

# IOWA ENGINEER



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*It's not just about space exploration any more.*

**It's about benefitting "all humankind."**

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# PARTNERSHIPS IMPROVE LIFE ON (AND ABOVE) PLANET EARTH

TEXT BY SUSAN SHULLAW



Ask a citizen on the street what springs to mind at the mention of “NASA,” and you’re bound to hear about Mars landings, the International Space Station, and perhaps this year’s George Clooney-Sandra Bullock shuttle thriller, *Gravity*.

In its 55-year history, the National Aeronautics and Space Administration has been largely defined by that single word – space – and what it implies: the exploration of stars and planets, the search for intelligent life, and the deep desire to understand our universe and how it began.

NASA itself describes its mission and vision more broadly: “To reach for new heights and reveal the unknown so that what we do and learn will benefit all humankind.” In other words (and contrary to Captain Kirk), space is not our “final frontier.” It’s just one of many. In fact, NASA’s current research priorities represent a sharpened focus on what might be called our “first frontier” – achieving a greater understanding of what’s happening here on Earth.

Two recent NASA grants received by the University of Iowa College of Engineering illustrate the agency’s Earth-based scientific interests, as well as its desire to improve lives not just in the U.S., but around the world. The grants also reflect the college’s diverse research strengths and some surprising “only in Iowa” capabilities.



NASA's recent grants to these two very different research programs in the College of Engineering – one about flight, among our celestial neighbors. The grants also confirm the UI's central place in the

## PREDICTING RAINFALL FROM SPACE

In June 2013, the University of Iowa and communities throughout Eastern and Central Iowa marked the fifth anniversary of the floods of 2008, which devastated the UI arts campus, much of downtown Cedar Rapids, and scores of other cities and towns across the Midwest. While Iowans have long been wary of the weather, in 2008 they grew even warier of weather forecasts, when many rain and flood gauges failed to predict the severity of the coming deluge.

Increasing the accuracy of those predictions is the goal of several recent NASA grants to the Iowa Flood Center (IFC), under the leadership of IFC Director Witold Krajewski, the Rose & Joseph Summers Chair in Water Resources Engineering. Krajewski is a member of the science team charged with gathering research data in support of NASA's Global Precipitation Measurement (GPM) satellite mission, which will launch in early 2014. GPM is expected to set a new standard for precipitation measurement from space, providing worldwide precipitation estimates every few hours.

Before GPM can do its job, however, scientists must ensure that what existing satellites are seeing from space actually matches what's happening on the ground. Thus was born IFC's most recent NASA-funded project, the Iowa Flood Studies ground validation field campaign, or IFloodS.

From May 1 through June 15, 2013 – a fortuitously rainy six weeks – teams of UI researchers and other scientists cross-crossed the watershed basins of the Cedar, Iowa, and Turkey Rivers to gather data from a diverse network of ground instruments, from sophisticated NASA Polarimetric precipitation radar to rain gauges and soil moisture sensors.

"It's not an easy problem to quantify rainfall from space," says Krajewski. "One might assume that it would be most chal-

lenging to obtain accurate rainfall measurements in complex terrains like mountains or coastal areas. But it's often more difficult for satellites to achieve accuracy on a smaller scale. In that regard, Iowa provided an ideal sample size. In addition, our watersheds are well-instrumented, and NASA values the expertise of the Iowa Flood Center and IIHR, which is recognized as one of the top hydrology research centers in the world."

Krajewski adds that the UI team brought another unique asset to the IFloodS project. "We have four mobile radars that were acquired through a National Science Foundation grant to aid our hydrology studies," he explains. "No other institution has four mobile radars like this, and NASA was closely watching their performance during the IFloodS campaign."

Iowa's reputation in hydrology and GPM's global mission drew scientists from 10 other research institutions to participate in the IFloodS project. "This was a great opportunity for colleagues at other

institutions, including two in France and Switzerland, to send students here to see what's going on," Krajewski says. "It was a very active campaign, and we put them to work collecting data alongside UI team members and our NASA partners."

With the ground data-collection phase complete, Krajewski and his colleagues are now evaluating their findings, all of which will feed into the new GPM satellite's ability to more accurately assess rainfall and, along with it, the potential for devastating floods. The state of Iowa will most certainly benefit from improved satellite data, Krajewski says, but the impact of the IFC-NASA partnership goes well beyond the Midwest.

"These missions are especially meaningful for areas of the U.S. and other parts of the globe that don't have Iowa's well-developed network of ground-based radar and other instrumentation," he observes. In that way, the mission of the Iowa Flood Center has become truly global in scope, complementing NASA's own vision of benefiting all humankind.



*Here, on the cover, and on the preceding page, students help assemble a radar similar to the model that will be launched on the GPM satellite mission in 2014.*

the other about floods – reflect the agency’s desire to better understand the forces at work on this planet, as well as galaxy of top research institutions devoted to improving lives in Iowa and beyond.

## IMPROVING AIRCRAFT SAFETY

Another UI-NASA partnership with global implications involves Associate Professor Thomas Schnell, whose recent \$1.2 million, three-year NASA grant is aimed at making air travel safer. The UI’s Operator Performance Laboratory (OPL) in the Center for Computer-Aided Design is the study’s lead organization, with Rockwell Collins and the Boeing Company serving as subcontractors. The grant seeks to develop ways to help aircraft crews avoid the dangers of spatial disorientation and loss of energy state awareness; that is, maintaining awareness of an aircraft’s three main sources of energy – speed, altitude, and fuel.

Advanced autopilot systems in commercial airliners have greatly improved air travel safety, explains Schnell, OPL director and project principal investigator. However, those same systems can dull a pilot’s senses. “By the time the flight deck crew notices the problem, it may be too late to fix,” he says.

That’s what appears to have happened in the June 2009 crash of Air France Flight 447, which killed 228 people when it plunged into the Atlantic Ocean en route

from Rio de Janeiro to Paris. In its final report on the cause of the crash, France’s Bureau of Investigation and Analysis cited pilot error and a failure to respond effectively to problems with the plane’s speed sensors or to correct the plane’s trajectory after the autopilot disconnected.

Schnell says the UI’s approach to understanding and preventing these hazardous situations is unique.

“Our program is the only one of its kind to employ in-flight testing, rather than simulation alone, to assess pilot performance,” Schnell explains. Using the UI’s two L-29 jet trainers – two-seater jet aircraft that have been outfitted with sophisticated testing instrumentation – Schnell and other OPL staff pilots will serve as co-pilots for commercial airline pilots who’ve been recruited to participate in the research project.

“In-flight testing yields much more realistic and valuable data,” Schnell says. “For example, when the instructor surprises the pilot-subject with sudden variations in attitude, the pilot is going to feel as much as eight Gs of pressure, when simula-

tors can only deliver one or two Gs. Such real-world conditions enable us to obtain more accurate biometric data, using sensors to measure factors such as heart rate, blood pressure, and where the pilot’s eyes are focused before and during these variations in energy state.”

Besides considering technological improvements, the UI study is looking at the impact of cultural norms and human behavior on flight deck performance. Schnell, who also holds joint appointments as associate professor in the UI departments of Occupational and Environmental Health, Electrical and Computer Engineering, and Neurology, and conducts human factors research in the UI Public Policy Center, cites hierarchical co-pilot relationships as one example.

“If a junior pilot has been conditioned not to question the decisions, observations, or authority of a senior pilot, the results could be disastrous, particularly when corrective actions must be taken very quickly.” Schnell is also concerned that some commercial pilots have been trained on a single type of plane, reducing their ability to anticipate and respond to hazardous situations when piloting unfamiliar aircraft.

Although the UI-NASA study is just getting under way, Schnell predicts that one recommended flight-deck improvement will be the use of Synthetic Vision Systems (SVS) in all commercial aircraft. These systems provide pilots with real-time, 3D imagery of the view outside the aircraft – an invaluable tool during limited forward-visibility situations such as darkness, fog, and thick clouds.

SVS screens look very much like the landscapes in today’s most popular video games. Instead of “virtual” reality, however, SVS screens give pilots an accurate, visual representation of their real-time location, thereby increasing pilots’ ability to safeguard the lives of their passengers, whether they’re flying above Iowa or around the globe.



Tom Schnell gathers in-flight data for his research.

# Steve Somermeyer: Chemical Engineer, Corporate Executive, Connoisseur of Life



TEXT BY JEAN FLORMAN

Not many people can claim to have connected a passion for engineering, winemaking, Indy car racing, and fish. In fact, it's likely that only one person has ever done so and in a way that is coherent. That unique individual is former Eli Lilly executive, racetrack volunteer, winemaker, and aquarist Steve Somermeyer.

"I'm a guy that likes to see patterns, to connect the dots," Somermeyer says. "I also like to connect people. I learned early when studying physical chemistry at Iowa that teamwork is essential for success."

Somermeyer took the education and experience he gained at the College of Engineering (BSCE 1970) and forged a life that includes both professional success—three decades, plus, as a process engineer, management executive, and internal consultant with a multi-billion-dollar corporation—and intellectually and physically challenging avocations. His career at Eli Lilly's world headquarters in Indianapolis began right out of the gate after he graduated from Iowa. But with 20 plant visits and 18 job offers in hand, Somermeyer could easily have chosen a different path, but for a comment from his mentor, Professor of Chemical Engineering Karl Kammermeyer.

"I knew I wanted to work for a company that had the financial wherewithal to back people with good ideas," Somermeyer says. "One day during my senior year, Professor Kammermeyer suggested I interview with Eli Lilly—that day. I was wearing jeans and a tee shirt, but I interviewed anyway, and I guess they liked what they saw."

He began at Lilly as a process engineer charged with scaling up specific steps in the development of anticancer drugs, in particular enhancing the liquid/solid extraction process. As he pondered the most efficient, effective way to achieve this goal, it occurred to Somermeyer that tea makers have a similar challenge when they extract flavor from tea leaves. That broadminded, creative problem-solving approach helped him successfully adapt a food industry manufacturing process to the pharmaceutical industry. It also helped catapult him into management a mere three years after landing at Lilly.

*Somermeyer is one of the lead judges at the Indy International – one of the largest wine competitions in the United State. This was his 36th consecutive year of judging.*

*Credit: Brenton Russell*







As his roles evolved from managing a 150-person department to leading TQM (Total Quality Management – predecessor of Six Sigma) to implementing a 1,500-person division, Somermeyer successively moved through three different reporting lines: the process engineering, production planning, and product management groups. Along the way, he earned an MBA from Butler University (1973). Combined with his engineering skills and professional experience, his business school education enabled him to fuse the efforts of the chemists in the labs with the goals of corporate executives.

“I was in product development before I was in management,” Somermeyer says, “and I could talk the lingo of the chemists. In management, I was working on big changes and major projects, but I was right about the chemistry and engineering often enough that the researchers listened to me.”

Sommeyer spearheaded a dramatic culture change at Eli Lilly when he introduced the concept of “heavyweight teams” which broke down barriers between traditional disciplines and resituated employees into teams that focused on projects.

“People no longer lived in the Chemistry Building, they now lived in Evista or Zyprexa™ teams,” he says. “The project teams met weekly, and as soon as a compound graduated to the project team, the researchers no longer were involved with it.”

Sommeyer acknowledges this was a difficult adjustment for some employees. “They had gotten promoted under the old system,” he says, “and now the organization was measuring them with another standard.”

But strong leadership and humor can go a long way in helping to finesse corporate change. Each time a new compound shifted from the lab to the project team or development was terminated and the researchers moved on to focus their attention on another compound, senior management hosted a combination graduation party/wake, including an obituary for the compound, but with celebratory cake and candles.

Ninety-hour weeks began to take their toll during the TQM implementation, however, and in 1989 Somermeyer told his vice president, Dave Dennen, that he needed a change. CEO Vaughn Bryson agreed, and recognizing Somermeyer’s talent for connecting projects and people, as well as his creative problem-solving skills, the company pitched the idea of a new role: working with local politicians and business leaders to enhance the Indianapolis community. Somermeyer agreed, and Lilly “loaned” him as a consultant to the Indianapolis mayor’s office for a year, paying his salary.

“Lilly has always worked to ensure the local community thrives,” Somermeyer says of the company that was founded in Indianapolis in 1876 by a veteran of the Civil War. “My role was to help T-up some major initiatives for the next city administration, which followed some years later.”

During the year of Somermeyer’s tenure, City Commissioners passed 110 resolutions, implementing more than 80 of them within three years.

Sommeyer adds that he “gained a lot of appreciation for the talent-rich environment in the private versus the public sector in which people have to make major decisions with limited resources.”



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“I’m also the guy who sometimes has to make things disappear. When Mario Andretti kept leaving his golf cart in a no-parking zone, I made it disappear.”

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When he ponders how he developed such adaptable, collaborative problem-solving and communication skills, Somermeyer hearkens back to his days as an engineering student at Iowa. Beyond his academic learning, he also honed teamwork skills as a member of Theta Tau, a college delegate to the Democratic National Convention, and part of a four-person team that doggedly searched and eventually found the Mecca stone (“three feet deep in a stream near Cedar Rapids”). He also acknowledges strong family support. The Hamburg, IA native notes that his father and three brothers also were chemical engineers, and his mother and one brother share his status as an Iowa alumnus. When Somermeyer almost flunked out his first semester, his father drove to Iowa City and he and Karl Kammermeyer sat down with the young man and posed this question: “Are you going to give up or buckle down and do it?” And faculty members such as Professors of Chemical Engineering J. O. Osborne and Art Vetter, and Professor of Astronomy James Van Allen underscored the lesson that innate curiosity about the world can be a powerful, lifelong motivator.

That lifelong curiosity has driven Somermeyer well beyond his professional success into local vineyards and wineries, onto the track of the Indianapolis Speedway, and through the fish- (cobra-) infested waters of East Africa. After growing up in a family that made its own wine, Somermeyer’s adult interest in winemaking expanded to include the role of taster and judge at local, national, and even international competitions. He combined the expertise gained from thirty-some years as a judge with knowledge about fermentation gained early in his career at Lilly, and for the last ten years, he has worked part-time as an assistant winemaker for the award-winning Indianapolis winery, Chateau Thomas. As is appropriate for a chemical engineer, he takes the lead with the blending process.

Somermeyer’s connections to car racing began in 1970 when his fascination with the mechanical complexity of race cars led him to the world-renowned Indianapolis Speedway. At the track, he knocked on doors and introduced himself to members of the family that owned it. Impressed with his initiative, the owners allowed him to leapfrog the traditional rungs required of volunteers—parking cars, taking tickets, working in the garage—and immediately started him working with the drivers and crew members in the pits. During 43 years as a Speedway volunteer, Somermeyer’s impact has grown dramatically, and today his role as Coordinator of the Facility’s Command Center includes everything from controlling traffic around the Speedway to guiding the winning car into the winner’s circle to unplugging toilets to securing medical personnel for the occasional childbirth at the track.

“I’m also the guy who sometimes has to make things disappear,” Somermeyer says. “When Mario Andretti kept leaving his golf cart in a no-parking zone, I made it disappear.”

Somermeyer’s drive to discover and solve problems found yet another outlet in his avocation as an expert in aquarium fish. The hobby began many years ago when the 10-gallon aquarium his young children surprised him with for Christmas spent the next six months in a closet. Upon reconsideration, however, Somermeyer decided to set it up with a few fish, which promptly died.

“I decided right then and there I wasn’t going to get beaten that easily,” he says. He began researching aquarium fish, and when he realized he could even raise fish, he decided to become an expert in fish husbandry. In 1982 after attending a lecture by an expert on African fish, Somermeyer decided to learn to scuba dive. Six weeks later, he was in Burundi making his first open water dive in the crocodile-, hippo-, and cobra-rich Lake Tanganyika. Today he oversees 90 aquariums in his house and is well-known as an expert on raising certain species of the Cichlid family, which practice very sophisticated prenatal care.

When asked how he manages to juggle all his interests and commitments, Somermeyer says he’s “blessed with needing little sleep.”

He adds, “Heck, you have to go for it. If a door opens, run through it. Or open the door yourself. I may have bumped my nose now and then, but I was trained at Iowa to rely on my creativity and the creativity of others and to push past your limits. You can learn a lot by going beyond what you think are your limits.”

**Left, top:** Somermeyer and Ashley Judd (and her two dogs) at the Indy Speedway.

**Left, bottom, and below, bottom:** Somermeyer leads Indy 500 winner Helio Castroneves to Victory Circle.

**Below:** In 1982, after attending a lecture by an expert on African fish, Somermeyer decided to learn to scuba dive.



## AIChE Students Score Big at Annual Meeting

UI Chemical Engineering students again dominated awards at the annual meeting of the American Institute of Chemical Engineers, held November 3-8 in San Francisco.

Iowa was recognized as an Outstanding Chapter by the organization. This is the ninth straight year the chapter has been rewarded with the recognition. It has received the award 20 out of the past 21 years.

UI students were national champions of the Chem-E Jeopardy competition at the annual meeting, winning out of the nine regions participating. Team members were Austin Hangartner, Nick Schickel, Danny Yocius, and Matt Taylor. The team won the competition by one point, correctly answering a question from the chemical process design category.

Chemical Engineering student Austin Hangartner was awarded First Place in the research poster competition on engineering materials and sciences.

Nick Schickel received the Donald F. and Mildred Topp Othmer Scholarship, one of only 15 awarded in the U.S.

Sean Fitzgerald won the Donald F. Othmer Sophomore Academic Excellence Award.

Team members Kyle Kubat, Taylor Malott, and Darren Youngs, who graduated from the UI last spring, received three of five awards for safety and design – the Safety and Chemical Engineering Education (SACHe) Student Design Competition for Safety and Design and the SACHe Team Award for Overall Safety.

Matthew Buriam and Tyler Manning received the Safety and Health Division Student Design Competition Aware for Inherently Safer Design.

This year's annual meeting also included a special UI alumni reception, attended by about 60 graduates, friends, current students, faculty, and staff members.

## AMTech Releases New Video on PREVIEW

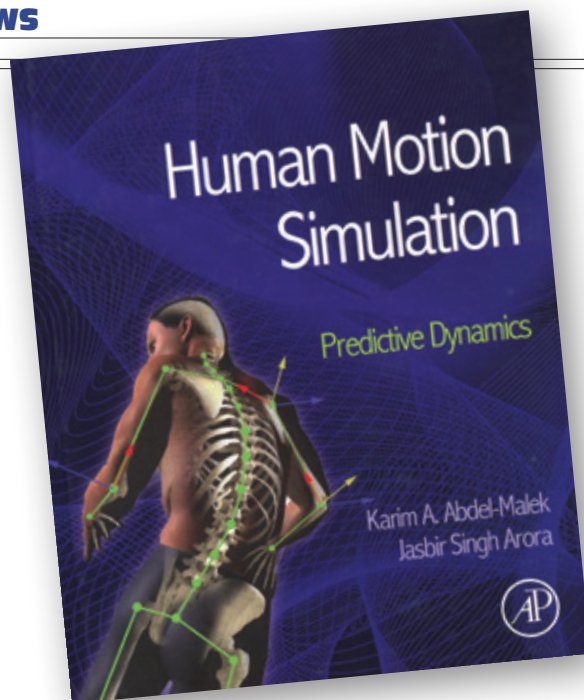
The Advanced Manufacturing Technology Group (AMTech), a unit of the UI Center for Computer-Aided Design, has created a new video that explains PREVIEW, a software program that designs and tests electronic circuit boards virtually.

To view the video, go to <http://www.youtube.com/watch?v=wXI8eoLVb5M>.

Currently, PREVIEW will test the electronics in nuclear power plants and will be available on manufacturing floors of companies.

Engineering students are building and designing the user interface of a software what will revolutionize the electronic and manufacturing industries.

To learn more about PREVIEW, go to <https://www.ccad.uiowa.edu/amtech/>.



## Virtual Soldier Research Publishes New Book

The Virtual Soldier Research (VSR) program at the University of Iowa has published a new book, titled “Human Modeling Simulation: Predictive Dynamics,” Elsevier: Academic Press.

The book culminates the work of 10 years at VSR, while publishing a novel and well-tested method for predicting human motion – “Predictive Dynamics.” The program, led by Karim Abdel-Malek, professor of biomedical engineering and director of both Center for Computer-Aided Design (CCAD) and VSR, along with Jasbir Arora, F. Wendell Miller professor, professor of civil and environmental engineering and associate director of CCAD, are working with more than 50 researchers from various fields to develop the VSR program.

VSR has pushed forward the field of digital human modeling by conducting novel research and creating new technology that predicts human posture, motion, and other functions in a high-fidelity, physics-based, three-dimensional, real-time environment.

Since its inception, VSR has had more than 200 people involved in developing the research. The program has delivered over \$40 million in external funding to the UI, with research work crossing over to all branches of the US military and through contracts with major Fortune 500 companies. It also has had major publications appear in the highest rated journals in the field, and has created technology transfer and commercialization of a major software environment, creating more than 40 jobs alone in Iowa. VSR has captured the attention of scores of national and international media, including the Discovery Channel, Computer Graphics World, EarthNews, AutoEvolution, AI Magazine, Wired News, India's IbiTimes, and many more.

For more information about the book, go to <http://store.elsevier.com/Human-Motion-Simulation/Karim-AbdelMalek/isbn-9780124051904/>.

For more on the Virtual Solder Research program, go to <http://www.ccad.uiowa.edu/vsr/>.

## Deep Ocean Carbon Sinks

By Gary Galluzzo

Although microbes that live in the so-called “dark ocean” — below a depth of some 600 feet where light doesn’t penetrate — may not absorb enough carbon to curtail global warming, they do absorb considerable amounts of carbon and merit further study.

That is one of the findings of a paper published in the *International Society of Microbial Ecology (ISME) Journal* by Tim Mattes, associate professor of civil and environmental engineering in the University of Iowa College of Engineering, and his colleagues.

Mattes says that while many people are familiar with the concept of trees and grass absorbing carbon from the air, bacteria, and ancient single-celled organisms called “archaea” in the dark ocean hold between 300 million and 1.3 billion tons of carbon.

“A significant amount of carbon fixation occurs in the dark ocean,” says Mattes. “What might make this surprising is that carbon fixation is typically linked to organisms using sunlight as the energy source.”

Organisms in the dark ocean may not require sunlight to lock up carbon, but they do require an energy source.

“In the dark ocean, carbon fixation can occur with reduced chemical energy sources such as sulfur, methane, and ferrous iron,” Mattes says. “The hotspots are hydrothermal vents that generate plumes rich in chemical energy sources that stimulate the growth of microorganisms forming the foundation for deep sea ecosystems.”

The hydrothermal vents the team studied are located in a volcanic caldera at Axial Seamount, an active underwater volcano in the Pacific Ocean. The site is located some 300 miles west of Cannon Beach, Ore., and about 1,500 meters beneath the surface. Mattes’ colleague, Robert Morris, gathered data and collected samples used in the study during a 2011 cruise sponsored by the U.S. National Science Foundation.

“Using protein-based techniques, we observed that sulfur-oxidizing microorganisms were numerically dominant in this particular hydrothermal vent plume and also converting carbon dioxide to biomass, as suggested by the title of our paper: ‘Sulfur oxidizers dominate carbon fixation at a biogeochemical hot spot in the dark ocean.’”

With carbon fixation occurring on a large scale in the dark ocean, one might wonder about the contribution of such activity to offset carbon emissions widely believed to contribute to global warming, but Mattes sets aside any such speculation in favor of further study.

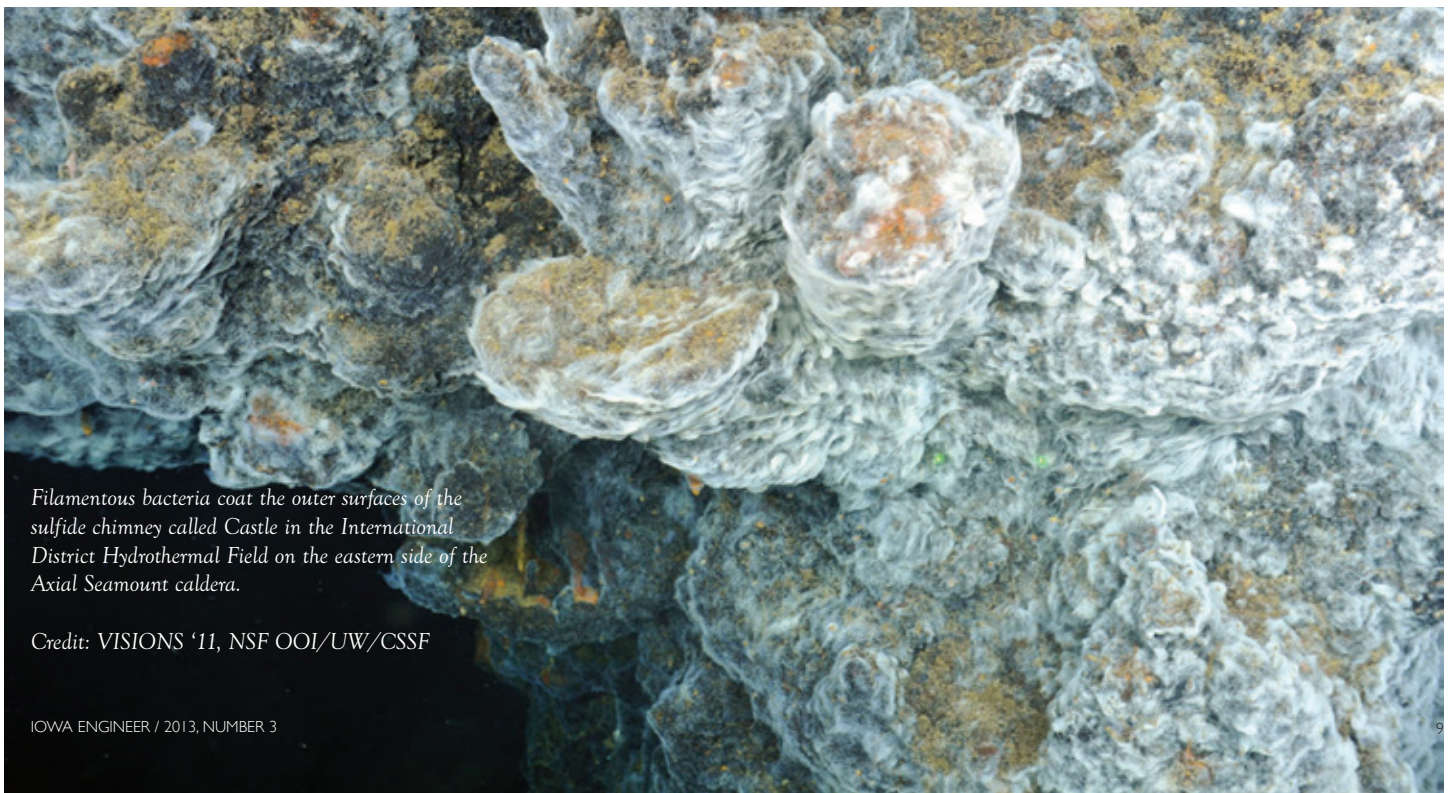
“While it is true that these microbes are incorporating carbon dioxide into their cells in the deep ocean and thus having an impact on the global carbon cycle, there is no evidence to suggest that they could play any role in mitigating global warming,” he says.

He adds that the primary value of the investigation is to better understand how microorganisms function in the dark ocean and to increase fundamental knowledge of global biogeochemical cycles.

Mattes conducted this research at the University of Washington School of Oceanography while on developmental leave from the UI.

Mattes’ colleagues in the study are: Brook Nunn, Katharine Marshall, Giora Proskurowski, Deborah Kelley, Orest Kawka, and Robert Morris of the University of Washington; David Goodlett of the University of Maryland; and Dennis Hansell of the University of Miami.

The study, published online in July, was funded under grants from the National Science Foundation OCE-1232840 and OCE-0825790 and National Institutes of Health 5P30ES007033-12 and 1S10RR023044.



*Filamentous bacteria coat the outer surfaces of the sulfide chimney called Castle in the International District Hydrothermal Field on the eastern side of the Axial Seamount caldera.*

*Credit: VISIONS '11, NSF OOI/UW/CSSF*

## Villarini Finds Human Activity Muddies Causes of Texas Floods

By Gary Galluzzo



Periodic flooding in Texas — one the most flood-prone states in the nation — cannot be firmly linked to climate change due to numerous dams and other manmade structures introduced over the years, according to a University of Iowa study.

The researchers also found that tropical cyclones are less responsible for major floods in the region than in the eastern United States.

The study, which looked at 70 years of records, appears in the August 2013 issue of the *Journal of the American Water Resources Association*.

Lead author Gabriele Villarini, assistant professor of civil and environmental engineering and assistant research engineer at IIHR-Hydroscience & Engineering, indicates that although the problem is severe, the causes of Texas flooding are less clear.

“In this study, we examined the time series of the largest flood peaks every year from 62 stations in Texas with a record of at least 70 years,” he says. “We were interested in examining whether flood magnitudes changed during the study period and, if so, what was the cause of these changes.

“We found that most of the changes we detected were related to human modification of the catchments and more specifically to river regulation.”

He points out that there are more than 7,100 permitted dams in Texas, with some 2,000 of them designed for flood control.

“We also examined the link between flooding and tropical cyclones. Tropical cyclones are an important flood agent with regionally varying effects. However, they are not associated with the largest flood events to the same degree we found for the eastern United States,” he says.

Historically, Texas experiences frequent flooding, resulting in numerous fatalities and extensive property damage. In fact, Villarini says, studies show that Texas led the nation in flood-related injuries and fatalities during the period from 1959 through 2005 and that Texas is the only state with fatalities occurring every year from 1960 through 2002.

But surprisingly, there are relatively few studies of Texas flooding focused on the long-term changes in hazardous flooding.

“Despite the large economic and societal impacts of flooding, there are few studies focusing on changes in annual maximum flood peak distribution in Texas. This is particularly important because of the possible acceleration of the hydrological cycle associated with human-induced climate change, which could potentially result in an increase of floods,” he says.

Villarini says that two of his future studies will also focus on flooding and tropical cyclones and their economic impact on the continental United States.

His colleague in the study, James A. Smith, is a professor in the Department of Civil and Environmental Engineering at Princeton University.

The paper is formally titled “Flooding in Texas: Examination of Temporal Changes and Impacts of Tropical Cyclones.” The DOI number of the paper is: “10.1111/jawr.12042”.

The paper was supported by the Willis Research Network and by a subcontract from Rutgers University, Department of Environmental Sciences, under Agreement Number G11AP20215 from the U.S. Geological Survey.

## UI Bridges to Prosperity Student Chapter Gets Team of the Year Award

The UI student chapter of Bridges to Prosperity won the Team of the Year Award at the inaugural Bridge Builder Conference September 20–22 in Sevierville, TN.

Engineering alumnus Ethan Gingerich (BS 2013 civil engineering) also received Bridge Builder of the Year Award.

The conference is a three-day, hands-on educational gathering for future bridge builders, taught by Bridges to Prosperity’s staff and professional technical board members. Departing from theoretical lectures, participants will leave with the skills and knowledge to build footbridges in remote communities around the world. More than 100 attended the inaugural conference.

Attending from the UI were Louie Hardin, Katie Langenfeld, Ian Nessler, Ethan Gingerich, Quinn McNutt, Natalie Jones, and Carl Beranek. Also at the conference were civil engineering alumni Avery Bang, executive director of Bridges to Prosperity and Thomas Bang, Bridges to Prosperity staff engineer.

Bridges to Prosperity provides isolated communities with access to essential health care, education and economic opportunities by building footbridges over impassable rivers.



From left: Avery Bang (UI alumna and executive director of Bridges to Prosperity), Louie Hardin, Katie Langenfeld, Ian Nessler, Ethan Gingerich, Thomas Bang (UI alumnus and Bridges to Prosperity staff engineer), Quinn McNutt, Natalie Jones, and Carl Beranek.

## Five UI Engineering Students Earn National Tau Beta Pi Scholarships

Five UI College of Engineering students received national Tau Beta Pi scholarships for the 2013-2014 academic year. They are:

- Brandon Demerath, mechanical engineering
- Hang Gao, mechanical engineering
- Ethan Budreau, mechanical engineering
- Nicholas D. Glynn, chemical engineering
- Kevin R. Johnson, biomedical engineering

The Fellowship Board of Tau Beta Pi selected 210 scholars from 364 applicants nationally. All Tau Beta Pi Scholarships are awarded on the competitive criteria of high scholarship, campus leadership and service, and promise of future contributions to the engineering profession.

Tau Beta Pi is the world's largest engineering society. Membership represents the highest honor to be obtained by an engineering student and is awarded on the basis of high scholarship and exemplary character.

## Guymon Appointed Sharon K. Tinker Professor of Chemical and Biochemical Engineering



C. Allan Guymon, professor and departmental executive officer of chemical and biochemical engineering, has been appointed the first Sharon K. Tinker Professor of Chemical and Biochemical Engineering, effective July 1, 2013.

Guymon, who joined the college in 2002, also is a researcher in the Photopolymerization Center (NSF IUCRC) and the Optical Science and Technology Center. His research interests are in polymer reaction engineering; UV curable coatings; polymer/liquid crystal composites; controlled release; and templated and ordered polymerizations.



He earned BS degrees in chemistry and applied mathematics in 1993 from Weber State University and MS and PhD degrees in chemical engineering in 1995 and 1997

respectively from the University of Colorado-Boulder.

The endowed professorship is named after Engineering alumna Sharon Tinker (BSE 1980 chemical engineering), unit maintenance department manager of the Baytown Refinery at the ExxonMobil Chemical Company, where she works with a team of engineers, machinists, electricians, instrument technicians, and supervisors to ensure that the plant meets its important maintenance requirements. Tinker is a member of the College of Engineering Campaign Task Force and has served on the Chemical and Biochemical Engineering Advisory Board.

## Lin Receives \$3.2 Million NIH Grant for Lung Study



Ching-Long Lin, professor of mechanical and industrial engineering and faculty research engineer at IIHR-Hydroscience & Engineering, has been awarded a five-year \$3.2 million grant from the National Institutes of Health (NIH) through National Heart, Lung and Blood Institute (NHLBI) to build a novel integrative statistics-guided image-based lung model for assessment and prediction

of lung functions at both individual and population scales.

Lin will serve as a project director on the grant to integrate statistical analysis of clinical and imaging data, in a large population of patients with asthma and chronic obstructive pulmonary disease (COPD), with sensitive lung functional variables predicted by a multi-scale subject-specific lung model. The study aims to identify phenotypic biomarkers and metrics for clustering and classification of healthy and diseased lungs in sub-populations, and establish the link between inhaled irritants and inflammatory processes in airways and tissues. The ultimate goal of the research is to translate big clinical, imaging and modeling data to graphical or other simple forms in a cloud-computing setting that are accessible to physicians and patients, for improved patient phenotyping and hence patient-specific therapy.

The project is a collaboration among the College of Engineering, the Roy J. and Lucille A. Carver College of Medicine, and the College of Liberal Arts & Sciences, with Lin's UI colleagues being professors Eric A. Hoffman, John Newell, and Kung-Sik Chan.

"I'm very pleased to have received this new NIH grant to study the lung structure-function relationship in sub-populations and its interplays with environmental factors due to inhalational exposure. The bridging between population and individual scales is a compelling multi-scale problem in the context of big data and precision medicine," he said.

Lin has an on-going NIH grant received in 2010 to study the interactions between pulmonary airflow, lung mechanics and cell response for the human airway defense system, which was a competitive renewal of his earlier NIH grant received in 2005 to develop a multi-scale digital lung mode. Lin also received a NIH Shared Instrumentation Grant (SIG) in 2008 to purchase a supercomputer to support cardiopulmonary research. Lin was elected and inducted into the American Institute for Medical and Biological Engineering (AIMBE) College of Fellows in 2013. Lin also led the effort to publish a special issue of the Journal of Computational Physics on Multi-scale Modeling and Simulation of Biological Systems in 2013 (<http://now.uiowa.edu/2013/07/lin-leads-effort-publish-special-issue-journal-computational-physics>).



## Long Lasting Steroids

Assessing the risk posed to aquatic organisms by the discharge of certain steroids and pharmaceutical products into waterways is often based on a belief that as the compounds degrade, the ecological risks naturally decline.

But there's growing sentiment that once in the environment, some of these bioactive organic compounds may transform in a way that makes their presumed impact less certain.

A new study led by the University of Iowa and published online in the journal *Science* found this was the case with the anabolic steroid trenbolone acetate and two other drugs.

Once popular in the bodybuilding and weightlifting communities, trenbolone acetate is now banned for human use. However, it is federally approved for use by the beef industry to promote weight gain and increase feeding efficiency in cattle.

In lab tests followed by field experiments, the researchers found that trenbolone does not fully break down in water as believed, retaining enough of a chemical residue to regenerate itself in the environment under certain conditions, to an extent that the drugs' lives may be prolonged, even in trace amounts.

Researchers says the study is a first step toward better understanding the environmental role and impact of steroids and pharmaceutical products, all of which have been approved by the federal government for various uses and that have been shown to improve food availability, environmental sustainability and human health.

"We're finding a chemical that is broadly utilized, to behave in a way that is different from all our existing regulatory and risk-assessment paradigms," says David Cwiertyny, assistant professor in engineering at the UI and a co-corresponding author on the paper. "What our work hopefully will do is help us better understand and assess the environmental fate of emerging contaminant classes. There are a variety of bioactive pharmaceuticals and personal-care products that we know are present in trace amounts in our water supply. We should use what we're learning about trenbolone to more closely scrutinize the fate and better mitigate the impact of these products in the environment."

The team found similar results for dienogest, a hormone used in a birth-control pill called Natazia, and dienedone, a banned anabolic steroid that has been marketed as a bodybuilding supplement.

Trenbolone acetate is implanted in the ears of more than 20 million cattle in the United States, according to studies cited by the researchers in their paper. The drug is metabolized and then

excreted by livestock, and makes its way into waterways mainly through runoff.

The steroid has been considered safe due to its rapid degradation, with studies pointing to an environmental half-life of less than a day. But there has been concern that it and other synthetic drugs, when found in concentrated amounts, can be harmful to aquatic species and the environment generally. Studies have pointed to steroids and other drugs' effects on fish, through fewer eggs produced by females to skewing the sex of some species.

"We rarely see fish kills anymore, and we probably aren't discharging many carcinogens into surface waters anymore. But I don't believe this necessarily means that our water is safe for aquatic organisms," says Edward Kolodziej, associate professor in engineering at the University of Nevada-Reno and the other corresponding author on the *Science* paper. "It just might be harder to characterize the adverse effects associated with contaminant exposures these days."

Sunlight is one catalyst for breaking down compounds in the environment. But in this study, by simulating day and night in the lab, the research team found that the steroid's chemical compounds never fully disappeared in daylight. In fact, during a simulated night, under typical surface water conditions, some of the compounds regenerated themselves, to as much as 60 percent of the metabolite's initial mass, when tracked over a 120-hour period.

"We knew something unique was going on," Cwiertyny says.

More of the drug's mass was regenerated—up to 88 percent in one highly acidic state (pH 2)—when water temperature was higher and when it was more acidic or alkaline, the team found.

The researchers validated the lab results with two experiments in the field—one with water culled from the Iowa River in Iowa City, Iowa and the other from samples taken from a collection pond at a cattle rangeland and research operation run by the University of California.

Shen Qu, a post-doctoral researcher at the UI who studied under Cwiertyny, is the first author on the paper. Contributing authors from the UI include Sarah Long, graduate research assistant in chemistry; James Gloer, chemistry professor; and Matthew Tarnoff, a senior in engineering. Jonas Baltrusaitis, who earned his doctorate at the UI and is now at the University of Twente, in the Netherlands, is a contributing author. Other contributing authors, all from Nevada-Reno, include Gerrad Jones, Peter Benchetler, Emily Cole, and Kaitlin Kimbrough. Eric Patterson, now at Stony Brook University but who worked on the study while at Truman State University, also contributed to the paper.

## Promotions

**Reinhard R. Beichel**, from assistant professor to associate professor of electrical and computer engineering.

**Anton Kruger**, from associate professor to professor of electrical and computer engineering.

**Jia Lu**, from associate professor to professor of mechanical and industrial engineering.

**Punam Kumar Saha**, from associate professor to professor of electrical and computer engineering.

**David Wilder**, from associate professor to professor of biomedical engineering.

**Olesya I. Zhupanska**, from assistant professor to associate professor of mechanical and industrial engineering.

## Grants, Contracts, Patents

**Reinhard Beichel**, associate professor of electrical and computer engineering, received a \$104,540 grant from Brigham & Women's Hospital, Boston, MA. He will conduct studies of quantitative image informatics for cancer research.

**Alejandro Miguel Castro**, postdoctoral research scholar at IIHR—Hydroscience & Engineering, has received a \$25,481 sub-contract from Patagonia Flow Dynamics LLC, Coralville, IA. The overall contract was awarded by the Office of Naval Research. Castro will study high efficiency computation of high Reynolds Number flows for moving objects.

**Yong Chen**, associate professor of mechanical and industrial engineering and researcher at the Center for Computer-Aided Design, has been awarded a \$150,000 NSF grant. Chen will conduct GOALI/

Collaborative Research on data-driven statistical prognosis and service decision making for teleservice systems.

**Julie Jessop**, associate professor of chemical and biochemical engineering and researcher at the NSF I/UCRC Photopolymerization Center, has been awarded a \$339,900 NSF GOALI grant. The grant is for EB polymerization: advanced characterization of curing processes and polymer materials.

**Troy Lyons**, director of engineering services at IIHR—Hydroscience & Engineering, has received a research contract from Stanley Consultants, Inc., Muscatine, IA, a corporate partner of the College of Engineering. Lyons will conduct a cavitation study of the Millwood Dam for the company. Millwood Dam is located on the Little River 16 river miles upstream from its confluence with the Red River about seven miles east of Ashdown, AR.

**Raghuraman Mudumbai**, assistant professor of electrical and computer engineering, has received a \$35,625 grant from the University of Pennsylvania. Mudumbai will use the grant to study micro autonomous systems technologies.

**Marion Muste**, research engineer at IIHR-Hydroscience & Engineering and adjunct professor of civil and environmental engineering, has received a \$15,000 U.S. Army Corps of Engineers grant. Muste will develop an Iowa-Cedar Watershed web-portal.

**Priya Pennathur**, assistant professor of mechanical and industrial engineering, has received \$223,972/year (\$671,951 total) for a three-year research project from the National Library of Medicine, National Institutes of Health, to understand and model how health care providers create, use and transform health

information in their work. The long-term goal of Pennathur's project is to design and test health information systems that best support healthcare providers' cognitive work.

**Joe Reinhardt**, professor and departmental executive officer of biomedical engineering, has received a \$233,060 grant from the Board of Regents of the University of Wisconsin System. The grant will be used to predict pulmonary function change to improve radiation planning and outcome.

**Douglas Schnoebelen**, a researcher at IIHR—Hydroscience & Engineering, has received a \$5,000 grant from the US Department of Interior; US Fish & Wildlife Service. Schnoebelen will conduct Horseshoe Bend hydrodynamics and vegetation modeling.

**Tom Schnell**, associate professor of mechanical and industrial engineering and director of the Operator Performance Laboratory at the Center for Computer-Aided Design, has received a \$10,000 research grant from Rockwell Collins, Inc., Cedar Rapids, IA. Schnell and his research team will develop a concept of instrumenting a manned flight test platform with equipment so it will operate as an unmanned aircraft system. Schnell also earned a \$99,907 contract from Advanced Infoneering, Inc., Iowa City, IA. Schnell and his research team will provide tailoring training for disparately skilled participants in large-scale training exercises (SKATE) expansion.

**Chris Schwarz**, senior research engineer at the National Advanced Driving Simulator, Center for Computer-Aided Design, has received a \$138,685 contract from McLaren Racing, Ltd. Schwarz will provide technical research to the company.

**Fred Stern**, George D. Ashton Professor of Hydroscience and Engineering, professor of mechanical and industrial engineering, and faculty research engineer at IIHR-Hydroscience & Engineering, has received a \$71,000 research grant for the US Department of the Navy. Stern and his research team will conduct integrated high-fidelity CFD/FE FSI code development and benchmark full-scale validation for slamming analysis.

**Hiroyuki Sugiyama**, associate professor of mechanical and industrial engineering, has received a \$34,429 research grant from the Regents of the University of Michigan. Sugiyama will study a flexible multibody dynamics approach for tire dynamics simulation.

**Nate Young**, associate research engineer at IIHR-Hydroscience & Engineering and associate director of the Iowa Flood Center, has received a \$25,708 grant from the Iowa Natural Heritage Foundation. Young will develop methods to assess and communicate flood-related scour potential in agricultural fields.

**Andrew Veit**, MiniSIM program director at the National Advanced Driving Simulator, received a \$55,300 grant from the University of Windsor to provide a MiniSim research driving simulator.

## Recognition

**Susan Beckett**, director, desktop services, Engineering Computer Services, has received a University of Iowa Outstanding Staff Award. The award recognizes staff members who have made outstanding accomplishments and contributions that significantly benefited or brought honor or recognition to the university.

**Tim Brown**, senior research associate at the National Advanced Driving Simulator, a unit of the Center for Computer-Aided Design, was featured in a *Chicago Tribune* feature story that focused on studies conducted about the legal limit of intoxication at the National Advanced Driving Simulator (NADS). National Transportation Safety Board says lowering legal limit of intoxication is needed to battle a 'national epidemic' of impaired driving. Meanwhile, critics say the proposed level is no more negligent than distracted driving. Brown is using that data to better understand the difference in driving abilities of someone who is sober, someone who has had a few drinks and someone who has had a few more drinks.

**Greg Carmichael**, Karl Kammermeyer Professor of Chemical and Biochemical Engineering, associate dean for graduate programs and research, and co-director of the Center for Global and Regional Environmental Research, has been elected a Fellow of the American Institute of Chemical Engineers.

**Edwin Dove**, associate professor of biomedical engineering, is a recipient of the 2013 Michael J. Brody Award for Faculty Excellence in Service from the University of Iowa. The Brody Award is named in honor of the late Michael J. Brody, president of the UI Faculty Senate in 1986-87. It recognizes outstanding faculty who have made exceptional contributions to the university and the state of Iowa.

The Lichtenberger Engineering library has purchased a new online resource called TechStreet. TechStreet allows access to over 12,000 individual standards electronically, including the current and historic version. Agencies included are ISO, ANSI, NFPA, AWWA and 44 other publishers. <http://purl.lib.uiowa.edu/TechStreet>

The MiniSim, a portable, high-performance driving simulator designed for research, development, clinical and training applications, was noted in the August 13 *New York Times* as a device growing in popularity among drug companies for drug testing. The MiniSim was developed by the National Advanced Driving Simulator at the University of Iowa.

The UI's Operator Performance Laboratory (OPL), a unit of the Center for Computer-Aided Design, was featured September 17 as a news segment on NBC's "Today Show." The investigative report, drawn from an earlier two-part investigative report by NBC San Francisco Bay News, questioned whether airline pilots are relying too much on automation in the cockpit. OPL was showcased, based on studies **Tom Schnell**, associate professor of mechanical and industrial engineering and director of the lab, and his team have conducted on the issue. *The Today Show* report can be viewed at <http://www.today.com/travel/are-airline-pilots-relying-too-much-automation-1B11170594>.

**Ibrahim Ozbolat**, assistant professor of mechanical and industrial engineering and co-director of the Advanced Manufacturing Technology Group at the Center for Computer-Aided Design, was featured in the September issue of *Physics World* about how researchers are making progress towards creating human organs with techniques such as 3D printing, using the patient's own cells for ink. To read the complete feature story, go to <http://www.engineering.uiowa.edu/sites/default/files/files/PWSep13ornes.pdf>.

**Gabriele Villarini**, assistant professor of civil and environmental engineering and assistant research engineer at IIHR--Hydroscience & Engineering, will receive the 2014 Editor's Award from

the *Journal of Climate* at the American Meteorological Society Conference February 2-6 in Atlanta.

## Publications

**Ching-Long Lin**, professor of mechanical and industrial engineering and faculty research engineer at IIHR--Hydroscience & Engineering, served as lead guest editor of a new special issue of the *Journal of Computational Physics*, focusing on Multi-Scale Modeling and Simulation of Biological Systems.

## Presentations

**Karim Abdel-Malek**, professor of biomedical engineering and director of the Center for Computer-Aided Design, was the technical speaker at the Third Annual All Iowa SWE Conference July 27 in Iowa City. His topic was "The How and Why of Digital Human Modeling."

**Keri Hornbuckle**, professor of civil and environmental engineering, faculty research engineer, and associate dean for academic programs, and one of her doctoral students, Wen Xin Koh, recently presented their research at the American Chemical Society (ACS) National Meeting and Exposition in Indianapolis, IN. Koh's co-advisor is Peter Thorne, professor and chair of occupational and environmental health and professor of civil and environmental engineering.

**Hosin "David" Lee**, professor of civil and environmental engineering, recently was a guest on Arirang TV in Korea. Lee discussed the US-Korea relationship in research and Korea's creative economy.

## 1950's

**Carl Fasbinder** (BSEE 1958) is retired and enjoys swimming.

## 1960's

**Terry Fleener** (BSME 1963) is retired and volunteering for Engineers Without Borders.

**William Gearman** (BSChE 1969) is retired.

**James Hurt** (BSME 1961, MS 1963) is founder and part owner of Enventive Engineering, Inc. (<http://www.enventive.com>).

**Irwin Magerkurth** (BSME 1960, MS 1962) is retired from the Savannah River Site at Eastman Kodak. He manages a horse farm and travels.

**Frank Parker** (BSChE 1963) is semi-retired and lives on Saratoga Lake, upstate NY, near the Adirondacks.

**Dennis Rhoads** (BSME 1962, MS 1965) is retired as department manager of thermal systems design and test from TRW (now Northrup Grumman) Space Defense, Redondo Beach, CA.

**Ron Speedy** (BSCE 1966, MS 1967) is retired from the U.S. Public Health Service.

**Kenton Toomey** (BSIE 1969) is a retired manufacturing executive.

**John White** (BSEE 1962) retired after 42 years with Square D Co.

**Richard Winnike** (BSCE 1960, MS 1960) is retired from the U.S. Army Corps of Engineers and from URS Corporation. He resides near Austin, TX.

**Stewart Zuber** (BSCE 1969) is a retired Lt. Colonel in the Wyoming Air National Guard. Previously, he was with the Veteran's Administration in Wyoming.

## 1970's

**Donald Doerres II** (BSEE 1973) and his wife, Denise Blommel, presented a special college-wide Grabbing the Globe seminar October 10 on "Soft Skills for a Hard World."

**Ted McKim** (BSCE 1975, MS 1977) is principal civil engineer at Reedy Creek Energy



Services at Walt Disney World, Lake Buena Vista, FL.

**Debra Simoff** (BSChE 1977) is a senior coatings engineer for OFS, Hartford, CT, a manufacturer of optical fibers, cables, and related photonic components.

## 1980's

**Mark Bogue** (BSME 1982) is featured in one of the latest Hometown Hawkeye videos produced by the University of Iowa. To view, go to <http://www.youtube.com/watch?v=k-ICiLCiVXA&sns=em>. Bogue is president of Hi-Way Products, Inc. and Hawkeye Fabrication, Ida Grove, IA. He also serves as the chair of the College of Engineering Campaign Task Force.

**Sherri Riessen Crepinsek** (BSE 1987) is global projects organization estimating manager at BP, Houston, TX.

**Steve Fleagle** (BSE 1984) is chief information officer and director, information technology services at the University of Iowa, Iowa City, IA.

**Mike Foley** (BSE 1987) is an independent contractor/consultant. He formerly was CEO of Bluetooth Special Interest Group.

**Larry Kagemann** (BSE 1986) is assistant professor at The University of Pittsburgh School of Medicine, Pittsburgh, PA, with a secondary appointment in bioengineering.

**Gregory Kirsch** (BSE 1987 electrical engineering) is partner/patent attorney at Smith, Gambrell & Russell, LLP, Atlanta, GA.

**John Kuruvilla** (MS 1989, PhD 1996) is employed with the University of North Texas, Denton, TX.

**Timothy Lafond** (MS 1982 civil and environmental engineering) is executive director, environmental engineering, at Johnson Controls, Inc., Milwaukee, WI.

**John Lee** (BSE 1988 biomedical engineering) works for VPI Engineering, Salt Lake City, UT. He enjoys skiing and hiking in Utah.

**Dean Meyer** (BSME 1982) was guest presenter at the Mechanical and Industrial Engineering Department "Grabbing the Globe" seminar. Meyer is senior vice president, buildings business, at Schneider Electric, Palatine, IL.

**Gretchen Miller** (BSE 1984) works for Climatic Programming Building Automation Systems, Phoenix, AZ.

**Kelly Ortberg** (BSME 1982) was appointed chief executive officer and president of Rockwell Collins, Inc., Cedar Rapids, IA. Ortberg is a member of the College of Engineering's Advisory Board. Ortberg also was featured in the August 5, 2013 issue of *Aviation Week & Space Technology Magazine*. The complete interview can be found at [http://www.aviationweek.com/Article.aspx?id=/article-xml/AW\\_08\\_05\\_2013\\_p64-601305.xml](http://www.aviationweek.com/Article.aspx?id=/article-xml/AW_08_05_2013_p64-601305.xml).

**Becky Lance Svatos** (BSCE 1982) manages the Coralville, IA, office of Stanley Consultants, Inc., providing environmental engineering services.

**David Toops** (BSE 1986) is a senior member of the technical staff at Texas Instruments, Dallas, TX.

**Rick Weires** (BSE 1987) works at Deere & Co. He enjoys bicycling.

## 1990's

**John Crowley** (BSE 1990) is contract engineer at Electrolux, Saint Cloud, MN.

**Shawn Cullen** (BSE 1998) is operations manager for Lyondellbasell, Clinton, IA.

**Matt Finnegan** (BSE 1996) is general manager at the Walter Scott Energy Center, MidAmerican Energy Co., Omaha, NE.

**Brady Fuller** (BSE 1996) is senior project manager, CH2M Hill Engineers, Inc., Bend, OR.

**Benjamin Langton** (BSE 1996) is senior engineer, suspensions and vocational primary suspensions, Link Manufacturing, Ltd., Sioux Center, IA.

**Martin Teal** (BSE 1993) is vice president of WEST Consultants, Inc., San Diego, CA.

**Ansar Matahel** (MS 1993, PhD 1997) is with the South Florida Water Management District, West Palm Beach, FL.

**Andy McCoy** (BSE 1999, MS 2003, PhD 2006) is a water resources engineer at HDR Engineering, Des Moines, IA.

**Matt McNutt** (BSE 1990) is division patent counsel for Corning Inc.'s Environmental Technologies Division, Elmira, NY.

**Chris Miller** (BSE 1995) is associate professor at the University of Akron, Akron, OH.

**Terry Rounds** (BSE 1992) works for Jtekt Corporation.

**Cary Solberg** (BSE 1994) is senior project manager at the Milwaukee Metropolitan Sewerage District, Milwaukee, WI.

## 2000's

**James Ankrum** (BSE 2007) recently completed his PhD in the Harvard-MIT Division of Health Science and Technology Medical Engineering and Medical Physics Program. He currently is a Medical Innovation Fellow at the University of Minnesota, Minneapolis, MN.

**Ritesh Bafna** (MS 2007) is a software development specialist at CD-adapco, Austin, TX.

**Avery Bang** (BSE 2007 civil engineering) is executive director of Bridges to Prosperity, and international non-profit organization that builds cable-supported pedestrian bridges in remote communities around the world. She is based in Denver, CO.

**Scott Bartolo** (BSE 2007) is a program manager with Smiths Medical, Minneapolis, MN.

**Brett Bathel** (BSE 2005, MS 2007) is a research engineer at NASA Langley Research Center, Hampton, VA.

**Gerald Beranek** (BSE 2010) is a manufacturing engineer at CIVCO Medical Solutions, Kalona and Coralville, IA. He also is owner of Generation Y

WorX, a product development and prototyping company.

**Kathie Bernhardt** (BSE 2002) is an engineer/kinesiologist at the Mayo Clinical Motion Analysis Laboratory, Rochester, MN.

**Jim Brown** (BSE 2003) is a software engineer at Tri-City Electric, Davenport, IA.

**Chelsey Lange** (BSE 2006) is a mechanical engineer at Swanson Rink, Denver, CO.

**Matt McConville** (BSE 2003, MS 2005) is a water resources engineer at HDR, Des Moines, IA.

**Jim McGurran** (BSE 2008) is a program manager at MGC Diagnostics, a provider of non-invasive cardiopulmonary diagnostic solutions, Vadnais Heights, MN.

**Chris McMillan** (BSE 2000) is a solutions architect at WebFilings, Charlotte, NC.

**Marcelo Mena-Carrasco** (MS 2003, Ph.D. 2007), director of UNAB Center for Sustainability Research, Santiago, Chile, is implementing measurements in Chile for black carbon, and other aerosol speciation. He also is working on a multi-hazard forecasting system for Chile with the Chilean Met Office. In addition, he persuaded former Chilean president Michelle Bachelet to place solar panels on her campaign headquarters. These same panels will be placed on the House of Government. Running for president again, Bachelet is committed to 30% renewable energy in Chile by 2030.

**Sean Parker** (BSE 2010, MS 2012) is a software engineer at Eleven Wireless, Portland, OR. Parker also is a team member <http://portland.stags.ml/ultimate.com/player/sean-parker/> of the Portland Stags of Major League Ultimate, a professional flying disc league.

**Nick Pribyl** (BSE 2009) has joined Black Hills Energy as senior design engineer serving eastern Iowa. His responsibilities will support the gas operations in the Dubuque, Manchester and Decorah, IA, units. Pribyl previously worked for Southwest Gas, Inc., and its subsidiary.

**Anne Fairbanks Ryerson**

(BSE 2000) is FarmSight Engineering Manager at Deere & Co., Moline, IL. She also serves on the Board of Directors for the Girl Scouts of Eastern Iowa and Western Illinois.

**Bill Schierbrock** (BSE 2007)

is senior substation engineer at MidAmerican Energy Co., Davenport, IA.

**Nate Schlueter** (BSE 2006) is

design engineer at Primordial Soup, a product design and engineering resource focused on the development of medical device, located in Minneapolis, MN.

**Jeff Skrentner** (BSE 2005, MS

2006) is quality engineer at Smiths Medical, Minneapolis, MN.

**Brooks Wheelan** (BS 2009)

has been named writer and performer on NBC's "Saturday Night Live."

**Nicole Wong** (BSE 2004)

is continuous improvement manager at General Mills, Philadelphia, PA.

**2010's**

**Arunan Arivalagan** (BSE

2011) is a product development engineer at Aurora Spine, San Diego, CA.

**Kelly Barnett** (BSE 2012) is

a product engineer for 3M, Knoxville, IA.

**Jared Bogue** (BSE 2010) works

for General Mills, Cedar Rapids, IA.

**Benjamin Behrendt** (BSE

2012) is a patent examiner at the US Patent and Trademark Office, Washington D.C.

**Nate Brimeyer** (BSE 2012)

is a process engineer for JRS Pharma.

**Collette Blake** (BSE 2010)

is an applications associate at DuPont Industrial Biosciences, Cedar Rapids, IA.

**Jesse Calderon** (BSE

2012) is employed with Baker Engineering and Risk Consultants, Chicago, IL, working on projects that involve consequence analysis, risk analysis, SIS/SIL, and HF QRA.

**Jessica Carlson** (BSE 2012) is associate engineer at Roche in Florence, SC.

**Kelsey Coulter** (BSE 2010, MS 2011) is an environmental specialist at Barr Engineering, Minneapolis, MN.

**Tim Decker** (BSE 2011) is a test engineer at Cloud Cap Technologies, Portland, OR.

**Jocelyn Dixon** (BSE 2012) is a project engineer at Ambitech Engineering, Cottage Grove, MN.

**Audrey Erickson** (BSE 2013) is a production management engineer at Cargill Corn Milling, Cedar Rapids, IA.

**Ethan Gingerich** (BSE 2013)

received Bridge Builder of the Year Award at the inaugural Bridge Builder Conference September 20-22 in Sevierville, TN.

**Emily Gorsalitz** (BSE 2012) is an environmental engineer at Symbiont, Milwaukee, WI.

**Robert Groody** (BSE 2011)

is an engineer with Abbott Nutrition, Columbus, OH. From January 2011-July 2013, he was a member of Abbott's Engineering Professional Development Program. He had the opportunity to work at three different Abbott sites (Redwood City, CA; Lake Forest, IL; and Temecula, CA) and serve in four different positions, which included roles in engineering, quality, and supply chain.

**Vincent Gutsell** (BSE 2013) is a manufacturing development associate with ConAgra Foods, Lincoln, NE.

**Rachel Chrome Hahn** (BSE 2011) is a maintenance team leader at General Mills, Cedar Rapids, IA.

**Rob Hart** (BSE 2010, MS

2011) is involved in project engineering and research/development at Centro, Inc., North Liberty, IA, serving John Deere, Caterpillar, CNH, Harley Davidson, Toro, and others.

**Adrianna Jarosz** (BSE 2013)

is staff engineer at Geosyntec Consultants, Seattle, WA.

**Kayla Kamber** (BSE 2012) is a lean industrial engineer at Mars Chocolate North America, Chicago, IL.

**Brennan Lentz** (BSE 2010) is a software and firmware engineer at Schneider Electric/Square D.

**Calvin Luzum** (BSE 2012) is an ensign in the US Navy.

**Brian Moore** (BSE 2011) is an access management engineer with the Wisconsin Department of Transportation.

**Nicholas Piplani** (BSE 2012) is technical engineer and project manager at Procter & Gamble.

**Greg Quebbemann** (BSE 2011) is a sales representative for Zimmer, Inc., Chicago, IL.

**Dustin Sargent** (BSE 2012) is an industrial engineer at Rockwell Collins, Inc., Cedar Rapids, IA.

**Kelly Simon** (BSE 2011) is an orthotic/prosthetic resident at Hangar, Inc. Kansas City, MO.

**Eryn Dattilo Stone** (BSE 2011) is a design engineer at Homer L. Chastain & Associates, Decatur, IL.

**Gregs Thomopoulos**

(Honorary DS 2010), chairman of Stanley Consultants, has been elected chairman of the American Council of Engineering.

**Samantha Westerhof** (BSE 2013) is an associate maintenance engineer for Hormel Foods, Chicago, IL.

**Joseph Whitlock** (BSE 2012) is a front line manager at Eaton Corporation, Arden, NC.

**Rachel Williams** (BSE 2011) is a research and development engineer II at Boston Scientific Endoscopy, Boston, MA.

**1940's**

**Robert L. Miller** (BSChE 1941) of Norton, Ohio, August 15, 2013.

**John W. Morris** (MS 1948) of Wilmington, NC, August 20, 2013.

**1950's**

**Lloyd E. Allen** (BSEE 1957) of Toms River, NJ, July 15, 2013.

**John E. Althouse** (MS 1952) of San Diego, CA, September 15, 2013.

**Richard A. Bogue** (BSCE 1950) of Ida Grove, IA, September 26, 2013.

**Robert A. Boyd** (BSME 1950) of Auburn, WA, August 31, 2013.

**William A. Emanuel** (BSME 1959) of Huntsville, AL, November 9, 2011.

**Arthur W. Fridl** (MS 1950) of Mill Valley, CA, June 29, 2013.

**Richard J. Hovey** (BSME 1950) of Marion, IA, August 4, 2013.

**Ralph L. Jackson** (BSEE 1950) of Muscatine, IA, August 30, 2013.

**John R. Jeffers** (BSEE 1956) of Rolling Meadows, IL, August 6, 2013.

**Hubert E. Storer** (BSE 1959) of Shreveport, LA, July 8, 2013.

**David K. Zimmer** (BSME 1957) of St. Paul, MN, January 11, 2013.

**1960's**

**Richard C. Edwards** (BSEE 1965) of Katy, TX, July 23, 2013.

**Chester L. Francis, Jr.** (BSME 1964) of Huntley, IL, September 4, 2013.

**Richard M. McKinley** (BSME 1966) of Boise, ID, September 9, 2013.

**Herbert G. Noble** (MS 1966) of Crossville, TN, October 1, 2013.

**Robert P. Stearns** (BSME 1960) of Marina del Rey, CA, August 1, 2013.

**C. James Styers** (MS 1961, PhD 1967) of Cedar Rapids, IA, August 15, 2013.

**Royal W. Turner** (BSME 1960) of Baton Rouge, LA, July 19, 2013.

**Thomas A. Wheelan** (BSCE 1962) of Houston, TX, September 15, 2013.

**Roger A. Wood** (BSEE 1962) of Indianola, IA, June 23, 2013.

**1970's**

**Jamal Hashemi** (MS 1970) of Mountain View, CA, May 19, 2013.

**1990's**

**Mary A. Gerontakis** (BSE 1999) of Arlington Heights, IL, August 7, 2013.

**College Loses Two Members of Distinguished Engineering Alumni Academy**

The College of Engineering lost two of its Distinguished Engineering Alumni Academy over the past few months.

They are Lt. Gen. (Retired) John W. Morris, II (MS 1948), inducted in 1996 and Robert P. Stearns (BSE 1960 in civil engineering), inducted in 2005.

Morris passed away on August 20, and Stearns on August 1.

For more than three decades, Jack Morris served in critical staff and command. He was sworn in as the 44th Chief of Engineers on July 1, 1976. He retired in 1980 with over 37 years of service and held the rank of Lieutenant General. Upon retirement, he started his own company and provided consulting services to some 50 firms, many from overseas. Among the many recognitions is his selection as a Distinguished Graduate from the U.S. Military Academy in 1989. For more on Morris, go to <http://www.engineering.uiowa.edu/alumni-friends/honor-wall/distinguished-engineering-alumni-academy-members/lt-gen-ret-john-w-morris>.

Bob Stearns was co-founder of SCS Engineers in Long Beach, CA, and served as its president for 36 years until retiring in 2006. Stearns's Pacific Palms Resort Project earned the "Outstanding Civil Engineering Achievement" of the year award from the American Society of Civil Engineers in 1981. He was inducted into the Environmental Industries Association "Hall of Fame" in 2003 and was named a "Professional Achievement Award – Life Member" by the Solid Waste Association of North America in 2009. He served the American Society of Civil Engineers in many capacities, including as chairman of ASCE's National Ethics Committee. For more on Stearns, go to <http://www.engineering.uiowa.edu/alumni-friends/honor-wall/distinguished-engineering-alumni-academy-members/robert-p-stearns>.

**From the Foundation**

Ralph I. and Barbara G. (1985 B.F.A.) Stephens each had the chance to pursue their passions at the University of Iowa — and now they both are giving back to the place they call "utopia."

"I have not had to work a day in my life at Iowa," says Ralph, who spent 47 years as a UI professor of mechanical engineering — with a focus on mechanical systems, materials, fatigue, and fracture mechanics — before retiring in 2012, at the age of 78. "I just love teaching, and I love working with students."

Ralph earned a bachelor's and master's degree at the University of Illinois, and completed a doctoral degree in engineering mechanics at the University of Wisconsin, before beginning his distinguished UI career.

While Ralph was busy teaching, publishing research results, and mentoring graduate students, Barbara discovered that she, too, was interested in metals. In the midst of raising the couple's three children, she decided to go back to school at Iowa to learn about metalsmithing, earning a degree in art and art history — and proudly graduating with her son, Robert — in 1985.

It was defining moments such as these that have inspired the couple to give back so generously to Iowa. "Our daughter got married at Danforth Chapel, and I remember standing outside, gazing at the river and at the College of Engineering," says Ralph. "I thought: 'Sometime, I've just got to pay this place back.'"

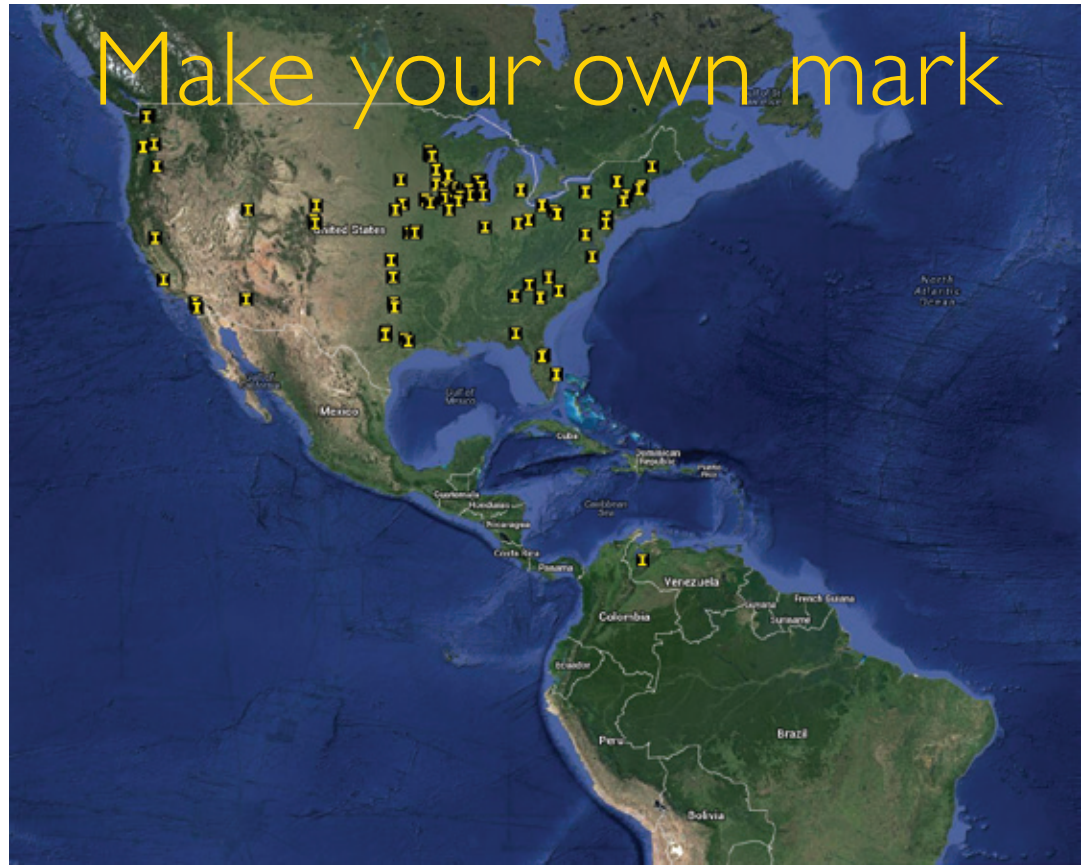
That's exactly what the Stephenses have done. The two, who are members of the Presidents Club — which recognizes the UI's most generous contributors — have made several transformative gifts for Iowa. Their contributions include a gift to create the Professor Ralph and Barbara Stephens Experimental Engineering Lab in the Seamans Center for the Engineering Arts and Sciences; a donation to establish the Professor Ralph I. and Barbara G. Stephens Women's Basketball Scholarship; and a recent gift — as part of President Mason's Golden Pledge initiative to raise money for scholarships — to start a new scholarship fund in the School of Art and Art History.

"We want to help students learn effectively, because that is the key to success in life," says Barbara.

The Stephenses credit their own successes to the university that has given them so much: "This place is the foundation of the future," says Ralph. "And when you love the University of Iowa as much as we do, you have no choice but to give."

To learn more about how private support from generous contributors such as the Stephenses can make a difference for the UI College of Engineering, please visit [www.uifoundation.org/engineering](http://www.uifoundation.org/engineering) or contact me at [kate-metcalf@uiowa.edu](mailto:kate-metcalf@uiowa.edu) or by phone at (319) 467-3445 or 800-648-6973.

# Make your own mark



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Ever wonder where fellow alumni ended up after graduation? Had a desire to reconnect with former fellow classmates for work? Want to see the widespread effect Iowa Engineers have on the world?

Engineering alumni can do all of these things with a new on-line, interactive world map, now available at <http://alumnimap.engr.uiowa.edu/>. If you haven't done so already, click on Make Your Mark and tell fellow alumni who you are, where you're at, your email address, your degree information, and any other information about yourself you would like to share about yourself. You are free to add as much or a little information as you want. By clicking on each Iowa "I," you can see where alumni reside and work around the globe. Also, there is a program "drop down" list that enables you to see all alumni posted or only those from a specific major. You also can zoom into a particular state or country with the zoom bar, or zoom out to show the entire world. The new interactive world map can help loyal Engineering alumni connect even more with each other, as more and more graduates participate. Enjoy!