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# Letter *from the Chair*

## Dear Colleagues:

This has certainly been a banner year for the Department of Chemical and Biological Engineering at Iowa State. For example:

- CBiRC, the National Science Foundation Engineering Research Center for Biorenewable Chemicals, Iowa State's first NSF Engineering Research Center, has started up with a five-year \$18.5 million NSF grant. The effort to create the center was spearheaded by Professor Brent Shanks, the center's director, and includes Professors Jackie Shanks, Laura Jarboe, Derrick Rollins, and Peter Reilly, as well as a number of academic and industrial partners worldwide. This development underlines Iowa State's stature as the national and international leader in biorenewable chemicals. Congratulations to Brent and his team!
- CBiRC complements the initiative started last year with the eight-year \$22.5 million biofuels research program funded by ConocoPhillips and led by Professor Robert Brown, who directs the Iowa State Bioeconomy Institute. Professors Brown, Shanks, and Rodney Fox are among the faculty members involved with research sponsored by this grant program.
- Professor Monica Lamm is co-principal investigator of an NSF "peta-apps" research grant for which she is developing multiscale molecular simulation computer programs to take advantage of the next generation of high-speed scientific computers ("peta-flop" machines).
- Three outstanding new faculty members joined the department this year, as mentioned in my previous letter to alumni—Laura Jarboe from UCLA (via postdoc at Florida), Jennifer O'Donnell from Delaware (via postdoc at Sydney), and, beginning in January, Ian Schneider from North Carolina State (via postdoc at Scripps). We need help from generous alumni to aid them in starting up their careers. Also, we welcome Peter Hemken (vice president, DuPont) and Bob Lane (vice president retired, Shell EP) as new members of the department's advisory council.



- The department is excelling with other research efforts, including use of the local electrode atom probe microscope (LEAP)—one of only a handful at U.S. academic institutions—in the Keck laboratory, directed by Professor Andrew Hillier. It is a wonderful tool for materials research.
- The employment outlook for our undergraduate and graduate students is excellent. Over 100 companies were seeking ChE graduates at the Engineering Career Fair held earlier this fall, and 65 companies were looking only for ChEs! Starting salaries continue to increase, and the undergraduate population has responded to this demand (now about 400 undergraduate students), so our physical facilities are bursting at the seams.
- The National Science Foundation-sponsored undergraduate research program "BioMaP" (Biological Materials and Processes), developed by Professor Balaji Narasimhan in partnership with the Instituto Tecnológico de Monterrey (Mexico), has completed its third year and has inspired many students to further their education in graduate school. We are hoping for the program to continue.

By the time you receive this newsletter, we will have hosted an alumnus reception at the AIChE annual meeting in Philadelphia, celebrating AIChE's centennial. We hope that we saw you there! Please keep in touch. We love to hear how you are doing in your own careers and about life after Sweeney. And if you are in the Ames area, please stop by the department to visit.

As mentioned last year, we are actively planning to ensure Iowa State's future as a pre-eminent Department of Chemical Engineering. Very successful thrust areas for us recently have been in biorenewables, reaction engineering, biomaterials and biochemical research, new polymeric materials and processes, nanotechnology research, advanced computational tools, advanced laser diagnostic tools for fluid mechanics and transport problems, and the use of advanced microscopic techniques. We seek your help—both financial and advisory—in ensuring this future. Our greatest needs fall in the areas of faculty development and facilities (the ChE Excellence Fund), and naming opportunities are also available.

Best wishes for the rest of 2008 and for a prosperous 2009.

James C. Hill  
University Professor and Chair

## On the cover:

Postdoc **Nattaporn Lohitharn** sampling a batch reactor being used to produce biorenewable chemicals. See NSF center story on page 7.



# Keck Lab moving full speed ahead

The W. M. Keck Laboratory for High Throughput and Atom-Scale Analysis, located on the third floor of Sweeney Hall, is a busy place these days. The goal is for it to get even busier, according to **Andrew Hillier**, CBE associate professor and principal investigator for the lab.

Officially opened in 2007, the facility is home to the local electrode atom probe microscope (LEAP), which was funded with the help of a \$1.6 million grant from the W. M. Keck Foundation. The APM, along with other highly specialized equipment including a combinatorial

sputtering system, chemical printer, gradient coater, scanning electrochemical microscope, and infrared microscope, makes the facility an ideal place for advancing the discovery of new materials.

Hillier and Krishna Rajan, also one of the lab's principal investigators and director of Iowa State's Institute for Combinatorial Discovery, are spreading the word about the lab's unique capabilities to researchers around the world. The goal is to develop new collaborations with industry and academic institutions and to use the facility's technology for projects ranging from solving problems and developing new materials to advancing the science of combinatorial technology.

Due to the complexity of the instruments, getting the facility fully operational and devising a plan for others to be able to use it has been a lengthy process. The first step was training the lab's four co-principal investigators: Hillier, who is also associate professor of chemistry; **Balaji**

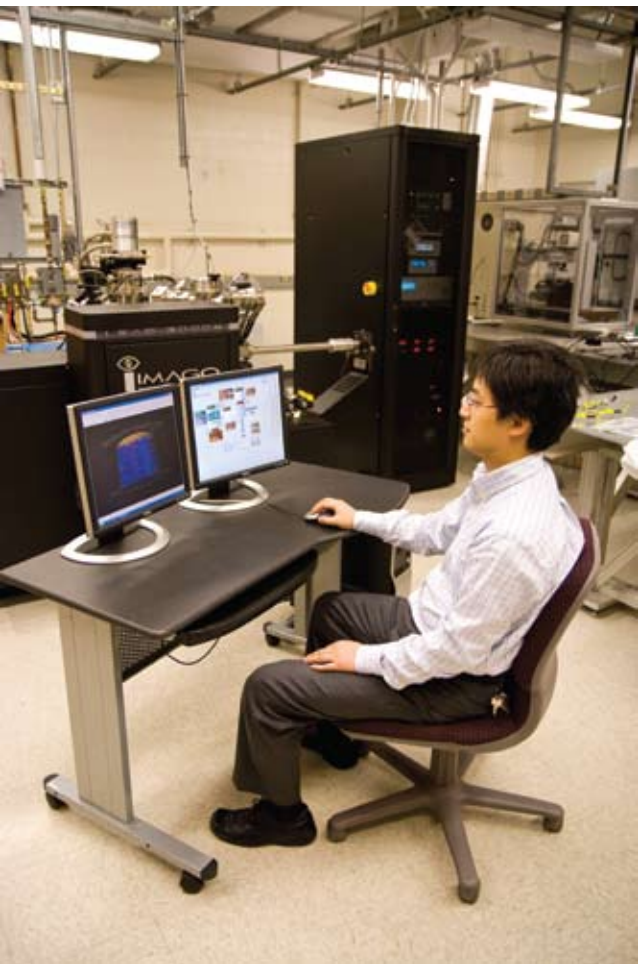
**Narasimhan**, CBE professor and College of Engineering associate dean for research and economic development; Rajan, the Stanley Chair in Interdisciplinary Engineering and materials science and engineering professor; and Sriram Sundararajan, associate professor in mechanical engineering; as well as their graduate students.

To facilitate the lab's usage, **Mike Stukowski** was hired last March to manage the lab. Stukowski earned his PhD in materials science at Rensselaer Polytechnic Institute. He spent the last two years as a postdoc working for Rajan.

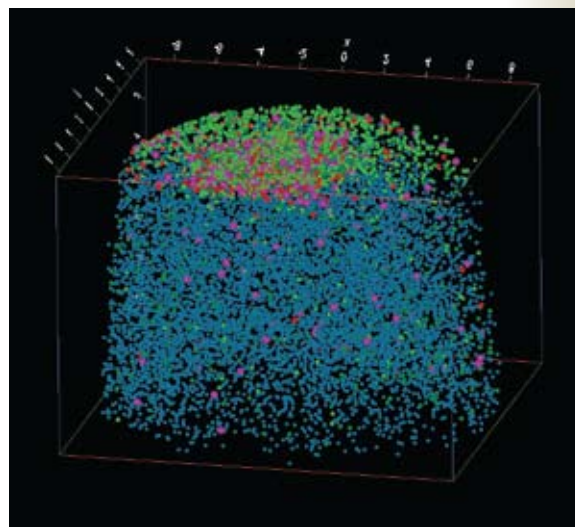
Stukowski runs samples, trains others on the use of the equipment, and also ensures that the instruments are operating at their peak levels. "Mike is essentially a master of all of the instruments in the laboratory and the go-to person for folks wanting to run samples using these facilities," says Hillier. "The LEAP, for example, is a very high-end instrument that can do some amazing things, but it also can present some significant challenges. Mike has the experience and expertise with these instruments to solve problems, troubleshoot, and assist users with their particular experiments."

One of Stukowski's most recent tasks was to upgrade the sputtering system by installing a radio frequency power supply. "The original version would only work with conductive materials," Stukowski explains. "Now it can deposit almost anything—for example, carbon black or silica—and it can deposit several elements at the same time. You could have aluminum in one gun and carbon in a different one, and they would mix together at the surface. It's a way to form new substances." The sputtering system, he adds, is normally used for thin film applications such as protective coatings.

While each of the instruments in the facility contributes unique features, the LEAP is the centerpiece. Only a few academic institutions have this instrument, so the LEAP has drawn visitors to campus, led to funding that supports graduate students and visiting fellows, and prompted research collaborations with other institutions.



*Yi Zhang examines an atom probe image*



*Atom probe images of a palladium tip covered by a ultrathin polymer layer.*

# Advisory council welcomes two new members

## Two new members joined the department's advisory council in April 2008

**Peter C. Hemken** is vice president and general manager for DuPont Bio-Based Materials—Bio & Specialty Polymers and DuPont Agriculture & Nutrition—Biofuels. He also has responsibility for agriculture and nutrition business development and several functions within DuPont business Pioneer Hi-Bred International.



Hemken, who earned his BS in chemical engineering from Iowa State and his MBA from the University of Richmond, joined DuPont in 1977. During his career with DuPont, he has worked in engineering, technical, manufacturing, and marketing management roles in the chemicals, photo products, and fibers departments throughout the United States.

In 1989, Hemken transferred to Tokyo, Japan, where he was responsible for the DuPont Nonwovens businesses in the Asia Pacific region and later for the nylon textile fibers business.

Returning to the United States in 1997, Hemken served as global planning manager for DuPont Nylon and later became global business director for the industrial nylon business unit. Prior to this current position, Hemken served as chief executive officer of DuPont-Sabanci International, more recently known as Kordsa Global.

## Patterson joins CBE staff



**Christi Patterson** joined CBE in August as a program assistant. Patterson, who earned her BA in business management at William Penn University, provides both undergraduate and graduate student support for CBE. Her responsibilities include assisting the faculty and adviser with academic issues, coordinating the department's seminar series,

and providing general assistance with marketing, recruitment, and retention of students.



**Robert A. (Bob) Lane** is a retired vice president for Shell EP International Ventures, Inc. He joined Shell in New Orleans, Louisiana, after graduating from Iowa State in 1968 with a BS degree in chemical engineering. During his 30-year career with the company, Lane worked with Shell's oil and gas exploration and production (EP) businesses throughout the United States.

His senior management positions included manager of plans coordination and strategy, Shell Oil Company; general manager of engineering, U.S.

Exploration and Production Company; vice president and general manager, Shell Western EP Company; and vice president, Shell EP International Ventures, Inc., all in Houston. He also served as liaison for Shell Oil Company in London for three years.

After electing to retire from Shell, Lane became the chief operating officer of Sonat Exploration, a large independent exploration and production company in Houston. He served in this role until 2000 when Sonat was sold to El Paso.

The CBE advisory council has six continuing members:

**Gary Griswold**, president and chief intellectual property counsel, 3M Innovative Properties Company

**Mary Jane Hagenson**, vice president of research and technology, Chevron Phillips Chemical Company

**James Katzer**, manager (retired), ExxonMobil Research and Engineering Company, and CBE affiliate professor; Katzer is chair of the council

**David Morgan**, manager (retired), Procter & Gamble Pharmaceuticals

**Umit Ozkan**, professor of chemical and biomolecular engineering, Ohio State University

**Leigh Thompson**, epoxy performance enablers technical leader, the Dow Chemical Company



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# Gates presents Doraiswamy lecture



Bruce C. Gates, distinguished professor of chemical engineering at the University of California, Davis, presented "Molecular Catalysis on Surfaces" as part of the L. K. Doraiswamy Honor Lectureship last November.

The Doraiswamy lecture series is named in honor of **L. K. Doraiswamy**, Anson Marston Distinguished Professor Emeritus in the Department of Chemical and Biological Engineering at Iowa State University and a former director of India's National Chemical Laboratory. The lecture series brings internationally recognized scientists and engineers to present lectures at both Iowa State and the National Chemical Laboratory in Pune, India. Gates was the eighth speaker in the series.

Internationally known for his work in catalysis, nanomaterials, and chemical reaction engineering, Gates presented the research he has collected through the Catalysis Research Group at the University

of California, Davis. His focus was the combination of solid and molecular catalysts by synthesizing nearly uniform catalytic sites on solid surfaces. The results determine catalyst structures, including bonding of the metals to the supports and identification of reaction intermediates.

Gates earned his BS in chemical engineering from the University of California, Berkeley, in 1961 and his PhD from the University of Washington in Seattle in 1966. He joined the University of California, Davis, chemical engineering faculty in 1992.

Recently elected to the National Academy of Engineering, Gates has been recognized with the Malcolm E. Pruitt Award, the Alexander Von Humboldt Prize, and the R. H. Wilhelm, William H. Walker, and Alpha Chi Sigma awards of the American Institute of Chemical Engineers. Gates also serves on the board of directors for the Catalysis Society of North America.

## CBE alumni selected to receive PACE awards

**Timothy Anderson**, a 1973 chemical engineering alum, received a College of Engineering Professional Achievement Citation in Engineering (PACE) award at the 2007 Iowa State homecoming festivities. **Daniel H. Yoder**, a 1980 alum, received his PACE award at the 2008 homecoming ceremony. The PACE awards recognize graduates for superior technical or professional accomplishments in research, development, administration, education, or other engineering activity.

Anderson is Distinguished Professor and director of the Florida Energy Systems Consortium. After earning his BS at Iowa State, he continued his education at the University of California, Berkeley, where he earned his MS and PhD degrees in chemical engineering.

One of Anderson's major career accomplishments was pioneering the application of the chemical engineering principles of thermochemistry and phase equilibria to the processing of advanced electronic photonic materials. He has written more than 200 refereed publications.



*College of Engineering 2007 PACE award winner Timothy Anderson, BSChE'73, (center) with his wife, Sandra Anderson, and James Hill, University Professor and CBE chair.*

A member of CBE's advisory council for six years, Anderson advocated for a vigorous postgraduate program. His influence led to a highly beneficial focus on specific areas of research and faculty development.

Anderson is a fellow of the American Society for Engineering Education (ASEE) and the American Institute of Chemical Engineers. He has been recognized with numerous ASEE honors, such as the Dow Outstanding Young



*Daniel Yoder, BSChE'80, accepts his award at the College of Engineering homecoming breakfast.*

Faculty, Union Carbide Lectureship, and Benjamin J. Dasher awards.

After receiving his BS degree at Iowa State, Yoder joined Shell Oil Company as a process engineer in Norco, Louisiana. His appointment launched a distinguished career marked by a series of increasing responsibilities and achievements. In his current position as technology manager for Norco Refinery, Yoder is a key member of the Shell Oil/Motiva Enterprise management team.

Yoder is credited with creating and supervising a technical organization that has made significant contributions to the refinery's overall performance and reliability. It was under his leadership, for example, that the refinery, which was heavily damaged and completely shut down by Hurricane Katrina, was repaired and back in full operation in just 11 days.

Yoder's technical and managerial skills have been clearly evident in other large-scale and challenging projects as well. One of these projects required overseeing the design, construction, and startup of a 50,000 barrel/day delayed coker and a 35,000 barrel/day high-pressure distillate hydrotreater at the Deer Park Refinery near Houston. Yoder devised and implemented a new systems management plan that enabled the project, which was the major portion of a \$1 billion upgrade, to be completed three months ahead of schedule and 18 percent below estimated cost.

In addition to his present role as technology manager, Yoder serves on the Technology Management Leadership Team for Shell Americas, which comprises all 15 manufacturing sites owned by Shell in North and South America.



# Computational modeling plays key role in discovery

From delving into the molecular structure of nanoparticles to predicting the complex chemical reactions occurring in reactors, computer modeling serves as a powerful tool for CBE researchers.

Assistant Professor **Monica Lamm** is one of those researchers. A member of the CBE faculty since 2003, Lamm's area of expertise is molecular simulation, a tool enhanced through the development of high-performance computing.

"Molecular simulation is a way to visualize systems at the molecular level," Lamm says. "It's not just qualitative visual assessment, however; it is also very quantitative. We can calculate and compare directly to experiments."



*Monica Lamm*

Lamm's research program at Iowa State got off to a quick start when she joined a research team headed by **Rodney Fox**, the Herbert L. Stiles Professor of Chemical Engineering, on a five-year project sponsored by the National Science Foundation's Nanoscale Interdisciplinary Research Team program to study nanoparticle aggregation.

The team's focus is to develop strategies to prevent nanoparticles from aggregating into

larger units that might alter their fundamental properties. The ability to control aggregation at the nanoscale has implications for a variety of applications, according to Fox. These include such areas as the delivery of drugs across complex tissues and the development of composite materials that could increase fuel efficiency in vehicles.

For her portion of the project, Lamm's team is using what she calls the first principles approach. "We build models from the ground up, starting with electronic structure calculations on the basic building blocks, the molecules in the system," she explains.

By creating the molecular models, the researchers are gaining an understanding of the properties that cause the particles to behave the way they do. From there, they can figure out how to change the properties to either promote aggregation in a directed way or to prevent it. That knowledge is essential to designing new nanoparticles for use in the biomedical, optical, and electronic fields.

Another area of Lamm's research focuses on dendrimers, synthetic polymeric molecules with tendrils branching out from a central core. Publication of work she and her research team have done on the behavior of dendritic systems led to a current collaboration with the Army Research Lab.

"We're looking at dendrimers as building blocks for making smart coatings," Lamm explains. "These are materials that respond to different environmental conditions. For example, say you want a soldier's jacket to be coated with a film that can recognize a toxic agent, causing the molecules in the film to rearrange themselves and prevent the agent from penetrating."

Lamm's task is to develop simulations to show the army researchers what the dendritic molecules are doing in the films. "Seeing the molecular structure will provide insight about what to change to try to improve the film's properties," she says.

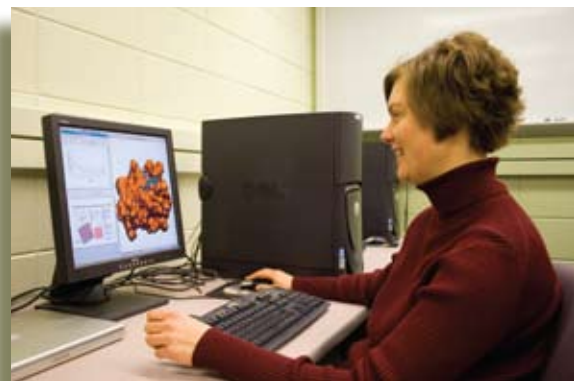
While Lamm's research group currently uses "Lightning," a computer cluster in the Iowa State Durham Center for Computation and Communication that has 576 processors for most of the molecular simulations, she is part of a new interdisciplinary team developing multiscale molecular simulation programs for a petascale computer being built at the University of Illinois. Capable of running 1,000-trillion operations per second, the petascale computer "Blue Waters" will be able to run molecular dynamics simulations, such as modeling dendrimer interactions with proteins.

Fox's research focuses on the development, implementation, and validation of computational fluid dynamics (CFD) tools for chemical reaction engineering. "We develop CFD codes to solve big problems," he explains. These big problems include the design and construction of new systems to meet energy needs. "Current models were developed for certain types of situations that may not be applicable any more," he adds. "We're trying to improve them."

One current area of emphasis comes from ConocoPhillips' \$22.5 million research program at Iowa State dedicated to developing technologies to produce biorenewable fuels. Fox's group is working on simulations for biomass reactors.

"Biomass particles are injected into a bed of sand. Air is put through it and turns it into a fluid. If you do it fast enough, it lifts the particles up so it is very good for heat transfer," Fox explains. Researchers on the mechanical engineering side use special instruments to measure what is happening inside the bed, while Fox does the numerical simulations to predict what goes on. The results are then compared. "If the predictions are okay," Fox adds, "the idea is to eventually use the computational tool to scale up the lab-scale reactor to full scale."

For the computational work, Fox's group uses Lightning as well as CyBlue, an IBM Blue Gene/L supercomputer capable of trillions of calculations per second. Iowa State's high-performance computing capability is continuing to grow, which is essential, according to Fox. "The problems we're trying to solve require a lot of computing time. The more computing resources we have, the more competitive we can be in getting grants to support our work."



# Iowa State wins \$18.5 million grant to create NSF Engineering Research Center for Biorenewable Chemicals

The National Science Foundation (NSF) has awarded Iowa State University and its research partners a five-year, \$18.5 million grant to establish the NSF Engineering Research Center for Biorenewable Chemicals (CBiRC) based at Iowa State. CBE Professor **Brent Shanks** is director of the center. Other CBE faculty affiliated with the center are **Laura Jarboe, Peter Reilly, Derrick Rollins**, and **Jackie Shanks**.

The award is part of the NSF's Generation Three Engineering Research Centers Program. These centers are designed to create university and industry partnerships in research and education that promote innovation, transform engineered systems, advance technology, and produce engineering graduates who can creatively contribute to U.S. competitive advantage in a global economy.

"The National Science Foundation's decision to establish a third-generation Engineering Research Center on our campus is a great endorsement of the work our faculty, staff, and students have been doing in biorenewable technologies," says Iowa State President Gregory Geoffroy. "And the new Engineering Research Center for Biorenewable Chemicals is a tremendous opportunity for Iowa State to work with partners in the United States and Europe to create a culture of innovation that can develop a sustainable chemical industry."

The goal of CBiRC is to develop technologies that can transform today's petroleum-based chemical industry into an industry based on plants and other biorenewables. The focus will be to develop catalysts that promote the chemical reactions that can efficiently produce biorenewable chemicals. A unique strategy will be to integrate two research communities—those studying biocatalytic technologies and those studying chemical catalytic technologies.

Another objective of the center is to educate undergraduate and graduate students to be creative, innovative engineers who can

function in a global economy.

The center aims to do that by exposing students to multidisciplinary research that can advance the production of biorenewable chemicals. Through international partnerships, students will gain experience working in teams with faculty and students from other cultures and will gain exposure to entrepreneurship and innovation through partnerships with industry, including start-up companies and venture capitalists. The center's education efforts will also include programs for pre-college students and teachers that bring engineering concepts into their classrooms to stimulate students to study engineering and science.



*Brent Shanks*

CBiRC is one of five Engineering Research Centers that NSF is launching this year. Iowa State University—through the Office of the Executive Vice President and Provost, the Office of the Vice President for Research and Economic Development, and the Colleges of Engineering, Agriculture and Life Sciences, and Liberal Arts and Sciences—is also committing \$600,000 per year for the center.

Shanks says the state of Iowa and university leaders made it possible for the project team to successfully compete for a research center. He said investments in the university's Bioeconomy Institute and its Plant Sciences Institute helped attract the faculty and research capabilities necessary for the new center.

"It takes a lot of people pulling together and commitments at a lot of levels to make something like this happen," Shanks says.

James Bernard, an Iowa State Anson Marston Distinguished Professor in Engineering and interim dean of the College of Engineering, says winning NSF support "is a strong affirmation of our commitment to researching the science and developing the technologies that will produce a sustainable and prosperous future. The complexities of the problems we face are enormous, from climate change to sustainable infrastructure. Their solution will come from interdisciplinary and inter-institutional collaborations such as the new NSF Engineering Research Center for Biorenewable Chemicals."

CBiRC's academic partners are the University of New Mexico in Albuquerque, Rice University in Houston, the University of Wisconsin–Madison, the University of Virginia in Charlottesville, and the University of California, Irvine. Affiliated faculty will also come

## CBiRC Academic Partners

Rice University in Houston  
University of California, Irvine  
University of New Mexico in Albuquerque  
University of Virginia in Charlottesville  
University of Wisconsin–Madison

## Affiliated Faculty

University of Michigan in Ann Arbor  
Salk Institute for Biological Studies in San Diego

## International Partners

Fritz-Haber-Institute of the Max-Planck-Society, Berlin, Germany  
Technical University of Denmark, Lyngby, Denmark

*Continued on back cover . . .*

# Faculty Awards



**Robert C. Brown**  
Anson Marston Distinguished Professor



**Jim Hill**  
AIChE Award, 2008 F. J. and Dorothy Van  
Antwerpen Award for Service to the Institute

**Rodney Fox**  
Fellow, American Physical Society



**Balaji Narasimhan**  
College of Fellows, American Institute for Medical  
and Biological Engineering  
Award for Mid-Career Achievement in Research,  
Iowa State University



## 2007 Patents



**Surya Mallapragada and  
Brian Anderson**  
Injectable bodily prosthetics employing methacrylic  
copolymers. U.S. Patent 7,183,369  
pH-sensitive methacrylic copolymer gels and the  
production thereof. U.S. Patent 7,217,776  
pH-sensitive methacrylic copolymers and the  
production thereof. U.S. Patent 7,160,971



**Thomas Wheelock and  
Brent Shanks**  
Catalyst and sorbent material for the  
production of hydrogen. U.S. Patent  
7,176,159



*Rachel Iheanacho—courtesy of the Ames Tribune.*

# Student awards

## Deutsch receives 2050 Challenge Fellowship

**Keenan L. Deutsch**, BSChE'07, was one of the first recipients to be awarded a College of Engineering 2050 Challenge Fellowship. Established in 2008, the 2050 Challenge Fellowships support PhD students whose research addresses engineering issues related to sustainability and quality of life over the next four decades. The purpose is to attract greater numbers of students who have the potential to become the world's next generation of insightful thinkers and problem solvers.

"Graduate fellowships are critical for us to succeed in our research and education mission as we take on the tough societal and technological challenges that lie ahead," says Balaji Narasimhan, associate dean for research and economic development. "We have no choice but to succeed if we want to leave behind a prosperous society for future generations."

As a graduate student in chemical and biological engineering, Deutsch's research involves the development of a catalyst system for the conversion of biorenewable-derived furfural to dimethylfuran (DMF). DMF is a potential second-generation biofuel with properties that are much more compatible with the existing gasoline infrastructure than ethanol is. The research is being conducted as part of a National Science Foundation Partnership in International Research and Education grant and is in collaboration with the Universities of Wisconsin, Virginia, and New Mexico. Deutsch's major professor is Brent Shanks.

## Guy Sander recognized

CBE graduate student **Guy Sander** received an award for Outstanding Graduate Student Poster Presentation at the Midwest Section meeting of the American Society of Plant Biologists held at Iowa State last March. A record 79 abstracts were submitted for the meeting. Sander also received a Teaching Excellence Award presented by the Iowa State Graduate College for fall 2007.

## Rachel Iheanacho

**Rachel Iheanacho** received a Wallace E. Barron All-University Senior Award at the 2008 Iowa State University Scholars and Leaders Recognition Ceremony. The award, which is given by the Iowa State Alumni Association, recognizes exceptional performance in academics, leadership, and community service. Iheanacho, a George Washington Carver Academy Scholar, came to Iowa State from Baker, Louisiana. She assisted with the founding of the Iowa State chapter of the National Organization for Black Chemists and Chemical Engineers and was active in both the National Society of Black Engineers and the Iowa State Society of Women Engineers. Iheanacho also served as alumni relations co-chair for Veishea 2008 and was a peer mentor for the Leadership through Engineering Academic Diversity program.



# BioMaP gives undergraduates an inside look at research

Over the last three summers, undergraduates from as far away as New York, California, Michigan, Texas, Florida, Colorado, Arkansas, Puerto Rico, and Mexico have converged on Iowa State for a 10-week research experience for undergraduates (REU) program. While here, the students get a feel for what it is like to conduct research, according to CBE Professor **Balaji Narasimhan**, who directs the program.



**BioMaP Picnic**—Front row, from left: *Sujeily Soto (University of Puerto Rico), Julia Vela (Monterrey Tec), Elise Schiltz (Iowa State), Chelsea Sacket (Iowa State), Kate Faust (University of Missouri), Amy Claeson (University of Michigan); Middle row: Mariana Rodriguez (Monterrey Tec), Matthew Johs (Manhattan College), Kyle McHugh (SUNY Buffalo), Juan Montoya (Monterrey Tec), Kevin Pustulka (SUNY Buffalo); Back row: Hernan Trevino (Monterrey Tec), Joel Hernandez (University of Puerto Rico), Justin Sweet (University of Michigan), Colin Paul (University of Arkansas).*

"Our goal has been to give students an experience that will tell them whether research and graduate school are something they want to pursue," explains Narasimhan, who is also the associate dean of research and economic development for the College of Engineering. "It is an opportunity for them to experience what we go through as researchers, both the frustrations when things don't work and the eureka moments when things click."

Narasimhan started the CBE program, which focuses on research in biological materials and processes (BioMaP), in 2006 with a three-year National Science Foundation (NSF) grant. With 2008 being the final year of the original grant, Narasimhan recently submitted a proposal for a new grant to continue the program,

and he has been encouraging the other engineering departments to seek REU funding as well. The Department of Materials Science and Engineering, in fact, received an NSF REU grant this year and offered its first REU session this past summer.

"Our goal for the college is to increase our graduate student numbers," Narasimhan explains, "and this program provides an excellent opportunity to introduce students to Iowa State and all that we have to offer. From the first two years, 10 students have gone on to some form of graduate school and about half of those have come to Iowa State," he continues. "Since the students are primarily juniors when they participate, we expect those numbers to increase as they complete their undergraduate education."

During the three years the program has been offered, a total of 49 students from 26 different universities have participated. The original NSF grant funded 30 students; however, Narasimhan leveraged those funds with support from other sources including individual researchers, the department, the college, and Iowa State to fund an additional five to eight students each year.

Several special features have contributed to BioMaP's popularity. One of these is the interdisciplinary nature of the research. The faculty mentors and projects come from diverse areas including chemical and biological engineering, cell biology, molecular biology, and veterinary medicine.

The projects are also intended to challenge the students. "We give them problems that we know will require them to think things through," Narasimhan points out. "We're not just looking for hands to do tasks, but for students who have an inherent curiosity, and who can help us understand things better and move science forward." The intensity of the research is one of the program's outstanding qualities, acknowledges **Kate Faust**, a biomedical engineering major from the University of Missouri. "The people here are awesome," she says. "They trusted us to do work that actually counted for something."

**Kyle McHugh**, a junior from the State University of New York at Buffalo, adds that BioMaP was a great learning experience. "We all had to write a final report," he says, "and if you had given me my report two-and-a-half months ago, I would have had no idea what it meant."

BioMaP also has a unique international component that was built on CBE's history of collaboration with Mexico's Tecnológico de Monterrey. Eleven Monterrey Tec students have participated in BioMaP over the last three years. One of the first was **Brenda Carrillo**, who participated in the 2006 program and is now a CBE graduate student.

"We didn't have an opportunity to work in a laboratory in Mexico," says Carrillo, whose undergraduate major was chemical engineering with a minor in environmental systems. "My work experiences were all in industry, and so when I was a senior, I applied to BioMaP to find out whether I would like doing research."

Carrillo, whose BioMaP project focused on using biomaterials for drug delivery, discovered she did like research. Her BioMaP experience coupled with follow-up contacts from Narasimhan convinced her that graduate school was a good option and that Iowa State would be a great place to do it. She began her graduate studies in fall 2007 and helped with the BioMaP program in both 2007 and 2008.

The Monterrey Tec connection has also provided an opportunity for six U.S. students to gain international experience. They have split their time between Iowa State and Mexico working on projects that are jointly administered by faculty at the two institutions.

While BioMaP offers a research focus, it also includes workshops on topics such as bioethics and safety and a range of social activities. "It was the complete experience," says **Hernan Trevino**, a senior from Monterrey Tec. "You get friends, you get social activities, you work on a real project with real responsibility in the lab, and you learn about graduate school and communication. It was amazing." More information about BioMaP is available at [www.eng.iastate.edu/biomapreu/](http://www.eng.iastate.edu/biomapreu/).

# CBE Faculty Update

Professor **Robert C. Brown** was named Anson Marston Distinguished Professor in Engineering and Gary & Donna Hoover Chair in Mechanical 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 by 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, is currently completing an invited chapter for the book *Methods in Bioengineering*. This past year he initiated a collaboration with Srdija Jeftinija, a vet med associate professor, looking at mechanisms of vesicle fusion using quantum dot probes. This fall, he will give an invited talk at SPIE Photonics West on two-photon excitation of quantum dots and its application to biology.



Professor **Eric Cochran** has continued his research with block copolymer/layered silicate nanocomposites while expanding into new areas related to polymers for use in organic photovoltaics and fuel cells. He and his wife, Allison, continue to dote on their two-year-old daughter, Dillan, and their new son, Michael, who was born on June 11.



Assistant Professor **Liang Dong** received Ames Lab seed funding in February of 2008 for his research on optofluidic glucose sensors. He was busy setting up his research lab at both Coover and MRC and mentored three undergraduate researchers. He continues to work on microfluidic single cell manipulation and analysis, hydrogel biosensors, luminescent nanofibers, and bioMEMS. This fall he is mentoring two PhD students and a master's student.



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



Professor **Chuck Glatz** took on three new activities last year while continuing a few of the usual ones. After nearly two years of organizing, he and co-organizers Anne Lee of Genencor and Sam Guhan of Amgen chaired a very successful Recovery of Biological Products Conference held in Quebec City, Canada, June 22–28, 2008. This was the 13th offering of this ACS-sponsored international meeting. Glatz's teaching and research activities mirrored the topic of the conference. After teaching the Bioseparations course in the fall, he handled the first-ever offering of the Biological Engineering Senior Lab (an alternative to the Unit Ops Lab for those in the new biological engineering option). Meanwhile, he celebrated the graduation of research students Cheng Zhang (PhD, producing collagen from corn), Ramon Morales-Charbrand (MS, aqueous extraction of oil from soybeans), and Drew Cookman (MS, protein recovery from distiller's grain).



In unrelated activity, Glatz has worked on improving the practices and climate of the College of Engineering to improve the success of all faculty members with a particular focus on increasing the numbers and success of women faculty in the sciences and engineering. This is part of the Iowa State ADVANCE program, which is supported by the National Science Foundation.



**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. He also has planned presentations for the Midwest Association of Colleges and Employers' 15th annual Trend in Recruiting Conference and the 2009 American Society for Engineering Education national meeting. 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 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 and Department Chair **Jim Hill** served as the 2007 chair of the AIChE Chemical Engineering Technology Operating Council (CTOC), which is the arm of the board of directors that oversees all AIChE technical activities. This year, he is past chair of CTOC and liaison to the other two operating councils. At the annual meeting celebrating the centennial of AIChE in November, Hill will receive the Van Antwerpen Award for service to the institute.



**Andy Hillier** is associate professor of chemical engineering and associate professor of chemistry as well as director of the W. M. Keck Laboratory for High Throughput and Atom-Scale Analysis.



Assistant Professor **Laura Jarboe** has spent the past year completing a postdoctoral research position at the University of Florida's Center for Renewable Fuels and Chemicals. Her research has focused on the adaptive response of biocatalysts to the physiological challenges presented by ethanol production from biomass.



Professor **Ken Jolls** has continued developing and making use of software-based methods in his courses. He continues to take students on inspection trips to the Ames Power Plant, and, with the help of Cargill, he initiated "Separations Day," a Saturday visit by students in ChE 358 to a Cargill plant in Eddyville, Iowa. Jolls taught in the Foreign Study Program in Oviedo, Spain, for the seventh time.







Assistant Professor **Monica Lamm** presented an invited talk in the session on "Thermodynamics in Chemical Engineering: Prospects and Perspectives" at the American Institute of Chemical Engineers' spring meeting in New Orleans. She is part of a four-member team from chemical and biological engineering, chemistry, and computer science that received funding by the National Science

Foundation to develop quantum mechanical and molecular dynamics simulation applications for petascale supercomputers.

Senior Lecturer **Stephanie Loveland** continues to teach the undergraduate laboratory courses in the department. She completed her PhD in May of 2008 and returned to full-time status this fall, teaching one section of ChE 356 in addition to the labs. She will also be serving as the department's safety committee co-chair for the coming year. She and her husband, Brian, are the parents of three-year-old twin boys and a 16-month-old girl.



Professor **Surya Mallapragada** was on faculty leave for part of the last year, spending time in Professor David Tirrell's laboratory at the California Institute of Technology. She is currently serving as chair of the Food, Pharmaceutical and Bioengineering Division of AIChE. She is also a member of the NIH Biomaterials and Biointerfaces Study Section.

Professor **Balaji Narasimhan**, who serves as associate dean of research and economic development for the College of Engineering, was elected to the College of Fellows of the American Institute for Medical and Biological Engineering. He also received the Iowa State University Award for Mid-Career Achievement in Research.



Assistant Professor **Jennifer O'Donnell** joined the CBE department in August and is currently teaching ChE 210, Material and Energy Balances. She is excited about starting new research projects in the areas of controlled polymerizations in heterogeneous media and the self-assembly of polymeric amphiphiles.

**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.



In the last year, Professor **Pete Reilly**'s group has continued to work



on enzyme structure and function, primarily with enzymes that cleave bonds between sugar units. Most of this work has been on cellulases, and it has encompassed both computational and experimental research. This has led to a number of journal articles with former graduate students Chandrika Mulakala and Tony Hill, both now postdoctoral fellows at the University of Minnesota; present graduate student Blake Mertz, about to become a postdoctoral fellow at the University of Arizona; and Monterrey Tec undergraduate David Cantú, who was here in 2006 on the department's

Research Experiences for Undergraduates program and who is returning to be a graduate student. Reilly's work was featured recently in a cover article in *Biopolymers*, his seventh cover for a technical journal.

Reilly gave talks on his research at the 235th American Chemical Society Meeting in New Orleans and in seminars at the University of Tokyo, the Karlsruhe Research Center, the Technical University of Braunschweig, and the Mannheim Applied Science University in Germany, as well as at three American Chemical Society local sections in Florida. He continues to coordinate Iowa State's exchange program with the Swiss Federal Institute of Technology—Lausanne and the University of Lausanne in Switzerland.

In January of 2008, **Derrick Rollins** was named assistant dean for diversity in the College of Engineering. He is also professor of chemical and biological engineering and professor of statistics.



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** led the effort to establish the NSF Engineering Research Center for Biorenewable Chemicals (CBiRC) and is director for the center that began operation in September. CBiRC combines chemical catalysis and biocatalysis research to produce biorenewable chemicals. Partner institutions include Rice University, the University of Virginia, the University of Wisconsin, the University of New Mexico, and the University of California, Irvine.



Professor **Jackie Shanks** will serve as Thrust 2 co-leader (with Professor Ka-Yiu San of Rice University) for the NSF Engineering Research Center for Biorenewable Chemicals. Thrust 2 is the metabolic engineering technical team that uses microbes to produce biorenewable chemicals. Thrust 2 members are from Iowa State, Rice University, and the

University of California, Irvine.

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



Associate Professor

**Dennis Vigil** is organizing the 16th Larson Workshop of the Association for Crystallization Technology to be held in October 2009 in Boston.



Although a member of the emeritus faculty, **Tom Wheelock** continues to guide research supported by the U.S. DOE for use in producing hydrogen. He also continues to write and review papers for technical journals. Wheelock enjoys serving on both the advisory council and the Continuing Education Committee for the Green Hills Retirement Community where he and his wife, Edra, reside.





# Moses family legend proven to be true

**Douglas Verne Moses** made history when he earned his PhD in 1925. Not only was he the first PhD graduate in chemical engineering at Iowa State, he was the first in the engineering division.

"It had always been the family story that Verne, my father's uncle, was the first PhD graduate," says Brad Moses, "but when we checked with the alumni association, we were told he just received his BS degree here."

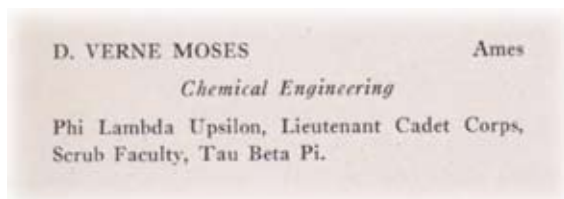
When the family gathered in Ames this past June for the funeral of Ronald W. Moses (Brad's father), Brad Moses and his siblings, Ron Moses, Jr., and Marsha Orcutt, decided to find out for certain about their great uncle's academic credentials. Brad contacted CBE program coordinator **Jody Danielson** who did some research and found documentation that Douglas Verne Moses was indeed the department's first PhD graduate. O. R. Sweeney was his major professor.

Verne Moses earned all three of his degrees in chemical engineering at Iowa State. He received his BS in 1919, MS in 1921, and PhD in 1925. Danielson located his dissertation at the Iowa State library and made a copy to present to the Moses family along with a copy of the department's history book.

Brad Moses and his siblings were thrilled to have confirmation about their great uncle's accomplishments. "We have always felt very fortunate that our ancestors settled near Ames," says Brad Moses. "Verne's father had moved here in a covered wagon when he was a boy. Verne, who was the youngest of four children, grew up here and graduated from Ames High and Iowa State."

After completing his PhD, Verne and his wife moved to Charleston, West Virginia, where he worked for DuPont as a technical superintendent and chemical engineer. He died of a heart attack in 1952.

The pursuit of higher education, however, has continued with Verne's relatives. "Our family has always valued public education," Brad Moses says, "My dad, brother, sister, and I all earned our undergraduate degrees at Iowa State." In addition, Brad and his siblings hold advanced degrees in veterinary medicine, physics, and medicine, respectively, and another generation is now in college.



# 2008–2009 Upperclass

Michael Alexander	Frederick Martinson
Michael Anctil	Ralph S. Millhone
	The College of Engineering
	Engineering Undergraduate Merit Scholarship
	National Merit Finalist
Curtis Anderson	Roderick Seward, Flossie Ratcliffe
	and Helen M. Galloway
John Ascherl	Kent and Anne Floy
Brian Baehler	Dow Chemical Company
Anthony Barthel	Frederick Martinson
	The College of Engineering
	Engineering Undergraduate Merit Scholarship
Christine Bauer	Engineers' Week
	The College of Engineering
	Engineering Undergraduate Merit Scholarship
Jenae Baumert	Ralph S. Millhone
	National Merit Finalist
Ann Baumhoer	Lawrence E. Burkhart
	The College of Engineering
	Engineering Undergraduate Merit Scholarship
Samantha Beary	Lyle J. and Marcia L. Higgins
Zachary Beversdorf	Griffen Family
Kristen Bonifas	Robert O. and Marie E. Dierks
Meredith Breton	L. C. "Doc" and Lina Allen
Alyssa Brown	Rockwell International
Diane Brown	Skogen-Hagenson
	National Merit Finalist
Joseph Burkemper	Roderick Seward, Flossie Ratcliffe
	and Helen M. Galloway
Joshua Buyert	Lyle J. and Marcia L. Higgins
Melissa Cali	Engineering Leadership Program
	Engineers' Week
Angela Cannavo	Kathy and Ken Garrett
Samantha Chalfant	William Cantrell Miller
Allison Cole	Frederick Martinson
	The College of Engineering
	Engineering Undergraduate Merit Scholarship
Erwin Columbus	Devin and Indira Shepard Scholarship
Elliot Combs	Ralph S. Millhone
	National Merit Finalist
Jeffrey Conner	P. Fred Petersen
Stacey Countryman	Lyle J. & Marcia L. Higgins
Courtney Crego	Lyle J. & Marcia L. Higgins
Leigh Cumpston	Rockwell Collins-Engineering Leadership Program
	Frederick Martinson
Tingsong Dai	Engineers' Week
Anna Dasilva	Engineers' Week
	The College of Engineering
	Engineering Undergraduate Merit Scholarship
Emily Davenport	Frederick Martinson
Elizabeth De Hoedt	Roderick Seward, Flossie Ratcliffe
	and Helen M. Galloway
Naomi Demmon	A. Douglas and Helen Steffenson
	The College of Engineering
	Engineering Undergraduate Merit Scholarship
Alison Dirks	William Cantrell Miller
Curtis Donelson	Memorial Endowment for Leslie Miller Wallace, Jr.
Martin Dufficy	Lyle J. and Marcia L. Higgins
	The College of Engineering
	Engineering Undergraduate Merit Scholarship
William Edwards	Roderick Seward, Flossie Ratcliffe
	and Helen M. Galloway
Lars Ellingson	Engineers' Week
Kevin Emard	Lyle J. and Marcia L. Higgins
Jeffrey Emrich	Frederick Martinson
Jacob Epstein	Ralph S. Millhone
	National Merit Finalist
Daniel Erickson	Frederick Martinson
	The College of Engineering
	Engineering Undergraduate Merit Scholarship
Matthew Erickson	Skogen-Hagenson

# Scholarships

Maria Fabiosa	Frederick Martinson
Anthony Fischels	Edwin John Hull
Jake Gillilan	Jerrold S. and Mary R. Feroe
	The College of Engineering
	Engineering Undergraduate Merit Scholarship
Ann Gleason	Jerrold S. and Mary R. Feroe
	The College of Engineering
	Engineering Undergraduate Merit Scholarship
Anne Graber	Frederick Martinson
	The College of Engineering
	Engineering Undergraduate Merit Scholarship
	George W. Catt
Christopher Grace	The College of Engineering
	Engineering Undergraduate Merit Scholarship
Christopher Griffin	Lois and Manley Hoppe
	Erwin and DeLoris Whitney
Derek Grygiel	Frederick Martinson
	The College of Engineering
	Engineering Undergraduate Merit Scholarship
Michael Gustafson	Skogen-Hagenson
Jason Haase	James B. Cecil
	The College of Engineering
	Engineering Undergraduate Merit Scholarship
Kathryn Hausman	Clifford A. Shillinglaw
Kenneth Healy	Lawrence E. Burkhardt
Patrick Hermiston	William Cantrell Miller
Andrew Hughes	Roderick Seward, Flossie Ratcliffe and Helen M. Galloway
Nicole Johnson	Frederick Martinson
Samantha Journot	Frederick Martinson
Michael Kalkhoff	Engineering Leadership Program
	Engineers' Week
Erin Kelly	William Cantrell Miller
Richard Kienzler	William Cantrell Miller
Justin Kleingartner	Frederick Martinson
Bryant Koons	Frederick Martinson
Jonathan Kramer	Gretchen L. Bruffy
Jennifer Kuplic	Frederick Martinson
	The College of Engineering
	Engineering Undergraduate Merit Scholarship
Isha Labhasetwar	Frederick Martinson
	The College of Engineering
	Engineering Undergraduate Merit Scholarship
Jonathan Ladwig	Frederick Martinson
Nicole Larson	Roderick Seward, Flossie Ratcliffe and Helen M. Galloway
Nicole Lauzon	Harry Oakley Price
Linda Lippold	Engineers' Week
Meredith Little	Lyle J. and Marcia L. Higgins
Andrew Longnecker	Glenn A. and Mary Ellen Atwood
	Roderick Seward, Flossie Ratcliffe and Helen M. Galloway
John Lottes	Engineering Undergrad Scholarships
	Engineering Undergraduate Merit Scholarship
Amanda Machacek	William Cantrell Miller
Emily Manternach	Lyle J. and Marcia L. Higgins
Christopher Maxwell	Don Delahunt
	Frederick Martinson
Ryan McClatchey	Roderick Seward, Flossie Ratcliffe and Helen M. Galloway
Edward McCoy	Roderick Seward, Flossie Ratcliffe and Helen M. Galloway
Elif Miskioglu	Engineering Leadership Program
	Engineers' Week
	The College of Engineering
	Engineering Undergraduate Merit Scholarship
Waddah Moghram	Barbara L. Feroe
Kelsey Moore	Engineers' Week
	The College of Engineering
	Engineering Undergraduate Merit Scholarship
Anh Nguyen	Engineering Student Leadership Development

Steven Nystrom	Engineers Week
Gregory O'Brien	Harry Oakley Price
Tyler Pauly	Ralph S. Millhone
	National Merit Finalist
Christopher Pedersen	Dow Chemical Company
Angela Peet	Frederick Martinson
	The College of Engineering
	Engineering Undergraduate Merit Scholarship
Bo Peng	Ralph Luebbers
Vincent Percuoco	Lois and Manley Hoppe
Paul Perkins-Mcintosh	Devin and Indira Shepard Scholarship
	The College of Engineering
	Engineering Undergraduate Merit Scholarship
Meredith Ritter	Hans Buehler
Luke Roling	Ralph S. Millhone
	National Merit Finalist
Eric Roman	Jerrold S. and Mary R. Feroe
	The College of Engineering
	Engineering Undergraduate Merit Scholarship
Lee Rudebusch	Engineers' Week
	The College of Engineering
	Engineering Undergraduate Merit Scholarship
Chelsea Sackett	Ralph S. Millhone
	National Merit Finalist
Ashley Saunders	Lyle J. and Marcia L. Higgins
	Lois and Manley Hoppe
Elise Schiltz	Frederick Martinson
Benjamin Schneider	Lois and Manley Hoppe
Jennifer Schoborg	Donald H. Beisner in Honor of Dr. Morton Smutz
Joshua Schuchmann	Roderick Seward, Flossie Ratcliffe and Helen M. Galloway
Jamie Schumacher	Roderick Seward, Flossie Ratcliffe and Helen M. Galloway
Ryan Slinger	Ralph S. Millhone
	National Merit Finalist
Claude Smith	Archer Daniels Midland Company
Justin Smith	Ralph S. Millhone
	National Merit Finalist
Blake Stalder	Donald H. Beisner in Honor of Dr. Morton Smutz
Elizabeth Staloch	Ralph S. Millhone
	National Merit Finalist
Andrew Stapleton	Donald H. Beisner in Honor of Dr. Morton Smutz
Matthew Stebbins	A. Douglas and Helen Steffenson
Katherine Steffensmeier	Roderick Seward, Flossie Ratcliffe and Helen M. Galloway
Zachary Stern	William Cantrell Miller
Paul Stoick	Harry Oakley Price
Cheryl Tebben	Skogen-Hagenson
Ting Tee	P. Fred Petersen
Stephanie Thompson	Lyle J. and Marcia L. Higgins
Todd Thorson	Kenneth and Mary Heilman
Jessica Tobelmann	Engineering Leadership Program
	Engineers' Week
Samantha Ulrich	Frederick Martinson
	The College of Engineering
	Engineering Undergraduate Merit Scholarship
Lindsey Vance	Deere and Company
Alene Vandermyde	Alpha Chi Sigma
Katharine Walz	Ralph S. Millhone
	National Merit Finalist
Nathan Wieseler	Roderick Seward, Flossie Ratcliffe and Helen M. Galloway
	The College of Engineering
	Engineering Undergraduate Merit Scholarship
Julia Wiggen	Stuart M. Totty
Bryce Williams	Harry Oakley Price
Christopher Wilt	Harold Langford
Adam Wright	Ralph S. Millhone
	National Merit Finalist
Ashley Yeager	Engel Scholarship Endowment in Engineering



## CBE Scholar/athletes in the news

**Ann Gleason**, a CBE junior from Stillwater, Minnesota, is goalkeeper for the Iowa State University soccer team. In 2007, she led the Big 12 Conference in save percentage and recorded six shutouts. She was also named to the first all-Big 12 academic team. For the 2008 season, which just began in August, Gleason has already been selected to one all-tournament team for allowing just 2 goals and registering 12 saves in 2 matches.

**Molly Lohry**, a CBE junior from Sioux City, Iowa, is a member of the Iowa State track and cross-country teams. At the Missouri relays on March 30, 2008, she took second place in the 800-meter run with a career best time of 2:27.14. Lohry also competed on the Iowa State Women's 4x800 relay team that took first place with a time of 9:38.52.

# 2008-2009 ChE Freshmen Scholarships

Taylor Bove . . . . . Harvey Louis Dunker  
 Veronica Bryant . . . . . Philip Jennings  
 Alejandro Caban . . . . . Skogen-Hagenson  
 Timothy Clayton . . . . . The College of Engineering  
     Engineering Undergraduate Merit Scholarship  
 Austin Coccione . . . . . Skogen-Hagenson  
 Deidre Dickinson . . . . . Skogen-Hagenson  
 Kianna Elahi . . . . . The College of Engineering  
     Engineering Undergraduate Merit Scholarship  
     Dow Chemical Company  
 Michael Forrester . . . . . Engineering Leadership Program  
 Nathan Fowler . . . . . Ralph S. Millhone  
     National Merit Finalist  
 Debanjan Ghosh . . . . . Engineering Leadership Program  
 Meredith Gibson . . . . . Engineering Leadership Program  
 Jessica Goedken . . . . . The College of Engineering  
     Engineering Undergraduate Merit Scholarship  
 Breanna Gordon . . . . . Skogen-Hagenson  
 Robert Hable . . . . . The College of Engineering  
     Engineering Undergraduate Merit Scholarship  
 Lauren Hall . . . . . Skogen-Hagenson  
 Michael Harrington . . . . . Skogen-Hagenson  
 Nathan Hartman . . . . . Skogen-Hagenson  
 Jacob Hemberger . . . . . The College of Engineering  
     Engineering Undergraduate Merit Scholarship  
 Cody Ingle . . . . . Skogen-Hagenson  
 Ian Jehring . . . . . The College of Engineering  
     Engineering Undergraduate Merit Scholarship  
 Abby Jensen . . . . . Skogen-Hagenson  
 Zachary Juhl . . . . . The College of Engineering  
     Engineering Undergraduate Merit Scholarship  
 Katy Katona . . . . . Skogen-Hagenson  
 Stephanie Kohn . . . . . Engineering Undergraduate Scholarships  
     Engineering Undergraduate Merit Scholarship

Jared Koliha . . . . . The College of Engineering  
     Engineering Undergraduate Merit Scholarship  
 Marissa Kruse . . . . . Skogen-Hagenson  
 Phap Lam . . . . . Skogen-Hagenson  
 Cassidy LeClaire . . . . . Skogen-Hagenson  
 Derick Light . . . . . The College of Engineering  
     Engineering Undergraduate Merit Scholarship  
 William Lohry . . . . . Ralph S. Millhone  
     National Merit Finalist  
 Katelyn Metzger . . . . . Ralph S. Millhone  
     National Merit Finalist  
 Kelly Miller . . . . . The College of Engineering  
     Engineering Undergraduate Merit Scholarship  
 Stephanie Mulder . . . . . The College of Engineering  
     Engineering Undergraduate Merit Scholarship  
 Leonel Nguendon . . . . . Skogen-Hagenson  
 Timothy Ouverson . . . . . Engineering Undergrad Scholarships  
     Engineering Undergraduate Merit Scholarship  
 Ryan Peetz . . . . . Engineering Undergrad Scholarships  
     Engineering Undergraduate Merit Scholarship  
 Paula Rusenovich . . . . . The College of Engineering  
     Engineering Undergraduate Merit Scholarship  
 Sara Schaubroeck . . . . . The College of Engineering  
     Engineering Undergraduate Merit Scholarship  
 Brian Spicer . . . . . The College of Engineering  
     Engineering Undergraduate Merit Scholarship  
 Maria Wahl . . . . . Skogen-Hagenson  
 Allison White . . . . . The College of Engineering  
     Engineering Undergraduate Merit Scholarship  
 Janell Wieland . . . . . The College of Engineering  
     Engineering Undergraduate Merit Scholarship  
 Chelsey Zahler . . . . . The College of Engineering  
     Engineering Undergraduate Merit Scholarship  
     Skogen-Hagenson

## Alum gives back to the department with scholarship

Growing up on a dairy farm near Red Oak, Iowa, **Kenneth Heilman** could have easily become a dairy farmer. There was just one small problem. "I was not an animal husbandry sort of person," he says. "My dad told me, 'You'd better get up to Ames and get an education.'"

In August of 1938, Heilman and his dad drove to Ames to enroll Ken in classes. He had done well in chemistry in high school and in a year of junior college, so chemistry seemed like a good choice. At Ames, however, the registrar offered an alternative, chemical engineering. "My dad said, 'Ken likes machinery so he should go with chemical engineering.' It was the best decision he ever made for me," Heilman laughs.

Completing his BS in 1942, Heilman was hired by DuPont to work in an ordnance plant in Oklahoma. After about a year, he enlisted in



the U.S. Navy, where he took the navy's radio radar servicing course. "It was," he notes, "another 11 months of college-level training."

After the service, Heilman returned to DuPont and worked in plants in New Jersey and Delaware until his retirement in 1984. Heilman and his wife, Mary, who was a reference librarian in the DuPont business library, then moved to Florida. Today, Heilman volunteers his time and mechanical skills doing odd

*Ken and Mary Heilman*



# CBE Individual Donors (September 1, 2007–August 31, 2008)

Russell Abarr	Thomas Danhaki	Frank Helmer	John McDonald	David Stahlhut
Frank Adams	Jay Davenport	Pamela Hemken	Ann Meitz	Michael and Jean Steffenson
Keitha M. Anderson	James Davis	Peter C. Hemken	Christopher Miller	Michael R. and
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Timothy Anderson	Walter Drobot	K. C. Hong	Stanley and Merrilee Morris	Mark Strenger
Glenn and Mary Ellen Atwood	Alfred Drumm	Melissa Houston	Robert Neumayer	Lawrence Stretz
Joyce Backhaus	Jason and Gabrielle Egli	Kathleen Hunt	Richard and Cynthia Nielsen	Larry Swinney
Paul Bame	William Ellis	Walter Inkofer	Patrick Noonan	Joseph Sytwu
Jon Barkman	Dan and Lorraine Endres	Alexander Irvine	Eric Olander	R. Kirk and Leigh Thompson
Joseph Bauer	Dennis and Faye Fear	Ronald Jensen	Andrew Owens	Alice Timm
Richard and Rebecca Beem	Margaret Flaugh	Gary Johnson	Bernice Paige	Robert Tischer
Donald Beisner Revocable	Kent and Anne Floy	James and Ann Johnson	Terry Patton	Joseph Treshler
Living Trust	Joseph Foulke	Ronald and Joanne Johnson	Virginia Pehrson	Yvette Trzcinski
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Kris Berglund	Fridley Family Fund	David Juist	Faye Perkins	Rene Vance
Robert Berkland and Lucy Do	Paul Friedman	Isabelle and James Katzer	Reid Peterson	Michael Vander Molen
Clarence Beutel	Michael Gard	Charitable Fund	Jeffrey Philip	Dennis and Karen Vaughn
Nathan and Ann Bibus	Kenneth Garrett	James Katzer	James Pint	Richard Von Langen
Carol Bohnenkamp	Kenneth L. Garrett	Harold Kaufman	Mark Pipal	Kenneth and Kathryn Walter
Lowell Bowie	Revocable Trust	Gregory and Terri Kimler	Elvin Powell	Harold Warner
Allan Boyken	Lawrence Gasper	Terry and Kathleen King	Joan Ranallo	Thomas Warren
Michael Brady	Robert Gerwig	Bryan Kinnamon	Dale Ranta	Bartholomew and Marianne
John and Corrine Briggs	Robert W. Gerwig	Donald Kjerland	Dale I. Ranta	Waters
Wallace Buelow	Revocable Trust	Timothy Kremer	Revocable Trust	Marianne and Bart Waters
Robert Bush	Charles Glatz	Gene Kruger	Frank Rawling	Charitable Gift Fund
Robert Campbell	Jennifer Graham	Kevin Kutsch	Robert Rice	Marianne and Bart Waters
Jarod Carl	Bruce and Karen Grasser	Robert Langerhans	Lanny Robbins	Family Fund
King Chan	Robert Green	Ronald Lantz	David Sageman	Jennifer Waters Griffin
Michael Chihak	George Griffiths	William Lehfeld	Steven and Laronna Sawin	Martin and Ruth Welt
Ralph and Janet Clements	Gary and Karen Guetzk	Louis Licht	John Scheve	Martin and Ruth Welt
Richard Coats	David and Ellen Haberkorn	Ken Lin	David Schwake	Philanthropic Fund
Leo Coffey	Randy and Mary Jane	David and Jennifer Linkenheld	J. Michael Scigliano	Neil Wessman
John Cooper	Hagenson	Peter Ludgate	Roger Sebenik	Craig Wheatley
Gregory and Lois Cottingham	Kelly Hammar	Loren Lupp	Richard and Marilyn Seemann	John and Barbara Witt
Jon Coy	Risdon Hankinson	Myron and Barbara Madsen	Carl Shank	John and Barbara Witt
William Cramer	Greg Hanselman	Scott and Ann Mahlberg	John Sharf	Charitable Fund
John Cronk	Johnie Hanson	Wallace Malmstedt	Devin and Indira Shepard	D. Carl Yackel
Joe and Patricia Cuning	Douglas Hayes	John Marsh	Kevin Siefering	Yale Yager
David Cushman	Kenneth Heilman	Gregory and Leandra Martin	Gordon Specht	

jobs for the other residents at the continuing care retirement facility where he and Mary live.

The Heilmans are also helping Iowa State CBE students. They established the Kenneth and Mary Heilman Scholarship in CBE in 2007 and have also established a scholarship at Mary's alma mater, Douglass College in New Jersey. "Our education has been very important for both of us," Heilman says. "We realize how hard it is for students today, so we wanted to help them."

**Todd Thorson**, a junior in chemical engineering from Forest City, Iowa, is the 2008–2009 recipient of the Kenneth and Mary Heilman Scholarship.

## CBE Corporate Donors (September 1, 2007–August 31, 2008)

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# Alumna resumes career after 18-year hiatus

As a new chemical engineering graduate in 1982, **Nancy (Adams) Beaudry** had some lofty goals. She planned to work in the chemical or pharmaceutical industries and eventually become a vice president.

Beaudry's career didn't evolve exactly the way she had planned. She took time off—about 18 years—to raise four children, but, in 2006, she successfully reentered the engineering field. And just this past September, she achieved another long-term goal when she graduated with her MBA from Willamette University in Salem, Oregon.

Today, Beaudry is a sales manager with Wah Chang, part of the Allegheny Technologies Incorporated group of specialty metal manufacturers in Albany, Oregon. Her niche is selling specialty metals such as zirconium and hafnium to the nuclear market.

Although Beaudry originally thought a career in sales wasn't for her, she says this position is indeed a good fit. "Zirconium is used to house uranium pellets. It is highly corrosion resistant yet allows the neutrons from the uranium to pass through," she explains. "It is a very technical area that requires a good handle on the technical aspects in order to address the issues that come up in this highly regulated industry. I have the technical background so I can talk to the engineers and translate information for those who aren't engineers."

Beaudry's early work experience actually helped lay the groundwork for her career today and her interest in the business side of industry. Immediately after graduation, she went to work for Monsanto's manufacturing plant in St. Louis. She soon moved to the corporate office, working with customers on their needs for a specific product.

"This was a great job for me," recalls Beaudry. "It covered everything from customer inquiries through design, manufacturing, shipping, and service after the sale. I was involved in the whole nine yards, and I really liked that."

When the company reorganized, however, Beaudry was laid off. About the same time, her husband, **Edward Beaudry**, BSChE'80, completed his doctorate at Washington University. He was offered a nine-month teaching position at Oregon State University, so in 1987 the family moved to Corvallis.

"We thought it was going to be temporary," Nancy Beaudry says. "We had two children at the time, so I stayed home with them and planned to go back to work when they were school age. Ed found a permanent position in Corvallis, and then we had two more children. By the time our youngest was in middle school, it was 2005."

The thought of reentering the engineering workforce was intimidating, according to Beaudry. "I wondered if I was still worth what an engineer is worth, and would anybody even want me?"

Her misgivings were eased when she attended a Society for Women Engineers (SWE) regional convention that was being held in Corvallis. "The people were so supportive and so encouraging," says Beaudry, who had been a SWE member early in her career. "They said, 'Go for it!'"

A professor at Oregon State, where Beaudry's oldest daughter was majoring in chemical engineering, also gave her some assistance. "He helped me set up a couple of interviews with employers coming to campus," Beaudry explains. "Nothing panned out from those, but interviewing gave me practice and confidence."

A newspaper ad led to Beaudry's employment with Wah Chang in 2006. "The only reason I answered the ad was because the four-year engineering degree plus experience that they wanted as qualifications didn't match the job description, which sounded like inside sales," she says. "They ended up hiring me for a job they created in business development."

Beaudry, who had begun work on her MBA shortly after being hired, worked in business development for about two-and-a-half years. When the sales manager position opened up this past year, she decided it would be a good opportunity for her. "So far, so good," she says.



*The Beaudry family (from left): Edward, director of process development at Hydration Technologies in Albany, Oregon; Nancy; Michelle, a high school freshman; Laura, a high school senior; Beth, a 2008 graduate in chemical engineering from Oregon State and now working for WaferTech in Camas, Washington; and Carolyn, a junior in mechanical engineering at Oregon State.*



# Alumni in the news

Professor **Daina Briedis**, PhDChE'81, has been recognized as a fellow of ABET. The fellow award was presented at the 2007 Annual ABET Meeting in Incline Village, Nevada. ABET, Inc., is the sole accreditor for college and university programs in applied science, computing, engineering, and technology and is a federation of 28 professional and technical societies representing these fields. The award recognizes Briedis, who is on the Michigan State University faculty, for her outstanding contributions and sustained quality service to engineering accreditation.

**Sridhar Desikan**, PhDChE'97, and his family moved to Bangalore, India, in January 2008 to lead drug product and analytical development groups for Bristol-Myers Squibb (BMS) operations in India. BMS is partnering with Biocon in India with the vision to augment research and development efforts.

**James Katzer**, BSChE'64, an independent energy consultant and a member of the National Academy of Engineering, serves on several National Research Council panels that are studying resource needs and commercial status of a range of energy technologies to meet U.S. energy needs. He wrote an article, "The Future of Coal-Based Power Generation," in *Chemical Engineering Progress*, published by the American Institute of Chemical Engineers, in March 2008. Katzer also serves as chair of the CBE Advisory Council and is an affiliate professor in the department.

**Everett Lewis**, BSChE'70, was named executive vice president, strategy and asset management, for Tesoro Corporation, San Antonio, Texas, in March of 2008. He first joined Tesoro in 1999 as senior vice president, strategic projects.

**Kirby Mohr**, BSChE'69, founded and owns Mohr Separations Research, Inc., in Jenks, Oklahoma. As a consulting firm, Mohr helps companies save money by improving their oil-water separations, by adapting their existing equipment, and by providing new designs and processes where needed.

**Troy Shaner**, BSChE'89, was appointed director of process improvement for VeraSun Energy Corporation in Ft. Dodge, Iowa, in May. VeraSun is one of the nation's largest ethanol producers.

**Terry Sporer**, BSChE'04, worked for Cargill in Omaha, Nebraska, before deciding to join the Marines. He is an engineer maintenance mechanic for the Marine Corps reserve unit in Omaha.

**Dave Torp**, BSChE'85, was named vice president of standards and technology for IPC—Association Connecting Electronics Industries, Bannockburn, Illinois, in October 2007. He is responsible for IPC's certification, professional development, and multimedia programs and provides strategic direction, leadership, planning, and oversight for all standards development and technical activities.

**Donald Weinkauff**, BSChE'86, was named dean of the School of Engineering at the University of St. Thomas in St. Paul, Minnesota, effective July 1, 2008. Weinkauff joined St. Thomas from the New Mexico Institute of Mining and Technology, where he was chair of the Department of Chemical Engineering, a department he helped found 12 years ago. Prior to joining New Mexico Tech, he was a research engineer with Shell Oil Company. Weinkauff holds a PhD from the University of Texas at Austin.

## Death Notices

**Lynn Dreeszen**, who earned his BS in ChE in 1961, died December 30, 2007, in Scotts Valley, California. Following his service as a U.S. naval officer, he worked for Procter & Gamble for 29 years.

**Manley R. Hoppe**, 96, of Moline, Illinois, died October 28, 2007. He graduated from Iowa State with a BS in 1932 and an MS in 1935, both in chemical engineering. Hoppe, who became president of Parr Instrument Company, Moline, in 1957 and chairman of the board of directors in 1974, was chairman emeritus from 2003 to 2007. He maintained his contact with the department, endowing a professorship in chemical engineering and establishing numerous scholarships for undergraduate chemical engineering students. Hoppe received many honors and recognitions, including the Iowa State University Alumni Merit Award in 1969 and the SAMA Award (the scientific instrument industry's highest award).

**Harvey Jensen**, 85, died June 9, 2008. From 1962 until his retirement in 1985, Jensen was a senior technician at Ames Lab and worked in **George Burnet's** research group. Jensen, Burnet notes, brought unique talents to the group with his machinist and mechanical skills honed through his years in industry prior to joining Ames Lab and his perseverance in figuring out how to fix something that wasn't working.

**Walter Daniel McKinley**, 99, died February 28, 2008, in Green Valley, Arizona. After earning his BS in chemical engineering in 1933, McKinley worked as a chemist for DuPont, where he was instrumental in the development of Teflon. In 1941, his expertise was sought out by the U.S. government, which assigned him to work as a chemist on the Manhattan Project that led to the development of the atomic bomb. After leaving DuPont in 1953, he started his own plastics tubing company in Verona, New Jersey.

**Robert (Bob) William Shearer**, 86, died October 22, 2007, in Ames. A 1942 chemical engineering graduate, he worked for the Mallinckrodt Company in St. Louis, Missouri, and was assigned to the Manhattan Project during World War II. Shearer returned to Ames in 1964 to teach chemical engineering at Iowa State and also worked with the Center for Industrial Research and Service until his retirement in 1987.

## 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](http://www.aiche.org) or call 800 242-4363 today!



# Alumni Days offer special memories Alumni Days offer spe

At the end of May, chemical engineering alumni from across the United States returned to campus for the annual Iowa State Alumni Days festivities. While the Iowa State Alumni Association plans the campuswide event, several ChE alumni organized a special effort to bring the '58 grads together in Sweeney Hall.

**Karl Johnson** e-mailed the alumni who had indicated they were planning to attend Alumni Days to suggest a special get-together for the 50-year reunion class, and **Jud Harper** contacted **Jim Hill**, CBE department chair, to arrange for a tour of the facilities.

From all reports, the event was a great opportunity to renew acquaintances, visit with some faculty members, and get an update on the department. Some of the written comments included:

“ I am so glad I came back . . . ”

“ Thanks so much  
for everything. ”

“ We were really glad  
to see George Burnett,  
Tom Wheelock, and  
Ken Jells . . . ”

“ I would say it was  
successful and rewarding. ”

“ Prior to the reunion, we had  
had very little or no contact  
with each other, which made  
the event very special . . . ”

## Please stay in touch at 515 294-7642 or [cbe@iastate.edu](mailto: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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\$ \_\_\_\_\_ Other interest in CBE: \_\_\_\_\_

\_\_\_\_\_

# cial memories Alumni Days offer special memories Alumni



ALUMNI DAYS PARTICIPANTS—(Left to right) **George Burnet**, Distinguished Professor Emeritus; **Ken Jolls**, Professor; **Tom Wheelock**, University Professor Emeritus; **Jud Harper**, BSChE'58; **Karl Johnson**, BSChE'58; **Judy (Risda) May**, BSChE'58; **Marilyn (Lewis) Engle**, BSChE'58; **William Rehder**, BSChE'58; **Walter Inkofer**, BSChE'58; **Marion (Zeke) Johnston**, BSChem'62; **Bob Peterson**, BSChE'53; and **Jim Hill**, CBE department chair.



From left, **Walter Inkofer**, **William Rehder**, and **Karl Johnson** look at the graduation notebook.



**Marilyn (Lewis) Engle** (left) and **Judy (Risda) May** look at their entries in the graduation notebook.

**Department of Chemical and  
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## Iowa State wins grant . . . continued from page 7

from the University of Michigan in Ann Arbor and the Salk Institute for Biological Studies in San Diego. International partners are the Fritz-Haber-Institute of the Max-Planck-Society in Berlin, Germany, and the Technical University of Denmark in Lyngby.

Lynn Preston, an NSF deputy division director and leader of the ERC Program, says, "NSF is delighted to welcome Iowa State University into the ERC 'family.' CBiRC will contribute to the knowledge and technology platforms needed to develop chemicals from biorenewable feedstocks. We look forward to CBiRC graduates joining the next generation of leaders and innovators in building a sustainable chemical industry for the U.S."

Shanks, a former employee of Shell Chemicals, adds that it will take a lot of research, education, and training to develop a sustainable

and biorenewable chemical industry. The petrochemical industry has been developing catalysts and other technologies for producing fuels and chemicals from fossil fuel molecules for about 80 years, he says. Researchers working with biobased molecules are just starting to develop the catalysts and technologies necessary to produce chemicals.

To learn more about CBiRC, please visit [www.cbirc.iastate.edu](http://www.cbirc.iastate.edu).

