CEE@Berkeley Connections

Fall 2010

CIVIL AND ENVIRONMENTAL ENGINEERING | UNIVERSITY OF CALIFORNIA, BERKELEY

**CHAIR'S MEMO:**

## Dear CEE Alumni and Friends,

Lisa Alvarez-Cohen

**It's an exciting time for civil and environmental engineering at Berkeley—the department has had another incredibly busy and productive year. We've come through a challenging time of budget cuts and reorganization and have emerged an even stronger and more cohesive department. Initiatives that have emerged from this past year are truly impressive and will serve the department, and in turn, society, for many years to come.**

**One such initiative is the new *Cal Student Leadership Endowment*. CEE's Advisory Council created this endowment to support the extensive student activities throughout the department and to relieve some of the pressure on students to fundraise in support of these activities, freeing up time and energy to build on that creative edge that sets our students apart in everything they do. By initiating this endowment, Council members have demonstrated their commitment to supporting our department and to promoting leadership skills in our students.**

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## How to Support CEE

**Visit www.ce.berkeley.edu and choose "Make a Gift to CEE." If you would like to designate what your gift should support, note this in the Special Instructions section.**

# New Endowment Helps Students Develop Competitive Edge

The CEE Advisory Council has established a new Cal Student Leadership Endowment (CSLE) with the goal to provide long-term funding for CEE student groups.

**Students participate in competition teams, host field trips, and perform community service.**

"These groups are exploding with activity, and they have a track record of success," says Rudolph "Rudy" Bonaparte (CE M.S. '78, Ph.D. '81), Advisory Council chair. "We want to create an environment where this energy can always thrive."

The need for an endowment was acutely apparent this past year, given the tough economy and the high level of success of the student competition teams at the regional and national levels. Students spent more time than ever making phone calls for donations. They were anxious about how they were going to transport their entries, as well as themselves, to national competitions.

"Berkeley students are competing at the highest level in all that they do. They need as much time as possible to focus on the creative edge that will give them the win," says Joan Chamberlain, CEE undergraduate student advisor.

"For example, students on this year's steel bridge team faced the choice of whether to make more phone calls or perform another bridge test. Testing was important, but so was getting the team to Indiana for the national competition," she explains.

That's where the new endowment will help. Funds from CSLE will decrease the pressure on students to fundraise so they have more time to focus on group activities.

"Fundraising will always be part of the competition team experience," says Joan, "but it would be ideal if students only needed to close the gap instead of having to raise most of the funds they need every year."

CSLE will also help ensure that all students can participate in groups regardless of their ability to pay.

### Graduate Groups

- CEE Graduate Student Society
- Women of SEMM

### Undergraduate Groups

- Professional Development Certificate Program
- ASCE Student Chapter
- Chi Epsilon Honor Society
- Steel Bridge Team
- Concrete Canoe Team
- Environmental Team
- Construction Team
- ITE Student Chapter

For example, ASCE field trips often require a fee. Having an endowment to cover such fees will allow more students to participate.

"You would no longer see students who could not afford the cost just not showing up," says Joan.

Participation in CEE's 8 undergraduate groups and 2 graduate groups has doubled in the past 5 years, and students are more engaged within each group. Groups sponsor functions where faculty, students, and alumni get to know one another and first-year students meet seniors.

Field trips, peer advising sessions, community-building activities, and the new Professional Development Certificate Program all contribute to a buzz of excitement in Davis Hall. Incoming students often choose civil and environmental engineering because of this activity, attracting a stream of talented new students to the department each year.

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## CHAIR'S MEMO

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**In this issue, we invite you to read about the philanthropy of three individuals, Council members David Friedman and Robert Wadell, and long time friend, alumnus Dr. Awtar Singh. David, along with his wife and family, donated funds to support a *Faculty Chair in Earthquake Engineering Excellence,* as part of the Berkeley Hewlett Challenge. Robert established the *Robert P. Wadell, P.E. F.ASCE Endowed Scholarship Fund* to assist Berkeley undergraduate students with financial need. And Dr. Awtar Singh has been a devoted friend of CEE students over the years through the *Awtar and Teji Singh Fellowship*.**

**We have revitalized our Structures Laboratory by investing in state-of-the-art equipment upgrades and by hiring talented new staff members. A web page devoted to describing the upgraded facilities has been linked to the departmental web site and large-scale tests conducted in the laboratory can now be filmed and documented for possible upload or streaming on the Internet. The upgraded Structures Laboratory is currently available for service-to-industry projects as well as research projects, and a flurry of future activity is expected.**

**No issue would be complete without a shout out to the student competition teams. Steel Bridge placed second at Nationals, and Environmental placed first at its regional competition. Construction and Canoe did not make it to the podium this year, but both teams were commended for being innovative, even if Canoe's innovation resulted in a dramatic and heartbreaking end to their pursuit of glory.** **(See page 7.)**

**One exciting development is the recent release of the National Research Council (NRC) rankings of doctoral programs. The NRC generally ranks graduate programs every twelve to fifteen years (the last was in 1995). I am extremely pleased to announce that our CEE program took the top overall regression-based ranking in the country out of a field of 130 Civil and Environmental Engineering programs! This is a tribute not only to the fine faculty, students and staff in the department, but also to the successful, innovative and energetic alumni who have graduated from this program over the years. You should all be very proud of this achievement.**

**We thank you and join you in a hearty Go Bears!**

**Lisa Alvarez-Cohen**
**Fred and Claire Sauer Professor of Engineering and Chair**
**Civil and Environmental Engineering**

# A Long-Lasting Legacy of Experimental Excellence in the Structural Testing Laboratory of Davis Hall

The CEE Structures Laboratory located in Davis Hall of the UC-Berkeley campus, together with its sister laboratories of the Pacific Earthquake Engineering Research (PEER) Center and nees@berkeley located in Richmond Field Station, continues the long-lasting UC-Berkeley legacy of pioneering new experimental and numerical modeling techniques and structural assessment methods.

At the CEE Structures Laboratory one can conduct conventional tests using the lab's uniquely large strong floor, flexibly-configured reaction systems, and variety of actuators and modern instrumentation devices and sensors. The facility is capable of inducing forces ranging from few pounds to millions of pounds. It can apply and measure deformations ranging from a few thousandth of an inch to tens of inches.

The testing capabilities of the CEE Structures Laboratory is expanding to include modern techniques for hybrid simulation methods that combine physical and analytical sub-structures into a hybrid model of the entire structure using state-of-the-art digital controllers, the Open-source Framework for Experimental Setup and Control (OpenFresco), and the latest finite element models built using the Open System for Earthquake Engineering Simulation (OpenSees) framework.

**Above: West end of the laboratory showing a test setup for a full-scale steel beam-column joint. Left: East end of the laboratory showing construction of full-scale reinforced concrete beam specimens.**

The Structures Laboratory houses equipment for studying the behavior of structural elements and systems both on scale models and prototypes. The available equipment ranges from miniaturized precision devices to a four-million-pound capacity testing machine. Studies range from detailed stress analyses to both static and dynamic tests on full-sized structural systems. A well-equipped machine shop and electronic shop complement the laboratory facility.

Laboratory staff members are able to create specialized test fixtures, complex and large test setups, and a variety of detailed instrumentation networks. They are able to fabricate complex test specimens for structural components and systems made of steel, reinforced concrete, masonry, adobe, wood, composites, and other materials. Instrumentation available in the laboratory ranges from simple mechanical indicators to a high speed computer-controlled data acquisition systems.

The mission of CEE's Structures Laboratory is to provide the means to advance the field of structural engineering through cutting-edge research activities, to support the profession of structural engineering by solving practical problems, to educate the next generation structural engineers through laboratory demonstrations in undergraduate and graduate courses, student-taught experimental and hands-on-experience classes, and semester-long courses on experimental methods in structural engineering.

The CEE Structures Laboratory is available to all researchers, professionals, and clients from industry to solve basic and applied problems in structural engineering.

**For more information regarding CEE's testing facilities and capabilities, to schedule a visit or request a quote for an upcoming test, contact Laboratory Manager, Joel Carr at 510.642.4309 or Vice Chair for Research and Technical Services, Professor Khalid Mosalam at 510.643.4805.**

# New Faculty Chair in Earthquake Engineering Excellence

A major gift to UC Berkeley has endowed the Faculty Chair in Earthquake Engineering Excellence within the Department of Civil and Environmental Engineering. This Chair was created with generous philanthropy from David A. Friedman (CE B.S. '75), along with his wife Paulette J. Meyer, Phyllis Friedman, and Ted and Francis Geballe, as well as a matching gift from the William and Flora Hewlett Foundation, as part of Berkeley's Hewlett Challenge.

David A. Friedman

David is the immediate past President and CEO of Forell/Elsesser Engineers and current Board chair and is one of the founding members of CEE's Advisory Council. He has served as Project Principal on a variety of new design and retrofit projects including community and civic facilities, university complexes, research laboratories, and transportation facilities. Currently, he serves as the lead engineer on the seismic retrofit of California Memorial Stadium. He also serves as a trustee of the UC Berkeley Foundation.

David has always been a strong supporter of the CEE department. "CEE's faculty, its graduate students, and its high quality research programs are all focused on the pressing issues of the day," he says. "It is amazing how many societal challenges need civil and environmental engineering solutions."

He also recognizes the importance of maintaining excellence. "Competition is fierce for faculty and graduate students, and support for CEE is imperative to keeping the United States at the forefront of the field of civil and environmental research and education. CEE has taken a pre-eminent role in advancing the research and science of earthquake engineering, past and present.

"My own career in structural and earthquake engineering, and that of my colleagues at Forell/Elsesser Engineers, have been greatly enriched by the collaboration with the esteemed faculty at CEE. This endowed chair will hopefully assist CEE in sustaining its excellence in earthquake engineering research and education well into the future."

Chair Lisa Alvarez-Cohen says, "We are extremely grateful to David, Paulette, and their family for the gift of the endowed chair, which will benefit the field of earthquake engineering now and for decades to come. Moreover, the funds from the chair will offer important support to both our faculty and graduate students. Through his work with the Advisory Council and his philanthropy, David is one of the strongest advocates of our department and of our students. We are the fortunate recipients of the generosity of David and his family and of David's vision for the future of CEE."

# New Wadell Scholarship for Undergraduates

Robert Wadell, a member of the CEE Advisory Council, together with his wife Angela have established the Robert P. Wadell, P.E. F.ASCE Endowed Scholarship Fund to assist Berkeley undergraduate students who show financial need. Preference for the scholarship will be given to undergraduate students in Civil and Environmental Engineering.

Robert P. Wadell

Bob Wadell received his B.S. in Civil Engineering in 1967 and his M.S. in Civil Engineering in 1968 from UC Berkeley. While at Cal, Bob was encouraged to pursue graduate studies by Professor Emeritus Carl Monismith and Robert Horonjeff. He was also encouraged to become a member of ASCE. To this day, Bob has continued his participation in ASCE as a Fellow.

After graduation, Bob gained experience at several large engineering firms in the Bay Area. In his late twenties, he started his own company, Wadell Engineering Corporation, which specializes in airport planning, engineering, and management consulting to civil and military airports. Bob credits the highly respected reputation of UC Berkeley and ASCE as the foundation for Wadell Engineering Corporation's continued success completing airport projects around the world.

Bob hopes that this scholarship will provide for the creation of outstanding civil engineers through opportunity. "CEE attracts the best faculty and the most eager and outstanding students. The type of education it provides is not just desired but mandatory for future success."

Chair Lisa Alvarez-Cohen says, "This gift will benefit our most gifted students, promoting a bright future for civil and environmental engineering education. Bob continually demonstrates his belief in our students."

## Nancy Love and Rhodes Trussell Join Advisory Council

Nancy Love

**Nancy Love, Chair of the Department of Civil and Environmental Engineering at the University of Michigan, and Rhodes Trussell, founder of Trussell Technologies, Inc. joined CEE's Advisory Council in Spring 2010.**

**Nancy Love took over as Chair of CEE at the University of Michigan after teaching at Virginia Tech for fourteen years. Her research focuses on environmental biotechnology and water quality with an emphasis on engineered treatment systems. She focuses on the fate of chemical stressors in these systems and the use of technologies to sense and remove these chemicals.**

**"UM and Berkeley have multiple similarities, including being in states that are particularly impacted by the economic downturn in the US," says Nancy, "I hope that the combination of my experience of being chair of another CEE department combined with the expertise already represented on the Council will help both schools' programs weather the economic storm.**

**"However, despite facing difficult economic times, CEE continues to shine as an academic leader in our field," she adds, "Graduates from CEE at Berkeley are among the most influential in practice and academia around the world."**

Rhodes Trussell

**Rhodes Trussell (CE B.S '66., M.S. '67, Ph.D '72) is the founder of Trussell Technologies, Inc. He is an authority in methods and criteria for water quality and in the development of advanced processes for treating water or wastewater to achieve the highest standards.**

**Rhodes has served on the EPA's Science Advisory Board, and serves on the Membership Committee for the National Academy of Engineering, and as Chair of the Water Science and Technology Board for the National Academies. In 2010, he was awarded the A.P. Black Award from the American Water Works Association.**

## In Memoriam: Hugh D. McNiven

**Hugh Donald McNiven, professor emeritus of civil and earthquake engineering, died of heart failure on December 7, 2009 at his home in Berkeley, California. He was 87.**

**Hugh was a professor in Berkeley's Civil and Environmental Engineering Department from 1957 to his retirement in 1991. He was director of Berkeley's Earthquake Engineering Research Center between 1980 and 1985. He also served as president of the University Art Museum and on numerous University committees.**

**An author of over 100 scientific research papers and books and a well loved lecturer, Hugh worked in the area of mathematical modeling of structures during earthquakes and the mechanics of solids. He was a member of ASCE, ASME, Sigma Xi, and the International Society of Biorheology. In 1971, Hugh was elected a Fellow of the Acoustical Society of America.**

**"Hugh was a good colleague with a fine sense of humor," said Professor Emeritus Karl Pister.**

**Born August 6, 1922, in Toronto, Ontario, Canada, Hugh McNiven was the second of three children born to James McNiven and Pearl Beatrice Mary (Jackson) McNiven. He graduated from Etobicoke High School, and attended the University of Toronto (class of 1944). In addition to serving in the Canadian Army, Hugh obtained a masters degree from Cornell University (1949) and a doctorate from Columbia University (1957). He married Marion Elizabeth Fitzhugh in California on September 12, 1959. After retirement, Hugh pursued his love of antiquarian book collecting.**

**He is survived by his wife, Marion; his daughter, Carolyn Fitzhugh McNiven; his grandsons, Charles Lee and James Henry; and his sister, Kathleen Compton.**

**Visit UC Berkeley's In Memoriam tribute to Hugh D. McNiven at: universityofcalifornia.edu/senate/inmemoriam/hughdonaldmcniven.html**

# Lessons from Chile's 8.8 Earthquake

Chile's magnitude 8.8 earthquake on February 27, 2010 was the 5th largest earthquake since 1900. Its effects were felt along 600 km of the central Chile coast. Strong shaking lasted for over a minute in some areas. Widespread damage occurred in some cities, killing hundreds of people. Aftershocks contributed additional damage to an already fragile infrastructure.

Soon after the quake, CEE faculty members Jonathan Bray, Jack Moehle, Juan Pestana, Ray Seed, and Nicholas Sitar, along with graduate students Katherine Jones and Gabriel Candia, went to work to study its effects, as part of a larger effort to document the damage and analyze what held up and what failed.

"It is important to use natural disasters such as this one to improve our understanding and help prepare for future earthquakes in California and the Pacific Northwest," says Jonathan Bray, who co-led the NSF-sponsored Geoengineering Extreme Events Reconnaissance Association (GEER) team.

GEER team members included engineers, geologists, and scientists from Chile and the United States. The team analyzed satellite images and selected critical sites for further investigation on the ground.

The earthquake tested modern buildings in Chile constructed to seismic codes comparable to those in California. The team found that most engineered buildings performed well, although some did not. Poor performance was often the result of construction deficiencies or design oversights related to structural detailing.

**Liquefaction and Lateral-Spreading Induced Damage at the Port of Coronel (GEER, 2010; S37.0287°, W73.1500°; 03/17/2010)**

The team also found that soil played a significant role. "Buildings, bridges, railroads, highways, ports, and other facilities built on weaker soils suffered more damage as the ground liquefied during shaking," says Jon. For example, ground failure displaced and distorted waterfront structures, which impacted some of Chile's key port facilities. Damage to some sections of Ruta 5, the primary North-South highway in Chile, disrupted the flow of supplies and traffic after the quake.

All of the team's findings will help engineers, urban planners, and government officials plan for, respond to, and rebuild after a major earthquake. "We don't want a repeat performance here," says Jon.

# Meet Mike Riemer

"Juggling is an important job skill," says Mike Riemer, the only person in CEE who is a member of the faculty, a member of the staff, and a researcher.

**Mike Riemer**

As faculty, he teaches classes in soil properties and design; as staff, he manages the geotechnical labs; as researcher, he supports experimental projects and collaborates with partners in industry.

And in his spare time, Mike serves as faculty advisor to Chi Epsilon, the undergraduate honor society.

In 2007 and 2009, Mike received the Arthur Chiu Outstanding Faculty Advisor Award from the National Chapter of Chi Epsilon. He was nominated for the award by his Chi Ep students, who wanted to recognize Mike for the long hours he put into their meetings, and, to quote his nomination letter, "mentoring them to be the best they can be."

How does he do it all? Mike is also, for real, a juggler. His act of juggling everything from bowling balls to cigar boxes is one of the most highly anticipated events at the annual ASCE faculty-student talent show.

## Most Satisfying Part of His Job

**I get a lot of satisfaction out of developing new testing equipment and procedures. It is a great feeling to design and assemble (or even just modify or repair!) a testing system that provides the data that we are looking for.**

# Alumni Profiles: Awtar Singh

"I want to take good students and make them better," says Dr. Awtar Singh, CEE alumnus and donor of CEE's Awtar and Teji Singh Fellowship.

Awtar established the fellowship in memory of his late wife, Teji, a Montessori teacher for over 20 years. "Teji and I shared a lifelong interest in education."

In fact, Awtar once volunteered to help students with math in Teji's Montessori school, with a lecture titled, "How to be friendly with numbers."

"I asked the students for their favorite numbers. No hands. I asked them for their favorite colors. Four hands. Favorite car? Every hand went up. Finally, one girl said that her favorite number was 2. I asked why. She said 2 was easy to use, to add, multiply, etc. She knew where she was with 2. At the end of the class, we were discussing applied math."

Born in Pakistan, Awtar Singh moved to the U.S. in the early 1960s. He came to Berkeley at age 35, having been in the construction engineering business for several years. After earning his Ph.D. from CEE in 1966, he went on to teach at UCLA until co-founding Lockwood-Singh & Associates in 1972. The firm completed more than 5,000 geotechnical and geological projects before Awtar sold the company in 2000. He currently is a consultant and expert witness in the field of geotechnical forensic engineering.

But his passion is promoting higher education at his old schools: PEC University of Technology (formerly Punjab Engineering College) in Chandigarh, India; the University of Colorado at Boulder; and UC Berkeley.

The Singh Fellowship supports outstanding graduates of PEC who want to pursue a master's degree in civil and environmental engineering at Berkeley. "I connected my two old schools so that students can get an education like I did."

Since 1999, 12 students have received the Singh fellowship. Awtar keeps in touch with them and remains curious about the careers they pursue—everything from working for the United Nations to designing bridges or starting their own companies.

Each year, Awtar travels to Berkeley to meet the new fellowship recipient. He also helps recipients connect with resources.

At a recent reunion of all the Singh fellowship recipients (along with their wives, husbands, girlfriends, and boyfriends) in San Francisco, 25 people showed up. "Their families have become connected. They meet and they are friends for life now. They stay in touch."

**From L- R: Arvinder Chopra, Swati Verma, Deepansh Kathuria, Tilak Dhir, Shruti Malik, Geeta Brara, Aseemita Malhotra, Pardeep Saini, Preeti, Nimrat Bhattal and Dr. Awtar Singh.**

## Most Impressive Thing About CEE Students?

How enthusiastic and well-rounded they are. Their enthusiasm extends beyond the classroom to all sorts of extra-curricular projects and jobs. They are remarkable at balancing those other time commitments with the demands of their studies.

## What is New in Chi Epsilon?

Chi Ep is thriving! Our branch has begun to host weekly study sessions for CEE undergraduates and experienced seniors provide peer advising to help new students learn the ropes. They host résumé workshops, industry info-sessions and career nights, as well as popular social events and banquets. Former leaders have stayed involved even after graduation, which gives us all great momentum.

**Mike juggles cigar boxes in annual ASCE talent show.**

## What Should CEE Alumni Know?

There are so many opportunities for involvement! The student groups increasingly focus on preparing students for the profession of civil engineering. They welcome alumni to come in and give their perspectives.

## Franklin Receives His Hood After 40 Years

**Lisa Alvarez-Cohen and Andy Franklin**

**In 1970, all of Cal's graduation exercises were cancelled due to escalating concerns about antiwar protests. One of the graduates that year, Herbert "Andy" Franklin, approached the College of Engineering to ask if he could, after 40 years, finally walk across the stage for a formal conferral of his degree.**

**Andy had earned his Ph.D. in the Structural Engineering, Mechanics and Materials program of CEE. He went on to a successful career with Bechtel, where he worked on projects ranging from forensic engineering, robotics in construction, unusual structural designs to even studies of resources on the Moon, until his retirement in 2004.**

**On May 16 in 2010, Andy Franklin participated the College of Engineering Commencement. He assembled backstage, in regalia, with the other CEE Ph.D. candidates. At the time of his conferral, Chair Lisa Alvarez-Cohen announced:**

> ***We would now like to recognize an honorary member of the Class of 2010. Herbert A. Franklin completed his doctorate in civil engineering at Berkeley in 1970. At that time, hundreds of colleges had cancelled their graduation exercises over concerns about violent student protests against the Vietnam War. UC Berkeley was among them. Today, on the 40th anniversary of his graduation from Berkeley, we would like to formally confer the Ph.D. to* Herbert Alexander Franklin*. He will be hooded by* Paulo Monteiro*.***

**Andy said afterwards, "The delay of 40 years happened to have a fortunate side in that my children and grandchildren could witness an event that otherwise they wouldn't be around to see.**

**"While we were on campus after the ceremony many people approached me to say gracious things about the event. Comments and good wishes continue to roll in from family and friends around the world."**

## ITE: Hub for Transportation Undergrads

**Berkeley's ITE student chapter was organized in 2008 in order to give undergraduates a bridge between transportation in academics and real life practices.**

**"Learning about new topics and acronyms in the field is like learning a new language, and Berkeley ITE is like an "English to Transportation" translating dictionary," says Thomas Wong, ITE president.**

**This year the chapter hosted field trips to the Bay Bridge and the San Francisco MUNI Transportation Management Center. They also organized a scavenger hunt that created a lot of enthusiasm for transportation when a large crowd gathered to watch participants run around searching for BART passes and asking strangers on their motorcycles for rides.**

**Cal ITE Officers for Fall 2010 L to R: Thomas Wong, Katie Leung, Francis Chen, Alan Uy, and Kawai Mang.**

**When I take a look at my résumé, I realize that 60% of my experiences come from being in Cal ITE.**

**Next year ITE will focus on expanding its membership base to include non-engineering students who are interested in some aspect of transportation. They will also concentrate on showing members how important they are to ITE by sponsoring their attendance at events and conferences.**

**"When I take a look at my résumé, I realize that 60% of my experiences come from being in Cal ITE. That's when I realize how much Cal ITE has shaped my life," says Thomas. "And to think that I found out about the organization from a flier in Davis Hall."**

# Second at Nationals!

CEE's Steel Bridge, *BEARicade,* placed second among 46 teams at the National Student Steel Bridge Competition at Purdue University on May 28 and 29. Berkeley placed first in the stiffness and efficiency categories, coming in second overall behind North Dakota State.

**2010 CEE Steel Bridge team**

Andrew Wagner, project manager, said the team decided this year it would focus on creating a bridge that was ultra stiff, yet still constructible. Berkeley has a history of building stiff bridges, the team placed in the top 10 for stiffness in the past four years.

Several schools at Nationals chose a simple deck span design for their bridges. They banked on scoring a really fast construction time which is more possible if the bridge design is simple and easy to assemble.

Berkeley, however, decided on a more complex design involving a modified truss structure, in order to achieve that superior stiffness.

The underarch design that ultimately gave Berkeley the win in the stiffness category would not have come about if the team had not stepped out of its comfort zone.

"Sometimes the members who have been on the team for a while get stuck in the mindset of staying conventional," says Andrew, "They dismiss a new idea because their engineering judgment says it wouldn't work."

But the idea for the winged underarch design came from team members who did not recognize the usual limits. They only saw a problem, the bridge envelope, and came up with the winged underarch design as a possible solution.

The team also experimented with using a slip-and-lock system for its connection scheme. Due to fabrication limitations encountered in the machine shop, the team needed an alternative to its T-slot scheme. They remembered seeing another school use the slip-and-lock at the previous Nationals, so they decided to try it.

"We had never used a system like this before and we had no prior knowledge how to make it work. When we fabricated a prototype and realized it would work, we knew we could use larger tubes in our design and increase our stiffness and efficiency," says Andrew.

**Watch the Bridge Team construct BEARicade at http://www.youtube.com/watch?v=ZIMUCHB780w**

# Environmental Takes First at MidPac

**2010 CEE Environmental Team**

The Environmental team shared a sweet moment at MidPac when judges told members that their treatment system, *CAL Before the Storm,* worked so well that even water sampled at the end of the treatment period was clean enough to earn Berkeley the win.

The team went on to compete in the first national-level environment competition ever held, the Water Environment Federation Wastewater Challenge, where they placed third.

"Winning is recognition for our hard work," says Nick Lee, project manager, "but getting students excited about water quality and water-related engineering is the whole point of the competition."

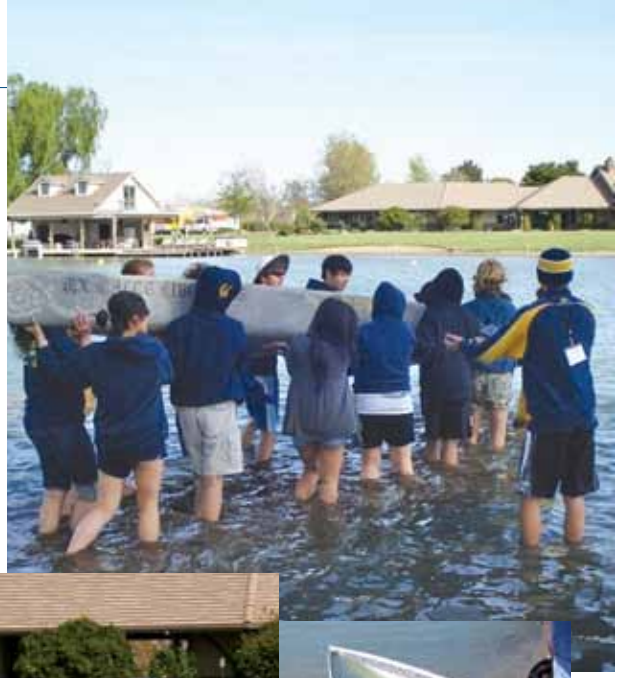
As part of their outreach this year, the team tabled at Berkeley's eco-themed PlayGreen Festival, presenting the treatment system while discussing sustainability in design and engineering. At Cal Day they talked to prospective students about what Cal could teach them about sustainability.

This year saw a new collaboration between CEE's Environmental and Canoe teams. Environmental lent Canoe last year's water treatment system to treat and recycle the dirty water for their concrete mixing. A Canoe graphic artist helped Environmental produce its design paper.

"If you take people who are passionate about the same things and put them together, you are bound to spark creativity and friendships," says Nick.

# Sinking to New Heights of Knowledge

Concrete Canoe suffered heartbreak at its Mid-Pacific regional competition, when its entry, *Ex CALce Liberatus*, broke in half as it rounded the first corner in the first race.



**Above: Team carries *Ex CALce Liberatus* to first (and last) race. Left: Back to the drawing board.**

"We watched in shock," said Justin Buetel, project manager. "All that time that the construction team and the graphics team and the paddling team had put in during the year... suddenly, it was all gone.

"Berkeley had won Nationals the year before, and then this year? our canoe broke."

The reason behind the break was the geopolymer mix of fly ash and slag that was chosen for the *Ex CALce Liberatus* mix. Over the last few years, canoe competition rules have placed increasing emphasis on sustainability, encouraging teams to use mixes that relied less on Portland cement.

"We decided to push the envelope and use no Portland cement," said Justin.

When tested in the usual battery of tests, the geopolymer performed as well as mixes containing Portland cement. However, after the canoe broke and the team began its analysis of what went wrong, they concluded that the geopolymer mix did not perform as well when cast.

"We learned that if we change anything, we need to make sure it works not just in testing but in the actual product."

After the initial shock wore off, the team came together and resolved to participate in the competition to the fullest extent possible.

Berkeley was still slated to compete in the presentation portion of the competition on the day after the canoe broke. The night before, the team got together and figured out what they wanted to say. They removed the section on how great the geopolymer mix was and substituted why they thought the mix had failed and what they had learned from the process.

**We saw the competition through to the end. This was the best part for the whole team.**

Other schools thought Berkeley would not show up for their presentation; they thought Berkeley would have left the competition after the race.

"But we didn't leave. We saw the competition through to the end. This was the best part for the whole team. We pulled together and saw it through to the end," says Justin.

Professor Paulo Monteiro, faculty advisor for the canoe team, was excited at the opportunity to dissect what went wrong. He took the team out for pizza, and they began an animated in-depth analysis of what happened.

"We've since received a lot of e-mails from schools telling us they were impressed that we tried to eliminate Portland cement altogether," says Justin.

"And we are *really* excited about next year."

## Construction Team Impresses with Innovation

**With an almost entirely new team competing at the 2010 Associated Schools of Construction (ASC) Competition, CEE placed fifth in the Design Build and Determining Project Risk categories.**

**Although they did not make it to the podium this year, the CEE teams were specifically called out for coming up with clever innovative solutions.**

**For instance, the DPR team was given the challenge of how to fit a large expensive statue into a building that was under construction. The statue was too big and it could not be cut. Berkeley students proposed to leave the statue in the courtyard and create a café in the lobby where people could sit and look out at the statue.**

**"They thought this was interesting and fun, but in the end we were told to come up with another solution," says Elizabeth Kincaid, project manager.**

**Students have only 18 hours between the time they are handed a proposal and design document and the deadline for their proposed solution. One team ran its proposal over to the judges with only 20 seconds to spare.**

**Companies know that if we can successfully come out of this competition, we will succeed in the work force.**

**"Companies that attend this event know the stress that we are put through and know that if we can successfully come out of this competition, we will succeed in the work force," says Elizabeth.**

**DPR team L to R: Chris Boswell, Debra Zepeda, Christine Chung, Will Glassberg, Madeline Ziser, and Ariana Navarro.**

For more information and photos, visit
**www.ce.berkeley.edu**

# Recent CEE Faculty and Student Achievements

## Faculty

**Alexandre Bayen** was interviewed by *The Wall Street Journal* for a story about traffic entitled "The Inconvenient Truth About Traffic Math: Progress Is Slow." The article focuses on the challenges faced by traffic engineers working on congestion remediation. Alex and his work on the Mobile Millennium project were highlighted.

**Alexandre Bayen** and **Ashok Gadgil** were selected as Top 10 Innovators on Water Sustainability by NASA. Alex was selected for his project titled The Floating Sensor Network. Ashok was selected for his project titled Electro Chemical Arsenic Remediation.

**Robert Bea** and **Ray Seed** are featured in *The Big Uneasy*, a documentary about the causes and aftermath of the Hurricane Katrina disaster.

**Anil Chopra** was named as one of 60 most influential people in the hydro power and dams industry over the last 60 years by the *International Water Power and Dam Construction* magazine. Anil received the additional honor of being awarded the title of Honorary Professor by the Harbin Institute of Technology, China.

**Carlos Daganzo**' s research is the basis for RetBus, the ambitious next generation bus rapid transit to be implemented in Barcelona, Spain. Carlos conceived the advanced network system and led the scientific research effort underlying the plan development.

**Armen Der Kiureghian** published *The Life and Art of Sumbat*, a book about the life and work of his father, Sumbat Der Kiureghian, renowned Iranian-Armenian watercolorist. Armen compiled the material over a period of 9 years, drawing on archival resources in Iran, Armenia and the United States, as well as interviews from around the world.

**John Dracup** has been elected a Fellow of the American Geophysical Union, which is a special tribute for those who have had a significant impact on their field within the earth and space sciences.

**Ashok Gadgil** has been appointed to the Andrew and Virginia Rudd Family Foundation Endowed Chair in Safe Water and Sanitation. Also this year he was named the new Director of the Environmental Energy Technologies Division (EETD) of the Lawrence Berkeley National Laboratory and was awarded the Sustainability Pioneer Award from the Sustainable Asset Management Group/Sustainability Performance Group.

**Steven Glaser** has been named a TÜV SÜD Guest Professor, and Fellow at the Institute of Advanced Studies, at the Technical University of Munich, one of the premier universities in Germany.

**Allen Goldstein** was awarded a Miller Research Professorship for 2010-2011. Faculty who receive this professorship are released from teaching and administrative duties, allowing them to pursue their research, full-time, following promising leads as they develop.

**Slawomir Hermanowicz** was appointed as a distinguished guest professor for the summer of 2010 by the Senate of the University of Natural Resources in Vienna (Bodenkultur Universitat Wien). He continued his research and teaching that he began in his tenure as the Fulbright-BOKU Distinguished Chair in Sustainability in 2008.

**Arpad Horvath** and Dr. Mikhail Chester, postdoctoral researcher, are the co-authors of "Environmental assessment of passenger transportation should include infrastructure and supply chains," the #1 most downloaded article in the *Environmental Research Letters* journal in 2009. Arpad and CEE alumna **Jennifer Stokes** (Ph.D. '04) co-authored "Energy and Air Emission Effects of Water Supply," #6 of the top ten most-accessed articles in *Environmental Science and Technology* for April-June 2009.

**David Jenkins** received the International Water Association Global Water Award in recognition of a lifetime of academic excellence and outstanding leadership in water science and technology. He was also the recipient of the 2010 Frederick George Pohland Medal from the Association of Environmental Engineering and Science Professors Foundation for his outstanding efforts in bridging environmental engineering research, practice, and education.

**Samer Madanat**, project principal investigator, and **Mark Hansen**, co-author, participated in the first academic review of the California High-Speed Rail Authority's ridership forecasts. The review was commissioned by the California State Senate Transportation and Housing Committee and was funded by the rail authority.

CBS News interviewed **Khalid Mosalam** in "Where America Stands?", its news segment on earthquake predictions and earthquake preparations. See "Is U.S. Prepared for a Quake?" at www.cbsnews.com/video/watch/?id=6134441n&tag=related;photovideo.

**William W Nazaroff** was selected as an American Association for Aerosol Research (AAAR) Fellow in recognition of his contributions to aerosol science and technology. Bill becomes one of 16 (total) AAAR Fellows. In October 2009, he was also elected Vice-President Elect of AAAR, a leadership role he will hold for four years.

**Mark Stacey** was named the recipient of The Nicholas P. Fofonoff Award by the American Meteorological Society. The Award is given annually to promising scientists in recognition of their outstanding research achievement in physical oceanography.

**Iris Tommelein**, and her Project Production Systems Laboratory (P2SL), has teamed up with Statoil, one of the world's largest crude oil and gas suppliers, and the Norwegian University of Science and Technology to establish a Mega-projects Research Initiative.

## Graduate Students

**Daniel Choe**, graduate student in SEMM, received both the American Institute of Steel Construction and Structural Steel Educational Council (AISC/SSEC) Scholarship and half of the AISC Education Foundation Fellowship.

**Eric Gonzales**, Transportation Engineering, and **Dan Work**, Systems Engineering, were selected as "Eno Fellows" by the Eno Transportation Foundation. Eric was selected for his work on the allocation of city space to multiple transport modes, and Dan was selected for his work on applications of mobile sensing for transportation systems. Dan also won the Rodney E. Slater Award for his work on Mobile Millennium, as well as for his outstanding achievements on traffic monitoring technology.

Three CEE students received the prestigious Dwight David Eisenhower Transportation Fellowship from the US Department of Transportation. They are: **Sebastien Blandin**, a Ph.D. student in Systems Engineering, who researches the use of cellular phone for traffic reconstruction in the Mobile Millennium project; **Weihua Gu**, a Ph.D student in Transportation Engineering, who researches bus queueing behavior at busy bus-stops; **Eleni Christofa**, a Ph.D. student in Transportation Engineering, who researches the development of a network-wide traffic responsive signal control system with signal priority for transit vehicles traveling on conflicting routes; and **Kristen Carnarius**, an incoming Transportation Engineering student, who researches optimization and implementation strategies for transportation systems.

Eight CEE graduate students received 2009 Outstanding GSI Awards. They are: **Daniel Choe**, **Andrew Ma, Matthew Over, Bing Yi Tsui, Alan Wang** (SEMM); **Sang Min Kim** (GEO); **Ian Tse** (ENV); and **Daniel Work** (Systems).

**Sangjoon Park**, SEMM Ph.D. candidate, was awarded the Best Presentation Award in recognition of Outstanding Contributions by a Young Researcher at the 7th International Conference on Urban Earthquake Engineering and 5th International Conference on Earthquake Engineering. The title of his paper was "Analytical and Experimental Study on RC Exterior Beam-Column Joints without Transverse Reinforcement." Sangjoon's advisor is Khalid Mosalam who was co-author on the paper.

Geo-engineering Ph.D. student, **Valerie Zimmer**'s study of rockfall in mines was featured in the UCB College of Engineering's *Innovations* article, "On a Yosemite cliff, listening." Valerie uses tiny acoustic sensors to document the rock mechanics and geophysical forces underground. Valerie's advisor is Nicholas Sitar.

Two Systems Engineering graduate students, **Anurag Sridharan** and **Emily Kumpel**, were part of a group that shared first place in this year's CITRIS Big Ideas White Paper competition.

Their project, NextDrop, addresses the challenge of unreliable piped water in developing countries.

## Undergraduate Students

**Kimberly Leung** was awarded the 2009 Women in Transportation Molitoris Leadership Scholarship, which is awarded to women pursuing undergraduate studies in transportation who demonstrate leadership skills and ability. Kimberly is the co-founder of the Cal student chapter of the Institute of Transportation Engineers.

**Sarah Klug**, graduating senior and Chi Epsilon member, won first place in the 2010 Daniel W. Mead Student Contest on the topic, "Ethics and the Civil Engineer of 2025." Sarah volunteered to represent Berkeley in the ASCE Mid-Pacific Regional Competition, and her efforts earned Berkeley a first in a competition that it had not won in many years.

Graduating senior **Reid Zimmerman** was one of four finalists for the University Medal, which is given to Berkeley's top graduating senior. He was also awarded CEE's Citation Award, which is given to the top undergraduate in each engineering department.

For more information on these achievements, and the achievements of others, visit News & Events on the CEE Web site, **www.ce.berkeley.edu**.

# Special Awards

**Lisa Alvarez-Cohen**, Fred and Claire Sauer Professor and Chair of Civil and Environmental Engineering at Berkeley, was among 68 new members elected to the National Academy of Engineering (NAE). She was nominated for her discovery and application of novel microorganisms and biochemical pathways for microbial degradation of environmental contaminants.

Academy membership honors those who have made outstanding contributions to engineering research, practice, or education, including, where appropriate, significant contributions to the engineering literature, and to the pioneering of new and developing fields of technology, making major advancements in traditional fields of engineering, or developing/implementing innovative approaches to engineering education.

Election to the NAE is among the highest professional distinctions accorded to an engineer.

**Ashok Gadgil**, Andrew and Virginia Rudd Family Foundation Professor of Safe Water and Sanitation, and member of CEE's Environmental Engineering faculty, was recognized with a Heinz Award for his work toward a more sustainable environment.

Ashok is known for creating simple inventions to solve fundamental environmental problems. He leads a group at Lawrence Berkeley National Laboratory that works to understand airflow and pollutant transport in buildings. The work helps to reduce health risks, improve energy efficiency and enhance the quality of life in developing countries.

His UV Waterworks, an inexpensive and reliable water purification system suitable for rural villages and disaster relief, significantly reduces the risk of life-threatening diseases.

Ashok also devised the Berkeley-Darfur cook stove for safer indoor use in Darfur, Sudan, as well as a filter to remove arsenic from groundwater.

**Carl L. Monismith**, Professor of the Graduate School, was honored with a named Lecture by the Geo-Institute of the ASCE. The "C.L. Monismith Lecture" will honor Carl's contributions in the Pavement Engineering field. The Lecture will be awarded annually for outstanding research contributions in Pavement Engineering.

Carl's teaching and research career in pavement technology at the University of California, Berkeley spans more than 50 years. Throughout this period he has mentored numerous graduate students that have disseminated pavement technology world-wide.

He has actively contributed to the Transportation Research Board (TRB), the American Society of Civil Engineers (ASCE), the Association of Asphalt Paving Technologists (AAPT) and the International Society of Asphalt Pavements (ISAP).

**Juan Pestana**, member of CEE's GeoEngineering faculty, was one of four Berkeley faculty selected as a 2010 recipient of Berkeley's Distinguished Teaching Award, the campus's most prestigious award for teaching.

The Award is intended to encourage and recognize individual excellence in teaching; teaching that incites intellectual curiosity in students, engages them thoroughly in the enterprise of learning, and has a life-long impact.

"I encourage students to develop their independent and original analytical and problem solving skills. I use many (sometimes insane) analogies to help the students internalize concepts and gain insight before knowledge is actually learned.

"As a result, detailed information is not only memorized but is imprinted with powerful emotional content," says Juan.

**Karl Pister**, Chancellor Emeritus and Professor of the Graduate School, was selected as the 2010 recipient of the Leon A. Henkin Citation for Distinguished Service awarded by the Committee on Student Diversity and Academic Development of the Berkeley Division of the Academic Senate.

The Citation recognizes a member of the Berkeley faculty who shows exceptional commitment to the educational development of students from groups who are underrepresented in the academy.

Karl's varied and profound devotion and service to the University includes serving as a CEE faculty member (1952-1996), chair of the Academic Senate (1979-1980), dean of the College of Engineering at Berkeley (1980-1990), and Chancellor of UC Santa Cruz (1991-1996).

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**NEW ENDOWMENT** *CONTINUED FROM PAGE 1*

Student groups also provide an invaluable opportunity for hands-on learning. "Emphasizing student activities that complement the formal curriculum is a key part of CEE's overall strategy. The skills that students learn by participating in these groups are essential to their success as civil and environmental engineers," says Lisa Alvarez-Cohen, department chair, "These skills come to life when applied in a hands-on, student-driven environment."

"Cal's CEE students are some of the most creative and innovative in the country," adds Rudy, "By supporting the CSLE, department friends provide for more activities that enhance the team building and cooperative spirit that is used throughout the students' careers. These attributes result in a very desirable and capable professional leader, who will go on to solve some of the most pressing problems of the day.

"It is also gratifying to hear from the students themselves when they express their appreciation, as they often do, for the support and encouragement provided by these friends and supporters. It means a lot to them."

## CEE Spring Career Fair

is a great opportunity to meet over 200 CEE undergraduate students. If you would like to participate, contact Lyndsie Harris, Career Fair Executive, at **careerfair@calasce.org.** The fair will be held on **March 2, 2011, 3:00-6:00 p.m.** in the Pauley Ballroom on the Berkeley campus.

www.ce.berkeley.edu

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