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Man of steel

Uncovering the hidden nature of metals
Can We Rise Above the Gathering Storm?

Without high-quality, knowledge-intensive jobs and the innovative enterprises that lead to discovery and new technology, our economy will suffer and our people will face a lower standard of living.

Following is the text of a published opinion piece by P. Barry Butler, dean of the College of Engineering. The message was delivered throughout the state of Iowa since the first of the year. Because the message has national impact, UI Engineering alumni all over America are encouraged to examine how their communities can address critical issues facing the engineering profession.

Whether living in Iowa or in other parts of the world, many of us keep a cautious eye on gathering storm clouds and know when it’s time to head for shelter. Similarly, some people have identified the rapidly growing global economies as a gathering storm that threatens to disrupt the economic picnic our nation has enjoyed for the past half century. They ask: Does our nation have a strategy for weathering the storm?

In the past year, the National Academies published a report titled “Rising Above the Gathering Storm—Energizing and Employing America for a Brighter Economic Future.” If you are unfamiliar with the National Academies, it’s an organization chartered by Congress in 1863 to advise the government on matters of science and technology and whose membership is a “Who’s Who” of top U.S. scientific, engineering, and medical talent. It includes Bill Gates, Lee Raymond (retired CEO of Exxon), Neil Armstrong, and Steven Jobs, as well as 22 faculty from The University of Iowa.

The National Academies’ report—unlike the truckloads of reports flowing out of Washington, D.C.—has grabbed the nation’s attention partly because it was authored by chairman Norman Augustine (retired CEO of Lockheed Martin Corporation) and a group of leading technology corporation CEOs, university presidents, and a couple of Nobel Prize winners. Senators Lamar Alexander (R-TN) and Jeff Bingaman (D-NY) charged them to “identify the top 10 actions, in priority order, that federal policy-makers could take to enhance the science and technology enterprise so that the United States can successfully compete, prosper, and be secure in the global community of the 21st Century.” In other words, it calls for a plan of action to weather the gathering storm.

The report’s executive summary makes a blunt statement about the challenge we face as a nation. “Without high-quality, knowledge-intensive jobs and the innovative enterprises that lead to discovery and new technology, our economy will suffer and our people will face a lower standard of living.” It identifies 4 high-priority actions we must take to remain competitive in a growing global economy:

- Increase America’s talent pool by vastly improving K–12 science and mathematics education.
- Sustain and strengthen
the nation’s traditional commitment to long-term basic research.

- Make the United States the most attractive setting in which to study and perform research.
- Ensure that the United States is the premier place in the world to innovate.

A recent national study conducted by the National Science Foundation titled “Science and Engineering Indicators—2006” supports a favorable view of Iowa. Of the 42 indicators believed to be contributors to a state’s potential for economic growth in the technology sector, Iowa already scores in the nation’s top quartile in 14. Interestingly, ALL are education-related, including: K–12 math and science proficiency, science and engineering degrees conferred, faculty research grants and contracts, and quantity of research conducted at our universities.

What does this say about Iowans, including our many alumni who either live and work here or have pursued their careers throughout the world? First, we have laid a long-term, critical, and well-tested foundation of educational values and assets that are ready to lead the nation in weathering the global economic storm (see story on page 10). Second, there is a keen sense of urgency that strategies for taking us past the storm need to be acted on—now.

Iowans—and Iowa alumni—comprise a hearty, intelligent, no-nonsense community that has weathered many economic, social, and cultural storms. Once again, Iowa is positioned for the world to point to and say, “See, that’s how education can make a difference!”

A summary of the National Academies’ “Rising Above the Gathering Storm” report is available on line at www.engineering.uiowa.edu/report.pdf.
The University of Iowa College of Engineering in June inducted two new members into its Distinguished Engineering Alumni Academy and one new member into its Legacy of Iowa Engineering during the college’s spring alumni reunion dinner on Saturday, June 9.

Pearl Cheng and Barbara J. Sines, who received their Bachelor of Science degrees in 1981 in biomedical engineering and in 1980 in industrial engineering, respectively, were inducted into the Distinguished Engineering Alumni Academy for contributions toward personal engineering achievement, leadership, and service to the profession and society.

The late Edward L. Ashton, professor of civil engineering in the UI College of Engineering from 1943 until 1957, was inducted into the Legacy of Iowa Engineering, which recognizes faculty, staff, alumni, and friends who made exceptional historical contributions toward advancing the college in teaching, research, or service.

Cheng is currently a school board trustee with the Cupertino (Calif.) Union School District, where she has served since 2000. After earning her UI degree and a master’s degree from Stanford University in 1982, Cheng joined the NASA-Ames Research Center, where she developed life science experiments for various space missions, including the Galileo Probe to Jupiter, the Mars Pathfinder and the Lunar Prospector. She also chaired advisory boards and received a number of group achievement and mentoring awards, and was selected for the NASA Honor Award for Equal Employment Opportunity for her leadership and proactive efforts in advancing equal employment opportunity. She also served as associate director of the Information Sciences Directorate just prior to leaving NASA.

Cheng has made significant contributions to the UI College of Engineering by mentoring students, speaking to the Society for Women Engineers and the Women in Science and Engineering groups, and delivering the commencement address to the class of 2002. In 2005, she received the Hancher-Finkbine Alumni Medallion in recognition of her leadership, learning, and loyalty to the UI.

Sines, as vice president and general manager for Rockwell Automation in Milwaukee, Wis., is responsible for worldwide engineering and marketing activities for control and information platforms, including programmable logic controllers and open and embedded visualization products. In addition to managing a highly technical business, she has served as a mentor to Rockwell Automation employees worldwide, and was one of the driving forces behind the implementation of company-wide programs designed to improve and accelerate performance. She was formerly vice president and general manager of Electronic Operator Interface Business, where she had global profit and loss responsibility including product planning, manufacturing, marketing, and engineering for the company’s visualization products. She was plant manager at Square D in Cedar Rapids before joining Rockwell Automation in 1995.

Since earning her UI degree, Sines has remained involved with the college as a speaker at the biannual Student Leadership Institute and as a volunteer with Alumni Seeking Iowa Students, for which engineering alumni encourage top students to consider attending Iowa. Sines also presented at the College of Engineering’s “Grabbing the Globe” series in the spring of 2007, discussing international business at Rockwell Automation and her views on the importance of being globally aware, adept, and adaptable. She is currently a member of the UI Engineering Advisory Board.

Ashton, a native Iowan, provided the UI College of Engineering with innovation, experience and passion—all of which amounted to a truly lasting contribution. Following an 18-year career of exceptional structural design experience, Ashton returned to his alma mater to provide innovative and effective approaches to teaching. His pragmatic approach and commitment to personal attention benefited all students, especially those he mentored following World War II. Ashton left an indelible impression on his students, the college, and the state through ingeniously designed structures and his equally unique approach to teaching. National recognition of his structural designs is as deservedly noted as the generous praise he received from former students and colleagues.
The College of Engineering celebrated continuing biomedical engineering excellence when the Cellular Engineering Teaching Laboratory was dedicated May 2 in Iowa City.

Funded in part by a grant from the Roy J. Carver Charitable Trust of Muscatine, Iowa, the laboratory will aid many aspects of teaching and research.

“Thanks to generous support from the Carver Trust for the purchase of equipment and from the College of Engineering dean’s office for laboratory renovation, a dream has become a reality with the establishment of a state-of-the-art cell biology laboratory for our students,” said Krishnan B. Chandran, Lowell G Battershell Professor and former departmental executive officer of the Department of Biomedical Engineering.

“This laboratory provides experiential learning for our students in required courses in basic cell biology, as well as in cell-material interaction. In addition, the laboratory will be available for other elective courses offered in the department as well as for any senior ‘capstone’ design projects that involve cellular manipulations,” he added. “In keeping up with the dynamic changes in the discipline of biomedical engineering, our faculty felt that our students must have hands-on experience in the culturing and manipulation of cells and making measurements at the cellular level,” Chandran said.

UI College of Engineering Dean P. Barry Butler said, “The Roy J. Carver Charitable Trust recognizes the value to society of educating the next generation of engineers with state-of-the-art equipment and laboratories.”

The UI program recently introduced curriculum changes requiring that all undergraduate students take an engineering course in cell biology having a laboratory component. The curriculum changes are important because, as Chandran noted, scientific advances in studying human disease and appropriate cures involve studies at multiple levels of scale. Biomedical engineers—along with basic scientists and physicians—will continue to be involved in making measurements and in modeling complex processes directed toward advances in human health care.

Michael Mackey, associate professor in the UI College of Engineering Department of Biomedical Engineering and the Roy J. and Lucille A. Carver College of Medicine Department of Pathology, course coordinator and principal architect of the new course, stated that this newest addition to the biomedical engineering curriculum will acquaint sophomores in biomedical engineering with basic techniques used in cell biology, as well as provide exposure to more advanced techniques such as gel electrophoresis, cDNA microarray analysis, and polymerase chain reaction, all important biomedical research tools that students are usually exposed to later in their undergraduate studies.
THE ENTIRE PROGRESS OF SOCIETY HINGES ON IMPROVING THE PRODUCTION OF STEEL, ALUMINUM, AND OTHER METALS. FIVE HUNDRED YEARS FROM NOW AND BEYOND, PEOPLE WILL STILL BE MAKING AND USING STEEL.

Christoph Beckermann

As good cooks know, the best baked goods result as much from the cooling process as from the baking process. The internal structure of a cookie changes as it cools to perfection. Disturb it too soon, and the texture never recovers. Remove it too late, and it’s a rock-hard disc, stuck to the pan.

As a youngster in Osnabrueck, Germany, Christoph Beckermann was more inclined to fix cars than bake cookies, but he did grow up to become an expert on cooling processes. His specific areas of expertise focus on thermal and fluid sciences—heat transfer, thermodynamics, and fluid dynamics—as they relate to metal casting and solidification.

“Metal casting has been around since at least 3000 BC,” says the director of the Solidification Laboratory in the Department of Mechanical and Industrial Engineering. “Yet there is a seemingly endless array of challenges and problems that relate to metal casting processes.”

Beckermann adds that metal casting is a worldwide industry worth hundreds of billions of dollars. In the airplane and automobile manufacturing industries, for instance, improved metal casting has led to vehicles that are significantly quieter, faster, and more fuel efficient. The University of Iowa is known as a world leader in casting simulation research, and external funding for Beckermann’s efforts has hovered around the half-million-dollar mark each year for the last 5 years.

After earning an undergraduate degree from the University of Hanover in 1981, Beckermann earned MS (1984) and PhD (1987) degrees from Purdue University. Since he joined The University of Iowa faculty 20 years ago, Beckermann’s research has ranged from the microscopic to the massive.

Beckermann conducts fundamental research on the physics of solidification and also collaborates with companies to help improve their casting processes.
of steel, aluminum, magnesium, and other metals. His industry partners in Iowa have included corporate giants IPSCO Steel (Muscatine) and Alcoa (Davenport), which produce rolled sheets and plates from massive slabs of steel and aluminum. He also works with smaller companies such as steel foundries Sivyer Steel Corporation (Bettendorf) and Keokuk Steel Castings (Keokuk), which produce shaped castings for the railroad, vehicle, and petroleum industries. The University of Northern Iowa’s Metal Casting Center also has drawn on Beckermann’s expertise to enhance its shaped casting techniques.

On the other end of the scale, Beckermann explores essential questions about what happens at the microscopic level when a liquid metal solidifies. When metals transform from liquid to solid, they form beautiful microscopic structures called “dendrites,” crystalline forms less than a millimeter wide with a branching, treelike appearance. To really understand how metals solidify, researchers must discover how these microstructures form and how they result in the engineering properties of metals, including strength, durability, and ductility.

“We simulate the physical conditions of casting by solving basic equations about heat transfer and fluid mechanics,” says the University of Iowa Foundation Distinguished Professor of Mechanical and Industrial Engineering. “We can then figure out at the microscopic and macroscopic level what happens to metals during three aspects of the casting process: the flow of the metal as it goes into the mold, the cooling process, and the creation of defects such as pores or cracks that can occur during solidification.”

To unlock the secrets of metals processing, Beckermann and his staff—including research engineers and adjunct faculty members Richard Hardin and Kent Carlson (BS 1991, MS 1993 in mechanical engineering), six graduate students, and three undergraduate students—formulate numerical simulations and conduct experiments to determine how dendrites grow under different conditions as well as how the formation of dendrites affects the flow and solidification of metals.

Among other things, the researchers have determined that dendrites grow more quickly at the “front” of the flow.

“This makes sense,” Beckermann says, “because the tip of a dendrite is the most exposed. It experiences the most heat transfer and therefore grows most quickly.”

Theorizing that weightlessness should have a profound effect on dendrite formation, Beckermann convinced NASA to fund experiments to be carried out on the International Space Station.

“In space we could create a very quiescent melt that would really enhance our ability to test our theories and equations,” Beckermann says. “And we know the dendrites that form up there are simply beautiful.”

One of the most intriguing properties of dendrites is that their formation is remarkably similar regardless of the type of metal. In addition, some other fluids also form dendritic structures similar to those in metals. This similarity has allowed Beckermann to generalize from experiments with nonmetallic, organic substances...

...all dendrites seem to obey the same universal geometrical laws regardless of how they grow or the material they’re made of. This is basic physics; we’re learning something fascinating about nature that we did not know before.

Christoph Beckermann

Four microscopic photographs of dendrites from the solidification laboratory. Dendrites are crystalline forms less than a millimeter wide with a branching, treelike appearance.
whose transparency enables him to actually observe how the microscopic structures form during solidification. What he has discovered is quite remarkable.

“If you measure the radius of curvature of the very tip of the dendrite,” he says, “and then scale the rest of the structure—that is, divide every other feature by that radius—you can derive universal relations that provide the surface area, volume, and side-branch spacing for any dendrite.

“In other words, all dendrites seem to obey the same universal geometrical laws regardless of how they grow or the material they’re made of. This is basic physics; we’re learning something fascinating about nature that we did not know before.”

In another experiment, Beckermann observed solidification in situ by moving a thin slide containing a transparent substance through hot and cold environments. The data gathered from this research have helped him tackle the question of how bubbles form during the solidification process, much like the bubbles in an ice cube. One of the challenges of successfully casting metals is to prevent the growth of cracks and bubbles, which can lessen the product’s reliability.

Metal casting facilities around the world benefit from process simulation, and Beckermann’s lab is one of the leading contributors of custom-made software for process control and casting simulation. Despite the high price of a single CD that can contain millions of lines of code, it can be more cost effective for a company to invest in simulation technology than to repeatedly experiment with actual castings.

In addition to providing rich research collaborations, Beckermann’s industry ties also have enabled his students to land positions in the field, where they can apply their knowledge and skills beyond academe. One former student, Marc Schneider (BS 1989, MS 1991, PhD 1995 in mechanical engineering), now heads the development group at MAGMA Foundry Technology in Aachen, Germany. He leads a team of 28, including 16 PhD-level engineers and scientists who continually improve casting simulation software.

“The mix of fundamental and applied research I experienced in Professor Beckermann’s lab prepared me for the work I do today,” Schneider says. “He has an excellent reputation in both academic and foundry circles. I’ve even heard some people in the metal casting business refer to him as the ‘Tiger Woods of casting simulation research.’ Fortunately, I’ve been able to continue working with him on modeling of segregation, porosity, and other defects in castings.”

Beckermann’s contributions to the University and the community reach well beyond his lab. In addition to serving on the editorial board of three professional journals, he teaches a weeklong summer course to industry researchers. As chair of the Engineering Faculty Council through May 2007, he was intimately involved in designing the engineering curriculum, shaping tenure and promotion policies, and establishing college teaching policies. Beckermann’s collegiate and institutional service earned him the 2002 College of Engineering Service Award. Between attending meetings and leading a high-powered research lab, Beckermann also manages to find time to practice clarinet in preparation for the next performance of the Iowa City Community Band.

Beckermann’s passion for his work is palpable. He understands that metal casting is a very rich phenomenon in physics that poses countless fascinating challenges with an equally limitless potential for the development of ideas, theories, models, and solutions. And shifting to a larger frame of reference, he notes that since the advent of the Iron Age, people have recognized the significance of metal casting.

“The entire progress of society hinges on improving the production of steel, aluminum, and other metals,” Beckermann says. “Five hundred years from now and beyond, people will still be making and using steel.”

Alex Monroe, a graduate student working with Beckermann, studies a casting. Above are four x-ray computed tomography slices of the part, showing where porosity has formed during its manufacture.
The statistics are sobering: Almost twice as many undergraduate degrees in physics were awarded in 1956 as in 2006. About one-third of American students who begin undergraduate degrees in engineering switch to other degree programs before graduating. The trade balance in high-technology manufactured goods in the United States shifted from plus $54 billion in 1990 to negative $50 billion in 2001.

Many of the country’s leading scientists, engineers, and educators agree that the United States is gradually losing its technological, scientific, and economic leadership in the world. In "Rising Above the Gathering Storm," a report to Congress issued earlier this year, 20 esteemed members of the National Academy of Sciences, National Academy of Engineering, and Institute of Medicine urged the nation to vastly improve K–12 science and math education, sustain and strengthen our commitment to basic research, and develop the best and brightest science and engineering students in the world (see “Message from the Dean” on the inside front cover).

Yet even before this clarion call, the College of Engineering had tackled the same critical issues in a variety of ways, including active participation in Project Lead The Way (PLTW) and the Junior Engineering Technical Society’s national science, math, and engineering competition for high school students.

Since 1997, PLTW, a nonprofit organization, has been dedicated to increasing the number, quality, and diversity of engineers and engineering technologists in the
Students from Clint Gadbury’s Principles of Engineering class at Prairie High School in Cedar Rapids, Iowa, sketch out solutions to a bridge engineering problem.
United States. Project Lead The Way promotes pre-engineering courses for middle and high school students by providing a rigorous curriculum, teacher training, and assessment of student learning. In partnership with affiliated universities, PLTW develops challenging courses such as Principles of Engineering, Computer Integrated Manufacturing, and Digital Electronics, and trains middle and high school teachers to lead them. The PLTW curriculum focuses not only on engineering and math but also on industrial technology and reading skills.

With the support of the Iowa Department of Education, the engineering colleges at The University of Iowa and Iowa State University have partnered to create one of the most successful and fastest-growing PLTW affiliate programs in the country. Iowa is the only state that has two affiliate universities, a partnership that Alec Scranton says has worked well.

“When we began the program in 2005,” says the associate dean for academic programs, “we worked with a dozen Iowa schools. Today that number has grown to more than 60. Project Lead The Way directors point to Iowa as one of their real success stories.”

Professor of chemical and biochemical engineering David Rethwisch says that the science-, math-, and technology-intensive PLTW courses not only provide technical knowledge and skills but also personal insight for middle and high school students. He notes that after taking the courses, “some students say, ‘That was great! I want to be an engineer.’ On the other hand, other students may come to realize that maybe engineering isn’t for them—a lesson worth knowing before entering college.”

In addition, PLTW courses that focus on engineering technology can guide students to pursue technology-related careers at community colleges or to land a manufacturing job directly out of high school.

During a 2-week summer continuing education course on the UI campus, Rethwisch and fellow professor of chemical and biochemical engineering David Murhammer help train high school teachers from Iowa and several surrounding states to lead 2 PLTW courses: Principles of Engineering and Biotechnical Engineering. (Engineering faculty members at ISU conduct teacher training for Introduction to Engineering Design.) To ensure rigor and consistency, the nonprofit program requires all its university-affiliated instructors—including Rethwisch and Murhammer—to become certified themselves.

In addition, PLTW university-affiliated representatives conduct certification visits to the middle and high schools that teach the PLTW curriculum. So far, 9 Iowa high schools have been certified, and the Iowa City Community School District recently committed to incorporating at least 1 course in its high school curriculum.

Rethwisch notes that since baby boomers began entering the workforce some 40 years ago, the cultural climate that once encouraged many young people to become engineers has changed.

“Back then, students who were attracted to engineering were the ones who
worked on their own cars or took things apart to see how they worked,” he says. “But with modern designs and microchips, it’s harder for young people to get the kind of experience that can help them determine if engineering is for them.

“That’s why I’m excited about Project Lead The Way. These courses provide an opportunity for students to get hands-on experience with technology before they graduate from high school.”

In addition to PLTW, the college is involved in another initiative to encourage and recognize talented high school students who are interested in math, science, and engineering. Each year, the nonprofit Junior Engineering and Technological Society (JETS) sponsors a nationwide event in which more than 14,000 high school students compete in teams of eight to solve real-world engineering challenges. The daylong event is fun and fast-paced, with an emphasis on creativity, teamwork, and critical thinking. Last February, the college hosted its second annual regional JETS competition. To further encourage talented Iowa high school students, The University of Iowa College of Engineering awarded eight $500 scholarships to the members of the team that won the first part of the day’s competition. This year’s competition was particularly exciting, as 2 Iowa City teams—Iowa City West High School and Regina High School—ranked first nationally in their respective divisions.

By supporting programs such as JETS that recognize students’ math and science abilities, and by becoming active partners in educational initiatives such as PLTW, the College of Engineering continues to help ensure the United States will be able to compete, prosper, and remain secure in the coming decades.
In 1994, Wu’s undergraduate alma mater, National Cheng Kung University, convinced him to return to Taiwan to become the school’s president and a faculty member in hydraulic and ocean engineering.
When Jin Wu arrived in Iowa City in 1959 after a 3-day Greyhound bus ride from Seattle, he had no idea that the trip would be merely a preface to a much longer journey about to begin at the College of Engineering alongside the Iowa River. Since then, Wu’s career has spanned continents, disciplines, and institutions, including not only institutions of higher education but also the halls of power in Taiwan and the US Library of Congress.

Today, Wu (MS 1961 and PhD 1964 in mechanics and hydraulics) is a world-renowned expert on fluid dynamics, particularly the complexities of momentum, heat, and mass that occur as air and water interface at the sea surface. Although retired from his official teaching and advising roles, he is actively engaged in research as the Distinguished Senior Kluge Visiting Scholar at the Library of Congress, where he is exploring a breathtaking series of sea voyages conducted by 15th-century Chinese sailors.

“I arrived in Iowa in 1959 as a civil engineer,” says Wu, who earned a bachelor’s degree in 1956 at National Cheng Kung University in Taiwan and taught high school physical education and physics for a year before coming to Iowa. “But it was my graduate studies at Iowa that introduced me to the wonders of hydrodynamics and research.”

As a student in the Iowa Institute of Hydraulic Research (now IIHR—Hydroscience & Engineering), Wu studied with two of the giants in the discipline: Louis Landweber and Hunter Rouse (see page 24). Landweber served as Wu’s thesis and dissertation advisor; Rouse hired the young man to work in his lab.

“He ran his lab with an iron hand,” Wu says, “and hinted to all of us that if we wanted to go on for a PhD, we had better do very well in his course on fluid dynamics.”
Wu apparently made the grade, as Rouse not only allowed him into the doctoral program but also invited him to serve as his teaching assistant. Wu soon discovered, however, that his mentor’s demands for excellence reached well beyond the lab.

“My English was so poor,” Wu says, “that Professor Rouse made me write an English composition once a week, every week for 2 years. And every Monday at 3 o’clock, he met with me to go over my grammar and usage.”

Wu adds that “it kind of ruined my weekends,” and there was no reprieve even when his mentor attended conferences, as Rouse simply asked another faculty member to fill in until he returned. Nevertheless, Wu says the extra work—which he also describes as “a very nice effort” by Rouse—greatly improved Wu’s English language skills, which in turn enhanced his future professional opportunities.

While at Iowa, Wu became reacquainted with a young woman who had been a schoolmate in Taiwan and who was a doctoral student at Iowa in biochemistry. Wu and Tzu-Chen Chang eventually married and had three sons. Wu also developed a passion for all American sports. An avid basketball player as well as spectator, he provided radio commentary for the 1996 NBA playoffs in Taiwan.

After graduating from Iowa, Wu joined Hydronautics, Inc., a private research group in Laurel, Md., that gathered and analyzed data on fluid dynamics and the nature of oceans. During the next 11 years, he worked as a research scientist and director of the company’s Fluid Motions Division and Geophysical Fluid Dynamics.
“It was the Cold War era,” says Wu, who became a US citizen in 1974. “I was involved in classified research that focused on submarine warfare. We were trying to identify Russian subs and to keep the Russians from identifying ours.”

In 1974, Wu left the private sector and returned to academics as an associate professor of marine studies and civil engineering at the University of Delaware, where, in addition to teaching, he developed and refined techniques to map the ocean surface from satellite data. In 1985, he was named the H. Fletcher Brown Professor of Marine Studies and Civil Engineering.

Wu enhanced his professional perspective beyond teaching and research by serving on advisory boards for the National Academy of Sciences and the Office of Naval Research. In recognition of his broad impact in the discipline of hydraulics and higher education, he has received a number of awards, including The University of Iowa’s first Outstanding Scholastic Achievement and Distinguished International Service Award (1997) and membership in the National Academy of Engineering (1995). The National Science Foundation and Office of Naval Research named him the National Ocean Educator (1991–94), and the Federal Asian Pacific-American Council named him Asian-Pacific American of the Year in 1995.

In 1994, Wu’s undergraduate alma mater, National Cheng Kung University, convinced him to return to Taiwan to become the school’s president and a faculty member in hydraulic and ocean engineering. Two years later, his success at the helm of a major educational institution had impressed the Taiwanese government officials so much that the country’s president appointed Wu to his cabinet as the Minister of Education, a role Wu took on with gusto.

“Even though I differed with many government officials about reform,” he says, “making meaningful changes in the Taiwanese educational system was fun. And I received a lot of support from the people. During the 2 years I served in the cabinet, a biannual Gallup poll indicated that the ministry of education received the highest approval rating of any department in the country.”

Among Wu’s important reforms was an approach to education that offered students a number of options once they completed high school: vocational training; 2-year college for licensure; four-year college leading to a degree; and alternating work and studies leading to a degree. Wu likens his approach to an “educational interstate” with various exits as well as one option that offers rest stops where students can take a break from academics and work for a while before returning to the education track.

Reflecting on his impact, Wu says he “tried to create an educational system that would provide young people with many choices and hope.”

Today, the distinguished scholar at the Library Congress devotes countless hours to researching a vast undertaking by 15th-century Chinese sailors to explore the world. Between 1405 and 1433, China sent out 28,000 men and more than 300 ships, reaching the east coast of Africa at least 7 times. Through his research on ancient maps, shipbuilding, ocean navigation, and wind and ocean currents, Wu hopes to piece together a clearer picture of this astonishing sea voyage. Given his own travels, Jin Wu also has proven to be a formidable explorer.
Engineering  Dean P Barry Butler was a keynote speaker May 30 at groundbreaking ceremonies for the new Acciona Energia wind-power manufacturing facility in West Branch, Iowa. The College of Engineering played a supportive role in attracting the company to locate in West Branch.

The College of Engineering hosted a June 14 ceremony to formally sign an agreement between the University of Iowa and Dharmsinh Desai University in Gujarat, India, establishing a joint bachelor's/master's degree program for students of the Indian university.

Rebecca Rowe, administrative assistant to the dean, has left the college to become senior executive assistant to the president of Iowa Wesleyan College, Mount Pleasant, Iowa. Becky has been in the College of Engineering Dean's Office for 25 years, serving five deans: Robert Hering, Interim Dean Paul Scholz, Richard K. Miller, Anthony L. Hines, and P. Barry Butler. She was recipient of a University Staff Council Staff Excellence Award in 1993 and the first recipient of the Mary Sheedy Award in 2006.

Biomedical Engineering James Ankrum, senior, was awarded the Hancher-Finkbine Undergraduate Student Medallion at the annual Finkbine dinner held April 17. Ankrum also was named recipient of a 2007 Churchill Scholarship. He is the first Churchill scholar from The University of Iowa and one of 12 nationwide. The award, worth $52,000, will send Ankrum to study for 1 year at Cambridge University in England.

Terry Braun, associate professor, and Abe Clark, research collaborator from Alcon Research Labs, gave a keynote bioinformatics address at the Association for Ocular Pharmacology and Therapeutics meeting in San Diego, Calif., February 8-11.

Nicole Grosland, associate professor and researcher at the Center for Computer Aided Design (CCAD), was awarded a 4-year, $1.98 million grant from the National Institute of Biomedical Imaging and Bioengineering of the National Institutes of Health (NIH) to develop a software toolkit to help physicians better understand the behavior of human bones and joints.

Alexandra Keenan, sophomore and international studies major, was awarded a 2007 Goldwater Scholarship. The scholarship, funded by the federally endowed Goldwater Foundation, provides up to $7500 per year for 1 or 2 years to cover the cost of tuition, books, fees, and room and board.

Tae-Hong Lim, professor, received a 2-year, $77,750 grant from the US Department of Health and Human Services NIH, to study an animal model for discogenic low back pain.

Adrian Loffler, senior, received the inaugural Alliant Energy Erroll B. Davis, Jr. award.

Madhavan L. Raghavan, associate professor, received a 2-year, $221,250 grant from the NIH to study endovascular grafts, an implant used to repair aortic aneurysms.

David Wilder, associate professor and research scientist in the Jolt/Vibrations/Seating Laboratory of the Iowa Spine Research Center, received the Faculty Excellence Award for Service at the Annual Faculty and Staff Recognition Luncheon held May 8. He was cited as an enthusiastic advocate for engineering. He was recently elected meeting chair and program chair for the 2010 American Conference on Human Vibration, which will be held at The University of Iowa.

Chemical and Biochemical Engineering

Gregory Carmichael, Karl Kamermeyer Professor of Chemical and Biochemical Engineering, delivered the 2006 Vernon L. Snoeyink Distinguished Lecture on November 6. The annual lecture is hosted by the University of Illinois Environmental Engineering Program. The title of his presentation was “The Globalization of Air Pollution: Implications for the Quality of the Air We Breathe.” He also gave a specialty presentation titled, “Integrating & Assimilating Chemical Data in Air Quality and Atmospheric Chemistry Models.”

Sherrie Renee Elzey, graduate student, won a prestigious 2007 National Defense Science and Engineering Graduate (NDSEG) Fellowship.

Jennifer Fiegel joined the Department of Chemical and Biochemical Engineering as an assistant professor. She holds a joint appointment in the Division of Pharmaceutics, College of Pharmacy. Fiegel earned her BS in chemical engineering in 1998 from the University of Massachusetts, Amherst, Mass. Upon completion of her undergraduate degree she enrolled in the PhD program in chemical and biomolecular engineering at Johns Hopkins University. Fiegel’s research laboratory focuses on development of novel drug delivery systems for diseases of the lung, with special emphasis on infectious and inflammatory diseases.

Lijing Gou won the Dean’s Distinguished Dissertation Award for his dissertation, “Photochemical Method to Eliminate Oxygen Inhibition in Free-Radical Polyolpolymerization.” Gou earned his doctorate in chemical and biochemical engineering in 2006. He is currently a research engineer at Micron Technology, Inc., a company that produces semiconductors for use in a broad range of products, such as digital cameras, automotive navigation devices, and medical equipment.

Vicki Grassian, professor, presented at the 2007 Annual Meeting of the American Association for the Advancement of Science (AAAS) in San Francisco, Calif., February 18. Her talk was delivered during an AAAS session on “Contributions from Chemical and Molecular Sciences in Achieving a Sustainable Future.”

C. Allan Guymon, associate professor, received a 3-year, $239,000 grant from the National Science Foundation (NSF) for “Kinetic Control of Polymer Nanostructure in Lyotropic Liquid Crystalline Systems.”

William Liechty was named recipient of a Gates Cambridge Scholarship. As a graduate student at Cambridge University, he will be involved in research on new technologies in electro-optic polymer composites.

Civil and Environmental Engineering

Elliott Campbell, graduate student, won a second place honor in the Sandra H. Barkan Mentor Award competition for guidance he provided to undergraduate students involved in research at the CGRER, Campbell was sponsored for the award by Charles Stanier, assistant professor of chemical and biochemical engineering, researcher at CGRER, and research engineer at IHIR—Hydroscience & Engineering.

George Constantinescu, assistant professor and assistant faculty researcher at IHIR—Hydroscience & Engineering, received a 16-month, $35,584 grant from the University of Guelph, Ontario, Canada. He will identify the movement rules sea lamprey use to navigate complex flows.

Rob Ettema, professor and departmental executive officer of civil and environmental engineering, has been appointed dean of the College of Engineering at the University of Wyoming, Laramie, Wyo., beginning August 1. Ettema joined the College in 1980 as a visiting research engineer and has made a profound, positive impact.
on the Department of Civil and Environmental Engineering as a faculty member, researcher, and administrator. He also was acting director of the Iowa Institute of Hydraulic Research during the transition period between the untimely death of Professor Jack Kennedy and the appointment of Professor V.C. Patel as director. Ettema served in many capacities at the departmental, college, university, and community level, and was recipient of the College of Engineering Faculty Award for Service in 2004 and the American Society of Civil Engineers Hunter Rouse Lecture Award in 2002.

Hosin “David” Lee, associate professor, was appointed chair of the Highway Pavement Committee of the American Society of Civil Engineers. Lee has also been appointed a member of the second Strategic Highway Research Program Renewal Expert Task Group on Utilities, Relocation, Technology Enhancement, and 2. Utilities: DOT Institutional Mitigation Strategies.

Wilfrid Nixon, professor, received a $72,714 research grant from the U.S. Environmental Protection Agency to conduct hydraulic model studies for bypass pumps in New York City’s Manhattan Pump Station.

Jerry Schnoor, Allen S. Henry Chair in Engineering, professor of civil and environmental engineering, co-director of the CCRER, and editor of Environmental Science & Technology Magazine, delivered the keynote address to more than 300 of the country’s best and brightest science graduate students in Washington, D.C., during the 2006 EPA Graduate Fellowship Conference September 25–26.

A. Jacob Ogaard, professor and research engineer for IIHR—Hydroscience & Engineering, received a $77,314 research contract from Silveme Construction Company, New York, NY. He will conduct hydraulic model studies for bypass pumps in New York City’s Manhattan Pump Station.

Irund A-Wan, junior, was awarded a Stanley Undergraduate Scholarship for International Research. Irund is a member of the Continental Crossings Team that traveled to Peru last summer to conduct research on footbridge design modifications and local construction. He will explore possibilities for incorporating a participative education for local laborers in conjunction with the organization Working with Bridges to Prosperity.

Electrical and Computer Engineering

Soura Dasgupta and Jon Kuhl, professors, received a 3-year, $240,000 grant from the NSF to study networks of objects that collaborate by mutually exchanging information, i.e., air traffic control systems, automated highway systems, disaster response communications networks, and satellites organized in formation.

The Second Edition of Fundamentals of Electromagnetics with MATLAB, co-authored by Karl E. Longren, professor; Sava V. Savov, and Randy J. Jost was published in January.

Hudson Ludvigson, graduate student and teaching assistant, was one of 25 who were named winners of the Outstanding Teaching Assistant Award.

Cameron Miller, junior, was awarded a $5,000 Ed Moldt Entrepreneurial Scholarship for 2007–2008.

Sudhakar Reddy, University of Iowa Foundation Distinguished Professor of Electrical and Computer Engineering, received a $25,000 contract for graduate student research from Mentor Graphics Corporation, a world leader in electronic hardware and software design solutions.

Andreas Wahle, adjunct associate professor and associate research engineer, and Dr. Ademola Abose, UI assistant professor of internal medicine, received a $50,000 research grant from the Department of Internal Medicine at the Roy J. and Lucille A. Carver College of Medicine. The funding will be used for a project, titled “Left-Ventricular Mechanical Dysynchrony Assessment by 4D Segmentation and Statistical Modeling of Real-Time 3D Echocardiography Data.”

Mechanical and Industrial Engineering

Christoph Beckermann, University of Iowa Foundation Distinguished Professor of Mechanical and Industrial Engineering and director of the UI Solidification Laboratory, was awarded a 4-year, $150,000 research grant from the US Council for Automotive Research to study Hi-MAC computer modeling and properties.

Linda Ng Boyle and Nagi Gebrael, both assistant professors of mechanical and industrial engineering, were selected by the NSF to receive Faculty Early Career Development Awards for 2006–2007. As award recipients, Boyle and Gebrael will each receive support of $450,000 over the next 5 years.

Kyung K. Choi, Roy J. and Lucille A. Carver Professor of Mechanical Engineering, was elected president of the International Society for Structural and Multidisciplinary Optimization during the organization’s World Congress held May 21-25 in Seoul, South Korea.

Richard Hardin, associate research engineer, received a Staff Research Excellence Award at the Annual Faculty-Staff Recognition Luncheon held May 4. His research interests include the dynamics of continuous steel casting. In particular, he has been cited for his many peer-reviewed articles in the field of metal solidification published in professional journals. Also, he was noted for his outstanding work in teaching an experimental engineering course for several years and coordinating the course-related laboratory.

Nico Heacock, senior, was awarded a Distinguished Student Leader Certificate at the annual Finkbine dinner held April 17. He was recognized as a Presidential Scholar, State of Iowa Scholar, Robert C. Byrd Honors Scholar; Valedictorian Scholar and Engineering Excellence Scholar; and has been included on the President’s and Dean’s Lists every semester of her college career. Heacock led the revival of the UI Chapter of the American Institute of Aeronautics and Astronautics during her sophomore year and has acted as president since that time. She is also a leader in the Engineering Student Ambassadors, lead hull design engineer for the UI Concrete Canoe Team, a member of Theta Tau Professional Engineering Fraternity, and Webmaster for the Engineering Senior Class Gift Committee. She is the non-voting student body representative to the College of Engineering Curriculum Committee.

Pavio Krokhmal, assistant professor, has received a $39,000, 1-year research grant from the US Department of Defense, Air Force, to study modeling and analysis of multi-agent cooperative formations with human operators-in-the-loop.

Sharif Rahman, professor and research engineer at CCAD, was elected a Fellow of the American Society of Mechanical Engineers.

Tom Schnell, associate professor and director of the Operator Performance Laboratory received a 1-year $50,000 research grant from the National Aeronautics and Space Administration to study and develop synthetic vision Hover displays for low-level helicopter operations in poor visibility environments. Schnell also received a $46,679 research contract from Rockwell Collins, Inc., Cedar Rapids, to develop a test environment to evaluate candidate operational concepts for flight alternative terrain awareness and warning systems.
The University of Iowa Society of Automotive Engineers Mini Baja took first place at the Michigan Tech Blizzard Baja Competition held in Houghton, Mich. Members of the Hawkeye Motorsports Baja team include Jon Zeman, Tom Morrison, Andrew Pietsch, Jeffrey Linneberg, Kevin O’Donnell, Tyler Williams, Matt Marquardt, Eric Green, Dan Chizek, Derrick Richmann, Taleb Salameh, and Dominick Geraci.

Ralph Stephens, professor, celebrated 50 years of Big 10 teaching at a reception held in his honor on May 8. Stephens taught 3 years at the University of Illinois, 5 years at the University of Wisconsin, and 42 years at The University of Iowa.

Kris Thornburg, graduate student, was named a finalist in the 2007 Vording Business Plan Competition for his entry, Thornburg Green Vineyards and Winery. Thornburg Green Vineyards and Winery will be a sustainable vineyard and winery, producing its own electricity with small wind generators, a hydrogenator, and photovoltaics; producing its own biodiesel for the vineyard equipment; and following organic wine making practices.

Shaoping Xiao, assistant professor and researcher at CCAD, is collaborating on a 1-year, $100,000 contract from the US Army Research Office to develop a computer-aided design (CAD) software tool for multiscale design and analysis. He also received a $46,256 research contract from NextGen Aeronautics, Inc., of Torrance, Calif., to develop a CAD-based software tool for multiscale and multiphysics design and analysis.

Center for Computer-Aided Design
Karim Abdel-Malek, professor of biomedical engineering and director of CCAD and the Virtual Soldier Research (VSR) Program received the Faculty Excellence Award for Research at the Annual Faculty and Staff Recognition Luncheon held May 8. The VSR Program, established in 2003, has received international recognition and more than $13 million in external funding. University of Iowa researchers, in conjunction with researchers at Iowa State University and the University of Northern Iowa, have been awarded a 3-year, $3 million grant from the US Department of Transportation for a transportation research center to help reduce the number of highway crashes by studying driver behavior and other safety-related issues. Linda Boyle, assistant professor, is the principal investigator for the UI team.

John Lee, professor and director of the Cognitive Systems Laboratory at the CCAD, was appointed director of human factors research at the National Advanced Driving Simulator, a unit of CCAD.

The United States Council for Automotive Research (USCAR), an organization composed of DaimlerChrysler, Ford Motor Company, and General Motors Corporation, has partnered with the VSR Program with a $1.3 million contract for manufacturing ergonomics research.

The Virtual Soldier Research Program received a $2.3 million contract from the US Army Tank Automotive Research, Development, and Engineering Center of Warren, Mich., to improve human modeling tools used in the design of military ground vehicles.

The Operator Performance Laboratory (OPL) received an $887,628 grant from NASA to develop Pilot-Avionics Interface. The project is designed to investigate concepts that will give aircraft avionics systems an awareness of the pilot’s state of mind — based on physiological measures, aircraft state, and flight mission parameters — and the ability to take appropriate action.

A team of researchers at OPL won best paper award at the October 2006 Augmented Cognition International Conference held in San Francisco, Calif. Co-investigators on the project include Carlton Richhey, Mike Keller, Pieter Poolman, Nicholas Lorch, and Andrej Lenert. The Discovery Channel produced a documentary on the work when the OPL team deployed the neural imaging technology on a Bell 412 helicopter at the Canadian National Research Laboratory (C-NRC) in Ottawa, Canada, during December 2006. The documentary of this joint research with C-NRC is called “Brains on a Plane” and aired as part of a Discovery Channel show called the “Daily Planet” in Canada.

Members of CCAD have launched a new publication: the International Journal of Human Factors Modelling and Simulation. Karim Abdel-Malek is editor-in-chief. Jingzhou Yang, research engineer, is executive editor. John Lee, serves as a member of the publication’s editorial board.

Salam Rahmatalla, research engineer, received a $200,000 grant from Caterpillar, Inc. of Peoria, Ill., to study whole body vibration. His research will focus on seat comfort, motion capture, and low and high frequency vibration.

Tom Schnell, associate professor and director of OPL, was appointed director of project development at CCAD.

Computer Systems Support
Doug Eltoft, director, received the Doug Sheedy award for staff excellence at the annual Faculty Staff Luncheon held May 4. Under his guidance, CSS provides outstanding support to faculty and staff at the UI campus.

IIHR—Hydroscience & Engineering
Marian V.L. Muste, associate research engineer, was awarded the Hancher Finkbine Staff Medallion at the annual Finkbine dinner held April 17. This is the first year a staff member was awarded the medallion. He has been recognized as a Fulbright Senior Scholar, Fulbright Senior Specialist, and Fellow of the National Science Foundation/Japan Society for Promotion of Science. Muste has taken responsibility for and worked on securing funding to modernize the College of Engineering Fluids Laboratory and leads the IIHR (Iowa Institute of Hydraulic Research) International Perspectives in Water Resource Management program.

Imaging Group
Seven engineering faculty and six engineering graduate students participated in the 2007 Medical Imaging Symposium, sponsored by the International Society for Optical Engineering (SPIE). Faculty participating from the College of Engineering were Professors Joseph Reinhardt and Vincent Magnotta, Biomedical Engineering; Professors Gary Christensen, Punam Saha, Milan Sonka, Andreas Wahle, and Xiaodong Wu, Electrical and Computer Engineering; graduate students Jessica de Ryk, Sangyeol Lee, and Lijun Shi, Biomedical Engineering, and Mona Haeker, Michael Merickel, and Honghai Zhang, Electrical and Computer Engineering, participated as authors and/or presenters at the meeting. Sangyeol Lee received an honorable mention poster award for his poster “Feature-based pairwise retinal image registration with radial distortion correction.”

Professor Milan Sonka was chairman for the Symposium. Professor Joseph Reinhardt served as chairman of the Image Processing Conference, and Professors Punam Saha and Andreas Wahle served as technical program committe members for the Image Processing Conference. Professor Gary Christensen gave an invited workshop presentation on “Validation in Image Registration.”

Mona Haeker, doctoral student in biomedical engineering, received the prestigious Michael B. Merickel Best Student Paper Award for her paper, “Automated segmentation of interlayeral pixels from macular optical coherence tomography image.”
1950s

A. Donald Sexton (BS 1950 mechanical engineering), his son Scott and daughter Ann were on campus October 19 to tour the Seaman’s Center. Sexton’s career was with Maytag Corporation. During their visit, the family relayed stories of their dad bringing appliances-in-progress to test in their home.

Luther H. Smith (BS 1950 mechanical engineering), retired US Air Force captain who flew 133 combat missions in World War II with the famed Tuskegee Airmen, and retired General Electric Co. engineer, received a Congressional Gold Medal at a ceremony held in Washington, D.C. March 29.

Kenny Ploen (BS 1958 civil engineering) was selected to be Iowa’s honorary captain for the Homecoming Football game, October 7, against Purdue. Ploen was a first-team all-American in 1956, his only year as a starter. He led Iowa to the 1956 Big Ten championship and a 35-19 win over Oregon State in the Rose Bowl. He was named the Big Ten’s 1956 team leader in rushing, his senior campaign. Ploen was Iowa’s honorary captain for the Homecoming Football game, October 7, against Purdue. Ploen was a first-team all-American in 1956, his only year as a starter. He led Iowa to the 1956 Big Ten championship and a 35-19 win over Oregon State in the Rose Bowl. He was named the Big Ten’s 1956 team leader in rushing, his senior campaign. Ploen was Iowa’s honorary captain for the Homecoming Football game, October 7, against Purdue. Ploen was a first-team all-American in 1956, his only year as a starter. He led Iowa to the 1956 Big Ten championship and a 35-19 win over Oregon State in the Rose Bowl. He was named the Big Ten’s 1956 team leader in rushing, his senior campaign. Ploen was Iowa’s honorary captain for the Homecoming Football game, October 7, against Purdue. Ploen was a first-team all-American in 1956, his only year as a starter. He led Iowa to the 1956 Big Ten championship and a 35-19 win over Oregon State in the Rose Bowl. He was named the Big Ten’s 1956 team leader in rushing, his senior campaign. Ploen was Iowa’s honorary captain for the Homecoming Football game, October 7, against Purdue. Ploen was a first-team all-American in 1956, his only year as a starter. He led Iowa to the 1956 Big Ten championship and a 35-19 win over Oregon State in the Rose Bowl. He was named the Big Ten’s 1956 team leader in rushing, his senior campaign. Ploen was Iowa’s honorary captain for the Homecoming Football game, October 7, against Purdue. Ploen was a first-team all-American in 1956, his only year as a starter. He led Iowa to the 1956 Big Ten championship and a 35-19 win over Oregon State in the Rose Bowl. He was named the Big Ten’s 1956 team leader in rushing, his senior campaign.

Ed Brinton (BS 1965 civil engineering) stopped by the College on April 19 to introduce a potential graduate student to the College.

1970s

Y.C. Chen (MS 1972 chemical and biochemical engineering) has been appointed president of the US branch-based business of W.W. Grainger, Inc., a leading broad line supplier of facility maintenance products serving businesses and institutions in Canada, China, Mexico, and the United States. Chen had been group president for the company’s operations in Canada, Mexico, and Puerto Rico since 2006. As president of the US branch-based business, he will become responsible for Grainger’s largest business unit. Chen joined Grainger in 1996 as vice president for Asia Pacific, where he established the company’s global sourcing operation. He was senior vice president for the supply chain of the US branch-based business, which included the sourcing and parts operations as well.


1980s

Greg Kirsch (BS 1981 electrical engineering), attorney and shareholder with Needle & Rosenberg, Atlanta, Ga., was a guest speaker at the Law Review Symposium organized by Georgia State University College of Law. He also presented “Patent Strategies for Start-Up Companies,” at the Advanced Technology Development Center (ATDC) on November 29th. Kirsch was also named to Georgi Trend magazine’s list of Legal Elite. The Legal Elite are selected as “the most effective lawyers” in 11 specified practice areas in a survey polling several thousand of their peers from the State Bar of Georgia.

Aaron Buchwald (BS 1982 electrical engineering) was on campus November 2 to present “Signal Processing Assisted (SPA) Analog Design: The Next Generation of Data Converters,” to the Electrical and Computer Engineering Graduate Seminar Class. Buchwald is CEO and co-founder of Mobius Semiconductor, a privately-held start-up company in Irvine, Calif.

Kelly Ortberg (BS 1982 mechanical engineering) has been appointed executive vice president and chief operating officer of commercial systems at Rockwell Collins, Inc., Cedar Rapids, Iowa. He will be responsible for the company’s aviation electronics, communications, and cabin systems for the air transport, business aviation, and regional airline markets. Prior to his current role, he served as vice president and general manager of communication systems in government systems.

John A. Jenkins (BS 1983 biomedical engineering) of Decorah, Iowa, is president of Jenkins Industries, a construction, marketing, and sales consulting company.

George Guo (MS 1985, PhD 1990 mechanical engineering) is the CEO and principle engineer of ZHI Engineering and Construction Inc., Orlando, Fla.

1960s

Robert P. Stearns (BS 1960 civil engineering) was honored with a UI Alumni Association Distinguished Alumnus Award at a special luncheon held June 9.

Ashok Rao (MS 1964 electrical engineering, PhD 1968 industrial and management engineering) was named dean for the E. Philip Saunders College of Business at Rochester Institute of Technology, effective February 1. Rao has worked as a senior systems engineer at Leeds & Northrup; assistant professor of operations research at Rensselaer Polytechnic Institute; manager of operations research at Canada Packers Ltd.; director of business systems at Northern Telecom Ltd.; associate professor of business administration at Northeastern University; and professor at Babson College of Business in Massachusetts, where he held the position of chair of the management division from 2000 to 2005.

Hung Tao Shen (PhD 1974 mechanical and hydraulic engineering), professor and chair of the Civil and Environmental Engineering Department at Clarkson University, was the recipient of the American Society of Civil Engineers (ASCE) 2007 Hunter Rouse Hydraulic Engineering Award.

Zarir Mistry (MS 1975 industrial and management engineering) recently registered as an alumnus on the new OnIowa.com web site. He noted, “After working for the last 30+ years as an entrepreneur and having held a senior-management position in the corporate world, I retired from my active career and have gone into part-time consulting. I live in Mumbai, India, with my wife, Nilufar, who is a CPA, and have a daughter who has recently returned to India after completing her MBA in London.”

Robert Lloyd (BSME 1979, MBA 1984) is plant manager of Clipper Turbine Works, Cedar Rapids, Iowa.
**1990s**

John Doering (BSE 1986 in civil engineering, MS 1987 in civil and environmental engineering) is project manager for Iowa Prestressed Concrete Inc., Des Moines, Iowa.

David G. Hayes (BS 1986 electrical engineering) is owner of Thinformation, Davenport, Iowa. Thinformation is a new form of digital signage and advertising that allows businesses to control content on video kiosks and high-definition monitors through the Internet.

Lori Stegink (BS 1986 chemical engineering) was named vice president of Barr Engineering, Minneapolis, Minn.

Remigio H. Galarraga-Sánchez (MS 1987 in civil and environmental engineering) is professor and chair of the Department of Hydraulics and Water Resources and co-director of the Graduate Program in Water Resources at Escuela Politécnica Nacional, Quito, Ecuador. He also is a member of the Ecuadorian National Committee for the Inter-American Institute for Global Change Research (IAI). His research interests include hydro-meteorological studies of high altitude meteorological stations to identify climate variability; El Niño; time and spatial analysis of aerial photography for global change studies in the Chimborazo Mountain; and disaster prevention studies for the city of Bahía de Car Quez (severely damaged during the El Niño of 1997–1998).

Charles Zimmerman (BS 1987, MS 1989 industrial engineering) is an information technology supervisor at Caterpillar, Inc., Peoria, Ill.

John Albright (BS 1989 in mechanical engineering) is a propulsion and fluid systems engineer at NASA’s Johnson Space Center, Houston, Tex. Albright recently visited the College of Engineering on a return trip to Iowa.

**1980s**

Leland Belding (BS 1990 electrical engineering, BS 1995 civil engineering) is a project manager with McClure Engineering, North Liberty, Iowa.

Tim Hughes (BS 1993 electrical engineering), professor in the Bantering and Best Department of Medical Research at the University of Toronto, Ontario, Canada, received a 2006 Howard Hughes Medical Institute International Research Scholars Award.

Renee Walter Lubbe (BS 1994 chemical engineering) has taken an extended leave of absence to be a full-time, stay-at-home mom for her three daughters, ages 6, 5, and 3.

Scott Larson (BS 1994 civil engineering) and Hunter Parks (BS 1996 civil engineering) were named to the Corridor Business Journal’s 2006 Forty Under 40. The Corridor Business Journal highlights 40 individuals under the age of 40 living in the Iowa City-Cedar Rapids Business Corridor; for their accomplishments at a young age. Larson, assistant city engineer for the City of Coralville, was recognized for dedication, creativity, and innovation in his work. Parks, president of Hunter Construction, Co., was recognized for combining 15 years of construction experience with long-lasting business relationships to spur economic growth along the Corridor.

Robert B. Nordstrom (BS 1994 electrical engineering, MD 1998) is a radiologist at Clinical Radiologists, Springfield, Ill.

Jonathan Bauer (BS 1995 mechanical engineering) is regional sales manager in the southwest US for Victaulic. He is also co-owner of Mirror Image Investments LLC, an investment company that manages equity investments in real estate, the restaurant industry, and legal funding.

Kyle J. Munn (BS 1997 biomedical engineering, MS 1999 electrical and computer engineering) is employed by NimbleGen Systems, Inc., Madison, Wis., as senior applications scientist for bioinformatics.

Matt Henry (BS 1998 biomedical engineering) has been appointed to the UI Department of Biomedical Engineering Advisory Council. Henry is manager of contract and OEM sales at Brown Medical Industries, Spirit Lake, Iowa.

Raymond E. Phillips III, (BS 1999 electrical engineering) of Waawotosa, Wis., is an engineer at the Astronautics Corporation of America, a manufacturer of navigation and computer systems in Milwaukee, Wis.

Matt Vincent (BS 1999 in industrial engineering) is president of Source Allies, Inc., Des Moines, Iowa.

Brian J. William (BS 1999 civil engineering) is a traffic engineer with Shive-Hattery, Iowa City, Iowa.

Jennifer Brozik (BS 2000 electrical engineering) has been working as an applications programmer/analyst for Wells Fargo Financial in downtown Des Moines, Iowa.

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**2000s**

Erin Granquist (BS 2000 civil engineering) is a project engineer with Howard R. Green, Cedar Rapids, Iowa.

Doug W. Fisher (BS 2001 Electrical Engineering) of Washington, Ill., is a systems engineer at Caterpillar, Inc., Mossville, Ill.

Allison Green (BS 2001 chemical engineering) is a lawyer with Finnegan, Henderson, Farabow, Garrett, and Dunner LLP, Washington, D.C. She is a member of the firm’s Chemical/Metallurgical Practice Group in the Washington, D.C., office. Ms. Green’s practice includes litigation and patent prosecution matters, with a focus on chemical, pharmaceutical, and cosmetic technologies.

Benjamin Moline (BS 2001 civil engineering) is employed with Burns and McDonnell, Centennial, Colo.

Amy Wheaton (BS 2002 biomedical engineering) is a product development engineer with Hollister, Inc., Libertyville, Ill.

Matt Banowetz (BS 2003 mechanical engineering) is the project engineer with E.S.P. International, Cedar Rapids, Iowa.

Michael Ihde (BS 2003 electrical engineering) is a software engineer in the Information Technology Department of Northrop Grumman, Herndon, Va.

Ori Sivan (BS 2004 civil engineering), and his business partner Joe Silver were recognized in the April 2007 issue of Chicago Magazine as winner of a Green Award. This is the first year the awards were given. Eight individuals were recognized for their pioneering ways in helping the Chicago the birthplace of a cleaner, smarter kind of work-in-progress. The winners participated in a panel discussion April 21, during the Green Festival at McCormick Place.


Shrujal Vakharia (BS 2005 electrical engineering) has been working as an applications programmer/analyst for Wells Fargo Financial in downtown Des Moines, Iowa.

Jennifer Brozik (BS 2006 industrial engineering) is employed with Kinsey Manufacturing, Inc., Williamsburg, Iowa.

Mike Elgin (BS 2006 mechanical engineering) joined two other former Hawkeye football players in this year’s National Football League draft. Elgin was drafted with the 37th pick in the 7th round by the New England Patriots. Also picked in this year’s draft were teammates Scott Chandler and Marshal Yanda. John Doering (BSE 1986 in civil engineering, MS 1987 in civil and environmental engineering) is project manager for Iowa Prestressed Concrete Inc., Des Moines, Iowa.

David G. Hayes (BS 1986 electrical engineering) is owner of Thinformation, Davenport, Iowa. Thinformation is a new form of digital signage and advertising that allows businesses to control content on video kiosks and high-definition monitors through the Internet.

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Donald E. Rhinehart (BS 1943 electrical engineering) of Le Mars, Iowa, June 22, 2006.
Raymond K. Pearson (BS 1934 electrical engineering) of Burlington, Iowa, February 8, 2005.
Donald D. Rhinehart (BS 1939 chemical engineering) of Painesville, Ohio, April 12, 2005.

1940s

Dick Duffey (MS 1940 chemical engineering) of North Manchester, Ind., November 10, 2006.
Lee Fah Yih (MS 1940, PhD 1943 civil engineering) of Kaneohe, Hawaii, date unknown.
Darrel W. Hughes (BS 1941 civil engineering) of Okmulgee, Okla., August 31, 2005.
Frank A. Kocur (BS 1942 civil engineering) of Knoxville, Tenn., November 27, 2006.
William R. Matson (BS 1942 mechanical engineering) of Columbus, Ohio, October 29, 2006.
Craig H. Strattemeyer (BS 1942 electrical engineering) of Boone, Iowa, December 10, 2006.
Erwin J. Anthofer (BS 1943 mechanical engineering) of Walnut Creek, Calif., December 7, 2006.
Robert A. Cuevas (BS 1943 civil engineering) of Key Biscayne, Fla., February 2, 2007.
Hugh D. Guthrie (BS 1943 chemical engineering) of Morgantown, W.Va., February 17, 2007.
Daniel Escobar (MS 1944 mechanics & hydraulics) of Lima, Peru, date unknown.

James R. Lightner (BS 1944 mechanical engineering) of Dallas, Tex., December 5, 2006.
Bhubaneswar Behera (MS 1947 mechanics & hydraulics) of Kalahandi State, India.
Hsin Min Lee (MS 1947 mechanics & hydraulics) of Wuhan, Hubei, China.
Joseph B. Summers (BS 1948 civil engineering) of Hanford, Calif., October 24, 2006.
Yunus Suzer (MS 1948 mechanical engineering) of Palm Beach Gardens, Fla., date unknown.
Hung-Ju Wang (MS 1948 mechanics & hydraulics) of Wuhan, Hubei, China, date unknown.
Jung-Han Huang (MS 1949 mechanics & hydraulics), date unknown.
Salvador T. Villa (MS 1949 mechanics & hydraulics) of New Manila, Philippines, date unknown.

1950s

Walter W. Lane (BS 1950 civil engineering) of Ankeny, Iowa, May 2002.
Harold A. Miller (BS 1950 industrial engineering) of Cedar Rapids, Iowa, October 2006.
Valdis Lapsins (BS 1952, MS 1953 civil engineering) of Kettering, Ohio, November 8, 2006.
Graydon P. Hass (BS 1957 mechanical engineering) of Zachary, La., December 18, 2005.

1960s


1970s


1980s

Steven C. Hukvari (BS 1979 chemical engineering) of Bettendorf, Iowa, December 26, 2006.

1990s

Julián P. Shriner (BS 1991 chemical engineering) of New Ulm, Minn., December 3, 2006.
Professor Hunter Rouse, long-term director of the Iowa Institute of Hydraulic Research (now IIHR—Hydroscience & Engineering) at the University of Iowa and subsequently dean of that institution’s College of Engineering, died on October 16, 1996, in Sun City, Arizona, at the age of 90.

Rouse was born in Toledo, Ohio, on March 29, 1906. He studied civil engineering at the Massachusetts Institute of Technology (MIT), receiving his undergraduate degree in 1929, and then spent 2 years as an MIT traveling fellow visiting hydraulic laboratories in Germany. Here he met Dorothee (Doi) Hüsmert, who was to become his wife of over 60 years and the mother of their three children. Rouse received an MS degree in civil engineering from MIT in 1932 and a doctoral degree in civil engineering hydraulics from the Technical University at Karlsruhe the same year. Later, in 1959, he received a doctorate in fluid mechanics from the Sorbonne, University of Paris.

While in Karlsruhe, Rouse became familiar with Theodor Rehbock’s River Hydraulics Laboratory and with similar efforts at other newly established German hydraulics laboratories. He quickly recognized the key importance of hydraulics laboratories, and of the recent developments in understanding the fluid mechanics of turbulent flow, for advancing civil engineering hydraulics. This recognition solidified his scholarly focus and guided his subsequent career. In 1932, he returned to MIT as an instructor and carried out research on weirs and spillways. The following year, he became an instructor at Columbia University in New York, where he taught courses on hydraulics for 2 years until accepting an assistant professorship in fluid mechanics at the California Institute of Technology in Pasadena. There he also performed research at the Soil Conservation Service’s Sedimentation Laboratory. In 1939, Rouse came to IIHR as a professor of fluid mechanics. He was appointed as IIHR’s director in 1944 and became Dean of Engineering in 1966, returning in 1972 to a research position at IIHR.

Hunter Rouse’s primary contribution, which underlay all his efforts and energized his work, centered on the application of fluid mechanics theory, validated by contemporary experimentation methods, to water flow processes in civil and mechanical engineering. This application, commonly called hydraulics, elevated hydraulic engineering to a substantially more rational plane than it had previously occupied.

Rouse championed this cause in many ways. He authored the first American textbook that explained hydraulics in terms of fluid mechanics principles, and he initiated and taught classes in this subject at The University of Iowa. He established teaching laboratories that did the same, designing some of their equipment himself. He insisted that IIHR expand its emphasis on theoretical research. His own research gave early insight into important general aspects of hydraulics, especially where turbulence played a significant role. Under Rouse’s galvanizing leadership, IIHR became the preeminent US center for hydraulic research and education. The name Hunter Rouse became synonymous with excellence in fluids engineering research, education, and application.

Hunter Rouse was both energetic and driven, carrying out prolific efforts with intensity and concentration. He insisted on high standards for his students but applied them equally to his own efforts. With these traits moving him forward, Rouse contributed to the field of hydraulic engineering in many additional ways. Rouse organized most of a landmark series of Hydraulics Conferences. A world traveler, Rouse was highly regarded for the exchange programs he organized and for his tireless promotion of international goodwill and cooperation among hydraulic research organizations. He became one of the world’s leading authorities on the history of hydraulic research organizations. He studied civil engineering at the University of Iowa in 1932 and a doctoral degree in civil engineering from MIT.

The late Hunter Rouse, UI professor of fluid mechanics, director of the Iowa Institute of Hydraulic Research, and dean of the College of Engineering, will be featured by the National Academy of Engineering in its annual Memorial Tributes publication, scheduled for release at the end of 2007. The publication honors deceased members and foreign associates of the Academy, providing a record of the many contributions of engineering to humankind. The Rouse tribute was co-authored by Cornelia Mutel, IIHR historian and archivist, and Robert Ettema, former professor and departmental executive officer of civil and environmental engineering and faculty research engineering at IIHR. Because so many UI Engineering alumni were the beneficiaries of Rouse’s mentoring, Iowa Engineer has printed the Memorial Tribute in its entirety here. Copies of the Memorial Tribute will be available later this year through The National Academies Press web site at www.nap.edu.
Hunter Rouse Honored in National Academy of Engineering Memorial Tribute

Rouse was elected to the National Academy of Engineering in 1966. His long and productive career earned him numerous additional awards and honors. He became a Fellow of the American Academy of Arts and Science (1958) and an Honorary Member of the American Society of Mechanical Engineers (1967), the American Society of Civil Engineers (ASCE)(1973), and the International Association for Hydraulic Research (1985). He was a Fulbright Research Scholar (1952–1953). A decade later, in 1963, he received ASCE’s Theodore von Kármán medal, and in 1975, he was awarded an honorary doctorate by the University of Karlsruhe, given in part for his “pioneering achievements in fundamental research and instruction in theoretical hydraulics.” ASCE honored him in 1979 by establishing an annual lectureship in his name, and in 1984 by presenting him with its History and Heritage Award. In 1991, Hunter Rouse received the American Association of Engineering Societies’ highly prestigious John Fritz Medal, “for pioneering the application of fluid mechanics to hydraulics, fusing theory and experimental techniques to form the basis for modern engineering hydraulics.” This commendation summarized both his hopes and his achievements. Rouse received several additional awards for his research publications and educational accomplishments.

Hunter Rouse moved from Iowa City after his retirement from The University of Iowa in 1976. However, he continued to teach summer courses in hydraulics at Colorado State University until age 82, and he took up lapidary as a hobby—characteristically publishing articles on the subject as well as polishing stones. He also continued to publish articles on the history of hydraulics. Thus, to the end, he displayed the intellectual curiosity and high standards that he had promoted and exhibited throughout his life.

Joining the UI Engineering Team

As friends and alumni of the University of Iowa College of Engineering, you should know that your reputation precedes you. You’re known among fund-raisers at the UI Foundation to be a community with vision, leadership, and a commitment to teamwork and results—and that reputation extends to your financial support for the college.

I’ve spent my last 9 years at the Foundation working with the group of UI contributors who might rival your team spirit—supporters of Intercollegiate Athletics. Because of my history as a Hawkeye fundraiser, I’ve already had the pleasure to become acquainted with a number of you, and I look forward to meeting many new friends as I assume my new role as executive director of development for the College of Engineering.

As I make the transition from raising private support for Hawkeye athletics to leading the development team for UI Engineering, I am excited about the challenge—but even more so, I’m thankful for the incredible individuals and organizations that accompany me in the switch.

I’d like to thank Kevin Collins, formerly the executive director of development for the college, who has now moved on to the position of associate vice president for Health Sciences development at the Foundation. During his 9 years working on behalf of the College of Engineering, Kevin made some wonderful friends for the college, contributed to building a strong community of supporters, and put together an effective and enthusiastic fund-raising team, including Kate Metcalf, associate director of development for the college, with whom many of you have already had the pleasure of working. Together, we will continue to work hard to merit your future support.

This transition has also been helped along by a warm welcome from the outstanding faculty, staff, and students at the college—and, of course, from you.

Thanks for your past support for the College of Engineering. I am really looking forward to talking with you personally and hearing your stories about how the College of Engineering has made a difference in your life.

Through continued support for your College—whether you’re contributing to scholarships, facilities, faculty support, research, or other areas of the College—you are helping the students of today make the memories that they will be talking about long after they graduate from the UI.

Please feel free to contact me, whether you want to discuss giving options or just to introduce yourself. With your continued partnership, the UI College of Engineering will continue to educate the brightest minds of tomorrow to be engineers . . . and something more. Thank you!

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Engineering Hawkeyes flock together online!

Thanks to the UI Alumni Association, the College of Engineering, and other campus partners, Hawkeyes now have a place to roost online. OnIowa.com, the UI’s official online community, connects you to friends, former classmates, and your alma mater. It’s free, exclusive, and secure.

OnIowa.com offers a safe landing with features including:

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• Hawkeye Notes. Catch up with old friends. Share news about family, career, and interests.
• An Alumni Events Calendar. Search and register for alumni events in your area.
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