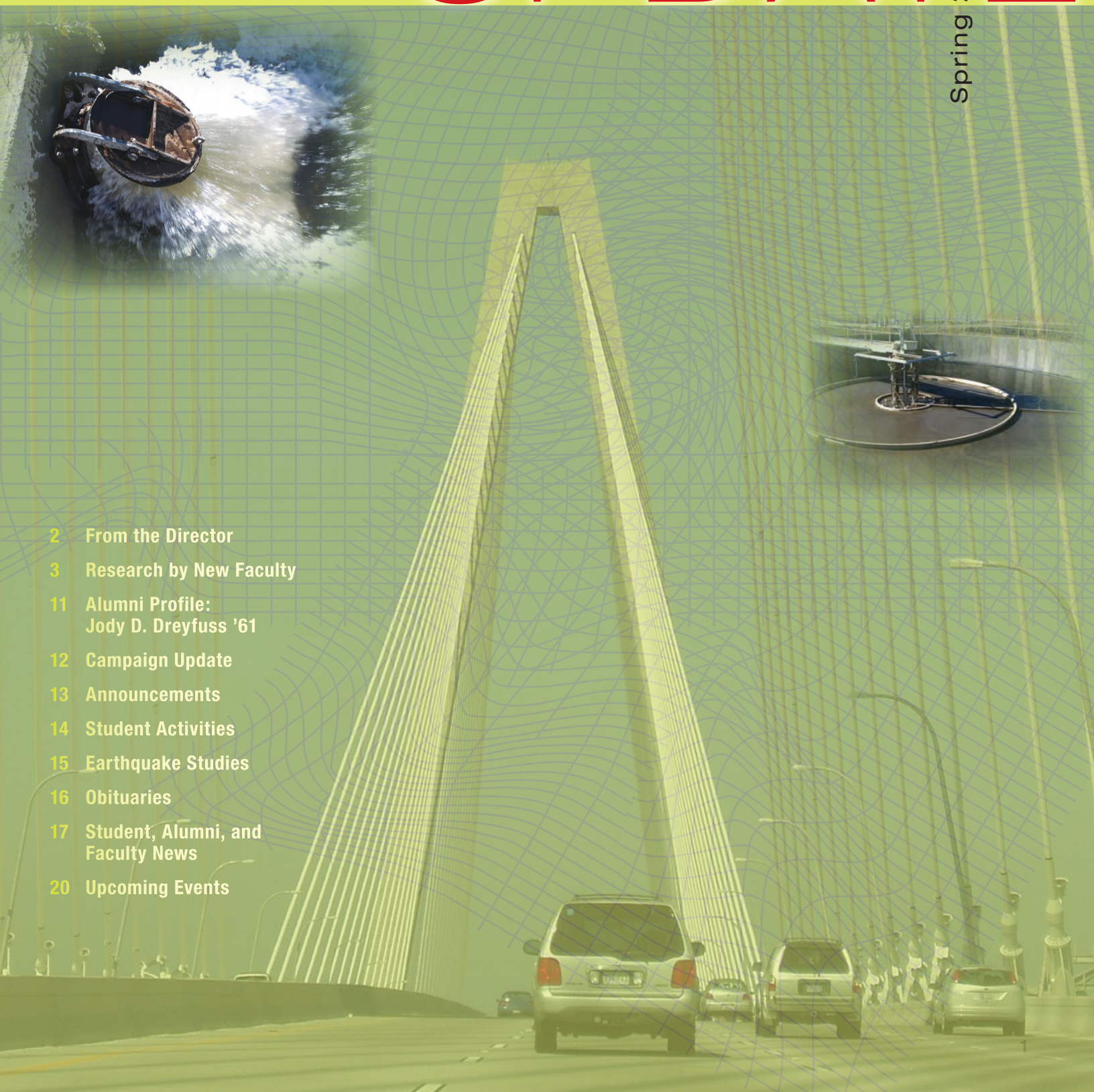
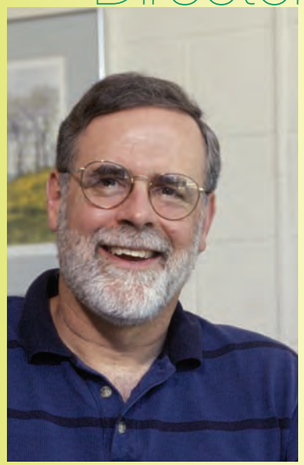
Cornell University
School of Civil and
Environmental Engineering

# UPDATE

Spring 2006



FROM THE Director



James M. Gossett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Spring 2006

I'm writing this note to you in late March; *Update* needs to go to press soon, so that you can be reading it in May. I have yet to see a crocus (other than in gardening catalogues); snow is in our forecast; and we're still living on "standard" time—in short, spring in Ithaca seems at once both a faded recollection and a distant promise.

It's been another busy year for the CEE School. Our renovation campaign is in full swing. We are on schedule to complete the first and largest phase of the project—the Bovay Civil Infrastructure Laboratory Complex in Thurston Hall—by the end of summer 2006. Come back to campus for Homecoming and join us in celebrating the improvements. We held several alumni events this past year (Boston; Rockland County, NY; an open house at fall Homecoming; and a luncheon for Ithaca-area alumni in April). I find interacting with alumni to be an invigorating and affirming experience—you are almost invariably enthusiastic about your Cornell CEE education. After all the prodding and poking we undergo from various "official" evaluations (e.g., ABET reviews and College of Engineering reviews of our programs), it's especially refreshing to hear from you, our most important "product."

However, the CEE School is undergoing yet two more reviews in the coming months: an external program review in April (an evaluation conducted every decade by a panel of distinguished CEEs from academia and private practice) and an ABET-accreditation review of our new BS program in environmental engineering. More prodding and poking...

We welcomed two new faculty members–Peter Diamessis (environmental fluid mechanics) and Oliver Gao (transportation systems engineering)–and we are concluding the search for another new faculty member in structural engineering to fill the line of our retiring Professor Teoman Peköz. If all these new faces and names are disorienting to you, get used to it! We're likely to welcome many more new faces over the next few years. Our challenge, obviously, is to fill the shoes of distinguished retirees with equally distinguished-to-be new faculty.

To ease your bewilderment, this edition of *Update* has feature articles on our four most recent faculty hires—Diamessis and Gao (mentioned above), as well as Wilkins Aquino (structural engineering) and Ruth Richardson (bioenvironmental engineering). I am confident that you will find their work fascinating and agree the CEE School's future is in good hands.

As always, I would welcome the chance to visit with you, if your travels bring you to campus. It would be my pleasure to show you the changes that are transforming your CEE School.

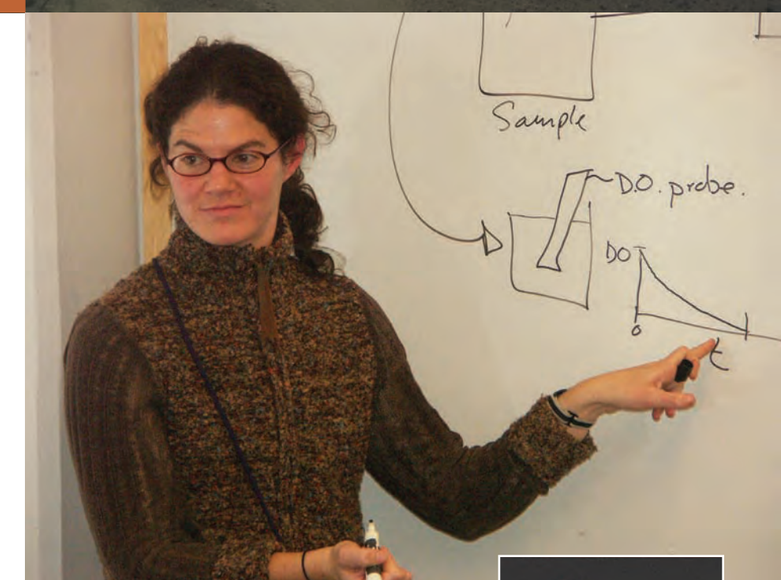


# Bioenvironmental Engineer Returns a Favor for Ithaca's "Born-to-Dechlorinate" Bug

**A discovery that began** in the sewage sludge of Ithaca's wastewater treatment plant is coming full circle, with work on microbial fuel cells by Assistant Professor of Civil and Environmental Engineering **Ruth E. Richardson** and her students—and the findings just might improve operation of sewage-treatment facilities.

Cornell environmental engineers have a long and distinguished history of collaborative work at the plant that processes wastes from the Ithaca community, including the university campus—going so far, at one point, to grow fragrant roses in the sludge. Later they "grew" a bioremediation industry when CEE Professor James M. Gossett and Cornell microbiologist Stephen H. Zinder found the so-called "Born-to-Dechlorinate" bacterium, *Dehalococcoides ethenogenes* Strain 195, which effectively detoxifies PCE (dry-cleaning solvent perchloroethylene) and TCE (the metal-cleaning solvent trichloroethylene) right there in the sewage. That discovery and subsequent work by Cornell scientists inspired the commercialization of at least two other *Dehalococcoides* strains that now are used in bioremediation at sites across the United States.

When Gossett learned of Richardson's expertise in the molecular biology aspects of bioremediation, she was recruited to join the faculty. In addition to being the keeper of the culture, Richardson has focused her research on molecular bioindicators—the DNA, RNA, and protein proof that natural bioremediation already occurs in chemically contaminated soil.




The presence of molecular bioindicators, Richardson explains, helps bioremediation engineers determine where and how to start and, ideally, when they can stop and claim success. Sometimes, she notes, naturally occurring microbes manage to detoxify a spill without human help. If not, engineers can jump-start the process by pumping nutrients into the site. That provides both the right environmental conditions and the food for the anaerobic bacteria that can dechlorinate pollutants.

And to escalate the war on chlorinated pollutants, bioremediation engineers can inject commercial strains of *Dehalococcoides*, usually together with nutrients. Throughout the process, molecular bioindicators tell planners if bacterial dechlorination is occurring.

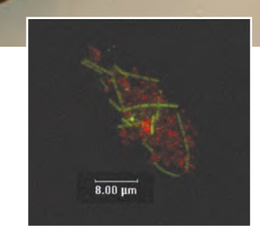



**Image of "Born-to-Dechlorinate" bacterium, *Dehalococcoides* (red), growing in close association with other microbes (green).**

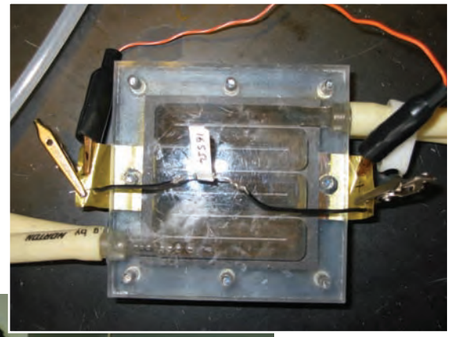
Richardson's studies are supported by grants from the U.S. Department of Energy and the Atlantic Philanthropies foundation, by way of Cornell's Biogeochemistry and Biocomplexity Initiative. And there's still plenty of work to be done on the topic. As many as 19 different enzymes in Strain 195 are involved in detoxifying chlorinated contaminants, Richardson observes, and it's not clear which are absolutely essential to the process.

"We are trying to leverage the powerful molecular biology tools to help with bioremediation, but we still have much to learn," she says.

In the meantime, students in Richardson's class, Microbial Biodegradation and Biocatalysis Lab (CEE 658), are discovering the potential of entirely different kinds of bacteria—those that generate electricity by metabolizing domestic wastewater in microbial fuel cells, or MFCs. Compared to the more familiar hydrogen fuel cells, MFCs use concentrated cultures of anaerobic bacteria already present in wastewater to transfer electrons from the waste to the negative electrode (anode) of the fuel cell while oxidizing the waste to carbon dioxide. The electrons travel from the anode to the cathode where they combine with oxygen to form water. In addition to pulling electricity out of wastes (with water and carbon dioxide as the main products), MFCs produce considerably less biomass solids than the traditional activated sludge process used in wastewater treatment plants—which ultimately leads to lower solids-disposal costs for the plant.

*"BOD tests are the constituent measurement of strength of the waste flowing into the treatment plant."*

Another advantage to the anaerobic MFCs is that—without the requirement for added oxygen—an MFC-based treatment facility would use much less energy to run aeration compressors. No one has yet built a full-sized MFC to treat wastewater, but Richardson's students are helping to make preliminary steps. By designing new configurations for MFCs, they are trying to meet challenges of sustainability (electrical output of laboratory-scale MFCs is in the watt-per-square-meter range) and high cost of materials (such as platinum catalyst for the cathodes).



Below: In Dr. Richardson's spring course, student teams build and test microbial fuel cells (shown on the right) for the conversion of waste directly into electricity.

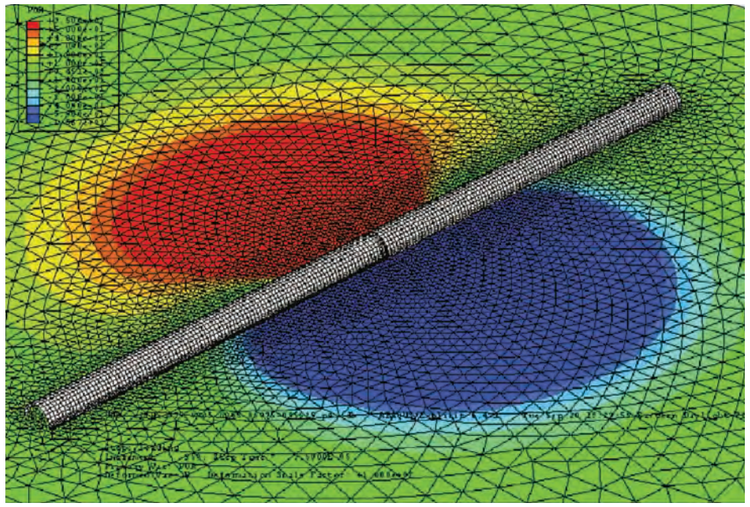
Among other things, the CEE 658 students learned that wastewater treatment is a $25 billion a year drain on America's municipal budgets, and that gave them an idea: Richardson and her students are trying to turn microbial fuel cells into real-time biochemical oxygen demand (BOD) meters, so that treatment managers will be able to fine-tune the operation of their facilities.

"BOD tests are the constituent measurement of strength of the waste flowing into the treatment plant," Richardson explains. "And the industry standard, the five-day BOD test, takes five days to generate results. By then the information is useless to treatment managers. We think a microbial fuel cell–BOD meter is a feasible solution, and we're trying it in collaboration with the Ithaca Area Wastewater Treatment Facility."

It's the least Cornell environmental engineers can do for the place that gave the world the "Born-to-Dechlorinate" bug.

*– Roger Segelken*





Above: Acoustic field emanating from an ultrasound-excited artery.

# Health Monitoring and Prognosis for Human-Made Structures—and for Humans, Too

**"How long have I got left, doctor?"** The answer differs, depending on whether the patient is a sick person or a "smart" bridge. But the approach that **Wilkins Aquino** (above) uses—in developing new computational and sensing techniques for structural health monitoring and prediction—might very well be the same for either type of case.

The assistant professor of civil and environmental engineering who heads the Structural Health Monitoring and Prognosis Group at Cornell begins his examination in the same place, whether for the 125,000 "structurally deficient" bridges in the United States or the millions of Americans at risk for cancer and heart disease. "Identifying the current state of a structure," Aquino says, "is the backbone for predicting future conditions and remaining service life."

As more "smart" structures—such as dams and bridges, aircraft, and skyscrapers—are instrumented to report on the health of their components, Aquino hopes to be ready. His strategy is to combine machine learning techniques, including neural networks, genetic algorithms, support vector machines, with optimization techniques and computational mechanics to solve a wide variety of inverse problems. "Health monitoring problems can be cast as inverse problems in which the attributes of a system are inferred from partial information about its response to controlled or natural demands," he explains.

One example of a "controlled demand," Aquino says, are the sound waves beamed into a human body to search for cancer tumors or plaque in hardened arteries by an experimental medical-imaging technique called vibro-acoustography, or VA. Compared to the more familiar ultrasound imaging, which produces sonograms by reading echoes from returning beams, VA uses microphones on the body surface to record the vibrations produced in structures of different kinds—such as a calcification or a tumor growing in breast tissue. VA imaging was invented by the Mayo Clinic Ultrasound Research Group and is still in the developmental stages, but the pictures it yields are expected to be more useful, in some respects, than radiographic X-rays. And VA images do not suffer from the "speckle" noise that sometimes makes sonograms hard to interpret.

Aquino's challenge, working in collaboration with medical imaging specialists at Minnesota's Mayo College of Medicine, is to develop computational methods that will help in the interpretation of the current-state pictures from vibro-acoustography—and determine how to use the data for predictions of future changes.

*"Our health-monitoring strategy with co-evolutionary algorithms not only searches for damage scenarios but also evolves tests to be performed on a structure."*

**Above: Corroded bridge columns in Illinois.**

An example of a "natural demand" is ambient vibration in structures, such as truss bridges, that Aquino intends to explore to identify cracks under service conditions.

Because overly instrumented smart structures can be too smart for their own good, Aquino works with a graduate student (Babak Kouchmeshky) and Cornell Engineering faculty members in Mechanical and Aerospace and in Computer Science (Hod Lipson and Josh Bongard, respectively) to reduce the number of sensors and tests by using co-evolutionary algorithms. "Our health-monitoring strategy with co-evolutionary algorithms not only searches for damage scenarios but also evolves tests to be performed on a structure," Aquino notes, "so that its damage state is ascertained with minimal physical testing."

In one project, Aquino is applying machine learning and optimization tools to develop a remote thermal-sensing technique that Civil Engineering colleagues Ken Hover and William Philpot hope can determine the internal strength of concrete structures. The project began when Hover successfully demonstrated that temperature observations on the surface of early-age concrete were strongly correlated to the concrete's strength and geometrical characteristics. Aquino credits a postdoctoral researcher in the Structural Health Monitoring and Prognosis group, William Chirdon, for developing laboratory techniques that measure diffusivity as a function of time in early-age concrete.

His work with computational and sensing techniques in so many kinds of structures impels Aquino to build alliances across an ever-growing list of scientific and engineering fields: computational mechanics, structural engineering, machine learning, optimization, materials science, mathematics, physics, and medicine. His monitoring of physical phenomena also spans the scales of size and time, from the micro to entire structures, from microseconds to centuries.

Centuries is how long concrete in the Hoover Dam needs to last. Aircraft and human bodies can approach the century mark. Or perhaps longer, if their ills can be diagnosed and remedied. The Hoover Dam was designed before engineers thought of embedding wireless monitoring instruments, so most probes of older structures must be noninvasive—from the outside. Science keeps adding to the roster of new techniques for noninvasive probes, and all the instrumentation in smart structures will add even more data.

**Dr. Wilkins Aquino in a research meeting with PhD student Sam Phillips.**

"Our challenge," Aquino says, "is what to do with all that data—how can the data be used to reveal the current state? What can we learn from the current state to help in predicting the future? That's what computational health monitoring is all about."

***– Roger Segelken***



# A Close Look at Environment, Energy, and Transportation Systems

**It seems so straightforward**—the more that people drive their cars and the more trucks that carry the goods that we depend on, the greater tailpipe emissions. The greater tailpipe emissions, the more that the air becomes polluted. The more air pollution, the more ozone in the atmosphere. Right? If that is true, how can it be that on the weekend, when truck and passenger car traffic goes down, the ozone level goes up?

This is the problem—the long-observed ozone weekend effect—that puzzled Assistant Professor **Huaizhu (Oliver) Gao** *(above)*, who has a background in transportation, the environment, statistics, and resource economics. The answer that he tested—the drop in truck traffic, relative to car traffic, is a key factor that stimulates ozone production under certain atmospheric conditions—underscores the complexity of the high-stakes quest for devising environmentally sustainable transportation systems.

It was already known that ozone is formed in the air by photochemical reactions of precursor gases that come mainly from transportation sources in metropolitan areas. There are mainly two of them: volatile organic compounds (VOC), contributed mostly by light-duty vehicles such as cars, and nitrogen oxide (NOX), from significant heavy-duty-truck contributions. Ozone formation is sensitive not only to the absolute magnitude of these two precursor gases but even more to the relative relationship between them.

"On the weekends, although both VOC and NOX drop, the VOC-to-NOX ratio goes up, since the reduction of the gases emitted by trucks is greater than the reduction of gases emitted by cars," Gao explains.

This tested hypothesis has major policy implications, since the current thrust is to reduce diesel-truck emissions.

"The weekend effect is like a virtual experiment of the results of reducing NOX emissions," Gao explains. "We need bigger air quality–simulation models and better transportation-emissions inventories to understand more fully all of what is going on here. In the meantime, things become even more complicated if we also think about another health threat in the air, particulate matter, also known as particle pollution, of which diesel trucks are also an important direct and indirect emission source."

*"Once the environment is contaminated, it is very difficult—and expensive—to clean up."*

Gao, who earned a PhD at the University of California, Davis, joined the CEE faculty in July 2005. The findings of his studies in California, conducted in the most ozone-polluted area in the nation, contributed to the development of state implementation plans—federally-mandated by the Clean Air Act—to promote the optimization of transportation systems, coordination of transportation planning, and air-quality control.

At present Gao continues to examine the role of heavy-duty freight trucks and other diesel-emission sources such as transit buses, construction and port equipment, and locomotives.

"In the past four decades much has been done to drive down emissions from passenger cars so that the cars we drive today are 95 percent cleaner than the cars we drove in the 1970s," explains Gao, noting that transportation still consumes

two-thirds of our imported oil. "The big challenge now faced by the Environmental Protection Agency is to clean up the legacy diesel fleet."

Diesel truck engines and locomotive engines, which form the backbone of the nation's freight-transportation system, are long-lived (20–40 years, respectively) and expensive to retrofit ($6,000 to $10,000). Stricter emission standards are in place for engines built today. To address the emission problems of engines already in use, Gao is working on technological, policy, and financial elements that promote adoption of diesel-conserving, emissions-reducing retrofit devices.

"Right now we have a voluntary diesel retrofit program, but even in California—the state that has always played a leading role in air-quality control—only 10 percent of the fleet has these devices," says Gao.

One of the major challenges of the problem is to develop robust testing procedures to meet federal certification requirements, which require proof that a given retrofit device behaves on the road as it does in the laboratory. Gao applies his expertise in mathematical and statistical modeling to assess the fuel-efficiency and air-quality impact of these devices. His models are designed with the capability of forecasting future effects as well.


"History has shown the urgency of long-term planning," Gao says. Once the environment is contaminated, it is very difficult—and expensive—to clean up. "Just think," he notes, "how better off we would be if the engineers who planned the Interstate highway system 50 years ago had the environmental impact in mind."

It is clear to Gao that engineers can no longer afford to be trained in just one specialty such as civil or environmental or electrical engineering.

"All of us must have a holistic point of view with every problem we are solving," says Gao, who embraced this interdisciplinary philosophy as an undergraduate when he studied both civil and environmental engineering at Tsinghua University in Beijing, China. It was in China's teeming capital, with its legendary traffic congestion and air pollution, that Gao became fascinated with the externality of transportation—the intersection of the environment, energy, and transportation systems. Now it is in the relatively pollution-free environment of upstate New York that Gao hopes to make his contribution to solving a problem where the dual societal demands for unlimited mobility and a healthy environment are on a collision course.

*– Metta Winter*

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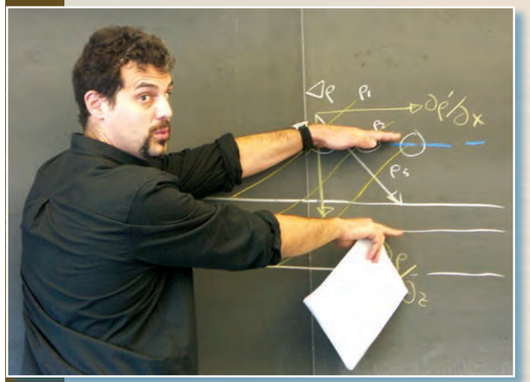
# Understanding Natural Fluid-Flow Phenomena through Spectral Methods



**A little over a year ago Peter Diamessis** couldn't have imagined himself living a landlocked life. Moreover, in his early twenties he could have never imagined being a college professor.

"Back in the day, around age 19 or 20, I thought I'd be a beatnik poet," says Peter Diamessis, assistant professor, who arrived in Ithaca in January as the only scientist at Cornell investigating the physics underlying stratified flows. Since childhood, Diamessis has been fascinated by the way fluids move through space, growing up as he did surrounded by the blue sky and blue waters of his native Greece. In his mid-20s, Diamessis says, he decided that the way to safeguard the sea with which he feels so attuned is to understand what goes on beneath the surface and then use this knowledge to avert trends that are leading to its degradation.

The unique tools that Diamessis brings to his research are what brought him far from those shores to the Finger Lakes. He came here after completing his postdoctoral work in the fluid dynamics group in the Department of Aerospace and Mechanical Engineering at the University of Southern California. Although his undergraduate and graduate degrees are in mechanical engineering, his PhD coursework incorporated a significant component of physical oceanography subjects at Scripps Institution of Oceanography. Motivated by the challenges of his postdoctoral research, Diamessis also has become a largely self-taught expert in spectral methods—advanced mathematical/computer science techniques largely unknown to engineers and oceanographers.

"The two universes of mathematicians/computer scientists and engineers/oceanographers usually don't communicate," Diamessis says. "Because Cornell is more open to new ideas, to new approaches, than many other places, I am valued and welcomed here."

The application of spectral methods to understand natural fluid-flow phenomena and the mechanisms by which they effect the ecosystem has many virtues, Diamessis explains. The past convention has been for scientists to isolate key features of interest and build scaled-down models in the laboratory.

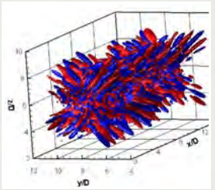
"The problem is that when you want to vary some of these external features, it gets extremely costly because you have to rebuild laboratory facilities," Diamessis explains. "What's more, in a laboratory setting it's very hard to get high-resolution, three-dimensional data that show evolution over time. Numerical simulations of the model flow are the only way to go, yet conventionally used techniques often suffer in terms of efficiency and accuracy."

Spectral methods are the numerical foundation on which Diamessis builds computer models that can accomplish all these goals with great accuracy.

"The results are clean—what you get, you can trust," he says.

Time and cost can be contained through using parallel computing—that is, by distributing the problem among many different interconnected computers, another area of Diamessis's expertise.

The natural phenomena in which he's most interested are fluid turbulence and internal gravity waves in ambient stable stratification. Through solar heating in lakes and in the ocean, fluids naturally form layers that are increasingly heavy with depth. These layers tend to be very stable, preventing vertical transport and hence



Radiation of internal gravity waves (inclined red-blue beams) by a turbulent wake in a stably stratified fluid.

*Diamessis is captivated by another problem that plays a significant role in the health of ecosystems in all types of bodies of water, including lakes—the behavior of internal gravity waves.*

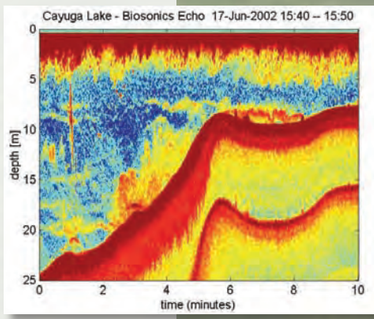
inhibiting the mixing of fluid properties in water. The only way such mixing can occur is through strong turbulent bursts.

Diamessis aims to understand the physics that occurs in turbulence, a highly non-linear state of fluid motion characterized by a very complex, seemingly disorderly flow structure. He passes on the results of studies of individual small-scale turbulent events to other scientists who incorporate the data into the kind of large-scale models of ocean activity used in a variety of practical applications, including weather forecasting.

Diamessis is captivated by another problem that plays a significant role in the health of ecosystems in all types of bodies of water, including lakes—the behavior of internal gravity waves. These waves, which operate well beneath the surface, come in many forms. A typical manifestation is the form of internal solitary waves, which have wavelengths of about a kilometer and sweep along the ocean or lake floor and drive upward all types of material—nutrients, pollutants, naval ordinances, and scientific data-collection instruments, for example.

"These forces are so big, they drive stuff up and throw it around," Diamessis explains. "Even oil companies need to understand the behavior of these waves because they batter the foundations of oil rigs."

Internal gravity waves also can be generated by localized turbulent bursts in a stably stratified environment. As the turbulence is overcome by the restoring effect of the stratification, narrow beams of short-wavelength internal gravity waves are radiated upwards, which can leave a distinct mark on the surface. In parallel with radiating-out internal waves, the initially disorganized turbulence transforms itself into pancake vortices. Diamessis is curious, too, about how these vortices—with notably organized flow structures—are formed.




Beyond his research (and classes that he hopes to design to familiarize engineers with the value and uses of mathematical tools such as spectral methods), Diamessis is eager to make a positive impact on the lives of students, as faculty mentors once did for him.

"At UC San Diego and USC, I found true scholars who nurtured and cared for me. I would like to do the same for others, as a teacher and PhD advisor," Diamessis says.

He particularly wants to exemplify the value of cultivating a multidimensional life as he himself is doing, as an athlete (a one-time competitive basketball player and now an enthusiastic yoga student and hiker), musician (Afro-Cuban percussion), and poet.

"I want to show younger people that you can do engineering without losing these kinds of aspects in yourself," he says.

*– Metta Winter*





## JOSEPH (JODY) DAVID DREYFUSS II '61

Jody and Kathy Dreyfuss

**One afternoon more than 50 years ago** as Jody Dreyfuss stood watching an employee wade her way through a list of 8,000 tenants looking for lease expiration dates, he remembers thinking to himself: "This doesn't make any sense."

That observation and the thought that immediately followed ("what a perfect application for a computer program") was the start of a new day for his family's property management firm.

"What that employee was doing was looking for expiration dates so she'd know to whom to send rent increases," Dreyfuss says. "The computer program I wrote to do that was in use until Y2K."

That program and others to follow—like the one to analyze the variables affecting utility costs during the energy-tight days of the oil embargo of the early 1970s and another that showed which unit sizes were in most demand and hence could be priced most profitably—put the family firm far ahead of the curve in the early adoption of new technologies. In 1968 it became the first business of its kind in the Washington, D.C. area to move from a hand/accounting machine bookkeeping system to an automated/electronic one.

It wasn't that Dreyfuss—who graduated at the head of his class (he credits diligence and discipline more than intelligence)—had any great interest in computers as an undergraduate. (He would, many years later, explore the idea of returning for a PhD in computer science but then discard the notion, preferring a family business to teaching or corporate life.) He hadn't even come to CEE intending to become an engineer.

"I studied engineering not for the sake of engineering itself but because I had an aptitude in math and science, and because engineering was—to a large extent—the basis for construction," says Dreyfuss who, from the age of 16, had been working hands-on in the properties that his father's company managed. "I knew I wanted to do construction and development after I finished college."

And he did just that—on site from 7:30 a.m until 4:00 p.m at warehouses and apartment units, he built, in partnership with his father, his uncle (a prominent Washington architect), and a few other investors of their generation. He also built his own home in 1967.

"Engineering was a great preparation in rigorous thinking," he says. "Particularly in civil engineering we learned to look at a situation and to ask the question: 'How many different ways are there to solve this, and how do I evaluate the options to find the best one?'"

He was well trained to approach and solve problems and thus often served as a primary resource in the company.

"When you manage numerous apartment units, there are many problems that deal with subjects I had studied: settlement problems, walls cracking, roofs leaking, electrolysis in pipes resulting in leaks, ground water leaking into buildings, air conditioning issues, air flow and temperature differentials," he says.

But Dreyfuss found that once the land acquisition, design, and structural plans for the project were complete, he became bored with the rest of the process. In the late afternoons he often found himself back at his dad's office. There, accounting caught his eye. At about the same time his brother-in-law joined the firm with a freshly minted MBA, hot new ideas, and the skills to back them up.

Looking back, Dreyfuss says that it was at this point when he began to see the payoff of his having taken a broad range of electives (among them the graduate-level computer course he'd taken at the Johnson School in his fifth year) in addition to engineering courses.

To write his company's computer programs Dreyfuss learned COBOL, and for 10 years he wrote code while he ran the accounting side of the business.

"My brother-in-law was the rainmaker, and I was chained to the desk," he laughs. "We were a good team like that and built the company to managing more than 32,000 apartment units from Boston to Florida and as far west as St. Louis."

Hard work runs deep in Dreyfuss's family. So does philanthropy. Dreyfuss says that his father set a good example for him by giving generously to various philanthropic endeavors. In turn Dreyfuss has made gifts in his parents' names to a Jewish social service agency in Washington, D.C. and also to endow a library in one of his daughter's schools. In 1986 he spearheaded a fundraising campaign in honor of one of his closest college friends, Craig J. Miller '61, who had died of cancer. The Structural Models Lab, part of the Civil Infrastructure Projects Laboratory in the School of Civil and Environmental Engineering, is named for Miller. Soon there also will be a Joseph D. Dreyfuss II '61 Control Center in the Civil Infrastructure laboratory complex, thanks to a recent contribution that Dreyfuss made.

"It was time again to do something for the institution that taught me the skills that brought me much success in life," Dreyfuss explains.

*– Metta Winter*

# Campaign Update: Renovated Lab Complex Becomes a Reality

**It's a dream come true** for professors like Tom O'Rourke, Ken Hover, and Tony Ingraffea. The large-scale laboratories in the civil infrastructure program soon will be modernized to reflect the use of new technologies and propel the program forward at the School of Civil and Environmental Engineering. Faculty members have waited a long time for these improvements. The newly refurbished spaces promise to create a new paradigm for teaching and learning.

A National Science Foundation grant for earthquake engineering provided the impetus for a concerted fundraising campaign, jump-started shortly thereafter by a lead gift from Class of '36 alumnus Harry E. Bovay Jr., who challenged other CEE alumni to step forward as he had done—and so they did.

"A couple of years ago we began reconnecting with alumni throughout the country and communicating the school's needs and its plans for the future," says Jim Gossett, CEE director. "Our alumni have shown a genuine excitement for our vision and a tremendous responsiveness to our fundraising drive. The school is extremely appreciative for the widespread participation and generosity shown by alumni and friends."

The $4 million phase I goal has been reached, the most ambitious for the school since the building of Hollister Hall in the 1950s. By the time this newsletter is published, construction will have begun, and the transformed spaces are slated to be completed and ready in time for the new academic year.

The school is especially pleased to recognize some of its most illustrious alumni by naming laboratory spaces in their honor: the Joseph D. Dreyfuss II '61 Control Center, the Reed McJunkin '32 Electronics Laboratory, and the Douglas M. Leone '79 Materials Technology Laboratory, all housed within the Harry E. Bovay Jr. '36 Laboratory Complex.

Looking ahead, the school's wish list goes on. Two more laboratories are slated for major improvements—the Environmental Fluids Teaching Lab and the Civil Infrastructure Student Projects Lab, each with price tags over $1 million and construction plans spanning the next two to three years. "We are celebrating one milestone, yet we realize there's more work ahead. I'm confident we will reach our long-term goal," Gossett says.

CEE alumni have many reasons to feel pride in the accomplishments at their alma mater. The school offers a world-class engineering program attracting the best students and the best faculty. "A premier engineering program is not about keeping up with our peers—it's about being ahead of the others, being the best we can be and maintaining that position into the future," says Gossett. "Assuring that our learning facilities are first-rate is an inseparable component of our program, and now we will have that."

## AWARD FOR INNOVATIVE TECHNOLOGIES

The new Engineering Teaching Facility named in honor of Professor Emeritus Dick White, built within the CI Lab Complex and in use for the past year, has received an Editor's Choice Award from **Sound & Video Contractor,** a trade publication. The award recognizes the classroom/lab combo for its innovative technological approach to record and transmit data and video images through high-speed Internet access. The installation is linked to communicate remotely with 14 other earthquake-study centers in the United States that are partners in the George E. Brown Network for Earthquake Engineering Simulation. (For the full story, see http://svconline.com/mag/avinstall_standout_integration/index.html.)



## A SON HONORS HIS FATHER: ROY H. RITTER '30 MASTER OF ENGINEERING FELLOWSHIP

Courtesy of the Division of Rare and Manuscript Collections, Cornell University Library

C. Willis Ritter (Arts and Sciences '62) has established a Master of Engineering Fellowship in memory of his father, Roy H. Ritter, who graduated with a Cornell bachelor's degree in civil engineering in 1930. Roy Ritter had a very successful and distinguished career as a public works engineer in Baltimore, Maryland and Virginia before his death in 1989. Working with the engineering firm of Whitman, Requardt and Associates, Mr. Ritter was a pioneer in the development of large, regional, combined industrial/municipal wastewater treatment facilities.

The Fellowship will provide financial assistance to students enrolled in the Civil and Environmental Master of Engineering Program. C. Willis Ritter's intentions are to provide, through a bequest, an endowment for this Fellowship, which will be given in perpetuity. The first Ritter Fellow is Casey Stevenson, CEE '05, MEng CEE '06.

## PROFESSOR TEOMAN PEKÖZ RETIRES

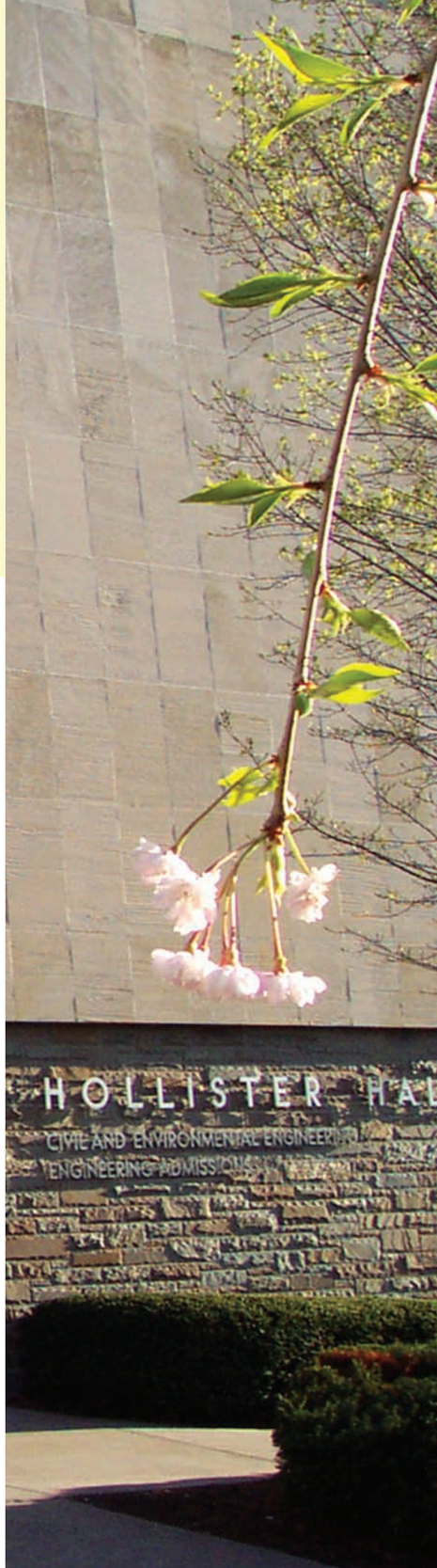
Teoman Peköz received his BS from Robert College in Istanbul in 1958 and MS from Harvard University in 1959 and started working for consulting engineering firms. He came to Cornell as a PhD student in 1964. In 1967, after receiving his PhD from Cornell, he headed off to work on aerospace structures for Raytheon Missile Systems Division in Bedford, Massachusetts. Three years later, Professor George Winter, who had been his PhD thesis advisor, offered him a position at Cornell. Thirty-six years later, Professor Peköz has announced his intention to retire on June 30, 2006.

Peköz's lifelong interests and research have been in the areas of behavior, design, and analysis of cold-formed steel and aluminum structures. In 2003, he received the ASCE Structural Engineering Institute's Shortridge Hardesty Award in recognition of his accomplishments in developing improved solutions to the complex problems of structural stability inherent to that medium. In 1999 he was the recipient of the Center of Excellence for Aluminum Design Award from the Aluminum Association for his work on the aluminum specification. Professor Peköz also was awarded an Honorary Professorship in 1991 from Xian Institute of Metallurgy and Construction Engineering, Xian, People's Republic of China. He is a member of several committees working on steel and aluminum structures in the United States and Europe.

Peköz has served as a consultant for many major companies and institutes. Many of the provisions for cold-formed steel and aluminum design specifications in the United States and abroad are based on the research conducted under his direction at Cornell University.

Professor Peköz has served as advisor on Master of Engineering (Civil) projects, where students have benefited greatly from his leadership and knowledge.

Professor Peköz plans to continue his consulting work both nationally and internationally, in addition to providing the school with assistance from time to time. He has two sons, one an associate professor at Boston University, the other a manager of a series of radio stations in the state of Washington. He is looking forward to retirement and spending more time with his wife, Willeke.




## PROMOTING ACTIVITIES TO BUILD COMMUNITY

The student chapter of the American Society of Civil Engineers aims to institute a community within the school and to provide professional development for its members. They have accomplished this through numerous functions this year.

The chapter participated in two full-day work trips for Habitat for Humanity. The trips allowed CEE students to mingle with residents of Tompkins County, other Cornellians, and students from Ithaca College while making positive changes in the community. The chapter also has diligently worked on a more expansive project for the Ithaca Sciencenter. Last year during the hot and dry summer, concerns arose over the high temperatures at the Sciencenter's mini-golf course. The Sciencenter asked ASCE to design and construct a canopy to provide shade to the players. The chapter is finalizing its design and is expected to begin groundbreaking for the improvement in May.

The chapter once again assumed responsibility for preparing its seniors for the annual Fundamentals of Engineering (FE) Exam. The chapter also has worked to coordinate seven company information sessions with leading engineering firms looking to recruit students for full-time, co-op, and internship positions. This year the chapter hosted "Hollister Homecoming: A Series of Alumni Speakers"—including Mike Nadler '56, Bob Rubin '60, Tracey Thayer Burnett '77, and Alex Vollmer '62, who gave the students some important career tips. The chapter looks forward to making this event a tradition.

## STUDENTS IN SERVICE THROUGHOUT THE WORLD

The students in the Cornell chapter of Engineers for a Sustainable World have been busy this year with several interesting projects.

In January, 16 students and three faculty members traveled to Honduras to check on a water-treatment plant built for a community last year, to meet with Honduran organizations involved in the project, and to meet the mayor and town water board in another town where a water-treatment plant will be built this summer. The team demonstrated technology with a working pilot water plant. The chapter has developed appropriate water-treatment technologies for Honduran communities.

Roslyn Odum '05, who is currently working on an MEng degree in CEE with a focus on rural water supply, was part of the team that returned to Honduras in January. She went back to monitor the plant and visit Hondurans whom she befriended last summer when she worked as a SEED volunteer on the water-treatment plant. Final tests show that the plant is 95 percent efficient. "It was the best we had hoped for," says Odum.

In partnership with Grupo Fenix, a nongovernmental organization in Nicaragua, ESW students have been working on designs for solar ovens to cook school lunches for 80 children at a community school in Nicaragua. Several ESW students visited Nicaragua during spring break to learn the methods and materials being used by the people in Totogalpa to build solar ovens. They will help design the larger ovens that will be used for the school.

The chapter has converted a diesel van to run on vegetable oil. The team is examining the filtration and distribution of vegetable oil for use in diesel engines that have been converted to run on vegetable oil.

In Ithaca students also continue to examine pollutants in Cayuga Lake. The group plans to give a presentation to the Cayuga Water Board this spring on their findings.



# Shifting Earth Might Impact Buried Pipes

Grid lines reveal soil displacement during a test of a four-foot fault on an underground pipe.

**Imagine if you firmly held a straw** at each end, and you slowly moved one hand away from you. The straw would slowly curve, twist, and become oval until it bent.

That's what pipes do in earthquakes.

On April 6 Cornell University researchers simulated an earthquake's effects on gas and water pipes by exerting a 120,000-pound force on a 16-inch diameter, 35-foot-long high-density polyethylene pipe buried in 102 tons of sand in Thurston Hall.

"This is the largest test of ground rupture effects on underground structures that has ever been performed in a lab," said co-principal investigator Thomas O'Rourke, a CEE professor who is affiliated with Cornell's National Science Foundation (NSF)–funded Network for Earthquake Engineering Simulation (NEES) in the School of Civil and Environmental Engineering. "You can't wait for an earthquake or a landslide, so tests like this give us a good idea of how a pipe will behave during large ground displacements."

During catastrophes like earthquakes, floods, and landslides that cause earth to shift, gas- and water-carrying pipes of steel or polyethylene can break, causing fires and water damage.

In the simulation, sensors recorded the pipe movement and how the pipe curved, twisted, and became oval. The data will be used to create numerical models that will allow researchers to improve their understanding of pipe-soil interaction during extreme events.

Michael Palmer, a CEE research associate and NEES project manager, added that the tests could lead to better design practices for lessening impacts and reducing recovery times in the case of catastrophic events. "If a gas pipe breaks during an earthquake, it can cause a fire," said Palmer. "If the nearby water pipe also breaks, the ability to control the fire is greatly reduced."

In the test, the researchers placed the pipe in two large test basins and secured the pipe at each end. The two basins, resembling large waste bins at construction sites, were filled with sand. One basin was held in place while the other was moved four feet in four minutes to simulate a sideways-sliding fault, called a strike-slip fault.

The pipe, buried three feet below the surface, did not break during the test, but the sand, which had a white grid painted on it, shifted, bulged, cracked, and created webbed lines on the surface as the pipe bent.

The test was one of 10 in a four-year, multimillion-dollar project. In the first test with the polyethylene pipe, no sand was used; the second test had the same conditions as the April 6 test, except that a laser-mounted robot traveled inside the pipe before and after the test and measured how the pipe ovaled under stress. The next set of tests will duplicate these experiments with a steel pipe.

High-density polyethylene is thick plastic that bends and reforms. In contrast, low-density polyethylene is the material, for example, from which plastic lawn bags are made. The commonly used pipes can withstand five to 10 feet of displacement without breaking.

Harry Stewart, associate professor of civil and environmental engineering and director of the Civil Infrastructure Laboratories, is co-principal investigator for Cornell's NEES project. Cornell's facility is one among 15 George E. Brown Jr. NEES research laboratories funded by the NSF for construction, expansion, and modernization of the nation's earthquake engineering experimental research. The data from these tests will be archived into NEES for public access.

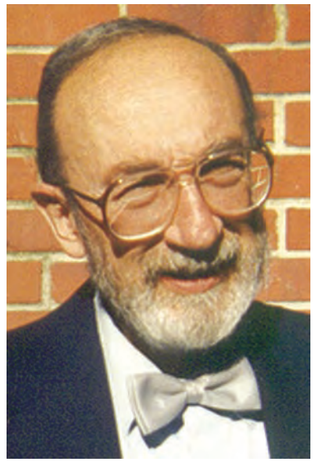
*– Krishna Ramanujan*

Above: Professor Tom O'Rourke; pipe end; Michael Palmer, NEES project manager (left), and Associate Professor Harry Stewart (right).

**Robert (Bob) Garmezy '44 EE, '45 MechE,** passed away on July 22, 2005. He was a long-time friend of the School of Civil and Environmental Engineering.

In 1985 Garmezy and his wife, Alice, enabled the purchase of a Forney high-strength concrete compression testing machine in honor of his father and distinguished alumnus, Samuel Garmezy, CEE '13, who had designed and constructed many important private and public works in the Philippines prior to World War II, including defense-related projects at Bataan and Corrigedor. The machine is used by students who compete to test materials and their quality. To further honor his father, a great Cornell civil engineer, Garmezy and his wife established the Garmezy Prize Fund, which provides a cash award to the student team in an annual competition that annually produces the highest strength concrete, "at the 99 percent confidence level." Garmezy and his wife also endowed a maintenance fund to keep the unit in top shape and properly calibrated.

Garmezy's enthusiasm and his love of the students and the university will be missed. His wife, Alice, will be present at the annual Garmezy Award reception in May, continuing the Garmezy tradition.



**Charles S. ReVelle, PhD '67,** adjunct professor in CEE, passed away at his home in Baltimore on August 10, 2005.

ReVelle earned his bachelor's degree in chemical engineering at Cornell in 1961 and his doctorate in 1967 in sanitary engineering. He served on the Cornell faculty in the Department of Environmental Systems Engineering from 1967–70. In 1971 he went to Johns Hopkins, where he was promoted to professor in 1975. At Johns Hopkins, he participated in the Program in Systems Analysis and Economics for Public Decision Making within the Department of Geography and Environmental Engineering and was jointly appointed in the Department of Mathematical Sciences. In 1975, ReVelle was a Fulbright Scholar at the Netherlands School of Economics at Erasmus University in Rotterdam. From 1993–98, he was a visiting scholar at the Institute for Water Resources of the U.S. Army Corps of Engineers, in addition to his regular Hopkins appointment. ReVelle was the Mary Shepard B. Upson Visiting Professor at Cornell for academic year 2001–02. In 2002, he was appointed adjunct professor in CEE.

ReVelle applied the methods of systems engineering, especially mathematical programming, to problems in many spheres, including water resources, water quality management, the siting of emergency services, transportation network design, epidemiology, the design of nature reserves, and forestry management science. He published approximately 180 journal articles and was the author or co-author of eight books, including five undergraduate texts on the environment that were co-authored with his wife Penelope ReVelle, a biochemist.

ReVelle is survived by two daughters, Cynthia of Boston, and Elizabeth of New Castle, Australia; two brothers, Douglas of Los Alamos, New Mexico, and Jack of Orange, California; and two grandchildren.

**William E. "Whitey" Mullestein '32** of West Chester, Pennsylvania, died at home on April 20, 2005. He was the husband of Dorothy Walsh Mullestein and of the late Louise P. Mullestein.

He was born in 1911 in St. Gallen, Switzerland, to Christoph and Hulda Mullestein. While at Cornell he was a member of the crew team. He actively supported crew and many other facets of the university throughout his life, particularly Cornell Plantations, the College of Engineering, and the School of Civil and Environmental Engineering.

A longtime Chester County resident, Mullestein was active in many civic and community organizations and was a member of the Uwchlan Meeting in Downingtown, Pennsylvania. He worked at Lukens Steel Company for more than 30 years, retiring as chairman of the board and CEO in 1976. During his career Mullestein arranged for the donation of the materials and then mobilized the Lukens mill to donate the shop services needed to fabricate the stainless-steel sundial (designed by Cornell President Emeritus Dale Corson) that has become the gateway piece of the Engineering Quadrangle and the symbol of the College of Engineering.

Mullestein endowed the Louise P. and William E. Mullestein Master of Engineering Fellowship, which is intended to prepare students for civil engineering practice as well as to attract outstanding women to civil engineering. This fellowship has been awarded to students since the 2000–01 academic year.

He is survived by his wife, Dorothy; his sister, Doris Riddell; his daughters, Mary Shuford and Linda Mullestein; and two granddaughters, Rebecca and Virginia Shuford.



# Student, Alumni, and Faculty News

## STUDENTS

**Stephanie Arbelovsky,** currently a PhD student, was quoted in the February 17 issue of *Engineering News-Record* on the "Rebuilding of New Orleans." (Full article is available at www.enr.com/people/ENRNext/archives/060217.asp.)

**Olivia Liu '06** is the recipient of the 2006 Moles Scholarship. This scholarship is given annually to a deserving and academically qualified senior studying civil engineering, who also has high academic standings and expressed interest to pursue a career in the construction industry.

**Mary Williams '07** is the recipient of the 2005–06 Clark Construction Group Inc. Prize. She was selected for her interest and performance in Design of Concrete, Masonry, and Steel Structures (CEE 473), in addition to her outstanding leadership skills.

## ALUMNI

**Jennifer Benaman, PhD '03** has been made a partner in Quantitative Environmental Analysis, LLC (QEA). She leads the firm's water resources and TMDL programs. Her PhD involved research on watershed modeling and quantification of model uncertainty. She worked for QEA before starting her PhD and returned to QEA to manage its Austin, Texas office.

**David Darwin '67, MS '68** received the American Concrete Institute's 2005 Joe W. Kelly Award "for his inspirational teaching of the behavior and design of concrete structures and for his many contributions to advancing design practices through research, technical committee work, and technology transfer activities." Darwin has served on many ACI committees during his 38 years as a member.

**Mohamed Nasser A.N. Darwish, PhD '88** received the American Concrete Institute's Chapter Activities Award-International "for his leadership and promotion of the ACI Egypt Chapter and outstanding service to the concrete industry." Darwish has been a professor of structural engineering at Alexandria University in Alexandria, Egypt, since 1977.

**Charles W. Dolan, MS '67, PhD '89** received the 2005 American Concrete Institute's Arthur R. Anderson Award "in recognition of his outstanding contributions to improving the design of reinforced and prestressed concrete structures through his enthusiastic leadership of many ACI committees and technical groups." Dolan teaches undergraduate engineering design courses at the University of Wyoming in Laramie.

**Donald O. Dusenberry '73, MEng '74,** principal at Simpson Gumpertz and Heger Inc., was elected chair for revisions to the standard American Society of Civil Engineers/Structural Engineering Institute 7, Minimum Design Loads for Buildings and Other Structures. ASCE/SEI 7 is the national standard for building design loads. It forms the basis of the loads provisions for the International Building Code.

**Brian Johnson '99, MEng '00** is a project geologist for ENGEO Inc. in the San Francisco Bay area, working both as a soils engineer and geologist specializing in large-scale residential development projects. He recently acquired his license as a professional geologist and is working towards licensure as a professional engineer and certified engineering geologist. His company, which provides environmental, hydrology, geotechnical, and construction services, is always looking for new talent (internship or full-time employment).

**Keith Kesner, MS '98, PhD '03** received the 2005 American Concrete Institute's Young Member Award for Professional Achievement "for his contributions to the nondestructive evaluation and repair of concrete structures through technical publications and participation on technical committees and for recognition of his national awards in the engineering evaluation and repair field." Since 2004, Kesner has been a project director at Thornton Tomasetti Group, LZA Technology Division, in New York City.

**Drew Lebowitz '05** was recognized as one of 10 finalists for the 2005 Philip E. Rollhaus, Jr. Essay Competition, a worldwide competition on the topic of

roadway safety. He is currently in the Peace Corps, serving in Panama.

**Vassilios K. Mantzavinos, MEng '87** is director of a shipping unit in Piraeus, Greece. He writes that he is happy to be working in the commercial shipping sector and that his engineering background has helped him considerably.

**Dave Martin '94** and his wife recently relocated to Mexico. He is managing a large distributed-power project for GE Energy. The customer is the government-owned utility in Mexico City, Luz y Fuerza. The scope of the project is the turnkey installation of 14 gas-turbine-based power plants around the city to provide power and grid stabilization to the area. The project has a value of just over $400 million and includes the design, procurement, and construction of the plants, as well as the maintenance of the facilities for a period of three years.

**Sami S. Matar, PE, MEng '95** was recently promoted to senior associate with Leslie E. Robertson Associates in New York City. He is currently the project manager for the $150 million Museum of Islamic Art, now under construction in Doha, Qatar.

**Michael S. Rolband '80, MBA '82,** president of Wetland Studies and Solutions, Inc. (www.wetlandstudies.com), announces that WSSI's new office facility in Gainesville, Virginia has been awarded "Gold" status under the U.S. Green Building Council's Leadership in Energy and Environmental Design (LEED) certification system for Commercial Interiors (LEED-CI); its site is also a demonstration of low-impact development.

**Surendra P. Shah**, Walter P. Murphy Professor of Civil and Environmental Engineering at Northwestern University, has been elected to the National Academy of Engineering. He was cited for his work on advanced cement-based materials and for promoting interdisciplinary research and education on concrete materials. Shah is director of the Center for Advanced Cement Based Materials, a National Science Foundation Science and Technology Center based at Northwestern.

**Donald W. White, MS '85, PhD '88** received an award of recognition by the American Institute of Steel Construction for his leadership role in formulating new and improved design criteria for beams and girders. He was also cited for his work on joint, connection, and slab analysis in steel structures. Since 1997, White has been a professor of civil and environmental engineering at Georgia Institute of Technology.

## FACULTY

Two CEE faculty members and a graduate student—**Kok Kwang Phoon, PhD '95; Fred Kulhawy; and Mircea Grigoriu**—were presented the Norman Medal of ASCE for 2005 for their paper "Multiple Resistance Factor Design for Shallow Transmission Line Structure Foundations" in the ASCE *Journal of Geotechnical and Geoenvironmental Engineering* (129(9), September 2003). The Norman Medal is the oldest and one of the most prestigious technical awards of ASCE, having been initiated in 1872. It is awarded for the best paper of the year, judged worthy of special commendation for its merit as a contribution to engineering science. In the history of this award, there have been only two prior awards to Cornell faculty—in 1962 to Bill McGuire and Gordon Fisher, and in 1994 to Bill McGuire, Gregory Deierlein, and Ronald Ziemian.

Professor **Arnim Meyburg** and Senior Lecturer **John Mbwana** received the "Outstanding ITS Project of the Year" award at the annual meeting of the Intelligent Transportation Society of New York, for their project "Capital District Advanced Traveler Information System (ATIS)," for which Meyburg and Mbwana serve as co-principals.

Two CEE faculty members—Assistant Professor **Ruth Richardson** and Professor **Jery Stedinger**—were named by the College of Engineering as recipients of Outstanding Teaching Awards for 2004–05.

**Leslie Banks-Sills,** adjunct professor in CEE and a professor of solid mechanics, materials, and systems at Tel Aviv University, has been awarded the prestigious Hanin Prize for Research from The Technion, Israel. The prize for excellence in aerospace research was established by Ruth Hanin, widow of Meir Hanin, who was a member of the Faculty for Aeronautical Engineering and Space at the Technion Institute. Banks-Sills received the prize for work in "Accurate Methods for Calculating Stress Intensity Factors." Banks-Sills also has been selected for honorary membership in the European Structural Integrity Society (ESIS). Honorary memberships recognize individuals "who have made outstanding original technical contributions to fracture mechanics and good service to the international fracture mechanics community." The award will be presented to Banks-Sills in July in Alexandroupolis, Greece, at the 13th International Conference on Experimental Mechanics.

**Len Dworsky,** professor emeritus, received a certificate of recognition from the University of Michigan's School of Natural Resources and Environment for his lifelong contributions and service to the field of water resources.

**Ken Hover** received the 2005 Chi Epsilon Professor of the Year Award. Each year Chi Epsilon, the Civil and Environmental Engineering Honor Society, awards an outstanding professor or lecturer in the school with the title. Hover also is the 2005 recipient of the Robert E. Philleo Award presented by the American Concrete Institute's Concrete Research Council "for contributions to the understanding of concrete, concrete construction, and quality control of concrete placement." Hover was recognized in the September 2005 issue of *Concrete Construction* as one of "the 10 most influential people in the concrete industry, changing the concrete industry in 2005."



**Mary J. Sansalone, PhD '86**, professor of structural engineering, will become dean of the School of Engineering and Applied Science at Washington University in St. Louis on July 1. As only the ninth dean of the school since 1870, she will oversee approximately 1,100 undergraduate and 750 graduate students, 89 tenured or tenure-track faculty, 60 research faculty, more than 150 adjunct faculty, and more than 300 undergraduates in the joint engineering program with the University of Missouri-St. Louis.

Sansalone has been a faculty member at Cornell since 1987. She holds a bachelor's degree in civil engineering from the University of Cincinnati (1982) and a master's degree in public administration from the John F. Kennedy School of Government at Harvard University (1999).

Sansalone is the recipient of numerous research, teaching, and advising honors. She was named U.S. National Professor of the Year by the Council for the Advancement and Support of Education and the Carnegie Foundation in 1992, and a Weiss Presidential Fellow at Cornell in 1993. She was elected a fellow of the American Association for the Advancement of Science in 2002 and a fellow of the American Concrete Institute in 1999.

**Tony Ingraffea** has been named a 2005 Stephen H. Weiss Presidential Fellow at Cornell, for effective, inspiring, and distinguished teaching of undergraduates. He also has been named co-editor of *Engineering Fracture Mechanics*, beginning with volume 73, January 2006, joining Prof. Karl-Heinz Schwalbe of GKSS Forschungszentrum, Germany.

**Fred Kulhawy** has been selected as the recipient of the 2005 Karl Terzaghi Award, one of the highest awards (along with the Terzaghi Lecture) of the ASCE Geo-Institute. Kulhawy also was elected an Honorary Member of ASCE, the highest membership award of the society. Only eight people were elected this year to honorary membership, joining only 534 other Honorary Members in the 153-year history of ASCE. The Structural Engineering Institute of ASCE selected Kulhawy as the recipient of the 2006 Gene Wilhoite Innovations in Transmission Line Engineering Award. He is the first geotechnical engineer to receive this award. And Kulhawy also was honored recently by the Ithaca Section of ASCE as its 2005 Engineer of the Year.

**Phil Liu** has been elected as Fellow of the American Geophysical Union, one of the few honors that AGU confers. Fellowship is awarded to scientists who have attained acknowledged eminence in one or more branches of geophysics. Liu delivered the "Sears Lecture" in August 2005 at Woods Hole Oceanographic Institution, sponsored by the WHOI Geophysical Fluid Dynamics Program. His talk was titled "The Great Sumatra Earthquake and Tsunamis in the Indian Ocean."

**Bill McGuire,** professor emeritus, was honored at the annual meeting of the American Institute of Steel Construction, receiving the Structural Stability Research Council's 2005 Lynn S. Beedle Award. He was recognized for being a worldwide leader in stability research and in the design of structures with significant stability issues.

**Art Nilson,** professor emeritus, has received the highest honor given by American Concrete Institute, Honorary Membership. This award is "for his outstanding teaching and research and for his contributions as the co-author of the textbook *Design of Concrete Structures*."

**Mary Sansalone** is the recipient of the Kendall S. Carpenter Memorial Advising Award. This award was established by Cornell Trustee Stephen Ashley '62, MBA '64 in honor of his former Cornell advisor and in recognition of the importance of undergraduate advising.

**Tom O'Rourke** has been named to a panel convened by the National Academy of Sciences and National Academy of Engineering to study the effects of Hurricane Katrina and the adequacy of the hurricane-protection infrastructure in New Orleans.

**Mark Turnquist,** as part of a team from General Motors, has won this year's Edelman competition. The Franz Edelman Award for Achievement in Operations Research and the Management Sciences is an award given by INFORMS (Institute for Operations Research and the Management Sciences) to recognize outstanding implemented operations research that has had a significant, positive impact on the performance of a client organization.

### CONTACT CEE WITH YOUR NEWS

We would like to hear from you about your accomplishments, awards, and activities so we can tell faculty, students, and other alumni. Please send your news to ceeinfo@cornell.edu or:

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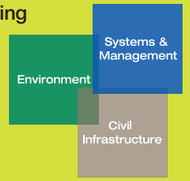
607-255-3690




www.cee.cornell.edu

UPCOMING EVENTS

# Reunion 2006: June 8–11

## Saturday, June 10

**Alumni Breakfast Buffet:** Plan to attend this year's CEE Alumni Breakfast—especially if it's your reunion year. The breakfast will be held from 7:30 to 9:30 a.m. in McManus Conference Center, Hollister Hall. Breakfast attendees are invited to attend a brief dedication of the Harry E. Bovay Jr. '36 Laboratory Complex immediately following the Alumni Breakfast in the foyer of Thurston Hall.

## Save the Date

Saturday, October 14, 2006
(Homecoming Weekend)
Open House Celebration of the completed Laboratory Complex renovations. Details to be announced.

**Top: CEE alumni enjoying the 2005 Reunion Breakfast. At left, bottom; Professor Richard White and Rich Gallagher CEE '76 at Homecoming 2005. At right, bottom: Alumni in the Teaching Facility.**


Cornell University
School of Civil and Environmental Engineering

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