

CEEM Continues to Celebrate Its Centennial

To honor our history and traditions, while paying tribute to the many successes of our graduates over the past 100 years, the Department of Civil Engineering and Engineering Mechanics (CEEM) continues to celebrate its centennial, culminating with a gala banquet during Homecoming 2005. The banquet will be held on Friday, November 4, 2005, in conjunction with the Arizona Society of Civil Engineers' (SCE) annual section meeting. Both events will be held at the Marriott University Park Hotel in Tucson. The banquet will include a hosted reception with cocktails, dinner, and dancing. Saturday's activities will include a departmental golf tournament organized by the student SCE chapter, a CEEM tailgate party/tent, and The University of Arizona's homecoming football game against the University of California-Los Angeles.

Four distinguished alumni awards and one outstanding young alumni



Some participants at an alumni luncheon in Emeryville, CA

award will be presented at the November gala banquet to CEEM graduates who have personally contributed toward engineering achievement, leadership and service to the profession and to the department. The department also plans to present centennial professor awards to four



Centennial participants at Hoover Dam on April 29, 2005

former CEEM professors who have contributed to the university and community in terms of teaching, research and service. Additional information is available on our website at <http://civil.web.arizona.edu/Centennial/>

A Chi Epsilon Honor Society chapter is being initiated within the department. In addition, a seminar series featuring well-known civil engineering researchers and practitioners is periodically taking place on Friday afternoons. Other events, such as a Las Vegas tour/dinner and a lunch meeting near San Francisco, have already occurred in the past few months.

Twenty-six CEEM alums and UA College of Engineering personnel participated in a behind-the-scenes tour of the Hoover Dam Bypass Project on April 29, 2005. Organized by David

Gildersleeve, an alumnus living in Las Vegas, the day's activities also included a trip to Hoover Dam followed by a dinner with spouses on the Nevada side of the Colorado River.

The bypass project is a 3.5-mile transportation corridor that will be the largest concrete arch bridge in the U.S. The bridge will have a 1,500-foot clear span and carry four lanes of traffic 840 feet above the river. The project, which is scheduled for completion in 2007,

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Centennial Celebration

One Hundred Years of Building Our Foundation

Highlights from this year

By Juan B. Valdés, CEEM Head

As the Department of Civil Engineering and Engineering Mechanics continues to celebrate its centennial, I want to thank our generous sponsors who have made our fundraising goals a reality. In addition, I want to thank the following people who are organizing alumni events: Dave Gildersleeve, Las Vegas; Robert Barksdale and Belle Tom, San Francisco; Eric Froberg and David Areghini, Phoenix; and, David Zaleski and Mike Barton, Tucson.

The strong loyalty and support of our alumni was acknowledged by the recent ABET accreditation review. The department was given an NGR (Next General Review) accreditation until 2011.

To prepare our graduates to enter the work force with a rich educational background, we depend, more than ever, on the generous contributions of

benefactors such as corporate donors and friends of the department, as well as current and past students and their parents. Our fundraising efforts will assist us in establishing an endowment for the department to be used for student support, professor retention, facility upgrades, etc.

I hope everyone associated with the Department of Civil Engineering and Engineering Mechanics will participate in these centennial activities to honor the accomplishments of students and faculty over the past 100 years. I encourage all alumni and other interested friends to become involved in these centennial activities by contacting me (phone: 520-621-6564; email: jvaldes@u.arizona.edu) or Mike Barton, chair of the Centennial Steering Committee (phone: 520-624-2306; e-mail: michael.barton@hdrinc.com).



Jack and Kathy Buchanan receive an award for their help with the ABET accreditation review.

Centennial Steering Committee

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Bob Barksdale '58
Nancy Patania Brown '85
Bob Ewing '51
Eric Froberg '98
Joe Gervasio '57
Dave Gildersleeve '80
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Thomas McGovern '74
Edward Nowatzki '65
Nanette Pageau
Steve Pageau '83
Claudia Perchinelli '85
Kim Steward '05
Bob Suarez '75
Lucy Thurston '85
Belle Tom '72
David Turner '58
Rob Turton '87
Juan Valdés
David Zaleski '84

CEEM Centennial Events

- 3/5/05 – *Game Watch Party*
Phoenix, AZ
- 4/29/05 – *Hoover Dam*
Las Vegas, NV
- 7/23/05 – *Bay Bridge and BART*
San Francisco, CA
- 10/7/05 – *Football Stadium Reunion*
Cardinals in Phoenix, AZ
- 11/4/05 – *Gala banquet*
Homecoming Weekend
Marriott (University Park), Tucson

Current Centennial Sponsors

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Ian Cameron: Studying Abroad Prompts Career Move for Recent Graduate

Ian Cameron, CEEM's salutatorian for the Spring 2005 graduating class, has some unique college memories that have been enhanced by studying in both France and Japan. As a result of these international experiences, he returned to Japan this past summer to begin teaching the English language to Japanese

students in elementary or high school.

Several years ago, after completing two years of study at the UA, Cameron decided to apply to the Global Engineering Education Exchange (GE3), a program that offers engineering students an opportunity to take classes at the Institut National des Sciences Appliquées (INSA) in Lyon, France. He participated in the program from August 2001 until July 2002.

Cameron lived in a dorm on the institute's campus and did some tutoring in English while he took geotechnical and structural analysis classes that earned him UA credit hours. INSA Lyon is ranked among Europe's top universities of science and technology with an international perspective



Ian Cameron at Spring 2005 Graduation

on innovation and entrepreneurship.

When Cameron returned to the UA to resume his third year of college, he spoke with his advisor, Amina Sonnie, coordinator of Career Experience in the Engineering Associate Dean's Office. She told him about an opportunity to receive a Japan Student Services Organization (JASSO)

scholarship. Within days, he decided to apply for the scholarship and to cram Japanese language courses into his class schedule at the UA.

Cameron, who was born in Canada but raised in New York in a family with two older sisters, took French in high school but had no prior knowledge of the Japanese language. Japanese is a difficult language with over 2,000 characters.

"I enjoy learning the Japanese language. Speaking is easier than writing but both have to deal with grammar. To learn to write in Japanese, you must have intense memorization skills to learn 2,000 characters," Cameron said.

"Students best suited to participate in GE3 need to be independent, adventurous, persistent and more than willing to learn and experience new things, said Sonnie. "Ian characterizes all of these traits and more, and is the only student who has participated twice in this program.

"I've never known a student as enthusiastic and committed to

immersing himself in the cultures where he is. I could not ask for a better advocate for the GE3 program than Ian Cameron," said Sonnie.

While he was in Japan from October 2003 until August 2004, Cameron took classes with mostly Japanese students and received a certificate of completion from Tohoku University in Sendai, Japan, which is north of Tokyo.

"I took general math and science courses because the program was designed for all types of engineers, and it was impossible to take specific courses for a major," Cameron said.

In the fall of 2004, while starting his fourth year of study here at the UA, Cameron decided to apply for the Japan Exchange & Teaching (JET) Program, which provides a chance for graduates with a bachelor's degree to go to Japan and teach English to Japanese students. The JET program has approximately 5,000 teachers mostly from Canada, England and the United States and is run by the Japanese Min-



Ian Cameron (front left) with sumo wrestler in Japan.

istry of Foreign Affairs.

"The JET program also seeks recent college graduates to act as facilitators in a local Japanese government for 'internationalization' efforts, creating an opportunity for Japan to learn how to open up to other countries," Cameron said.

Cameron signed a one-year contract to teach in Japan, and he has the option to extend it up to three years. Jeff Hiner, who graduated from the

The ARIZONA

Civil View

Fall 2005 special centennial issue

The *Civil View* discusses research, student activities and news of the Civil Engineering and Engineering Mechanics Department of The University of Arizona.

Editor/Writer:

Susan Kinsey Demma

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Cac Dao: Escape From Communism

Students bring diverse backgrounds with them when they arrive at The University of Arizona. One CEEM doctoral student, Cac Minh Dao, has traveled a dangerous path in life to pursue a better lifestyle and education.

During his youth, Dao's family included nine college-educated siblings who were identified as "non-persons" by the communist Vietnamese government and forced to work at menial tasks and hard-labor jobs.

In 1983, at the age of 25, Dao made his first failed escape attempt by boat from his homeland. After two hours in the South China Sea, the small boat sank and Dao—who could not swim—found himself clinging to an empty oil drum in the dark.

"There were about 100 people on the boat when it sank," he said. "When the sun came up, I could see many bodies of dead women and children floating around me. A wave would appear and then they would disappear. Wave after wave—it was a sight I will never forget."

Fisherman rescued the survivors but turned them over to the Vietnamese coast guard. Dao spent nine months in jail—the first of many incarcerations.



He unsuccessfully tried to escape from communism 10 times in a span of six years. Altogether, he received six different Vietnamese prison sentences.

In May of 1989, Dao and his younger brother, Van M. Dao, successfully escaped by boat to seek political asylum in the Philippines. The two brothers spent over three years in a refugee camp—where the older Dao learned to repair small appliances—with 9,000 other refugees. Then, the Catholic Community Services brought both of them to Tucson on September 30, 1992. Van now owns a beauty shop in Ohio.

"I was free to move to another city, but I didn't do it," Dao said. "Everything in Tucson is convenient."

After attending Pima Community College where he earned a 4.0 average, Dao earned his undergraduate engineering and master's degrees from The University of Arizona. He was one of six seniors to earn the UA President's Award in 1998 for his academic achievements. In addition, Dao was president of the CEEM Graduate Student Council during the 2001-02 school year.

Dao, who is employed as an engineer at Raytheon Missile Systems, is grateful for the actions of others and wants to "give back to the community" through civic duties and donations to community projects such as the Community Food Bank. In 1995, he was the director of the newly formed Pan Asian Community Alliance Center, which offers computer, language and life skills classes to Vietnamese refugees.

"I love doing my civic duties to help others," he said. "I started from scratch when I had nothing in my hand."

Dao and his wife, Phuong, now own and manage a restaurant in Tucson and are the parents of three children: Bruce, Anh and Khoa.

Dao is currently taking a leave of absence from Raytheon during the fall 2005 semester to complete his doctoral research and dissertation. He is teaching a fall semester undergraduate course in the CEEM Department. He plans to defend his dissertation and graduate with a PhD degree in May of 2006.

Dao's mother and seven siblings still live in Vietnam. Dao, who became a naturalized American citizen in 1999, hopes to eventually teach mechanical engineering at the college level.

Studying Abroad

Continued from page 3

UA Electrical and Computer Engineering program in May of 2005, studied in Japan with Cameron in 2003-04 and is also going back to Japan to work for the JET program.

"Everyday life in Japan is an adventure that can be unpredictable," Cameron said. "It makes life interesting for me. To have a new experience and meet new people is a fantastic opportunity."

Cameron has interned with Schneider and Associates here in Tucson

since December of 2004. After graduation in May of 2005, he worked full time in the office doing fieldwork involving commercial and residential structural designs before flying to Japan on July 22, 2005. When he returns to the United States after his teaching contract expires, Cameron will probably apply to graduate school at the University of California-Berkeley.

After two years of delays while living in different countries, Cameron graduated second in his CEEM class. Although Cameron had to postpone his graduation, he wholeheartedly

supports his decision to study abroad, which gave him the opportunity to experience new challenges.

"Passing up a chance at an international experience while being a student is truly a missed opportunity," said Ian Cameron. "I love different challenges outside of engineering, such as the challenge of learning a hard language."

アリゾナ大学の皆さん
がんばってください！

"Students of UA: Good Luck!"

Faculty Profile

Mohammad Ehsani: Adding Muscle to Tucson's Historic Fox Theatre

Excerpted in part from "Arizona Engineer"

Tucson's historic Fox Theatre will soon be structurally stronger than on the day it opened in 1930, thanks to research from a University of Arizona Civil Engineering lab.

The Fox Theatre, which is listed as a nationally significant building on the National Register of Historic Places, is being restored after lying dormant for 31 years in downtown Tucson. It's scheduled to reopen on December 31, 2005.

Like many buildings of its era, the Fox movie palace was built primarily with unreinforced masonry. There are some reinforced concrete columns and beams in the basement under the stage and orchestra pit, but, for the most part, the theater's walls are unreinforced, said UA Civil Engineering Professor Mohammad Ehsani.

While unreinforced masonry is extremely strong in compression, it's weak against lateral loads from wind or earthquakes.

"The building has been standing for 75 years, and the unreinforced masonry has done a good job in resisting gravity loads," Ehsani said. "The building could stand for many

more years. But the problem is that there has been some deterioration over the years and the building doesn't meet current standards for lateral loads. So, since the building is being rebuilt, it doesn't make sense not to bring the structure up to 21st century

In 1930, Tucson's historic Fox Theatre opened to the biggest block party that tiny Tucson had ever seen. But by 1974 the party was over and the theatre closed its doors. Now it's being rebuilt and is scheduled to reopen on New Year's Eve (2005).

standards." This includes a new design for lateral loads to resist strong winds as well as earthquakes.

Retrofitting the building to meet current standards using steel bracing and supports would be extremely expensive and time consuming, and the steel supports would take up a lot of room inside the building.

Ehsani's company isn't using steel. Instead, workers are strengthening the walls by wrapping them with Fiber Reinforced Polymers (FRPs) that are similar to fiberglass and Kevlar. The FRPs are glued to the walls with epoxy, creating a tough, fiber-rein-

forced exoskeleton around the masonry that is extremely resistant to lateral loads.

The same technology, which was developed by Ehsani

and UA Civil Engineering Professor Hamid Saadatmanesh, was used to reinforce the Fox Theatre's lobby floor.

"Originally, they had considered strengthening the lobby floor slab by supporting it from the basement with steel beams and columns," Ehsani said.



Workers apply a fiber reinforced polymer coating to the lobby floor.

"And then on top of the slab, they were required to add a layer of waterproofing membrane to prevent rain water or wash water leaking through the floor."

Ehsani proposed using FRPs to strengthen the slab. The slab could be waterproofed by running the resin and fabric over its entire surface. "We showed them that this would cost only a couple thousand dollars more than just waterproofing the floor, and they would get both the structural strengthening and waterproofing in one shot."

The same technology will be used to strengthen the parapet, or wall, that runs around the roofline of the building.

"The problem with the parapet wall is that it's about four feet high and free standing," Ehsani said. "There's nothing but mortar pasting it to the building and during earthquakes these kinds of walls fall from roofs, creating a deadly hazard for people in the street below."

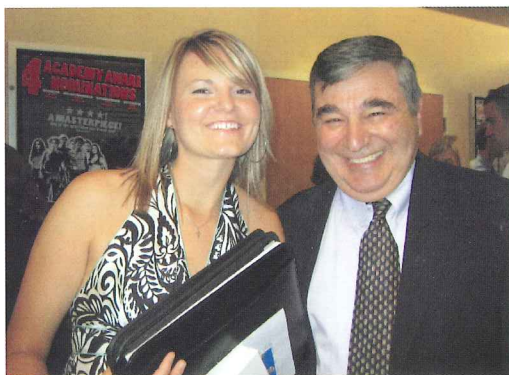
Similarly, some of the beams and columns in the basement of the historic movie house will be reinforced with FRPs. "There are certain beams and columns, which were originally constructed with reinforced concrete, that are now really pitted," Ehsani said. "They have big honeycombs or

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Student Profile

Kimberly Steward

Kimberly Steward with Dr. Juan Valdés at graduation



Kimberly Steward was named valedictorian for the Spring 2005 CEEM graduating class. She plans to attend graduate school at the University of Texas-Austin.

As president of the student branch of the UA Society of Civil Engineers (SCE) during the 2004-05 academic year, Steward was active in four Pacific Southwest Regional conferences by helping with the seismic design, steel bridge, and concrete canoe. In addition, she wrote the technical paper for the competition entitled "Using Computer Programs as a Civil Engineer," which received first place at the conference. She has been an SCE member since her freshman year and was an external vice president in her junior year.

Raised in Prescott, AZ, Steward served three years as an engineering ambassador for the College of Engineering. She was a member of Tau Beta Pi, the engineering honorary, for two years and was part of the inaugural class of the civil engineering honorary. She also joined the Order of the Engineer, an engineering organization for which all members must take a vow to always be ethical, in fall 2004.

Steward served on various departmental committees, including the Centennial Steering Committee and the Alumni Industry Council (AIC) during her senior year.

"I cannot believe that my time with the CE Department is already over. I have enjoyed every minute I have spent here and will truly miss all of the faculty, staff, and my peers," said Steward.

"I am forever grateful to everyone in the department for helping me have this wonderful experience, and also to my family for their eternal love and support."

Fox Theatre

Continued from page 5

voids in them and, in some cases, the steel reinforcing bar is showing at the bottom of the column."

Ehsani is delighted that the technology developed in his lab is transferring so quickly to real-world applications.

"A lot of times, we do research, of which the results may make some small changes over the years, leading to something totally new decades down the road," he said. "But it's very rewarding to see that, in such a relatively short time, we've been able to take this technology from concept to the real construction world."

Ehsani and Saadatmanesh pioneered the use of FRPs in construction beginning with a 1986 exploratory research grant from NSF.

"For the first six or seven years, people thought this was a really crazy idea," Ehsani said. "We were funded under an exploratory research grant because the idea of using FRPs to retrofit and strengthen structures was considered very far out at that time."

But Ehsani and Saadatmanesh proved the skeptics wrong and the initial grant led to a patent on the process. When the researchers wanted to take the results from their lab to the field for further testing, Ehsani formed a company for liability reasons.

The process has been used in California to help masonry structures resist earthquakes, and in Arizona to strengthen floors in local hospitals and to line pipes for the Central Arizona Project. It has been used in Arizona to add elevated bleacher seating to the Coolidge High School Roundhouse

Gymnasium (see "Civil View" vol. 11, Spring 2005) and is going to be used to strengthen a parking garage that's being rebuilt in downtown Tucson.



Workers apply a sheet of fiber reinforced polymer (FRP) to a beam in the basement. The sheet has been saturated with resin and the beam also is coated with resin. The beam (foreground) has already been retrofitted with FRP and resin, forming a strong exoskeleton that encloses the beam and makes it much stronger.

CEEM History



1904 – Frank Kelton (arrow). Kelton was the first CE graduate and the first CE student to play on the UA football team. He subsequently was head of the CE Department from 1922 until 1942. (Photo courtesy of the UA Athletic Department)

Commemorative Booklet to Review CEEM History

The Centennial History and Heritage Committee—comprised of emeritus faculty members, alumni and current CEEM students—is compiling a commemorative booklet that presents a written and pictorial review of the department's history since 1905. The booklet, which will be ready for sale by November 2005, will contain approximately 100 pages of text with black and white photos, a CD of additional photos, and a DVD containing a 1970s video. Narrated by Professors Haaron Miklofsky and Quentin Mees, the video shows various CEEM labs, classes, and field trips.

CEEM Centennial

Continued from page 1

will bypass the existing road that crosses the river at the dam.

Two alums, Bob Barksdale from San Francisco and Belle Tom of Tucson, coordinated a centennial luncheon at a restaurant in Emeryville, CA, on July 23, 2005. The event, which was attended by 35 engineering alumni and their families, featured two presentations on current construction projects in the San Francisco Bay area.

Jim Dunn, chief engineer of the Bay Area Rapid Transit (BART), spoke

about the research and planning for retrofitting the 31-year old transbay tube with regards to new earthquake criteria that resulted from the 1989 earthquake. The other speaker was Lee Zink, a construction manager for Kiewit/FCI/Manson (KFM), who made a PowerPoint presentation on the building of the skyway portion of the new bridge between Oakland and Yerba Buena Island. (KFM is a joint venture of Kiewit Pacific Company, FCI Constructors, Inc. and Manson Construction Company.) Alumni viewed the construction site from the restaurant during lunch. The initial costs of the project have escalated from \$1.9 to \$6.2 billion due to various delays, plan changes, and an increase in material costs.

The Early Years

Jane Rider

Jane H. Rider (1890-1981) received her undergraduate degree in civil engineering in 1911. She was the first female engineering graduate and the fourth graduate of the Department of Civil Engineering. Rider later directed the state laboratory that tested water for bacteria.

On March 1, 1960, she was one of seven alumni who were awarded the 75th Anniversary Medallions of Merit at a luncheon in the UA Student

Union.

An endowed scholarship in her name is awarded each year to several CEEM female students with GPAs

of 2.5 or greater. The 2004-05 awards were given to Breanna Connolly, Hailey Crosswell, Melissa Cox and Ashley Smith



1910 - Jane Rider
"Courtesy of Special Collections, UA Library, UA photos, students, 1909-1914"



March 1, 1960 – Jane Rider
(standing, 3rd from left)



View of new bridge between Oakland and Yerba Buena Island.

Faculty Award

Robert Fleischman: Assistant Professor Receives Two Prestigious PCI Awards

CEEM Assistant Professor Robert B. Fleischman and Kenneth T. Farrow of Houston, TX, received the 50th Annual Martin P. Korn Award and the first ever George D. Nasser Award from the Precast/Prestressed Concrete Institute (PCI). Drs. Fleischman and Farrow received these two prestigious awards at PCI's Golden Anniversary Convention/Exhibition and National Bridge Conference in Atlanta, GA, on October 17-20, 2004. The 50th anniversary celebration was attended by approximately 1,200 members and guests.

Dr. Fleischman and co-author Farrow accepted the Korn Award for their article, "Seismic Design Recommendations for Precast Concrete Diaphragms in Long Floor Span Construction," which was published in the November-December 2003 issue of *PCI Journal*. The Korn Award is awarded annually to "the paper which offers the greatest contribution to the advancement of precast or prestressed concrete in the areas of design and research."

The Nasser Award honors authors 40 years and younger who publish outstanding papers in the *PCI Journal* contributing to the advancement of the precast, prestressed concrete industry. The award is named in honor of George Nasser, who was editor-in-chief of the *PCI Journal* for 32 years and is now editor emeritus.

The award-winning article was the second of a pair of companion papers, the first being "Effect of Dimension and Construction Detail on the Capacity of Diaphragms in Precast Parking Structures" published in the *PCI Journal*

September/October 2003 issue with Dr. Farrow as the primary author. These papers provide recommendations for design provisions on diaphragm strength, allowable

flexibility, and ductility capacity based on seismic performance requirements, and are being used as the basis for a \$1M multi-university effort being led by Dr. Fleischman to develop a new seismic design methodology for precast floor diaphragms.

The article has also been nominated for the 2005 T.Y. Lin Award from the American Society of Civil Engineers (ASCE), recognizing the outstanding publication in the area of prestressed concrete.



Kenneth Farrow (l) and Robert Fleischman (middle) accept the Martin P. Korn Award from Leslie Martin, chair of the PCI Journal Awards Committee

Write to Us!

If you have an interesting event that you want to share with former classmates and friends, please send a letter with an update on your activities to:

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Or e-mail: skinsey@enr.arizona.edu
Please include your name, degree (BS, MS, PhD), year of graduation, address, home and/or business phone number, e-mail, and your current employment information. Thanks!

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