Sparks Fly

AS STUDENTS LEARN BY DOING

ARCHITECTURAL ENGINEERING DEPARTMENT | COLLEGE OF ARCHITECTURE & ENVIRONMENTAL DESIGN | SUMMER 2015
Commemorating Another Eventful Year

As another academic year closes, we celebrate the graduation of our senior class and prepare for the arrival of our new freshmen. This year took our faculty members to Haiti, Nepal, Tanzania and the Napa Valley as they investigated earthquakes and assisted with humanitarian projects. We had five faculty members present papers at the Earthquake Engineering Research Institute in Alaska. Even better, undergraduate students presented research project results at a number of national and international venues. Read further in our latest edition of ARCE magazine and learn more, including an article about our successful accreditation visit.

I offer a special thanks to MHP in Long Beach for sponsoring this edition. The company and its staff have a long history of service and involvement with this department, and we are proud to profile its heritage and accomplishments. We completed the Barth challenge and raised $100,000 for the Parent’s Learn by Doing Fund. Florian and Lori Barth attended the celebration at which we unveiled the commemorative plaque and thanked those donors who made it possible. We are seeking other parents who will issue a similar challenge. I thank all of you who have given generously to the department, allowing us to enhance the educational experience in ways the state budget cannot. My fundraising priority for the coming year will support interdisciplinary collaboration between ARCE, architecture and construction management disciplines.

We bade farewell to Abe Lynn, our longest-standing faculty member, who retired from Cal Poly to work full time for Degenkolb Engineers in Oakland. We thank Abe for his years of service and will miss his dedication, friendship and expertise.

Allen C. Estes, Department Head


As I enter my third year as dean, I have grown to appreciate the many ways our community achieves excellence. From innovative design for the Solar Decathlon competition, to applied research on concrete masonry, to hands-on worldwide disaster recovery efforts, our faculty and students transform the built environment.

As the college prepares for the future, we aspire to enhance learning and teaching. Our focus — Places. Projects. People. — will enable us to continue to offer extraordinary educational experiences. We are completely re-imagining our labs and shops and planning to invest in life-changing learning opportunities. We invite you to view these priorities at www.caed.calpoly.edu/caed-giving.

The Architectural Engineering Department will play an essential role as we refresh, expand and equip our Learn by Doing settings with the engagement of our alumni and friends … and ARCE alumni and friends are so engaged in all we do! We are grateful for your support.

Christine Theodoropoulos
AIA, PE, Dean, College of Architecture & Environmental Design
An interdisciplinary team of Cal Poly students has designed and engineered an interactive, intuitive and integrated solar-powered home to compete in the U.S. Department of Energy Solar Decathlon 2015.

Cal Poly was selected to participate in the international competition in which 17 teams design, build and operate a solar-powered residence that will be judged on affordability, consumer appeal, design excellence, optimal energy production and maximum efficiency.

Solar Cal Poly is comprised of 24 students in architecture; architectural, electrical, and mechanical engineering; computer science; construction management; landscape architecture; graphic communication; marketing; and business.

The Department of Energy awarded Cal Poly $50,000 as seed money. The team is soliciting for cash donations. The College of Architecture & Environmental Design (CAED) is hosting Solar Decathlon events throughout the state for friends and alumni until the competition begins Oct. 8 in Irvine, Calif.

“The Solar Decathlon is an ideal project for Cal Poly students; it epitomizes the Learn by Doing motto, requires collaboration between multiple disciplines, and involves successful teamwork between students and faculty,” said Kevin Dong, CAED associate dean of administration.

For more information about Solar Cal Poly, go to www.calpolysolardecathlon.org. More information on the competition is available at www.solardecathlon.gov.
Bamboo-reinforced masonry. It’s not yet a common building material, but architectural engineering (ARCE) Professor James Mwangi, senior Daniel Berger, and Caleb Dunne (B.S., ARCE, 2014) think the idea is worth further investigation.

Those three and ARCE Professor Jim Guthrie embarked on a study last fall, substituting bamboo for steel rods to reinforce concrete masonry blocks.

When considering ways to build stronger, safer structures in developing nations, steel is often too expensive and difficult to come by.

“Our bamboo product is cheaper and more plentiful, making it a viable option for building in many Third World countries,” Mwangi said.

Bamboo is readily available, affordable and sustainable, making it a very attractive alternative to steel. But does it make walls any stronger?

“We found the behavior to be promising,” Mwangi said. “The strength of the walls improved considerably. The bamboo completely improved the wall’s performance, but its durability needs further study.”

Mwangi, who went to Haiti after the devastating 2010 earthquake hit there, knows it’s important to look at building failures in order to learn.

“The buildings in Haiti were constructed out of unreinforced masonry. I saw the destruction the earthquake caused,” Mwangi said. “I wondered, ‘What kind of impact can we make by using local materials?’”

Berger admits bamboo is unlikely to replace steel in the developed world, but he said, “The significant increases in strength over the current practice of using unreinforced walls were amazing. Caleb and I believe bamboo could potentially save tens of thousands of lives if it replaced unreinforced masonry in seismically active areas.”

More studies could be forthcoming. In September, the 2015 Structural Engineers Association of California Convention will be held in Seattle. The students have written a paper and have been invited to present their findings.

“When that happens and we get that kind of exposure, we can look for funding to continue our research,” Mwangi said.
Eight hours north of campus by car — nearly to the Oregon border — sits the private 67,000-acre Wyntoon estate, the Hearst family summer home and the site of a once-in-a-lifetime senior project opportunity. Dotting the landscape are several mini-mansions, the handiwork of famed architect Julia Morgan, who also designed San Simeon’s Hearst Castle.

Architectural engineering (ARCE) Professor James Mwangi, ARCE seniors Nicole O’Hearne and Kendall Johnson, and fourth-year architecture student Conor Beck are working on “as-builts” and a new design for the Bridge House, so named because of its proximity to the McCloud River.

As-builts are plans that document a finished building as it was actually built. Since there are no plans for the Bridge House, the students had to start from scratch.

The five-story wooden structure, designed in 1937, remains unfinished above the first floor. “The family wants to occupy all five stories, and that’s where the fun begins,” Mwangi joked. “Today’s building code doesn’t allow a conventional wood building higher than three stories.”

Several other challenges await Mwangi and the students. “The complexity of the structure adds to the fun,” O’Hearne said. “We have to figure out why a door opens to a 50-foot drop and where the new construction starts and the old stops. Every little thing matters in this project, and the puzzle makes it so much more interesting.”

O’Hearne enjoys the interdisciplinary nature of the project and having the opportunity to work on a real project. “We are learning to work well together and what our respective roles are. This project is one that a structural engineer would be tasked with in industry, so it’s a fantastic learning experience.”

“It’s really special to do something like this for the Hearst family,” Mwangi said. “It shows how much trust they put in Cal Poly and support the Learn by Doing pedagogy.”
The idea is to provide professors at other universities all the educational materials they need to teach the course.

“We will supply professors with all the tools — everything they need,” Mwangi said. “We’ve mapped out everything that will be taught in every class. We prepared all the board notes — or lesson plans, the PowerPoint presentations, lab procedures and lab experiments, handouts, and sample exams.”

They worked on the project over the course of two years, designing it for both the semester and the quarter systems. Both professors are grateful for the strong support of Air Vol Block Inc. in San Luis Obispo and general manager Russ Kissinger.

The CMACN provides the textbooks, including the design codes. The association has great connections to masonry block manufacturers, so students have the opportunity to tour a plant as part of the class.

The pilot course was taught by ARCE Professor Kevin Dong, who had never taught the Masonry Design class before.

“Craig and James have created a wonderful class. Students appreciated seeing the block manufactured at the Air Vol plant and enjoyed conducting the wall compression test (prism) experiment. The two experiences complement the lecture material by exposing students to applied applications of masonry design.”

Two students from Dong’s course shared their experience in a poster session at the 2015 Pacific Southwest Conference of the American Society of Engineering Education in April in San Diego.

The goal of CMACN is to have the course taught at other universities, first in the Western region and then throughout the country.

This relationship has resulted in a five-year commitment by CMACN to sponsor ARCE 305: Masonry Design. “Course sponsorship is new to the department and the university,” said Department Head Al Estes. “We are very grateful to the CMACN for going first and blazing the path for others as we attempt to find creative ways to honor such donors.”
On Aug. 24, 2014, one day after the 6.1 magnitude earthquake struck Napa, Calif., a contingent of Cal Poly Architectural Engineering Department faculty traveled there to evaluate and document the performance of the buildings involved and bring home lessons learned.

Abe Lynn, Jim Guthrie, John Lawson and James Mwangi spent two days inspecting buildings in Napa and Vallejo. “Seeing how the buildings perform directs future design,” Mwangi said. “What failed? What worked? What building codes are adequate? Those are all lessons we bring back to the classroom.”

Mwangi reported that most of the buildings performed very well; however, they did see significant damage to unreinforced masonry buildings and cripple-wall failure in wood structures, which is typical in older construction.

The Napa County Courthouse (left) was among the historic buildings that sustained major structural damage.
Newsworthy Notes

Passing Muster

DEPARTMENT REPORTS
SUCCESS IN FALL 2014
ACCREDITATION PROCESS

For two days in October 2014, the architectural engineering (ARCE) program was under a virtual microscope as it went through its six-year ABET accreditation visit.

Although the final accreditation results won’t be official until late summer, Department Head Al Estes was pleased with the visit.

The accreditation process is a cycle of assessment and continuous improvement. The visit began with a self-study in June 2014 that documented the curriculum, students, faculty, facilities, resources and program outcomes and objectives. The ARCE Advisory Board provides valuable industry input into this process.

Detailed dialogue between Estes and the evaluator continued throughout the fall, culminating in a two-and-a-half day visit by a team of ABET evaluators and a team chair.

“ABET accreditation is incredibly important for any engineering program,” Estes said. “It plays a crucial role in the professional licensure process and the reputation of the program.”

ABET is recognized as the world leader in assuring quality and innovation in applied science, computing, engineering, and engineering technology education. It accredits more than 3,300 programs at more than 680 colleges and universities worldwide.

ARCE faculty members celebrate at the end of the accreditation process, which began with course notebooks and a self-study and ended with an evaluator’s visit.

Meet Our Advisors

The Architectural Engineering (ARCE) Department thanks the ARCE Advisory Board for giving generously of its time and expertise. The 2015-16 board members are (front row, from left): Robert Newsome (AC Martin), Trailer Martin (John A. Martin & Associates), Geoff Neumayr (San Francisco International Airport), Robert Gayle (UC Riverside), Sarah Storelli (IBM) and Bill Rader (Buehler & Buehler).

Back row (from left): Jan Dougalas (kpff), Paul Kovach (WJE), Department Head Al Estes, Maryann Phipps (E-Structure) and Michelle Kam-Biron (American Wood Council).

Not shown: Ricardo Arevalo (Simpson Strong-Tie), Luvelyn Benitez (Hope Amundson), Colin Blaney (ZFA), Dirk Bondy (Seneca), Consuelo Crosby (Edifice Complex), John Edmisten (emeritus faculty), Ken O’Dell (MHP), Jim Pappas (Hensel Phelps), Mark Sarkisian (SOM).
The Architectural Engineering (ARCE) Department hosted a reception at the Central Coast Wine Shop in San Luis Obispo in December 2014 to honor the winter graduating seniors and to celebrate the completion of the ARCE Parents Learn by Doing Fund.

Department Head Al Estes thanked Florian and Lori Barth, parents of ARCE student Florian Barth, for their generous donation and initiating the $100,000 Barth Learn by Doing challenge.

Two years ago, the Barths pledged a total of $50,000 and challenged ARCE to use their gift as a matching fund to encourage other parents to contribute. The Barth’s plan was to match gifts in increments of $10,000. This year, the fund met its goal of $100,000.

Estes and the Barths unveiled a plaque that honors those who contributed $250 or more. Estes gave special recognition to Ken and Jeanne Stone (parents of student Daniel Stone) and Charles and Gail Greene (parents of student Jamie Greene), who contributed significantly to the success of the challenge.

“We are incredibly grateful for the gift and hope to replicate the effort with other donors in the future,” Estes said.

Guests at the celebration enjoyed assorted hors d’oeuvres and J. Lohr wines donated by Jerry Lohr. Professor Ed Saliklis sang “Caro Mio Ben,” accompanied by student Geeyyun Park on keyboard. On a lighter note, the band Professor S and The Stress (Saliklis and students Jay Hinshaw, Kevin Church and Connor Hanlon) performed “Sum Together,” sung to the tune of the Beatles’ “Come Together.” It can be seen at youtube.com/watch?v=gQyG1WXzE48.

“The wonderful result of the challenge is additional funding to enhance the ARCE experience for students in a way state dollars cannot support,” Estes said. Thank you to the Barths and the other parents who contributed to this effort.”

Hoping to create a second iteration of the Learn by Doing Fund, Estes is looking for ARCE parents who are willing to support a similar challenge to other parents whose sons and daughters will benefit greatly from the program.
Architectural engineering (ARCE) Professor Ed Saliklis, senior Jared Parker, and Evan Gerbo (B.S., ARCE, 2014) presented papers at the International Association of Shell and Spatial Structures World Conference in Brazil in September 2014. Parker presented findings on the Maney-Goldberg Method; Gerbo discussed the optimization of a-frame geometry using genetic algorithms.

“It’s remarkable that undergraduates present research at a peer-reviewed conference as prestigious as IASS,” Saliklis said. “The students interacted with some of the world’s foremost structural engineers, including Bill Baker, chief designer of the Burj Khalifa, the world’s tallest man-made structure.”

Parker said the project changed his academic focus. “By taking the risk to learn about a topic I knew nothing about, I met people at the forefront of a field I have become fascinated with,” he said. “I would never have guessed that this paper would have changed my direction in structural engineering so drastically. I am grateful to Dr. Saliklis for offering me such a watershed.”

Gerbo echoed Parker’s sentiments. “Dr. Saliklis motivated me to turn an idea into an academic project that allowed me to explore my interests and introduced me to people who changed my future. Those connections made my dream of pursuing a Ph.D. a reality.”

Having ARCE undergraduates presenting at conferences is becoming a more frequent occurrence. In April 2015, Professor Craig Baltimore took students Satiya Taeidi and Alexander Lohr to the Pacific Southwest Division Conference of the American Society of Engineering Education in San Diego, where they presented a poster on their experience in a masonry course that incorporates the reality of industry interwoven with code application and academic theory.

The department is grateful to the senior project scholarships and the Parents Learn by Doing fund for supporting undergraduate attendance at these conferences.

Above (from left): Evan Gerbo and Jared Parker meet Notre Dame University Professor Ashley Thrall and world-renowned structural engineer Bill Baker.

Oscar Niemeyer’s Cathedral of Brasilia (left)
A Call To Aid

PROFESSOR JAMES MWANGI TRAVELS TO NEPAL IN THE WAKE OF TWO CATASTROPHIC EARTHQUAKES

Architectural engineering Professor James Mwangi was called by Washington, D.C.-based Global Fairness Initiative to aid in Nepal’s recovery efforts after two earthquakes flattened parts of Katmandu and nearby villages.

After a 32-hour journey, Mwangi joined a team of structural engineers to evaluate the structural stability of the buildings alongside professionals with the Nepal Engineers Association.

His team was sent in to perform rapid assessment of structures so that people could start moving back into their homes.

“This was especially crucial after the second earthquake,” Mwangi said. “Many of the buildings that had been damaged in the first quake completely collapsed during the second. The monsoons are coming, and people need to get out of the tents.”

During Mwangi’s nine-day stay, he spent most of his time in the villages.

“The buildings in Katmandu performed better than I would have expected,” he said. “Compared to the damage I saw in Haiti after the 2010 earthquake, I was very happy to see most buildings still standing.”

The nearby villages didn’t fare as well. Most of the destruction occurred there because of poor building techniques.

Mwangi has extensive experience helping nations cope after a natural disaster. He has made several trips to Haiti to aid in recovery efforts, including a one-year sabbatical in 2010-11 devoted to teaching local contractors proper building techniques.

Using that as a model in Nepal, each American structural engineer teamed up with two or three Nepali engineers to show them what to look for.

“They were getting great on-the-job training,” Mwangi said. “And they helped us by bridging the language gap between the villagers and us.”

Mwangi said he couldn’t have done it without the help of colleagues back home.

“I was lucky. Department Head Al Estes and Professor Cole McDaniel took over my classes. When an earthquake hits, you don’t have the luxury of planning. You have to pick up your boots and leave. I’m very grateful to Al and Cole and my colleagues in the department.”

If asked, he’ll return to Nepal. “If I’m invited, I will definitely go back. I would especially like to train the contractors in the villages how to rebuild more safely.”
Experiences Abroad

Fourth-year architectural engineering (ARCE) student Shannon Abeling spent last summer abroad, but it wasn’t all rest and relaxation. She first went to Haiti with the campus group SESH (Structural Engineering Students for Humanity) and Professor James Mwangi (see story, page 11), then headed to New Zealand to complete a two-month internship at the University of Auckland (UoA).

In Haiti, the students worked with Miyamoto Global Disaster Relief, helping on a variety of projects, including a school, Lycee de Cite Soleil, and the Bernard Mevs Hospital.

“We worked on CAD drawings and building reports; we even got our hands dirty helping on a construction site,” Abeling said. “I left with a very positive image of Haiti and with dreams of continuing SESH’s legacy in years to come. We were able to contribute a lot of little things to the disaster effort there.”

Abeling then traveled Down Under to become the first Cal Poly — perhaps the first American — intern at UoA’s Civil Engineering Department, where she learned more about materials such as concrete and unreinforced masonry and broadened her international viewpoint. The internship was facilitated by ARCE alumnus Lucas Hogan (2009) who is completing post-doctoral work at UoA.

“Because I was the first American UoA intern, I was kind of a test case, and I had quite a bit of freedom choosing which projects I wanted to work on,” Abeling said. “I spent a lot of time in the Civil Test Hall, learning about the experimental and theoretical aspects of structural engineering.

Summer of Service

SHANNON ABELING LENDS A HAND IN HAITI; Completes an Internship in New Zealand

Shannon Abeling with Cristina Chilin (center) and Katerina Petrova in Haiti.
“My favorite experiments were those in which I got to use a shake table to break things,” she continued. “The most memorable was shaking a full-sized chimney replica, complete with metal sheathing for a roof. We had a complete failure, and bricks went flying. Luckily we were at a safe distance and managed to not ruin any equipment.”

Abeling said the internship gave her valuable knowledge and skills. “Cal Poly does an amazing job of teaching us the practical aspects of structural engineering, so it was an exciting change to work on more theoretical aspects, learning about testing equipment and procedures,” she said.

Her internship was so successful that UoA is providing similar internships to ARCE students Peter Inman and Julio Mendoza this summer.

Graduating architectural engineering (ARCE) seniors Shannon Abeling and Cristina Chilin organized a trip to Haiti through SESH (Structural Engineering Students for Humanity), a campus group formed after Haiti’s devastating 2010 earthquake.

Professor James Mwangi, ARCE seniors Daniel Menno, Katerina Petrova and Omar Ramirez; graduate students Joaquin Bermudez and Andrew Stephens; and alumnus Daniel Greer (B.S., ARCE, 2014) also made the trip in summer 2014 — the third such trip in five years.

For Chilin, the best part of the trip was meeting people and hearing their stories. “It made them human instead of a collective group of people across the ocean without history or background.”

They met Noll Tufani, country director of Build Change in Haiti, who explained what that organization was doing to improve construction. “The Children’s Academy houses a training program for locals to learn to become masons,” Chilin said. “They showed us how to cut and lay concrete masonry units, apply grouting and plaster, and attach steel C channels to concrete. We were really terrible, and they laughed a lot; it was fantastic!”

Chilin admits it was a challenge to organize the trip. “But in the end, it was so invigorating and inspiring that the stress didn’t matter.”
Architectural engineering (ARCE) graduate student Charlene Tu spent two weeks in the city of Same in Tanzania last summer, not as a tourist but as part of a multidisciplinary effort to build a vocational college in rural East Africa.

The Same Polytechnic College is the brain-child of alumnus David Lambert (B.S., ARCE, 2006; M.S. 2008), who, as a graduate student, incorporated the conceptual design of the school’s campus into his thesis work. He remains involved to this day.

The campus master plan includes facilities for 1,000 students enrolled in agriculture, automotive/mechanical technology, building/construction, business, education, social studies, and other disciplines.

On her trip to Tanzania, Charlene Tu (left) encountered “every animal depicted in ‘The Lion King.’”

Rustic huts built by sustenance farmers dot the more remote areas of the country (opposite, bottom).
tourism courses. The project is now an ARCE graduate-level studio taught by professors Kevin Dong and Tom Fowler. Tu, a graduate assistant working on the project, was invited to accompany Dong and Fowler to Tanzania — a journey that took more than 24 hours.

The trip gave Tu an insight into Third World poverty. She discovered that despite extreme economic hardship, the Tanzanian people “make the most with what they have and are incredibly welcoming. The children were super enthusiastic to meet foreigners.”

And Tu was excited to experience a safari. “We drove a Jeep deep into a crater of a dormant volcano,” she recalled. “We saw every type of animal imaginable; every animal depicted in ‘The Lion King.’”

Tu also experienced “African time” firsthand — something most Westerners are not accustomed to. “Things went about at a more leisurely, relaxed pace compared to what we are used to. Once we waited more than two hours for lunch to be served.”
Kudos!
ARCE and CAED Award
2015-16 Scholarships
To 18 Recipients

More than $31,000 in student scholarships was awarded at the 2015-16 Architectural Engineering (ARCE) Scholarship Luncheon, held in June at the KTGY Gallery on campus. Department Head Al Estes served as emcee and College of Architecture & Environmental Design (CAED) Dean Christine Theodoropoulos and Associate Dean Michael Lucas presented the college-level scholarships.

Art Ross from CYS, Christina Ford from Simpson Gumpertz & Heger Inc. (SGH), and Russell Berkowitz of Forell/Elsesser Engineers attended to personally present scholarships on behalf of their firms. Four other donors (Degenkolb Engineers, kpff, KNA and Fluor) sent videos that were played as their scholarships were awarded.

ARCE offers special thanks to the ARCE Scholarship Committee (faculty members Pamalee Brady, James Mwangi and Graham Archer) and to staff members Erika Clements, Michelle Edwards and Michael Salmon for planning the luncheon.

Congratulations to our winners (listed alphabetically) and thanks to our generous donors!

COLLEGE OF ARCHITECTURE & ENVIRONMENTAL DESIGN SCHOLARSHIP RECIPIENTS
Jessica Ellis | Herbert E. Collins Scholarship Undergraduate – $1,200
Elvis Hernandez | Herbert E. Collins Scholarship Graduate – $1,200
Kendall Johnson | Herbert E. Collins Scholarship Graduate – $1,200
Jacob Ludeman | Robin L. Rossi Award – $3,000
Megan Morgan | Herbert E. Collins Scholarship Undergraduate – $1,200

ARCHITECTURAL ENGINEERING DEPARTMENT SCHOLARSHIPS
Daniel Berger | KNA Consulting Engineers Senior Project Scholarship – $1,000
Parbi Boodaghian | Emanuele Barelli Structural Engineering Scholarship – $1,200
Aaron Cook | Fluor Foundation Lower-Division Scholarship – $1,250
Aaron Cook | Hans Mager Scholarship – $1,200
Anthony Keshishian | Forell/Elsesser Engineers Scholarship – $1,000
Anthony Keshishian | Simpson Gumpertz & Heger Inc. Scholarship – $2,000
Alexi Kouromenos | Paul F. Fratessa Memorial Scholarship – $1,000
Brianna Kufa | kpff Los Angeles/Pasadena Scholarship – $1,500
Kion Nemati | CYS Eugene Cole S.E. Senior Project Award – $1,425
Angelica Quach | Degenkolb Engineers Scholarship and Internship – $2,500
Carla Simental | Fluor Foundation Upper-Division Scholarship – $1,250
Anthony Tiapon | John A. Martin and Associates Scholarship – $1,500

OUTSIDE SCHOLARSHIPS
Elena Good | AISC – $5,000
Anthony Keshishian, Michael Nidetz and Alec Zavala | JLA Scholarship – $1,500 each
Nicole O’Hearne | SEAOSC – $3,000

ARCE Department Head Al Estes and scholarship recipient Kion Nemati
High Points

FACULTY, STUDENTS DELIVER AT EERI AND QUAKE CONFERENCE


Faculty members Graham Archer, Peter Laursen, John Lawson, Cole McDaniel and Jill Nelson presented papers at the conference.

“Having five faculty members present technical papers at such a prestigious conference is a testament to their ability to combine research with teaching and to the seismic emphasis in the undergraduate program,” Department Head Al Estes noted.

The Cal Poly Seismic Design Team competed in the Earthquake Engineering Research Institute (EERI) Undergraduate Seismic Design Competition. ARCE students Derek Avrit, Mason Hahn, Michael Jensen, Awaaz Patel, Blake Reeve, Willy Rosenblatt and Yoshitaka Tamiya and civil engineering students Adam Stevens, Farhan Lilani and Ted Park competed against 30 teams from universities nationwide and the world. Cal Poly placed in the top 10 in all sub-categories, winning first in presentation, second in poster, and ninth in seismic cost.

SWE RECOGNIZES PROFESSOR LAWSON AND SENIOR O’HEARNE

Associate Professor John Lawson and graduating senior Nicole O’Hearne were honored by the Cal Poly Society of Women Engineers (SWE) at an Evening with Industry event in January. Lawson was named Most Supportive Professor, and O’Hearne was among five recipients of the 2014 Outstanding Women in Engineering award.

Lawson, nominated by students and interviewed by a student committee, is known for being approachable and for giving solid advice to students. “I tell them, when interviewing, it’s important to notice what roles women play and to find out how long they’ve been with the company,” he said.

The Outstanding Women in Engineering awardees were chosen based on faculty recommendations, leadership, work experience and GPA.

O’Hearne was cited for her “distinguished record of academics and student leadership development.”

She is this year’s president of the Cal Poly Structural Engineers Association of California student chapter, which has a majority of women elected to its board.
Student Lyndsi Halvorson, this year’s Structural Forum chair, decided to shake things up a bit with the popular event, switching venues and attracting more companies to the career fair. Approximately 170 students attended Structural Forum’s 25th year on Feb. 7. The theme was World Stabilization.

Structural Forum had followed the same format for nearly a quarter of a century, but Halvorson saw there was “room for improvement and ran with it.”

The morning portion of the event was moved from the Business Rotunda to the new Baker Center for Science & Mathematics, and the evening career fair and dinner were held at the Alex Madonna Expo Center, with ample room to accommodate additional companies. “We had 39 companies attend this year, the most we’ve ever had,” Halvorson said.

Morning session speakers included David Lambert from ARUP, who talked about his work and lessons learned in rural East Africa; Alessandro Beghini, SOM, discussed structural optimization and its applications; John Osteraas, Exponent, spoke about building failures and their causes; and keynote speaker Tom Sabol from Englekirk gave a presentation on performance-based design, an innovative approach to analyzing and designing buildings.

“All the speakers discussed very different topics, but they incorporated the problems and solutions we need to implement on a global scale,” Halvorson said. “The central message was ‘think about what you are designing and the implications your designs can have.’”

Halvorson’s early preparations for Structural Forum began in June 2014. Things got a bit more involved in September, and by winter quarter, she was working about 12 hours a week on the event.

Her time paid off — everything ran smoothly, and she even learned a thing or two along the way. “The management and planning skills I learned — including how to delegate — will continually serve me in life. When everything was over, and I knew people had enjoyed the event, the satisfaction I felt was amazing.”
ATTENDING COMPANIES
ARUP
Ashley & Vance Engineering
Barrish Pelham & Associates
Brooks Ransom
Bueller & Bueller
Crosby Group
DCI Engineers
Degenkolb Engineers
Desimone Consulting Engineers
Englekirk Structural Engineers
Fluor Corp.
Forell/Elsesser Engineers
Hilti
Holmes Culley
John A. Martin
KNA
kpff
Lionakis
LPA
Magnusson Klemencic
MHP Structural
Miyamoto International
MWA
Nishkian Menninger
Nucor/Verco Corp.
PCS Structural Solutions
Rinne & Peterson
Rutherford & Chekene
Sideplate Systems Inc.
Simpson Gumpertz & Heger
Simpson Strong-Tie
 Structural Engineering Inc.
Summit Engineering
Taylor & Sylvan Consulting Engineering
Tipping Structural Engineers
Watry Design Inc.
WJE
ZFA Structural Engineers

Splash and Bash
ARCE HOSTS RECEPTION AT 2015 SEAOC CONFERENCE

Members of the Architectural Engineering Department (ARCE) joined the largest annual gathering of California’s structural engineers at the SEAOC (Structural Engineers Association of California) conference in Indian Wells in September. Department Head Al Estes, faculty members James Mwangi and John Lawson — who both presented papers at the conference — and six students made the trip. Student attendees included Nicole O’Hearne, 2014-15 president of SEAOC’s student chapter; Daniel Menno, vice president; Kendall Johnson, Georgine Mooney, Ricky Stewart and Caleb Dunne.

Ashraf Habibullah and his company, Computers and Structures Inc., hosted the Cal Poly contingent at a special dinner at the Solomon Estate in Palm Springs. As an extension of the conference, the ARCE Department hosted its annual reception for friends and alumni. This year’s reception, organized by Administrative Assistant Erika Clements, drew more than 60 people. The department provided a number of Cal Poly door prizes. Outgoing SEAOC President Michael Cochran, from Wiedlinger Associates, won the grand door prize: a taste of SLO gift basket.

For the second consecutive year, the ARCE students won the President’s Cup competition, a friendly test of skill, intellect and dexterity in a game that varies every year between the SEAOC sub-chapters. “The win entitles the department to maintain custody of the President’s Cup Trophy — a dilapidated buoy — for another year,” Estes said.

As he has in years past, esteemed vintner and structural engineer Jerry Lohr donated wine from J. Lohr Vineyards and Wines for the event. Cal Poly’s ARCE Department is the only program that sends students to this conference every year. “This makes a powerful statement about the partnership between this department and the structural design industry of California,” Estes said. “It is great for the students and helps set us apart.”

ARCE team members who claimed the President’s Cup Trophy are (below, from left): Daniel Menno, Georgine Mooney, Nicole O’Hearne, SEAOSC President Kevin O’Connell and Kendall Johnson.
Carving Out Time for Fun

SEAOC/AEI members delight in an annual tradition at Halloween. The ARCE freshmen (from left) are: Brooke Lipsey, Eddie Kaminsky, Kyle Chase, Avery Kwong, Dario DiGiulio, and Cory Ihnotic.

They carved pumpkins on Halloween and turkeys on Thanksgiving and even managed to carve out some time for new activities.

Cal Poly’s student chapter of the Structural Engineers Association of California/Architectural Engineering Institute (SEAOC/AEI) held its first pancake breakfast fundraiser over Parents Weekend, offered volunteer opportunities with Habitat for Humanity and Avila Beach, and toured Hearst Castle with the student chapter of the Society of Civil Engineers and Society of Women Engineers.

This year, in lieu of the annual Simpson Strong-Tie Symposium, the company sponsored a trip for 25 architectural engineering (ARCE), civil engineering, and construction management students to its facility in Riverside, Calif. While there, students saw a shear wall pushover test with and without hold downs, learned about employment opportunities, and watched the fabrication of some products.

“The chapter also took more trips to local sites to allow more students to appreciate the Learn by Doing philosophy,” said 2014-15 SEAOC President Nicole O’Hearne. Tours included the new Mindbody office, Epoch Winery, and Journeyman International headquarters.

Quarterly field trips were made to San Francisco in November with Professor Abe Lynn, Los Angeles in May with Associate Professor John Lawson, and New York in March with Professor Graham Archer.

In San Francisco, Level 10 Construction led a tour of the new Frank Gehry-designed Facebook headquarters in Menlo Park. Hinman and HOK took students on a tour of the nearly complete San Francisco Public Safety Building. Students also visited the facilities of Nishkian Menninger and Tipping Structural (previously Tipping Mar).

The L.A. trip featured a site tour of The Broad museum and visits to the offices of John A. Martin, Englekirk Structural Engineering, and Nabih Youssef Associates.

In New York, Thornton Tomasetti led the students on a tour of the Hudson Yards Project. Students also visited the offices of BuroHappold Engineering, Serverud Associates, Robert Silman Associates, and DeSimone Consulting Engineers and toured High Line Park and the Hearst Tower.

“The Hearst tour was unique,” said Daniel Menno, SEAOC vice president and coordinator of the trips. “We saw the executive offices on the top floor and where Good Housekeeping does its product testing.”

GUEST SPEAKER SERIES

SEAOC’s weekly speaker series introduced a “Meet the ARCE Professors” segment “to give underclassmen ‘face time’ with ARCE professors,” said O’Hearne. This year’s speakers were:

Bernard Cruz from Hilti, who demonstrated Hilti products and spoke about alternative professions in engineering and opportunities at Hilti.

Taka Yokoyama (B.S., M.S., ARCE, 2011), Hinman Consulting Engineers, talked about Hinman’s various sectors, including blast engineering.

Professor Lynn spoke about his life’s journey and how things can turn out differently than you plan. (See related story, page 24.)

Brian Planas (B.S., ARCE, 2011) told of his experience in Haiti after graduation and...
SEAOC members took in the sights nearby at Hearst Castle (top) and afar in New York, where they visited Times Square (left).

gave advice about how to relate what you learn in ARCE to all aspects of life.

Ken O’Dell (B.S., ARCE, 1989), MHP, talked about the Napa earthquake response and MHP’s projects.

Daniel Wiens (B.S., CM, 2010), Journeyman International, provided details on interdisciplinary projects students could get involved with.

Laura Rice (B.S., ARCE, 2012), Allhouse Engineering, explained the transition from college to real life and showed projects she has worked on as a young engineer.

Erik Kneer (B.S., ARCE, 2001), Holmes Culley San Francisco, spoke about disaster resilience as sustainable design and incorporating that into LEED and other building codes.

Professor Ed Saliklis talked about the Lithuania Study Abroad program.

SESH (Structural Engineering Students for Humanity) members gave a presentation on their experiences in Haiti.

Ryan Sandstrom (B.S., Civil Engineering, 2009; M.S., Civil & Environmental Engineering, 2011), kpff, spoke about typical projects a structural engineer just starting out might face. He also talked about how individuals can market themselves and their companies to build reliable, strong relationships.

Maryann Phipps, Estructure, talked about the rebuilding efforts that are taking place in Napa after the 2014 earthquake.

Joshua Marrow (B.S., ARCE, 1998), Partner Engineering and Science Inc., discussed how his senior project analyzing the structural stability of wine racks and mass wine storage practices completely guided his career path.

Jose Mendoza, CRSI, gave a presentation on the use of concrete — particularly concrete reinforcing — for most buildings.

Next year, ARCE senior Nick Petrarca will serve as president of the Cal Poly student chapter of SEAOC.
During his nearly 28 years in the U.S. Air Force, Rod Petithomme (B.S., ARCE, 1986) saw much of the world “and had a great time.” When it came time for the colonel to retire from service, he and his wife, Jeannie, settled in San Luis Obispo.

Being settled anywhere is a new experience for Petithomme, who was stationed at 14 different bases in the U.S., Germany, Iraq, Kuwait and South Korea.

While the military — and the excitement of flying F-16s — is now behind him, the friendly skies of United Airlines await while he completes training to fly 737s. “It will be significantly different than flying F-16s; I won’t be able to fly upside down any more,” he joked.

Back on land, Petithomme has enjoyed helping out in the College of Architecture & Environmental Design (CAED) Support Shop while waiting to start his training with United. “I’ve spent a lot of time in that shop,” he recalled. “I was a shop technician when I was a student. I enjoy working with the students; I like helping folks learn how to do stuff.”

Architectural Engineering (ARCE) Department Head Al Estes is grateful for the help. “Rod arrived at a critical time, allowing the college shop to remain open. Key personnel had suddenly retired or left, and end-of-quarter student demand was in full swing. I am not sure what the college would have done without him. He saved the day.”

Once Petithomme completes his commercial pilot training, he’ll have four or five flight assignments a month, leaving plenty of time to enjoy the company of Jeannie and daughters Catherine, a Cal Poly wine & viticulture major, and Caroline, a sophomore at San Luis Obispo High School.

And still have time to lend a hand in the CAED shop.

Rod Petithomme is back, sharing his expertise.
Catching Up

CLASSES OF 1963-65
ALUMNI TURN OUT
FOR SPRING REUNION

Architectural engineering classes of 1963, 1964 and 1965 held a reunion May 1-3, including a banquet at the San Luis Obispo Country Club.

The event was emceed by Nick Watry (B.S., 1964) and Carl Schubert (B.S., 1964). Joanie Brown, spouse of recently deceased College of Architecture & Environmental Design (CAED) emeritus faculty member Bill Brown, presented her husband’s golf trophies to the winners of the reunion golf tournament. Paul Neal, former CAED dean, was honored with the gift of a commemorative stool.

The program featured a PowerPoint presentation of the careers of those in the honored classes. CAED Dean Christine Theodoropoulos and ARCE Department Head Al Estes spoke about the current state of the programs at Cal Poly.

Sadly, retired Cal Poly journalism Professor Jim Hayes, who attended the event, passed away several days later. We mourn his passing.

Clockwise (from top left):
Reunion attendees (from left) Carl Schubert, Ralph Bradshaw, an ARCE spouse and James Potter look back at the class history.
Rita and Jeff Wilson enjoy the event.
Bill Miller (left), and Bruce and Sharon Beckett converse on the back patio.
Dean Christine Theodoropoulos (left) and Joanie Brown enjoy the camaraderie of the evening.
The Private Sector Beckons
LONGTIME ARCE FACULTY MEMBER ABE LYNN BIDS FAREWELL TO TEACHING

Abe Lynn, the Architectural Engineering (ARCE) Department’s longest-standing faculty member, has retired from Cal Poly to work as a structural analyst at Degenkolb Engineers.

“We will all miss Abe and wish him the best,” said Department Head Al Estes. “Abe had been the interim department head when I arrived, and I could not have asked for a more gracious transition. He and I co-taught the Structural Analysis course during his last quarter. It was a blast.”

Below Lynn talks about the past, present and future.

When did you start at Cal Poly?
In 1996, as I was finishing at UC Berkeley.

What was the most rewarding part of your teaching career?
The students, hands down. Our students are exceptionally intelligent and highly motivated. Many, if not most, of the students have interests and talents far beyond the left-brain thinkers we expect engineers to be; they are multi-talented, three-dimensional individuals.

What are the biggest changes you’ve seen over the years?
The decreasing public support of higher education. Students now pay a major proportion of the cost of their degree. It’s led to the development of an entire industry within universities of advancement specialists whose sole job is to raise money from the private sector to supplement budgets. There will be — and already are — long-term impacts for taking this path.

Has anything remained the same?
In spite of rapid changes in technology, teaching still comes down to being face-to-face with your students. Effective teaching is as much about knowledge transfer as it is about inspiration and mutual respect. It’s a very human interaction that, for me, made it fun and much, much more than just a job.

What is your role at Degenkolb?
My skill sets and background are broad enough that I find myself tackling a diverse and interesting range of projects, including in-depth analyses and seismic evaluations of high-rise buildings; design of large-scale, critical facilities; retrofitting historic buildings and code development; and reconstruction work in Haiti after the 2010 earthquake.

Final thoughts?
I feel privileged to have been part of the ARCE program. So many former students lead interesting, successful, amazing lives. I am grateful to consider many as friends and to have been part of their journey. To all those former — and current — students: look me up anytime; I would love to hear from you.
Architectural Engineering (ARCE) Department faculty members Cole McDaniel and Ed Saliklis were promoted to full professor, and John Lawson and Jill Nelson earned tenure and promotions to associate professor, effective fall quarter 2014.

McDaniel and Saliklis were among 30 Cal Poly faculty members to earn the academic rank of professor; Lawson and Nelson also were among 30 faculty members to be promoted to associate professor. The award of tenure was extended to 29 faculty members.

McDaniel joined the ARCE faculty in 2005. He earned a bachelor’s degree in applied mechanics and engineering sciences, a master’s in structural engineering, and a doctorate in structural engineering, all from UC San Diego.

Saliklis has been teaching at Cal Poly since 2005. He earned a bachelor’s from the University of Illinois, Chicago, a master’s from Syracuse University, and a doctorate from the University of Wisconsin, Madison. All three degrees are in civil engineering.

Lawson, a Cal Poly alumnus, returned to his alma mater to teach in 2009. He earned a bachelor’s in architectural engineering from Cal Poly and a master’s in structural engineering from Stanford University.

Nelson, who began teaching at Cal Poly in 2008, earned a bachelor’s degree in civil engineering (structures) from the University of Nevada, Reno, and a master’s in civil engineering from the University of Washington.

“It’s gratifying to see the hard work of all these faculty members rewarded,” said Department Head Al Estes. “In just eight years, the ARCE faculty has transformed from a largely untenured faculty with only one full professor to an almost fully tenured group with almost two-thirds at the full professor rank. We hire great people and they tend to be successful.”

Celebrating their new status with (from left): Professor Cole McDaniel, Associate Professor Jill Nelson, Professor Ed Saliklis and Associate Professor John Lawson.
MHP

THE STRUCTURAL ENGINEERING FIRM’S PARTNERSHIP WITH ARCE RENDERS VALUABLE BENEFITS FOR BOTH PARTIES

MHP is a full-service firm that has offered exceptional, responsive structural engineering services for more than 40 years. The company’s robust design and due diligence practices allow it to offer unique expertise to clients with seismic issues.

MHP has a large and varied portfolio that includes police stations, libraries, airport facilities, K-12 schools, higher education campuses, multifamily housing, and healthcare facilities. The firm has completed more than 100 mixed-use projects and has extensive experience in stand-alone retail stores and urban infill projects. As one of a select list of approved Target structural consultants, MHP has completed more than 300 Target store projects nationwide.

The company serves as the campus engineer for several major universities, including NASA’s Jet Propulsion Laboratory in Pasadena and Cal State Long Beach.

Located in Long Beach, Calif., MHP’s reach extends across the U.S., with clients and projects in the Asia-Pacific region.

Project and travel diversity provide a great environment for career growth, encouraged by the management team of MHP. This includes sending partner and Cal Poly architectural engineering (ARCE) alumnus Ken O’Dell (B.S., 1989) to earthquake-ravaged Katmandu in Nepal. O’Dell spent 10 days there as part of a team of international experts helping to assess buildings after the two devastating earthquakes hit in April and May.

That wasn’t the first time O’Dell has traveled great distances to help communities rebuild after a disaster. He accompanied Cal Poly ARCE students on their first two trips to Haiti to aid in recovery work after that country’s 2010 earthquake.

O’Dell’s travel with the students is just one example of how MHP extends its support to Cal Poly. The company for years has enjoyed a special relationship with the ARCE Department, hiring its graduates, welcoming students to its headquarters, and offering tours of its offices and works in progress.

O’Dell is an important link in that relationship, going out of his way to welcome the students, lead tours and dispense advice.
He often opens his own home to the Cal Poly contingent, hosting barbecues that serve as both social and networking events.

MHP’s longtime support of the ARCE Department dates back more than two decades. While the department this year celebrated its 25th annual Structural Forum, MHP celebrated its attendance to at least 24 — if not all — of them.

According to MHP Partner Rick Beall (B.S., ARCE, 1984), “MHP’s countless trips to Structural Forum were made for a reason. We consistently find extremely well-prepared students who not only have very practical experience from the program but also typically have great experience outside the program, including humanitarian trips and valuable internships.

“In addition, with the advent of the blended master’s program, Cal Poly now has the ability to compete with research-based institutions to offer students an increased technologically based curriculum and hence better prepare students to start their employment with MHP and other structural engineering firms.”

This has resulted in several Cal Poly ARCE alumni finding employment at MHP. Indeed one of its original three founders, Rawn Nelson, is a 1967 ARCE graduate. Two of its five current partners are Cal Poly alumni, and a full one-third of MHP’s 30 staff members are Cal Poly ARCE graduates. (See sidebar for complete list.)

“MHP has provided wonderful support to this program, and we hope we have provided them with some great structural engineers,” said Department Head Al Estes. “I am most grateful to MHP partner Ken O’Dell. He has served on the ARCE Advisory Board since its inception in 2007 and represents the ARCE perspective on the Dean’s Leadership Council. He is the face of MHP at Cal Poly.”

“With the exception of those who have yet to sit for the exam, all our Cal Poly alumni have attained their structural engineer licensure,” O’Dell noted. “This is a huge accomplishment. We have 19 engineers — 13 structural engineers, three professional engineers, and three engineers in training. The high percentage of structural engineers to professional engineers is, I believe, unique in the industry. A recent graduate beginning a career in structural engineering would have a tough time finding a better opportunity for in-depth interaction with seasoned structural engineers.”

MHP fosters a culture of openness and trust. “We believe honest communication fosters long-term relationships and brings out the best in both clients and employees,” Beall said. “I think it’s safe to say that much of the company’s success can be attributed to that — and to our great relationship with Cal Poly’s College of Architecture & Environmental Design.”

PREVIOUSLY PROFILED INDUSTRY PARTNERS (IN ORDER OF THE MOST RECENT): J. LOHR VINEYARDS AND WINES | NUCOR CORP. | FLUOR CORP. | KPFF | DEGENKOLB ENGINEERS | BARRISH PELHAM & ASSOCIATES INC. | JOHN A. MARTIN & ASSOCIATES
Georgine Mooney (left) and Sydney Patrick joined 13 master’s students and 42 other graduating seniors for Commencement exercises in June 2015, capping off their years of commitment to Learn by Doing and architectural engineering — in college, that is.

Graduates of the colleges of Engineering and Architecture & Environmental Design participated in a large ceremony in Spanos Stadium, while a more intimate ceremony was held for architectural engineering (ARCE) grads in the department’s courtyard. As ARCE’s graduate program coordinator, Professor Cole McDaniel placed a hood on each of the graduating master’s degree students. Department Head Al Estes gave the graduates their certificates, and Professor Ed Saliklis served as the master of ceremonies. Staff members Erika Clements, Michelle Edwards and Michael Salmon organized the department event.