous personal best time (58.99). The ChE sophomore from Omaha, Nebraska, finished third in the 400-meter hurdles at the Big 12 Outdoor Track and Field Championships. Follow Elahi's track record for 2009–2010 at www.cyclones.com. The season begins with the Holiday Preview on December 11.

Wiggen, a senior from Duluth, Minnesota, served as cochair of the 2009 Fall Engineering Career Fair. Wiggen and fellow cochair Justine Bormann, a senior in aerospace engineering, worked closely with Engineering Career Services to organize the fair, which is the largest indoor engineering career fair in the nation. It is held each year at Hilton Coliseum and the Scheman Building. This year 240 companies were represented and 4,300 students and visitors explored full-time, co-op, intern, and summer employment opportunities at the fair.

Wiggen and Bormann also organized a variety of prefair events to help students prepare for their interactions with recruiters. Some 200 students participated in mock interviews and professional seminars conducted by employers coming to the fair. While cochairing the event meant a lot of work early in the semester, Wiggen says it was an amazing opportunity to work with students and employers.



Jessica Tobelmann



Julia Wiggen

2009–2010 CBE Freshman Scholarships

Derek Amundson H. Stuart Kuyper
Janee Becker Roderick Seward, Flossie Ratcliffe,
and Helen M. Galloway
Cody Berra Harvey Louis Dunker
Kyle Blakeney Roderick Seward, Flossie Ratcliffe,
and Helen M. Galloway
Kimberly Booe Ralph S. Millhone
Kristopher Borchardt Engineering Undergraduate Merit
Scholarship
Blake Bruene Engineering Undergraduate Merit Scholarship
Colin Burke Engineering Undergraduate Merit Scholarship
Dennes Burney Larry J. McComber
Jonathan Chapman Roderick Seward, Flossie Ratcliffe,
and Helen M. Galloway
Taylor Chesnut Engineering Undergraduate Merit Scholarship
Erin Claeys Engineering Undergraduate Merit Scholarship
ETEC Scholarship
Sydney Copley Engineering Undergraduate Merit Scholarship
Amanda Cosgrove Engineering Undergraduate
Merit Scholarship
Marley Crusch Harry Oakley Price
Priya Desai Engineering Leadership Program
Daniel Ducharme James B. Cecil
Nicholas Eddy Engineering Leadership Program
Matthew Ellis Ralph S. Millhone
Victoria Fry Engineering Undergraduate Merit Scholarship
Evan Gardner Engineering Undergraduate Merit Scholarship
Korey Gramenz Roderick Seward, Flossie Ratcliffe, and
Helen M. Galloway
Stephen Grechis Engineering Undergraduate Merit Scholarship
Michael Greenberg Engineering Undergraduate
Merit Scholarship
Mitchel Grundmeier Engineering Undergraduate
Merit Scholarship
Christopher Heitkamp Engineering Undergraduate
Merit Scholarship
Van A. Mensing Memorial
Andrew Hemken Engineering Undergraduate Merit Scholarship
Elizabeth Henning Engineering Undergraduate
Merit Scholarship
Elizabeth Heuertz Roderick Seward, Flossie Ratcliffe,
and Helen M. Galloway
Amber Hilderbrand Engineering Undergraduate
Merit Scholarship
Nicholas Hoogheem Alpha Chi Sigma
Nicholas Jaegers Roderick Seward, Flossie Ratcliffe,
and Helen M. Galloway
Lizette Jimenez E2020 Scholarship
Lindsey Jones Memorial Endowment for
Leslie Miller Wallace, Jr.
Elizabeth Karschnia Engineering Undergraduate
Merit Scholarship
Carly Kelty Roderick Seward, Flossie Ratcliffe,
and Helen M. Galloway

Gage Kensler ETEC Scholarship
Christopher Killingsworth Engineering Undergraduate
Merit Scholarship
John King ETEC Scholarship
E2020 Scholarship
Elizabeth Klaes Roderick Seward, Flossie Ratcliffe,
and Helen M. Galloway
Monica Krause Engineering Undergraduate Merit Scholarship
Bharath Krishnamoorthi Engineering Undergraduate
Merit Scholarship
Austin Lange Engineering Undergraduate Merit Scholarship
Jessica Loan Engineering Leadership Program
Kaylyn Ludwig Engineering Undergraduate Merit Scholarship
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Merit Scholarship
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Rebecca Meyers Engineering Undergraduate
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Alexander Palmas Engineering Undergraduate
Merit Scholarship
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and Helen M. Galloway
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and Helen M. Galloway
Amy Roggendorf Ralph S. Millhone
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Matthew Thompson Roderick Seward, Flossie Ratcliffe,
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Sara White Engineering Undergraduate Merit Scholarship

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Valve donation—Emerson Process Management in Marshalltown, Iowa, donated a cut-away demonstration control valve to the CBE department in November of 2008. Jim Hill (center) accepted the gift from Paul Gregoire (left), vice president of global human resources, and Ted Grabau, director of global technology.

Alum is ready to impact people's lives

Since August, **Amy Radermacher** has been on the road. She has camped at Denali National Park in Alaska, hiked with friends in Scotland, and spent four weeks in an immersion program in Guatemala refreshing her Spanish language skills.

The trips were a well-deserved vacation for the 27-year-old Radermacher. Immediately after earning BS degrees in chemical engineering and genetics at Iowa State in 2004, she headed west to Stanford University where she completed her PhD in immunology this past summer. In January, she will begin her professional career in the Minneapolis office of McKinsey & Company, a global management consulting firm.

Radermacher, who grew up in Minnesota, was still in high school when she first decided she wanted to earn her PhD. She was interested in the biological sciences and figured she would need an advanced degree to do research and teach at the university level. A National Merit Scholar, Radermacher visited several schools before choosing Iowa State. Advice from her dad, a computer scientist, and a meeting with ChE Professor **Richard Seagrave** led her to Iowa State and chemical engineering. "I remember the day I met with Dr. Seagrave and Liz Beck from the Honors Program," Radermacher says. "Everything clicked into place."

The decision to attend Iowa State was a good one, according to Radermacher. She attributes her success to factors such as the high quality of students in the chemical engineering program and having a number of women in each of her classes. This, she says, provided a great support system in a traditionally male-dominated field.

As a member of the Honors Program, Radermacher had flexibility in choosing the classes that would best meet her needs. This was especially useful since she majored in both chemical engineering and genetics and had a minor in Spanish. In addition, honors seminars provided the opportunity to learn about things such as neuroscience and nutrition just for the fun of it.

Radermacher also took advantage of opportunities to develop research skills. Her sophomore year, she worked in a biochemistry lab on campus and then participated in a summer internship program at St. Jude Children's Research Hospital in Memphis, Tennessee. "It was a great opportunity to see what it would be like to do research full time," says Radermacher, whose project focused on childhood muscle cancers.

During her junior year, Radermacher fulfilled a long-time goal of studying abroad by participating in CBE's exchange program with University College London. "Spending a year in another country where you are immersed completely in another culture really broadens your experiences educationally and also just as a person," she says. After London, Radermacher participated in the department's summer lab program at the University of Oviedo in Spain.

At Stanford, Radermacher focused her research on immunology, but she also continued her quest to explore new areas of interest such as business and entrepreneurship. One highlight of her graduate experience was developing a leadership class for graduate students.

"Stanford really tries to motivate students to take their education into their own hands," Radermacher explains.

"As a result, a lot of the programs adopted by departments have been initiated by students. I started a leadership class because I felt we weren't getting enough leadership training within our curriculum. Irrespective of what field you go into after graduation, whether it's academia, research, or industry, you need a set of skills outside of scientific research skills in order to succeed."

"I remember the day I met with Dr. Seagrave and Liz Beck from the Honors Program . . . everything clicked into place."



Radermacher holds an owl at the Kelso village faire in Scotland.

These skills include such things as communication—how to talk to people who aren't scientists about science, negotiation, conflict resolution, and management. With the support of the dean's office, departments, professors, and her fellow students, Radermacher developed the course with a classmate and recruited experts to lead workshops for students on these topics. The class is now in its third year.

While Radermacher started her graduate studies with a career goal of becoming a researcher, she began exploring other career options after her first couple of years at Stanford. "Research is a great profession, but it can take 20–30 years to discover a new drug and move it through the process so that it is actually helping someone," she explains. "I looked at a lot of different options because I wanted to be in a career that has more breadth and in which I can have an impact on people's lives more quickly."

As a consultant with McKinsey, Radermacher will work with large organizations and companies helping them solve their biggest challenges. She continues her interest in health care, energy, and the environment and would like to specialize in those industries.

CBE alum: Choose engineering to make a difference

Gayle Roberts, BSChE'81, is a perfect role model for aspiring young engineers. It is not necessarily because she is president and chief operating officer of one of the largest engineering firms in the country, although that certainly plays a role, but rather her conviction that engineers are the key to solving the problems the world will face in the next 50 years.

"When I think about the challenges that lie ahead—particularly those relating to energy, water, and the environment—

engineering is the profession that has the expertise to solve them," she says. "I tell students that they may be considering engineering because they like science and math, but the best reason to choose

engineering is because you have the ability to make a difference."

Roberts, who has served as president and COO of Stanley Consultants in Muscatine, Iowa, since 2007, joined the firm as a process design engineer immediately after earning her BS in chemical engineering in 1981. It certainly was not where she had expected to end up when she headed to Iowa State in 1976. Times were different then. Women were not encouraged to go into engineering, and Roberts, who loved math and science, chose textile science and home economics education as her majors. When some of her friends in engineering sought her help with calculus and chemistry, however, she decided that she too could become an engineer.

At the beginning of her junior year, Roberts transferred to chemical engineering. She filled her schedule with engineering classes and soon signed up to participate in the department's exchange program at University College London. "It was my first time on an airplane and first time outside of the U.S." she says. "It really opened my eyes that there is a bigger world out there with lots to experience."

Preparing to graduate in March of 1981, Roberts interviewed with engineering firms on the coasts. "I grew up in Iowa and thought I had to leave to make it big," she recalls. "My sister, however, lived here in Muscatine, and she suggested I interview with Stanley Consultants. In the end, I chose to work here."

Roberts has worked her way up at Stanley Consultants, but points out she never set out to be president or even a manager. For those seeking advice on how to reach the top of the management track, she tells them to look for opportunities to make a difference and to challenge and stretch themselves. Then, she says, getting ahead will take care of itself.

While serving as president and COO is a demanding role, Roberts attributes her success to her passion for the company and her desire to nurture it and grow it for the next generation of leaders. "The best thing you can do is find a company where your personal values fit with the company's core values," she says. "There are always going to be tough decisions to make,

but knowing my values align with the company's values helps me make those decisions."

One of those mutual values is a focus on family. The company, she says, values its members (employees) as a whole, for everything they are involved in and not just for the time they spend at work.

And for Roberts, her career at Stanley Consultants has gone hand in hand with being a wife and a parent of two daughters and three stepsons. "In a career, there are many things that tug at you, and sometimes you feel like you're in a fishbowl," she says, "but the bottom line priority when it comes down to the end of the day is being with family."

The College of Engineering recognized Roberts this year with a Professional Achievement Citation in Engineering (see article on page 4).

Roberts, who is a life member of the Iowa State University Alumni Association, has received a variety of awards throughout her career. Recent awards include the 2009 Voice of the Engineer Award presented by the Iowa Engineering Society, the 2008 Women of Influence Award presented by the *Business Corridor Journal*, and the 2008 Women of Innovation Award presented by the Technology Association of Iowa.



Alumni in the news

Sid Banwart, BSChE'68, retired October 1, 2009, from Caterpillar Inc. in Peoria, Illinois. Banwart, who first joined Caterpillar in 1968 as a development engineer, had served as vice president of Caterpillar's Human Services Division since 2004.

Bipin Dalmia, MSChE'90/PhDChE'94, was promoted to senior vice president, business development and intellectual property, at Biolex Therapeutics in Pittsburgh, Pennsylvania. Dalmia, who joined Biolex in 2003, was previously vice president of business development.

Allen Gross, BSChE'88, was named vice president, life science practices, for EFL Associates, an executive search firm in Overland Park, Kansas. He formerly was global marketing manager at SAFC Biosciences.

Jim Halligan, BSChE'62/MSChE'65/PhDChE'67, who served as president of Oklahoma State University from 1994 to 2003, was elected to the Oklahoma State Senate in the November 2008 election.

Kevin Hess, BSChE'85, was elected vice president, oilseeds production of Archer Daniels Midland Company. He joined ADM in 1985 and has held numerous positions in the company's oilseeds processing and corn processing business segments.

Robert Hoke, BSChE'73, has joined Nyemaster, Goode, West, Hansell & Obrien P.C. as a shareholder in the intellectual property department. Hoke, who is a registered patent attorney, earned his JD and MBA from the University of Iowa.

Edward Maginn, BSChE'87, professor of chemical and biomolecular engineering at the University of Notre Dame, received the Computational Molecular Science and Engineering Forum Early Career Award at the American Institute of Chemical Engineers annual conference. This is the first year for the award that recognizes outstanding research. Maginn holds a PhD from the University of California, Berkeley.

Pat McHenry, BSChE'79, has joined Larimer Associates, a Denver-based investment and management company. McHenry, who earned an MBA at Stanford University, previously was senior vice president with Catellus in charge of retail strategy and implementation.

Leigh Thompson, BSChE'93/PhDChE'97, was promoted to solvents and monomers senior R&D leader for Dow Chemical Company in Midland, Michigan.

R. Kirk Thompson, PhDChE'99, was promoted to Dow solar solutions senior R&D leader for Dow Chemical Company in Midland, Michigan.

Death Notices

Clarence A. "Larry" Beutel III, BSChE'81, was one of the passengers who died in the crash of Continental Airlines Flight 3407 near Buffalo, New York, last February. Beutel, who also had an MBA from Harvard Business School, was vice president of consulting at Salient Corporation, a computer software company specializing in business performance management solutions. Prior to joining Salient in 2001, Beutel was director of marketing and product development at Autokumpu American Brass.

Edgar Collins, long-time chemical engineering faculty member and alum, passed away in Ames on November 4, 2009. Born and raised in Ames, Collins served in the U.S. Army during World War II. The army sent him to school at Louisiana State University where he became a ballistics expert and earned a master's degree in mathematics.

Collins returned to Ames following his army service to attend Iowa State where he earned his MS degree in chemical engineering in 1947. He spent the next eight years working in the research labs at Sinclair Oil in Chicago. Collins then returned to Ames where he joined the Iowa State chemical engineering faculty. During his 37-year tenure on the faculty, Collins was known as a friend to colleagues, a mentor to many students, and an active member of the state chapter of the American Institute of Chemical Engineers.

Please stay in touch at 515 294-7642 or cbe@iastate.edu.

We want to hear about your career and personal news for future issues of *ACTIVESite*. We also need your help with donations to the department. If you're making a contribution to Iowa State, please consider designating it for the Department of Chemical and Biological Engineering using the form below. Enclose it with your pledge or gift and mail it to the Department of Chemical and Biological Engineering, 2114 Sweeney Hall, Iowa State University, Ames, IA 50011-2230.

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The Department of Chemical and Biological Engineering is now offering a master of engineering in chemical engineering degree

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—*Daqian Wu*, a student pursuing a master of engineering in chemical engineering degree, who works full time at Pella Corporation in Pella, Iowa

For professionals seeking additional education beyond a bachelor's degree to become an outstanding engineer, the Department of Chemical and Biological Engineering is now offering a master of engineering in chemical engineering (MEng ChE). This program provides a unique blend of technical and managerial education and will help you compete in today's ever-changing work environment.

Many of the course are delivered online. You, along with our department's faculty advisers, design a schedule that fits your needs.

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- For general information about chemical and biological engineering, visit www.cbe.iastate.edu.
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Department of Chemical and Biological Engineering

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ChE senior completes stellar soccer career



The final whistle in Iowa State's soccer match on October 30, 2009, marked the end of an outstanding career for goalkeeper **Ann Gleason**. The senior chemical engineering major ranks first all-time in career wins (26), shutouts (16), and saves (398). She also holds the top season marks in save percentage (.864) and goals-against average (.890), both from the 2007 season. Named to the *ESPN the Magazine* Academic All-America second team this year, Gleason is the first Iowa State soccer player to receive this honor. She is also a three-time first-team Academic All-Big 12 and *ESPN the Magazine* Academic All-District VII recipient.

While Gleason acknowledges that playing soccer at this level involves a lot of hard work and a big time commitment, she says the experience is something she will always remember and be proud of.

In January, Gleason will begin a co-op experience with Cargill. She will return to campus in the fall to complete her coursework. Following graduation in May 2011, the Stillwater, Minnesota, native would like to begin her career in Minnesota.

