Dear Alumni and Friends,

I hope this newsletter finds you well. Spring has finally sprung here in Ithaca after a final blast of cold and snow in April. It is an exciting time in Civil and Environmental Engineering. The intellectual footprint of the field continues to expand in new directions spurred by the need to address pressing societal problems. As one perspective on this evolution, The National Academy of Engineering identified 14 grand challenges of the 21st century. It is interesting to notice that four of them are heavily centered in CEE: restore and improve urban infrastructure, provide access to clean water, manage the nitrogen cycle, and develop carbon sequestration methods. These challenges are formidable and, left unaddressed, jeopardize the welfare of future generations.

To support our educational and research programs, our School welcomed a new faculty member in the Fall, two new additions to the faculty this past January, and we look forward to a new addition this coming Fall. John Albertson joined us as a full professor this past September. He came to us from Duke where he was the Department Chair in CEE. His research focuses on understanding the interplay between land, sea and the atmosphere. Greg McLaskey joined us as an Assistant Professor in Structural Engineering in October of 2014; due to our special historical edition of CEE Update in 2015, we now introduce him to you! Greg earned his Ph.D. from the University of California in Civil Engineering and Civil Systems. His research uses the analysis of transient stress waves to study material behavior such as earthquakes, faulting, friction, impact, and fracture. Samitha Samaranayake joined us in January as an Assistant Professor in the Transportation Systems area. He earned his Ph.D. from the University of California in Systems Engineering in 2014 and was a Postdoctoral Associate at M.I.T. prior to his arrival. His research focus is in the area of control of cyber-physical systems with a focus on transportation and other infrastructures. David Kammer also joined us this spring in Structures. He completed his Ph.D. in Mechanics at the Swiss Federal Institute of Technology in Lausanne (EPFL). He then worked as a research scientist at Bern University and as a Postdoctoral Fellow at the Hebrew University of Jerusalem. His research interests are in the mechanisms that lead to failure of materials and structures. You can read more about John, Greg, Samitha and David on pages 8-11.

On another note, Professor Mark Turnquist retired on June 30, 2015 and Professor Jim Gossett will retire at the end of this semester. Both have profoundly shaped the direction of this School and, while they will always be a part of this School’s future, we will miss the day-to-day interactions with them.

Our feature story is about our student teams and the projects they are engaged in. As many of you are aware, student project teams are a critical part of the education across Cornell Engineering; and CEE is no exception. We are home to five project teams: Steel Bridge, Concrete Canoe, Seismic Design, AguaClara, and Engineers for a Sustainable World (ESW) each of which draw students from across the College and many across the University. The Steel Bridge, Concrete Canoe and Seismic Design teams participate in a national competition sponsored by ASCE and EERI, respectively. AguaClara boasts the creation of water treatment plant designs used in Honduras and India that serve in excess of 50,000 people. Engineers for a Sustainable World team are focused on four projects, Human Powered Electricity Generation, Solar Systems and Renewable Design, Solar Kiosks, and Biofuels. All of these projects allow students to apply the technical skills they have learned in class as well as develop skills in technical problem solving. Every bit as important, their team involvement helps to develop skills in planning, organizing, communicating and collaborating; skills they will find critical to their success as they leave us.

Finally, I have begun to interact more directly with our alumni since becoming Director. It is absolutely wonderful to see all of the things our alumni do after they leave us. Over the next four years I look forward to the opportunity to get to know many more of you.

Warmest regards,

Linda Nozick
Professor and CEE Director
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Aside from the daily rigor of their curricular studies, many undergraduate students at Cornell undertake an incredible amount of additional responsibility as active members in Cornell Engineering Student Project Teams. Out of the 23 teams available to join, the School of Civil and Environmental Engineering (CEE) gives additional support to five teams that have direct relationships to the CEE concentrations by providing use of the School’s facilities, lab space, fabrication shops, and staff and faculty support.

Each project team has a vested, volunteer faculty advisor, but it is the students themselves who are responsible for all aspects of team management. Thus, students involved in a project team often express how they receive a unique experience that is unparalleled in any classroom. They learn first-hand what it means to create and maintain a production schedule, to adhere to a budget, to raise funds and develop relationships with sponsors, to utilize best-available-technology and advanced equipment, to design, test and redesign intricate prototypes, and to lead peers on a project that matters to everyone involved. “The students face critical decisions both personal and technical, which is something that can’t be simulated in class,” says Rebecca Macdonald, the Swanson Director of Engineering Project Teams at Cornell.

The culminating experience for most of the student project teams each year is a competition against project teams from other schools or service activity at an off-site location. Teams are given seed funding as a baseline, and seek outside support to make up the rest of the costs required for their project’s construction and to send the team to competition. Learn more about Cornell’s Student Project Teams and how you can contribute by visiting http://engineering.cornell.edu/teams.
Comprised of 26 students, The Steel Bridge Team works under faculty advisor Professor Ken Hover to construct a bridge composed entirely of steel, with the ultimate goal of winning the annual ASCE/AISC Student Steel Bridge Competition. Team members utilize their classroom knowledge to optimize a bridge with the lightest weight, fastest constructability, and lowest deflection, as they build a bridge that spans 20 feet, and will be judged on weight, construction speed, aesthetics, and deflection.

“The best thing about Steel Bridge is that every team member is involved with the final design,” says team leader Ken Shimizu ’18. Every September, the Steel Bridge students split up into five subteams, he explains. Each group works to conceptualize what they feel is the best design for the competition, and toward the middle of the fall semester they all meet and the groups each give a presentation of their full bridge design strategy. Following the presentations, the subteams discuss the best aspects from each design, and they’re incorporated into the final design. There are qualities from each subteam’s design built into the final project. “Everyone’s working toward a common goal, that we’ve all contributed to,” Shimizu said. “we’re all working together for a finished project we can be proud of. It’s this collective decision making that distinguishes us from other project teams. Everyone is involved in the design, fabrication, and construction.”

For the past nine years, ESW project team students have participated in an annual, week-long trip to Nicaragua, where they complete on-site projects in developing communities in the form of a technical exchange. The solutions evolve with the available technical capabilities. Partnered with Grupo Fenix, an organization at the Universidad Nacional de Ingenieria in Managua, the team has been working with a women’s collective called Las Mujeres Solares de Totogalpa, who have recently opened a solar restaurant in Sabana Grande. At the restaurant, food is prepared with solar cookers and other alternative energy cooking methods, including use of solar cookers, electricity from photovoltaic solar arrays and gas from bio-digested manure – all technologies developed, prototyped and built by the ESW project team. Sabana Grande is in a region suffering from deforestation. The use of solar ovens reduces the need for women to spend hours of their day gathering cooking fuels and helps reduce the health risks from smoke from open fires in the cooking areas.

Kevin Keene ’16 is an ESW student executive board member, and has traveled to Nicaragua with the team for the past four years. “This year we developed a solar oven and a solar dehydrator using Mylar® instead of glass, which is a flexible and less cumbersome material,” he said. The Mylar® is less expensive, and more easily replaceable. The team also created a vacuum system for manufacturing PV panels, and a composting latrine.

Keene explains that unlike other project teams, the goals of ESW are to create a world of environmental, social, and economic prosperity. “We are not competition-based, which sets us apart from the other teams,” he said.

The Biofuels facet of ESW is currently working to complete a million dollar proposal that would turn Cornell’s water treatment plant into a sustainable energy microgram by diverting Cornell’s waste-making into biofuels. ESW biofuels’ main goal is to transform waste from the treatment plant, along with compost and vegetable oil waste, into sustainable energy. To bring this to life, ESW is collaborating with Cornell’s wastewater treatment plant, the College of Veterinary Medicine (using manure), and Cornell Dining. As part of a soft launch, they have established a place where people can drop off vegetable oil from frying and food waste compost.
The Concrete Canoe Project Team offers students a unique opportunity to develop and improve concrete technology through the first-hand experience of designing and building a full-size canoe in concrete, which is then raced in an annual competition hosted by the American Society of Civil Engineers. Through both trial and error and connection to classroom activities, students gain an understanding of the various properties of concrete to ultimately achieve a specific outcome—in this case, to create a lightweight, high-strength material made into a boat. Like other project teams, there are several required to give a presentation and have a poster on display.

"By participating in the EERI project team, you gain design experience at the undergraduate level that you would never get in an internship somewhere," says Justyna Buono ‘16, Organization and Management Leader for the EERI project team. "It’s extremely valuable to someone who wants to be a structural engineer in an area that experiences frequent seismic activity."

This year’s Earthquake Engineering Research Institute (EERI) project team is comprised of 16 students who collaborated together to design a model building that is competitively tested for its seismic resistance. The team is advised by Professors Mircea Grigoriu and Tom O’Rourke, as well as Postdoctoral Associate Dr. Brad Wham.

Like Steel Bridge, there are three design sub-teams created at the beginning of the fall semester that each present to the entire team their ideas for the final design. It’s during this brainstorming session that the best aspects of each design are incorporated into the final product. Using specific requirements set forth by the EERI, the team’s model takes into account not only the tensile strength of the structural components, but also volume maximization and rentable floorspace, as well as the architectural concept and rendering—all aspects that factor into the judges’ point system at the undergraduate seismic design competition, which was held this year on April 7 in San Francisco. At the competition, the students’ model was evaluated through multiple tests, including resistance in an earthquake simulator, and the team was
The AguaClara program designs sustainable water treatment systems committed to long-term environmental, social, and economic stability. As a result of a 2005 Latin American water project, Program Director and Senior Lecturer Monroe Weber-Shirk founded the organization to innovate, expand, and develop new and old water treatment technologies to face the global challenge of safe drinking water. Students involved have the opportunity to take a two week trip to Honduras, where they visit AguaClara plants, meet the plant operators, assist in facilitation, and see the work they do in the lab being used in the real world, for a real cause.

“Concrete Canoe is unique because there’s tons of preplanning, and then the canoe is made in one day” says Team Captain Eugene Ng ’16. “There’s no room for mistakes, because it’s all done in one shot. It’s all about the pre-plan and then the execution of creating the canoe.”

subteams created within Concrete Canoe, each with their own responsibilities. These include: the mix team, mold team, paddling team, business logistics team, aesthetics team, and analysis team. The mix team and analysis team work together to create the ideal building material for the canoe. This year the team implemented the addition of glass bubbles into the concrete mix to create a very lightweight mixture resulting in a 20-ft, 180-lb canoe.

“Since freshman year, AguaClara has brought me to the crossroads of engineering and community,” says Team Lead Theresa Chu ’16. “Seeing AguaClara water treatment plants in Honduras changes the way we go about research and design, from designing for easy operator use to where sand for the filters is sourced. We aren’t working on an ordinary class assignment, but doing work that has real impact on communities around the world.”
When John Albertson was starting his doctoral studies at UC-Davis in 1993, his advisor, Professor Marc Parlange, recommended he read two books to get a firm foundation in hydrology, fluid mechanics, and turbulence. Those books were written by Wilfried Brutsaert and John Lumley—both of whom were faculty members at Cornell Engineering. Parlange himself had studied with Brutsaert while earning his Ph.D. at Cornell. And now, 22 years later, Albertson has joined Cornell’s School of Civil and Environmental Engineering as a David Croll Fellow Professor. “In some ways, it feels like things have come around full circle,” says Albertson. “There is a great legacy of excellent fundamental hydrology and fluid mechanics research at Cornell and now I get to be a part of it.”

Albertson comes to Cornell after 13 years in the Department of Civil and Environmental Engineering at Duke University, serving as department chair from 2009 to 2015. Before Duke, Alberston was on the faculty at the University of Virginia.

Underlying Albertson’s research is an effort to develop a comprehensive understanding of the exchange rates of mass, energy, and momentum between the land and atmosphere. Specific threads of Albertson’s research program are mobile sensing to identify fugitive methane emissions in oil and gas production regions; probabilistic prediction of wind energy production for improved grid integration; melding sensor data with models to improve understanding of air quality dynamics in urban areas; and the impacts of climate change and variability on water resources.

The interplay between land, sea, and atmosphere is incredibly complex. Albertson aims to bring clarity to some of what is happening as heat and energy make their way through this complex system. “We are in the midst of a sensor revolution,” says Albertson. “People are making small, low-cost sensors to measure all sorts of things. I want to provide the bridge from the raw data to the information needed in decision making. For example, we can use these data to build better models of water use to aid in increased food production. We will also be able to create block-by-block models of air quality for urban areas.”

Albertson is a strong believer in the idea that data can and should inform the choices people make. “If the data we collect can get to people, they can then vote with their feet,” says Albertson. “They can simply stop using areas that tend to be high in pollution. When the public is acting on the data, then the policy makers will be motivated to respond. I want to help build models that can account for all the factors that shape the air quality in cities block by block so that the data can affect behavior and policy decisions.”

Albertson is especially focused on fugitive methane leaks resulting from oil and gas production. Many people think of natural gas as a “bridge” fuel. Until cleaner alternative power sources can be integrated into the grid, natural gas will serve as a bridge between coal and cleaner alternatives such as wind and solar. Because methane is a much more potent greenhouse gas than carbon dioxide, (which is the main greenhouse gas produced by burning coal), this only holds true if the amount of methane escaping during the production and transportation of natural gas is below certain levels. Albertson is working to incorporate mobile and stationary sensors near natural gas well-pads, collection sites, and pipelines. The data he collects can then be used to quantify just how big a problem gas leaks are. Moreover, these data can be used to support mitigation of the leaks.

“In the end, I want to help us get to the point where we design built environments, transportation systems, and energy infrastructure in a way that promotes healthy and vibrant communities,” says Albertson. I came to Cornell because it is like a candy store of intellectual elements. There is a long history here of groundbreaking collaborative work on some of the biggest problems we face. I feel a real responsibility to build on this.”
David Kammer, Assistant Professor of Civil and Environmental Engineering at Cornell, studies what happens at the interface where two materials slide against each other. For such a common phenomenon, little is known about what exactly happens where the sneaker meets the pavement, the rubber meets the road, and the tectonic plate meets another tectonic plate.

In one line of research, Kammer uses high-performance simulations to model friction between two solids and to measure where surfaces stick, where they slide, and what sort of forces they are under at multiple points of contact as horizontal force is applied. “I am working to provide a systematic understanding of what is really going on in there,” says Kammer, as he points to the place where a sliding block and the table top meet. “We are finding that Coulomb’s Law of Friction, though often a convenient first approximation, isn’t exactly right. There is room to establish a better approach and that is one of the things I hope to do.”

Kammer grew up in the German-speaking part of Switzerland where, he says, “I was not a stereotypical child engineer who always took things apart. I did build things out of LEGO® a lot, but I was not very interested in technology.” Instead, Kammer wanted to be a doctor. There is a famous comic book character in Switzerland named Globi. Globi is an anthropomorphic blue parrot who wears red and black checkered trousers and a black beret. He is akin to Mickey Mouse in the United States. Kammer remembers very clearly reading one edition of Globi’s comic books wherein Globi got to be part of a mountain rescue and emergency helicopter medical transport team. “From that day until the final year of high school,” says Kammer, “I wanted to be a doctor.” But Kammer’s path to medical school was rerouted when a Career Day lecturer he wanted to see canceled, and Kammer instead went to a presentation by a civil engineer. “The guy did such a strong presentation,” says Kammer. “It really impressed me. I wrote to him the next day and he invited me to shadow him at work for a week. He even paid me to do some work for him.” From that moment on, Kammer wanted to be an engineer.

In retrospect, he says the things that attracted him to medicine are the same things that drew him to engineering. “Some things that are very important to me are to work with people, to understand things deeply, and to feel that the thing I am doing helps people,” says Kammer. “Engineering allows me to do all of these.”

What Kammer learns about the interface where two materials slide against each other could eventually be useful in understanding and possibly predicting earthquakes. It will also have bearing on the development of predictive models for the failure of layered materials under load. In his research, Kammer develops and uses numerical simulations and theoretical models from applied mechanics to understand “what is really going on in there.”

Kammer decided to join the faculty at Cornell because of the excellent atmosphere for research and the institutional dedication to collaboration. “I don’t think there could be a better place for me,” says Kammer. “I have Greg McLaskey, Chris Earls, and Derek Warner all right on the same floor of my building. The chances to work together are endless and our strengths really mesh well.”
When people think about earthquakes, they typically imagine epic disasters that topple buildings and shatter bridges. But in fact, earthquakes are shuddering throughout the Earth’s crust all the time, they’re just too subtle to be felt by you and me. Greg McLaskey, assistant professor in the School of Civil and Environmental Engineering, thinks these tiny tremors are just as important as the large ones, and is interested in learning as much as he can about these vibrations, both large and small, that emanate from our planet’s depths. “I’m interested in earthquakes and sound propagating through solids,” says McLaskey. “Studying sound is the only way we know about earth’s core.”

McLaskey’s academic path actually started right where he is currently—at Cornell’s CEE department, as an undergrad in civil engineering. He then pursued a Masters in structural mechanics and materials at the University of California, Berkeley, followed by a Ph.D. in civil systems. While his degrees were formally in civil engineering “I was actually doing earthquake science,” says McLaskey. “I was studying miniature earthquakes.” He got to really delve into the field as a post doc at the US Geological Survey center in Menlo Park. While there, he created earthquakes in a lab setting using a giant square steel frame containing a 1.5-square-meter block of rock with a fault cut down the middle. The frame squeezes the rock with a million pounds of force, causing this interface within the stone to slip and create seismic waves—just like what happens during a real earthquake.

This is exactly the kind of set-up McLaskey plans to build now that he is a professor at Cornell. Except his model takes things up a notch. “The apparatus I plan to build at Cornell will be capable of applying 7 million pounds to rock that’s three meters long,” says McLaskey. “So it’s going to better simulate the conditions occurring deep within the Earth’s crust.”

Still, while McLaskey is creating a bigger model for his lab, it doesn’t mean he’s only interested in big quakes. “Earthquakes come in all sizes, actually,” he says. “They can of course be as big as magnitude 9, but there are small ones—we’re able to record down to magnitude 1 or 0, but we can’t feel anything smaller than a magnitude 3.” Traditionally, to study the truly tiny quakes, he explains, you have to dig deep into the earth, and in that case scientists might pick up a tremor at magnitude -3. With McLaskey’s new set-up, he can generate mini earthquakes as tiny as -8.

Why bother with such minuscule events? “Part of geophysics is trying to understand how earthquakes scale,” says McLaskey, “and it’s thought that we can learn a lot about the big ones by studying the little ones.” These little ones are caused by something as seemingly insignificant as a tiny rock fracturing into grains of sand; any event on or within the Earth’s surface creates waves of sound that propagate through the Earth. The effects of all these multitudinous shivers? Scientists aren’t sure. One thing is certain—larger disturbances in the Earth’s crust certainly do cause unusual earthquake activity.

“One practical reason we care about this is because of fracking,” says McLaskey, referencing the technique used to drill and pump natural gas out of the ground in multiple areas of the country. “With fracking there are more earthquakes happening in areas where they don’t normally...so a big question is, are these quakes getting triggered by the fracking, or would they have happened anyway.” McLaskey plans to find out once his earthquake model apparatus is up and running.

In addition to studying how vibrations affect the Earth’s crust, McLaskey is looking at how vibrations and sound can affect man-made structures like bridges and buildings. Part of his work in this area involves placing tiny sensors on concrete structures that measure the cracking that occurs over time. His hope is to better understand and predict how these structures respond to the countless vibrations that shake them, and how to assess their true level of safety and soundness.

When he’s not studying earthquakes and vibrations, McLaskey is traversing the many hiking trails that surround Ithaca with his foxhound, or playing washtub bass in a long-distance jug band that he joined while in grad school. While he admits to thinking ‘he’d never be back’ to the area, returning to Ithaca and Cornell suits him. “It’s hard to find a great university in a great small town,” he says.
Samitha Samaranayake believes that we’re at the dawn of a revolution in urban transportation systems. “This is a great time to study urban transportation problems and solutions,” says Samaranayake. “Bike-share and car-share programs are springing up everywhere. Cities are innovating and trying to be more agile with public transportation. On-demand systems like Uber and Lyft are becoming popular. Many people in urban environments are rethinking the need for personal vehicle ownership. Combine all these with the data we can collect in real time from smart phones and internet-enabled devices and you have a real opportunity to create some great solutions.”

Samaranayake, who is an assistant professor in the School of Civil and Environmental Engineering at Cornell is interested in the modeling, analysis and control of networked urban infrastructure systems with a focus on transportation networks. His long term goal is to help large urban areas create truly integrated multi-modal transit systems that move people efficiently and reduce energy usage and congestion.

Samaranayake comes to Cornell Engineering from a postdoctoral position in MIT’s Laboratory for Information and Decision Systems. He earned his Ph.D. in Systems Engineering from the University of California, Berkeley in 2014; his Masters in Management Science and Engineering from Stanford University in 2009; a Masters of Engineering degree in Electrical and Computer Science from MIT in 2003; and a BS in Computer Science from MIT in 2002.

Samaranayake grew up in Sri Lanka, where his academic interests were strongly influenced by his father, a mathematical physicist by training who later transitioned to create the Computer Science Department at the University of Colombo. Samaranayake says he always liked subjects based on logical reasoning because studying didn’t feel like work, since what mattered was understanding the underlying concepts and not memorizing things. He planned to attend university in Sri Lanka, but his mother encouraged him to cast a wider net, and as a result he ended up at MIT for his undergraduate education.

In the years since his start at MIT, Samaranayake has traveled easily back and forth between the academic world, government organizations, and tech companies. He has spent time working with Oracle, Synopsys, and Google as well as CalTrans and the French National Institute for Research in Computer Science (INRIA). These experiences leave him perfectly positioned to have a real impact in designing and implementing integrated transit systems for large urban areas.

The ubiquity of connected devices combined with the availability of cheap and highly scalable computing power, and the development of algorithms that can exploit this has led to an explosion in the use of algorithms to plan and manage very complex systems. A city’s transportation system really boils down to millions of individuals making decisions about how to get to where they are going. It is now possible to create computationally tractable algorithms to help cities plan a smarter transportation system that takes into account these millions of decisions made every day. “My main focus is on developing algorithms for effectively scheduling and routing vehicles in real-time,” says Samaranayake. “I work on problems related to vehicle routing with reliability guarantees, dynamic traffic management and control, and ride-sharing systems.”

He is particularly interested in developing computationally efficient solution techniques and algorithms that will allow municipalities to develop practical applications to transportation questions. Effective solutions will require collaborations not only with engineers, but also with behavioral economists, public policy experts and others from the social sciences. He decided to come to Cornell, in part, because of the well-founded reputation Cornell has as a place where researchers from many fields collaborate willingly and profitably.

“It was important for me to be somewhere with a strong engineering program, but also a place that recognized the importance of collaborations across Colleges and encouraged it,” says Samaranayake. “I came to visit and it was obvious how open and collegial people are at Cornell. Cornell Tech was also a huge selling point for me. I work on problems experienced by big cities and New York City could be an amazing test bed for my ideas.”

Samaranayake predicts that in the future, cities will design and develop transportation systems that take advantage of many modes of mobility including private vehicles, public transit, bike-shares, car-shares, ride-shares, and on-demand services. These systems will be nimble and respond to changing conditions quickly and efficiently. To make this future a reality, he is working to create the algorithms necessary to orchestrate such a complex system.
Nora Stanton Blatch was born in 1883 and earned her undergraduate degree in civil engineering from Cornell in 1905. She was the first woman to earn a civil engineering degree from any university in the United States. In August of 2015, a full 110 years after earning her degree, Blatch was posthumously accepted as a Fellow of the American Society of Civil Engineers (ASCE). You are probably wondering: “what took so long?”

Civil engineering was a man’s world in the early 1900s. Blatch was the only woman enrolled in engineering during her time at Cornell. This may have intimidated other women, but not Blatch. She was the granddaughter of suffragist Elizabeth Cady Stanton and the daughter of women’s rights advocate Harriot Stanton Blatch. She grew up believing women had every much as right to an education as men, no matter what the chosen field. Her performance in classes (including the mandatory Summer Surveying Camp junior year) and in her thesis research earned her election to the honorary Sigma Xi.

Soon after earning her degree, Blatch continued to break ground: she became the first woman member of ASCE (with Junior status) and she actually found employment as an engineer. She worked for the American Bridge Company and for the New York Board of Water Supply designing bridges and water supply facilities. At the same time, she remained committed to the cause of equal rights for women, eventually becoming Chair of the National Advisory Council of the National Woman’s Party. Her first marriage, to inventor Lee De Forest, ended in divorce in 1912 because, according to De Forest, “she persisted in following her career as a hydraulic engineer and an agitator. She was all mentality and ambition.”

Blatch’s ambition led her in 1916 to apply to be advanced from Junior to Associate Member of the ASCE. The Board of Directors rejected her application solely because she was a woman. Blatch challenged the Board’s rejection and took her case to the New York Supreme Court, which sustained the ASCE.

With or without the status of Associate Member, Blatch went on to a long and successful career in engineering while continuing to raise her daughter, Rhoda De Forest. She served as an assistant engineer for the New York Public Service Commission and, later, as an architect, engineering inspector, and structural-steel designer for the Public Works Administration. After she remarried in 1919 to Morgan Barney, she also worked as a real estate developer and continued to be a...
political activist.

Nora Stanton Blatch Barney died in 1971 without ever recovering ASCE membership.

This is where her ASCE story might have ended, if not for a sharp-eyed Cornell Engineering alumnus named David Darwin. Darwin, who is the Deane E. Ackers Distinguished Professor of Civil, Environmental, and Architectural Engineering at the University of Kansas, saw Blatch Barney’s story recounted in the 2015 CEE Update. “It was an injustice that needed to be righted,” says Darwin. “ASCE is a great organization, and as a member, I knew that its leaders would want to correct this past error. It only had to be brought to their attention.”

So Darwin contacted the members of ASCE’s Executive Committee and recommended that Blatch Barney be elevated to Full Member status. “I sent them the email on a Saturday afternoon in June,” says Darwin, “and I received a positive response from all members of the committee before the end of the day. And as you know, they did more than I recommended!”

Rather than advance Blatch Barney to Full Member status posthumously, the ASCE Executive Committee promoted her instead to the status of ASCE Fellow, which is an even greater honor. “We want to recognize and appreciate those who have paved the way for today and tomorrow’s diverse leadership for ASCE and the engineering profession,” said Thomas W. Smith III, Executive Director of the ASCE. “Advancing her to the higher level of ASCE Fellow recognizes her significant contributions.”

The ASCE honored Nora Stanton Blatch Barney at their annual convention in October, 2015. Professor David Darwin was a guest at the ceremony, representing Cornell’s School of Civil and Environmental Engineering. Also in attendance that day were Nora Stanton Blatch Barney’s grandchildren and great-grandchildren.

Later that same month, granddaughter Coline Jenkins and great-grandson Eric Jenkins-Sahlin came to Cornell to help the College of Engineering honor Nora Stanton Blatch Barney during a ceremony as part of the college’s sesquicentennial celebration. John F. Abel, Professor Emeritus of CEE, led the program. Abel recounted Blatch Barney’s story at the ceremony, concluding with the presentation of a plaque to Jenkins and Jenkins-Sahlin. The plaque has since been mounted in a place of prominence in Hollister Hall as shown in the accompanying photo with Coline Jenkins.

Blair Johnson, Ph.D. candidate in CEE Environmental Fluid Mechanics, and Coline Jenkins, granddaughter of Nora Stanton Blatch Barney stand in front of a newly mounted commemorative plaque in honor of Nora in the lobby of Hollister Hall.
After nearly 40 years on the Cornell CEE faculty, Professor James Gossett retires. Gossett was born and raised in the San Francisco Bay Area and received all of his university degrees from Stanford—B.S. in Chemical Engineering; M.S. and Ph.D. in Civil/Environmental Engineering. Having lived all his life to that point in sunny California—and feeling excessively deprived of gloomy, cold weather—Gossett moved east and joined the Cornell faculty in October 1976. Gossett wryly notes that he arrived in Ithaca on a Saturday and stood in front of his first class two days later (someone else had been teaching it until he arrived)—a class with many students older than he was.

At Cornell, Gossett held several administrative posts, principally including Director of the CEE School from 2003-2008, highlighted by a capital campaign to raise funds for renovation of the Bovay civil infrastructure facility in Thurston Hall and the instructional fluid mechanics laboratory in Hollister Hall. He fondly remembers the many outreach events he hosted with enthusiastic alumni throughout the country. “Affirming,” he labels that experience. Gossett was also one of the leaders among the environmental faculty of CEE and BEE that established the separately accredited B.S. degree in Environmental Engineering, jointly administered by the two schools.

Gossett’s research interests are in the general area of applied microbiology. From 1984 to present, he conducted investigations concerning biological transformations of chlorinated solvents—common, yet hazardous, groundwater contaminants. He and colleagues delineated the factors and conditions that influence biodegradation of such compounds, the metabolic pathways, the products formed, the general categories of microorganisms involved, and the microbial-competitive aspects affecting success. These efforts were instrumental in establishing the success of bioremediation technologies for chlorinated solvents.

Gossett developed two courses still currently offered by CEE: “Microbiology for Environmental Engineering;” and the graduate course, “Biological Processes.” He estimates that he’s taught Biological Processes” some 38 times. “I never tired of it,” he noted, “and I’ll miss it. I always liked to watch the little lights go off in my students’ heads when they finally ‘got it.’”

What changes have marked the field of environmental engineering over the past 40 years? “Research—and practice, too, to a large extent—have become more scientifically sophisticated. When I started, ‘laboratory instrumentation’ was a pH meter. You could do some decent research in jars on a stir-plate. Now we use molecular biology to knock-out genes and tandem mass spectrometry to analyze trace substances. On the research side, in particular, the lines are blurring between ‘science’ and ‘engineering.’ The challenge for faculty is to conduct cutting-edge research while also training undergraduate and M.Eng. students to be practicing engineers. But I am supremely confident in the colleagues who succeed me.”

Gossett plans to remain in the Ithaca area, where he and his wife, Elizabeth, have renovated a home on the east shore of Cayuga Lake. “After 40 years, Cornell can’t rid itself of me that easily, nor I of it. Besides...I’m not sure I could deal with excessive amounts of sunshine.”
Professor Mark Turnquist retired on June 30, 2015 after three decades of teaching and research; to be more precise, his academic career spanned over 37 years. After receiving his Ph.D. from Massachusetts Institute of Technology in 1975, Professor Mark Turnquist started his career as an Assistant Professor at Northwestern University. Four years later, he came to Cornell to the School of Civil and Environmental Engineering and rose through the academic ranks becoming a full professor in 1982. His research passion has been in management of large complex systems where uncertainty plays a major role.

Transportation systems engineering has been Turnquist’s career focus. More precisely, the development and application of algorithms and software to support car management for railroads, the efficient design and operation of logistics systems and, towards the end of his career, the robust location of supplies to support response to natural hazard events.

Turnquist was a recipient of a U.S. Department of Energy Excellence Award in 2000 and a runner up and winner of the Franz Edelman award in 1999 and 2005, respectively. He was also the recipient of college teaching awards in 2003 and 2013 and a recipient of the Chi Epsilon Professor of the Year award in 2006. He expressed at his retirement how deeply he has enjoyed the teaching and mentoring of the many bright students he has had the opportunity to work with over his very distinguished career.

In the early 1980s, Turnquist served as Associate Dean of Engineering for two years, taking on the responsibility for computing resources and policy in the College of Engineering. He had been instrumental as Director of the Engineering Management Program for the College since 1988, until his retirement. This concentration has the largest enrollment within the Master of Engineering degree.

Professor Turnquist reports that he is enjoying the less hectic daily routine of a semester schedule, but misses meeting with students as well as seeing his colleagues and staff members. In place of a teaching schedule, Turnquist and his wife, Lynn, will soon enjoy the coast of Portland, Maine, as they follow their son, Matt, his wife, Patty, and their young daughter, Emma, there this May. Mark and Lynn are excited to be moving and look forward to the ocean views and frequent visits with their granddaughter.

PLAN TO ATTEND!

CEE Alumni Breakfast

SATURDAY
JUNE 11, 2016
7:30–9:30 A.M.
McMANUS LOUNGE
166 HOLLISTER HALL

The School of Civil and Environmental Engineering will hold its annual free breakfast until 9:30 a.m. for all CEE alumni and their family members. Please come and enjoy breakfast with CEE faculty and staff and other CEE alumni who have returned to campus. Photographs and memorabilia will be on display. After breakfast, tours of CEE laboratories will be provided upon request.
Wilf Brutsaert has been awarded the 2015 William Bowie Medal, the highest honor from the American Geophysical Union. The award is given in recognition of “outstanding contributions to fundamental geophysics and for unselfish cooperation in research.” Professor Brutsaert’s interests have broadly covered hydrology and fluid mechanics in the environment. His activities related to atmospheric processes have been mostly with the ultimate objective of developing physically-based methods to calculate regional evaporation from natural land surfaces covered with different types of vegetation.

Paul Carr was the 2015 recipient of the College of Engineering Daniel M. Lazar ’29 Excellence in Teaching award.

Peter Diamessis was a recipient of the 2015 College of Engineering Michael Tien ’72 Excellence in teaching award.

Mircea Grigoriu has been selected by the American Society of Civil Engineers as the recipient of the 2016 Nathan M. Newmark Medal for “original theoretical contributions to uncertainty quantification and their applications to earthquake/wind engineering and material science.” Grigoriu will be officially presented with the medal during the Engineering Mechanics Institute conference, held this year in Nashville, Tennessee, on May 22-25.

Ken Hover has been named a Distinguished Member of American Society of Civil Engineers (ASCE), the highest level of recognition within ASCE. Hover has also been awarded the 2016 Richard D. Gaynor Award given by the NRMCA (National Ready Mixed Concrete Association).

Hover has also been recognized by the American Concrete Institute (ACI). At Cornell, Hover has received Class Councils recognition for his “remarkable contributions to the Cornell community.” Hover was 1 of 15 Cornell faculty members receiving this recognition.

In November 2015 Hover presented the Katharine and Bryant Mather Honorary Lecture sponsored by The American Concrete Institute (ACI). Hover has been selected to serve on the Committee on Reform of Structural Engineering Education (CROSEE), a board-level committee of the Structural Engineering Institute of ASCE.

Phil Liu was elected to membership of the class of 2015 National Academy of Engineering (NAE) in recognition of his coastal engineering research, education, computer modeling, and leadership in the area of tsunami and wave damage.

Tom O’Rourke is the recipient of the 2016 George W. Housner Medal given by the Earthquake Engineering Research Institute (EERI). The award is in recognition of his extraordinary and lasting contributions to public earthquake safety through the development and application of earthquake hazard reduction practices and policies, and is the most prestigious award of the institute.

O’Rourke’s research has had a critical impact on lifeline earthquake engineering across the globe. His contributions have improved the understanding of the response of geographically distributed systems, such as water supply and electric power networks, to earthquakes and other natural hazards.
Bill Philpot was elevated to the grade of Senior Member of the IEEE in 2015. This is the highest professional grade within IEEE for which a member may apply.

Ruth Richardson has been nominated to serve on the United States Environmental Protection Agency (EPA) Science Advisory Board (SAB) Environmental Engineering Committee for a three-year term. The SAB EEC is a Federal Advisory Committee that provides independent scientific and technical advice to the EPA administrator on risk management technologies to control and prevent pollution. Richardson was nominated to serve based on her expertise in wastewater treatment systems.

Christine Shoemaker has been selected by the ASCE-EWRI as recipient of the 2015 Lifetime Achievement Award. This award recognizes “members who are judged to have advanced the profession, exhibited technical competence, and significantly contributed to public service, research, or practice in the environmental and water resources profession.”

Jery Stedinger has been appointed by the Board of Trustees as the Dwight C. Baum Professor of Engineering. The chair recognizes a professor’s excellence in research and significant contribution in engineering education.

Gregory Fenves ’79 became the 29th president of the University of Texas at Austin in 2015.

Leonard Libenson ’64 was reminded of a story after reading the Spring 2014 CEE Update article on “Summer Surveying Camp” article. Perhaps his story will make you smile and laugh! He wrote, “My small survey group started our work somewhere near the waterfall that is seen in the background of the photo [published with the article]. We worked our way up a creek which provided us with fresh, clean, cool water to fill our canteens every day. The creek eventually became a small brook as we worked our way upstream. Eventually, in the last days of camp, we reached the end of the area we had been assigned to survey. To our surprise, a horse riding path crossed the brook at that point. We saw several horses crossing the brook…and yes, they were urinating in the “fresh, clean, and cool” water that we had been enjoying downstream for the past 5 weeks! I believe we all survived.”

Frank Robertson ’52 recalled his college days in Lincoln Hall where he learned how to design structures, mix concrete, test steel, and make detailed structural drawings and design hydraulic systems. He particularly enjoyed summer surveying camp saying, “summer surveying camp was one of the high points in the program.” He writes, “my civil engineering experience gave me a real start into a career of heavy construction.”

Robertson worked for Morrison Knudsen Company (MK) for 33 years. During his career he had the opportunity to work on a number of major construction projects within the U.S. and one in Africa, all the while advancing him to a higher job title level. From Office Engineer to Project Engineer on the construction of underground ICBM storage and launch sites for the U.S. Air Force in Colorado and Missouri, to Project Manager for the construction of NASA’s Vehicle Assembly Building at the Kennedy Space Center in Florida (at the time the largest building in the world), to District Manager of MK Eastern District, to Regional Vice President for the MK Eastern Region. Then a transfer in 1979 to Boise, ID, where he was made the Senior Vice President of the Heavy and Marine Construction Group until retirement in 1985.

“I owe much to my Cornell experience. Not only did I learn a trade but I found my wife of 63 wonderful years. We have spent much of our time since retirement traveling and fishing for trout in the west and in Patagonia.”
ESW BIOFUELS TEAM WINS DESIGN COMPETITION

Cornell Engineering’s Engineers for a Sustainable World (ESW) Biofuels Team took first place in a design competition held as part of the 2015 ESW National Conference in Rochester, NY. The Inter-Chapter Design Challenge required student teams to present a plan for integrating already-established technologies to improve the social, technological, and ecological quality of life in Rochester.

The Cornell team’s winning plan involved the construction of a High Tunnel that would be attached to each home and used to grow food year-round. The tunnel would include compost areas and worm bins to produce fertilizer. Their plan also included an educational component that would involve a MOOC, an app, and community outreach.

The competition was unusual in that the teams did not know what the specific challenge was going to be until they arrived at the conference. Also, members of the Rochester community were on-hand to provide information and immediate feedback on aspects of each team’s design.

The competition was judged by industry partners and Rochester Institute of Technology faculty members and students.

A 2016 MERRILL PRESIDENTIAL SCHOLARS AWARD has been awarded to Addie Lederman ’16, based on her “scholastic achievement, strong leadership ability, and demonstrated potential for contributing to society.” Her major is in Civil Engineering. Addie selected Professor Ken Hover “as the faculty member who has made the most significant contribution to her education while at Cornell.”

THE MOLES STUDENT AWARD

Shengnan Zhao ‘16 is the recipient of this year’s Moles Student Award. Zhao was one of our top students in CEE 4730 Design of Concrete and CEE 3410 Geotechnical Engineering. She is very involved in the Seismic Design Project Team at Cornell and serves as one of our Peer tutors for students that need help with Math and Physics.

CEE GRADUATE STUDENT ASSOCIATION RESEARCH SYMPOSIUM

For the past seven years, CEE’s graduate student association has planned and coordinated an annual research symposium that allows our graduate students to present an oral presentation of their research and to showcase their research work in a poster competition. This year on March 11, the 8th annual research symposium was held and the following students won monetary awards on their placements:

Oral Presentations:
1st Place: Amy Pochodylo
2nd Place: Sepehr Saroukhani
3rd Place: Amber Ye Jin
People’s Choice: Amy Pochodylo

Poster Presentations:
1st Place: Bill Wu
2nd Place: Cristina Fernandez-Baca
3rd Place: Wenqi Yi
Best MEng Project: Krishnamurthy Narayanan
Best Aesthetic: Veronica Citerone
People’s Choice: Justyna Kosianka
Fred Howard Kulhawy was born in Topeka, Kansas on September 8, 1943 to Fred and Gloria (Hahn) Kulhawy. He spent his childhood and early adulthood in New Jersey, where he received his B.S.C.E. in 1964 from Newark College of Engineering (NCE), which is now a part of New Jersey Institute of Technology. He completed his M.S.C.E. from NCE in June 1966, married Gloria Ianna in September 1966, and they relocated to Berkeley, CA for educational pursuits. He received his Ph.D. from University of California, Berkeley in September 1969, and began his Professorial career at Syracuse University, where he advanced to the rank of Associate Professor. In 1976 he joined the Cornell Faculty, becoming Professor in 1981.

During his 40-year academic career, Fred taught a wide range of courses in the field of geotechnical engineering. At Cornell he also supervised the annual Master of Engineering geotechnical design project 17 times. His courses emphasized basics and developing thought processes, but they always were oriented toward design and professional practice.

He has been a prolific researcher, with sponsors ranging from various government agencies to public and private companies. He has supervised 54 M.S. and Ph.D. theses. He has authored/co-authored more than 370 publications. The research done by him and his students has influenced geotechnical practice.

His contributions have been recognized with over 20 major professional society awards. Among them are the following: Distinguished Member of ASCE, the highest accolade of ASCE for acknowledged eminence in engineering; the Norman Medal, the oldest and most prestigious technical award of ASCE; and the Karl Terzaghi Award, the ASCE Geo-Institute career accolade for eminence in geotechnical engineering.

After his retirement he kept active in his consulting practice, as well as traveled to indulge one of his passions, opera. He is survived by his wife, Gloria; a brother Kenneth of Tempe, AZ; brother and sister in-law, Frank and Nancy Ianna, nieces Kristy and Lindsay, nephew Rob Ianna, of NJ; and numerous cousins.
HOMECOMING WEEKEND
September 23 - 24

Return to campus to celebrate with the Cornell community in Ithaca! Homecoming registration will open in August. Please visit the university website homecoming page: www.homecoming.cornell.edu/ to register and see the activities planned. Cornell vs. Yale football game will be at 3:00 p.m. on Saturday.