

ARCE

CAL POLY ARCHITECTURAL ENGINEERING DEPARTMENT | SPRING 2011
COLLEGE OF ARCHITECTURE AND ENVIRONMENTAL DESIGN



Global Insight

ARCE program takes students to Tanzania



Al Estes demonstrates his carving skills at SEAO's annual Thanksgiving feast (page 18).

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On the Cover

As part of Professor Craig Baltimore's research project, titled Long-Term Knowledge Transfer to Rural Areas of East Africa, students Nichole Brandt (left) and Ashley Moraes surveyed the site of a proposed school in Samé, Tanzania. Read about this and other faculty research projects on page 8.

A Veritable Feast

Our plate brims with generous friends, talented students

How do we go from good to great? That was a question the faculty asked themselves at the annual retreat in September. While we still struggle with the answer, I think we made some significant progress in that direction this year. For one, we need facilities and laboratory equipment that match the quality of our students. This year, we dedicated five design laboratories sponsored by generous industry partners and alumni. I offer my sincere gratitude to Computers and Structures Inc., Hilti, Mark Haselton, Simpson Strong-Tie and Verco Decking for making these lab renovations possible. I also thank Berridge Manufacturing and Degenkolb Engineers for committing to sponsor two additional laboratories.

Thanks also to KPFF for sponsoring this year's newsletter and the Fluor Corp. for its large annual contribution to scholarships and the student leadership fund. I continue to be grateful to all of our industry partners who attend Structural Forum, provide guest speakers for our students, and fund student scholarships.

We successfully reached out to parents this year during Parents' Weekend

with our first ARCE reception, which has become a model for the rest of the university. Our master's program took a more systematic approach to involving industry partners in our thesis projects. The Architectural Engineering Institute (AEI) annual conference was a huge success, as we sent 47 ARCE students to Oakland; Abe Lynn was a conference organizer; Craig Baltimore was on the AEI national competition Rules Committee; and our students won more prize money than any other school in the AEI national competition. I congratulate the students for hosting a Structural Forum that included such prominent speakers as Trailer Martin, Maryann Phipps and Kit Miyamoto.

Despite budget constraints, we continue to offer all classes twice a year and have maintained the small class size that makes Learn by Doing possible. I hope that you read about all of this and more in this newsletter and continue to provide such wonderful support to this program.

ALLEN C. ESTES, DEPARTMENT HEAD

Dean's Message

ARCE's menu boasts unique educational experiences

The Architectural Engineering Department continues to make our college unique. There are only 14 universities in the nation that offer architecture and construction management in the same college. We are the only university that adds architectural engineering to that combination, which presents unique opportunities. We are currently conducting upper division interdisciplinary experiences that are simply not possible in other places.

I continue to admire the success and contribution that graduates of this program make to the entire design construction

profession. I remain incredibly grateful for the financial support that industry partners and alumni have provided to the ARCE program this year. It is clear you have decided to back a winner.

As the college moves forward with an emphasis on interdisciplinary collaboration, sustainability, materials and technology, and global awareness, the Architectural Engineering Department has a huge role to play.

R. THOMAS JONES, AIA



PUTTING THE **FUN** in Fundraising

ARCE festivities celebrate generous lab sponsorships

The ARCE Department dedicated the new CSI Computer Lab, equipped with top-of-the-line computers and software, on Feb. 12, during Structural Forum. A large crowd enjoyed a buffet lunch, cake, and talks by Cal Poly dignitaries to celebrate CSI's generosity and foresight.

The CSI Computer Lab is one of seven labs to be revamped and renamed under a five-year sponsorship program. Four of the newly refurbished labs – Hilti, Haselton, Simpson Strong-Tie and Verco – are complete, and two new partners have signed on to create the Berridge and Degenkolb labs.



The named sponsorship program provides an opportunity for companies and individuals to make a real difference in the lives of students. A \$10,000-a-year commitment for five years will pay for needed upgrades and maintenance in the

Celebrating the CSI Lab opening (above, from left): Cal Poly President Jeffrey Armstrong, CAED Dean R. Thomas Jones, CSI Director of Marketing and Communications Miriam Leigh, and ARCE Department Head Al Estes.

CSI's founder and CEO Ashraf Habibullah (left)

lab, which is named in the donor's honor and includes special recognition.

Next up? "C-lab, A-lab and the seismic lab are our next priorities for sponsors," said ARCE Department Head Al Estes.

CSI Computer Lab

At the CSI lab unveiling, Al thanked those involved in the renovation, which, he noted, was done in record time. "The students left for the summer, and when

CONTINUED

Named Labs from page 3.

they returned in September, the new lab was waiting for them,” he said.

The former Scarab lab was in dire need of a transformation. “We literally gutted it,” Al said. “We took it to bare bones.” And in just a few months, they created an enviable

Hilti’s Marcus Oden unveils the new lab sign before the dedication ceremony (below).



computer lab that allows students to do their creative best.

The renovation was made possible by a generous donation by Computers & Structures Inc., the leading developer of software for structural and earthquake engineering. CSI’s gift included \$80,000 up front, which enabled the immediate transformation, and \$10,000 a year for five years to maintain the lab.

Unfortunately, CSI’s founder and CEO, Ashraf Habibullah, was unable to attend the dedication, but Miriam Leigh, director of marketing and communications, spoke on his behalf. “Ashraf recognizes that Cal Poly has extraordinary students,” Miriam said, “and he is a man of exquisite taste. He wanted the students to be the best they can be and train on the best equipment. He wanted to make an impact.”

Cal Poly President Jeffrey Armstrong also delivered remarks at the ceremony, as did CAED Dean R. Thomas Jones.

Hilti Design Lab

The first thing visitors notice is the striking mural depicting engineers and construction trades people caught in the

act of building. It covers an entire wall in what used to be the B-lab. The mural celebrates the donor, explains Al.

More significantly, according to Frank Brown, human resources director at Hilti, “We wanted to create a space that is conducive to innovation and quality. The lab’s bare white walls were transformed with help from a graphic artist, who created a unique wallpaper design featuring many of Hilti’s innovative products and high-quality materials. We wanted to remind students when they are creating, it’s about quality, innovation and solutions.”

The lab also received fresh paint and new window treatments. “The desks were in total disrepair, so we cannibalized the worst for parts and installed new tops to enhance the drafting surfaces,” Al said.

The lab was dedicated in October 2010, in conjunction with the weekly SEAOC/AEI luncheon. Marcus Oden, vice president and general manager of the Western Marketing Organization for Hilti, spoke and presented a \$50,000 check to Al, CAED Associate Dean Dick Zweifel, and SEAOC/AEI student chapter president Caelen Ball to represent full commitment.





Haselton Lab

Mark Haselton (ARCE '63 and Distinguished Alumnus '07), owner of Continental Concrete Structures, is the only individual so far to sponsor a lab, which was dedicated in April.

"Sponsoring the lab was personal," Mark said. "We did it out of compassion for the college, students, faculty and the entire program, as well as all the other departments. The idea was looking to the future."

On a recent visit to the lab, he introduced himself to a group of students. "They thanked me for the lab. That was the coolest compliment I could have gotten," Mark said. His gift so far has funded new tables, blinds and wallpaper.

Pictures from Mark's structural engineering career and of senior projects that Mark has sponsored over the years decorate and personalize the space. One of those images is the second 20-foot "flower"



Students, faculty and staff turned out to celebrate the dedication of the Haselton Design Lab in May (above).

Alum Mark Haselton (at left with his wife, Pam,) was "looking to the future" when he sponsored the lab.

built to replace the deteriorating original concrete blade structure that Mark and three architecture students built in Poly Canyon for their senior projects in 1963. Ken Minor, Steve Gilmore and the late Dan McMann were part of the original team.

Recently Ken, Steve and Mark funded and coached students in building a second Blade Sculpture in Poly Canyon. Steve and Ken attended the lab dedication along with longtime friends Luis and Estonia Ruf.

Mark hopes to return to the lab from time to time to discuss with students "design and construction issues normally not found in textbooks."

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Named Labs from page 5.

Simpson Strong-Tie Lab

Formerly known as E-lab, the renovated Simpson Strong-Tie Lab is easily recognizable by the large wall display created as a senior project using nothing but Simpson Strong-Tie products. “It was the obvious choice for Simpson to sponsor,” Al said.

Simpson Strong-Tie hosts an annual symposium for ARCE, construction management and civil engineering students that features technical presentations and hands-on opportunities for students to use

its products. The formal dedication of the Simpson Strong-Tie Design laboratory was held in conjunction with the symposium on May 14th.

The company employs many ARCE graduates. “We like the CAED’s interdisciplinary approach, which gives students great exposure,” said Simpson Strong-Tie’s Sales Manager Alan Hanson.

Simpson Strong-Tie has a long history of support to the ARCE Department that ranges from supporting senior projects and establishing a scholarship fund to sponsoring student attendance at conferences and attending Structural Forum.



Simpson Strong-Tie’s Alan Hanson (above, left) and Cal Poly Provost Robert Koob attended the lab dedication in May (top).

And Still to Come ...

Berridge Lab – “We have labs where we design things and labs where we break them,” explained Al Estes. The Berridge Lab falls into the latter category, operating

as a classroom, an activity room and an experimental lab.

Jack Berridge (ARCE ’59) owns Berridge Manufacturing, a Houston-based company that makes wall siding and ceiling panels. In addition to its \$10,000-a-

year, five-year commitment, Berridge will also provide and install its own materials in the renovation.

Degenkolb Lab – Degenkolb Engineers is sponsoring the Graduate Laboratory for students in the master’s program. “It’s a

Verco Design Laboratory

Improvements to the lab previously known as D-lab include new paint, window treatments and tabletops. The dedication ceremony was held May 26 in conjunction with the SEAOC/AEI lunch.

Keith Cullum (ARCE '07), an engineer with Verco Decking Inc., hopes the donation will “improve the classroom and equipment, and that the learning tools will promote a better understanding of steel design and construction.”

Verco is a big believer in Cal Poly. “Our engineering manager, in his 19 years with the company, has hired only four engineers, two of which were from Cal Poly,” Keith said. “He specifically went to Cal Poly for his first hire because of the reputation its grads have among the design community. We needed to be able to hire people who can contribute immediately. That would seemingly preclude most new grads, but input from West Coast design firms suggested otherwise when considering those from Cal Poly. It is by far the best at preparing students for the real world.

“The Learn by Doing credo, the outstanding faculty, and the vast array of upper division courses all contribute immensely to the program and its grads,” Keith continued. “I’m not alone in saying this; you can ask anyone in the industry, and they’ll tell you the same thing.”

Students anticipated the opening of the Verco Lab. Top, from left: Jose Chig, Jean-Luc A'breau, Caelen Ball, Linda Huang, Joshua Batham, Yoni Sadka and Devin Daniel

At the cake-cutting (right, from left): Verco's Jeff Martin, Holly Schaubert, Keith Cullum and Chris Brown with Cal Poly's Al Estes and Dean R. Thomas Jones



space where students live, breathe, eat and play,” Al said. “Instructors literally come to them to teach.”

The lab, which houses classroom, individual study, and computer areas, was in really bad shape when ARCE inherited

it two years ago. “I asked each successive class of graduate students to leave the room in better shape than when they found it,” Al said. “And they did. They painted the walls and ceiling and cleaned it up.” But there is only so much students can do.

Initial plans include new window treatments and new computers.

“Degenkolb has hired so many of our master’s graduates and has participated in so many master’s thesis projects, they were an ideal match to sponsor this lab,” Al said.

• FOCUS ON Discovery

Faculty members make
a difference through
outreach and research

Outreach efforts with local school
children, building relationships
with tribal leaders in East
Africa, identifying buildings
vulnerable to earthquakes, finding
better teaching methods, and
strengthening building materials
to withstand earthquakes are
some of the ways ARCE faculty
members are trying to make the
world a better and safer place.

A Matter of Trust

Professor Craig Baltimore and ARCE students Nichole Brandt, Hanna Ellis and Ashley Moraes spent two weeks last September in Samé, Tanzania, surveying land where the goal is to build a school.

The first two years of the three-year project were an investment in relationship building, said Craig. “Before ground can be broken, the trust of tribal leaders and government officials must be earned.” This is one of the valuable lessons learned from the overall project Long-Term Knowledge Transfer to Rural Areas of East Africa, now in its sixth year.

“When people from developed countries travel to developing countries, they bring new technology and the best of intentions, but too often the knowledge doesn’t stick,” Craig said. “They fail to infuse their knowledge into the lifestyle, skill set, and culture of the people who will be using it. The most important aspect to make knowledge stick is to develop relationships.”

“Our trip,” Craig said, “was two days of travel, two days to say ‘hello,’ six days of work, two days to see the sights, two days saying ‘goodbye,’ and two days traveling home. That is what the culture demands. Now that they know we are the good guys, we can start the design and planning.”

Hanna Ellis helps survey a potential
school site in Tanzania (above).

Students Jean-Luc D’Abreau (left)
and Caelen Ball use a shake table
device atop a campus building
to simulate an earthquake.





To that end, a group of students is building a structure in Poly Canyon. “It’s a dry run to see if our techniques will work for the skill set in East Africa,” Craig said.

The Tanzania project is a collaboration among academia, industry (ARUP - Los Angeles) and non-governmental organization The Mbesese Initiative, founded by alumnus David Lambert (B.S. ’06, M.S. ’10). The final project is a polytechnic high school for 500 students that will offer housing, support buildings, athletic facilities and classes in computer technology, automotive repair, construction and hotel management.

Good Vibrations On Campus

It’s small, portable and weighs only about 100 lbs., yet it has the potential to change the way structural dynamics is taught. Professors Graham Archer and Cole McDaniel found the shaking device by chance and are using it to teach structural dynamics. The shaker lets students explore the phenomenon of resonance of buildings that experience earthquake shaking and

may pinpoint areas of the building that are likely to be damaged in an earthquake.

Also by chance, the professors found the device could shake actual buildings, like the Kennedy Library. Most shakers used in these tests are massive. “They have to be brought in by truck,” Graham said.

According to Cole, the computer models created by students in structural dynamics classes are often flawed. “The buildings look good on the computer, but they haven’t been modeled accurately,” he said. With the portable shaker, students can shake buildings on campus and compare the results with their computer models. “When a good model has been created, it matches very well,” Graham noted.

With additional funding for their Forced Vibration Testing project, Graham and Cole would like to explore damage detection in buildings that have undergone a major seismic event.

Building Blocks

Professor Peter Laursen is testing how well interlocking compressed earth

Students Brian Planas, Megan Hanson and Kaitlin Ransford shake the Bridge House.

block (CEB) masonry walls hold up in earthquakes and strong wind conditions. Peter is expanding on research carried out in collaboration with civil engineering professors Dan Jansen and Bing Qu, who initially were looking more at the material properties of the CEBs. “No one was looking at how well the CEBs were performing structurally,” Peter explained.

CEB masonry is widely used in Thailand, mostly to build one-story structures. “The blocks can be manufactured locally, inexpensively, and without much technology,” Peter said.

With \$11,000 funding from Cal Poly’s Extra-Mural Funding Initiative, Peter, Dan, Bing and two graduate students started last year testing the performance of structures made of CEBs. “We are finding that they are fairly robust,” Peter said. “They stand up reasonably well considering they are made of dirt.”

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Discovery from page 9

Peter and two ARCE graduate students hope their continuing research will lead to design guidelines that ensure consistent and safe design of CEB wall structures.

Sizing up Seismic Data

Professors Jill Nelson and Jim Guthrie have been collaborating with the City & Regional Planning Department to prepare the 2010 State Hazard Mitigation Plan for the California Emergency Management Agency. That work has led to related work with Cal EMA on the California Vital Infrastructure Vulnerability Assessment (Cal VIVA) project. The pair was awarded a \$300,000 grant to assess the seismic vulnerability of state-owned buildings. It has the potential for additional grants in the future.

This FEMA-funded project will help Cal EMA prepare for natural disasters by identifying state-owned buildings that house critical functions and are vulnerable to earthquakes. The project will include developing a prioritization process for all state-owned buildings and preparing

seismic evaluations and upgrade concepts for at-risk buildings. The work includes funding for faculty members and graduate students in ARCE.

There will be opportunities to bring aspects of the project into the classroom in the form of seismic evaluation and upgrade, and public policy decision making. The project will also serve as a springboard for master's degree projects involving seismic vulnerabilities.

Hands-On Engineering for Kids

Professors Ed Saliklis and Pamalee Brady are unwavering in their commitment to teach children about engineering. They have separately pursued K-12 outreach by combining visual images and engineering principles.

"Unfortunately, a lot of typical outreach efforts are simply show-and-tell," Ed said. "Kids come to a campus and basically see a magic show." Ed's outreach efforts focus on sixth graders because they "have the ability to read an engineering scale, divide numbers, and draw parallel lines." Consequently Ed has designed an actual engineering project for them to do.

Professor Pamalee Brady and Equipment Technician Ray Ward with junior high students

In addition to this hands-on work, he also tries to make tangible connections to the children's lives by telling them about Rafael Guastavino and Felix Candela, two Hispanic engineer/architects from Spain. The thread connecting the children's project to Candela and back to Guastavino is the use of graphical statics, which is what Ed presents to the children, allowing them to re-create structural engineering calculations graphically. "They actually do number crunching!" Ed said.

Ed and Pamalee have inspired numerous groups of K-12 students by inviting them into their classrooms for creative hands-on exercises. In response to one visit, a Santa Maria school principal wrote, "Our students saw how what they are learning is applied in the real world. Equally important was the interaction with college students. Most of their families work in agriculture and have not thought about college for their children. These college students gave the sixth graders a glimpse into what could be in their future if they work hard and learn all they can."

When Jonathan ‘Yoni’ Sadka, a fourth year ARCE student, decided to “take a step back from the focused life at Cal Poly and see what else life had to offer,” he didn’t opt for the more-ordinary study abroad programs in England or Italy. He traveled to Israel to attend Tel Aviv University.

Yoni arrived in Israel in the summer of 2010 and began an intensive-two month Hebrew language course. During the fall, he studied Israel and the environment, modern Jewish history, business ethics, the Israeli economy, and Israeli politics.

“It was nice having a break from math and science,” Yoni said. “Most of the stu-

SIX MONTHS IN ISRAEL =

A Lifetime of Lessons

dents there were liberal arts and business majors, so living with them gave me a different point of view.”

Yoni was one of 200 students from around the world to take part in the program. His “suite-mates” were from Texas,

New York and San Francisco, and the four of them soon became inseparable.

But Yoni wanted more than new friends and a culturally different university life. He wanted new and interesting life experiences, and he found it in Tel Aviv, when he and his roommates met Itamar, Ido and Gilad, who had been recently discharged from the military.

They met over music. “One of my best friends is a singer, and they had open mic night at a club coincidentally called Mike’s Place,” recalls Yoni. “My friend sang. Itamar also sang, and we all just clicked.”

The Israelis and the Americans bonded quickly. The Israelis drove Yoni and his American friends all over, “introducing us to their families, showing us the cities, and – most importantly – the local night life.”

During Yoni’s six-month stay, he traveled all over Israel, visited Egypt, and spent two weeks in Italy. The experience changed his life.

“Meeting all these people, seeing how important family and friends are in their lives, and their indifference to material things made me rethink the necessities in life. Over there, it’s about enjoying life – enjoying the important things.”

Yoni with friends at the El Al Stream (left) and above Tiberius on the Sea of Galilee (below)





When third-year ARCE student Florian Barth chose to study in Australia, he made the uncommon decision to do it on his own, without friends or classmates.

FLORIAN BARTH GOES IT ALONE Down Under

or classmates.

"It took some adjusting to, being all alone in a country 7,000 miles from home and not having any friends," Florian admitted. "But I wanted to experience the adventure alone to see if I could adapt to a new environment far from home."

Turns out, he could. "I learned to be more self-reliant," said the Los Gatos native. "I had never lived outside the country before, and it was interesting to see how others viewed the United States."

Having vacationed in Australia with his family before, Florian was familiar with the friendliness of the people and liked the "inviting weather."

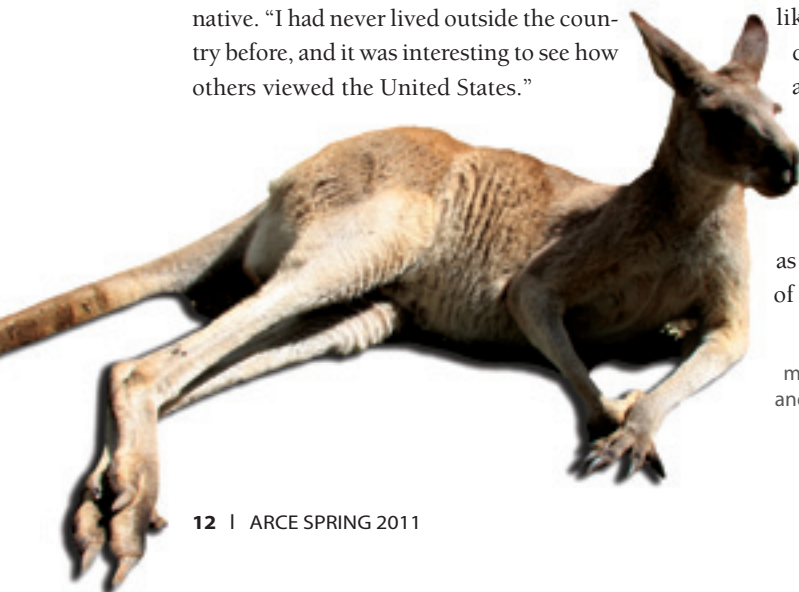
He studied at Griffith University Gold Coast on Australia's east coast just minutes from pristine beaches, taking government business relations, botany and zoology, and soil mechanics. "A typical day was much like Cal Poly," he said, "except class sizes were larger and we didn't have as much hands-on experience."

There wasn't a language barrier, but Florian faced other challenges, such as driving on the opposite side of the road and dealing with

less-than-reliable public transportation. "Buses often do not arrive on time and sometimes not at all."

He said students eager for a change of scenery should study abroad. "More importantly, experiencing different cultures and educational styles broadens everyone's horizon." To add to that experience, Florian combined his exchange with a trip to Bali, Indonesia.

Department Head Al Estes said he is often asked if there are opportunities for international study in the ARCE program. "There are," he said, "and the ideal time to go is fall quarter of the third year. Students are comfortable enough with college to appreciate a study abroad program, but are not yet into the highly specialized ARCE courses. Fall is the best time to go because students only miss one quarter. If they go in the spring, they miss two."



Florian Barth experiences a market in Bali, Indonesia (above), and Australia's exotic wildlife (left).

Y O U C A N

Go Home Again

Ansgar Neuenhofer enjoys a change of pace teaching in Germany

For two decades, Professor Ansgar Neuenhofer has been bouncing back and forth from California to Germany. He first came out West in 1990 to pursue a master's degree at UC Berkeley. He returned to Germany to work on his Ph.D. Then back to Berkeley to teach and conduct research, do a short stint in private practice in Sacramento, then back to Germany in 2000. But the job there wasn't a good fit, and in 2001, Ansgar landed at Cal Poly.

Ten years later, he and his wife, Beate, and their five children are back in Germany, where Ansgar is teaching at the University of Applied Sciences at Cologne for the academic year.

He wanted to return to Germany to expose his children to the culture and the school system. "It's our roots," Ansgar said.

Ansgar said German students differ from their American counterparts. "They are not as well behaved," he said. "The

students think nothing of leaving class 20 minutes early to catch a bus."

Even the young children at his kids' school show little respect. "They come late, they jump on the desks and chairs," he said. "It's shocking really."

Ansgar is happy the family settled a bit south of Cologne in Bonn, near Ansgar's childhood home. "Meeting kids who grew up where I did 30 years ago is interesting. It's not always easy because things change. It's no longer your home."

Germany is a beautiful country for bike riding, and the family is taking full advantage. "We ride these paths along the Rhine with beer gardens along the way. We spend long, mild summer nights riding bikes. It is wonderful," Ansgar said.

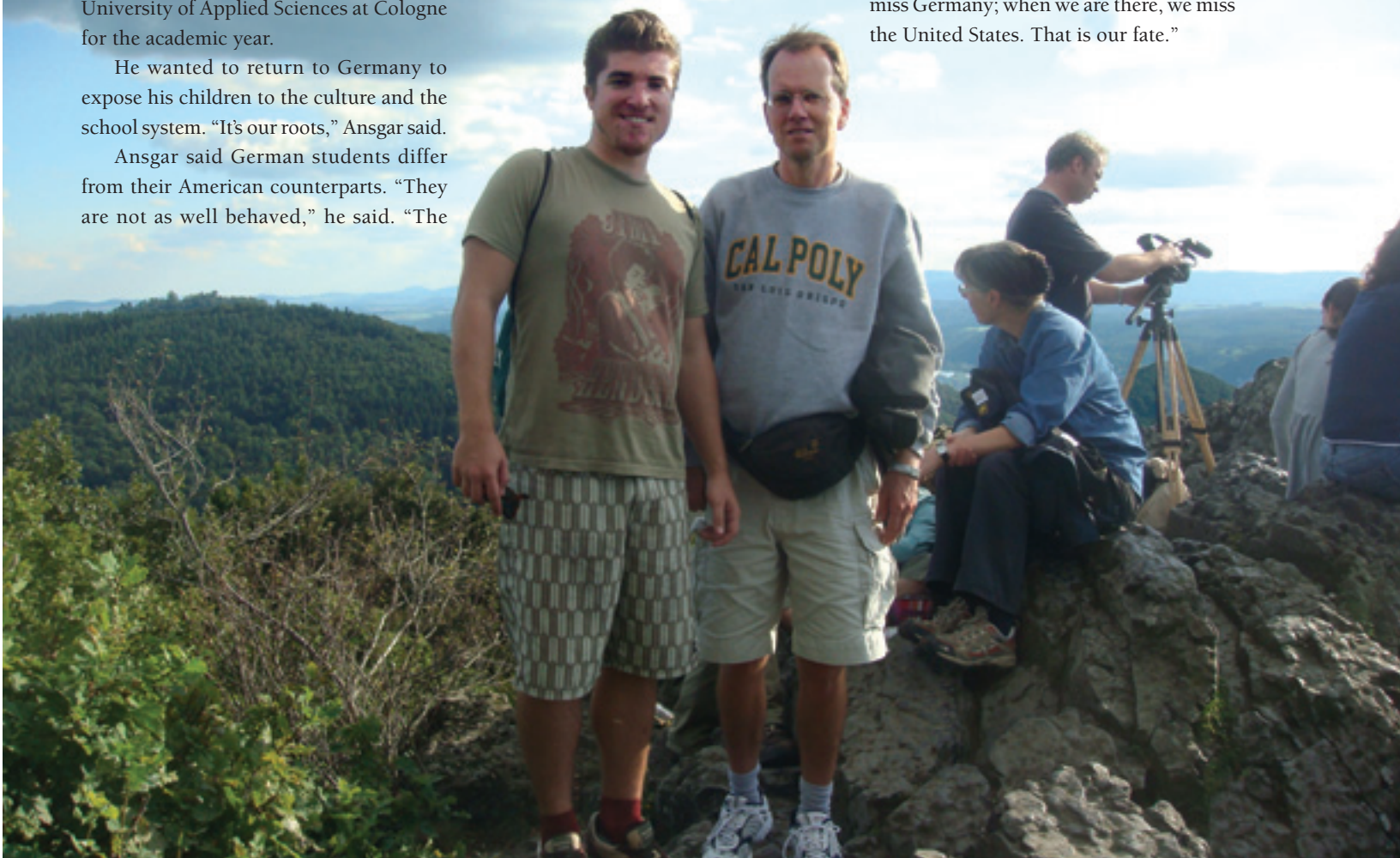
When he returns, Ansgar might miss those long summer nights, but he will be



Ansgar Neuenhofer, ready to roll (above) and hiking with Cal Poly student Brian Planas (below)

happy to be back teaching at Cal Poly. "It is such a rewarding experience at Cal Poly, where the focus is on teaching," he claimed. "Everyone who teaches here has a passion. The quality of teaching is better here. There is no doubt about that."

Ansgar admits he gets homesick. "When we are in the United States, we miss Germany; when we are there, we miss the United States. That is our fate."



Haitian trades people work with Professor James Mwangi (below, left) to rebuild the country's earthquake-ravaged buildings.



Building H In Haiti

Amid the country's natural beauty, James Mwangi teaches better construction techniques to help the trades people restore earthquake-damaged villages.

Architectural Engineering Professor James Mwangi is on a mission – a mission to rebuild the homes and lives of Haitians who are still without shelter more than a year after the fateful Jan. 12, 2010, earthquake devastated their island nation.

“When I first came to Haiti in March 2010, the amount of destruction in Port-au-Prince and surrounding cities was indescribable,” James says. “A year later, not much has changed. There is still a lot of rubble, and not many home repairs are going on.”

James, a certified disaster service worker with the California Emergency Management Agency, last year traveled to Haiti over spring break to inspect buildings for structural safety. He spent two weeks there via Engineers Without Borders and the Mennonite Central Committee (MCC).

After the first week, the Haitian government launched its own building inspection program, so James began conducting workshops on how to repair damaged structures.

The program became so popular that the MCC extended the workshops for a



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year, with the understanding that James would conduct them while on sabbatical from Cal Poly. He returned to Haiti in July to resume the workshops. “There is a lot of interest in the building industry to learn how to build safer, better and different from the past,” he says.

James hopes to have a lasting impact in Haiti by “changing the way the building construction process is conducted,” he says. “If the status quo remains, more people will die in future earthquakes.”

To that end, James is reaching out to government officials responsible for enforcing building regulations in the country. “My message is the need for introduction and implementation of enforcement of building regulations.”

In his workshops for architects and engineers, the emphasis is on building earthquake- and cyclone-resistant buildings. He stresses the importance of correct detailing of reinforced concrete columns, beams, slabs and unconfined masonry construction, as well as the quality of materials and the construction process.

James spends most of his time with construction trades people (bos masons)

because they build most of the family dwellings. The bos masons work directly with the homeowners to build the concrete confined masonry structures, explains James. “Most of the bos masons do not have high school diplomas, and French Creole is the only language we can communicate in,” he says.

Students spend the first day in the classroom, learning about correct building layouts and sites, the quality of building materials, reinforced concrete detailing and correct construction process for earthquake- and cyclone-resistant buildings.

“Each session is limited to 16 participants,” James says, “because four days is devoted to hands-on repair of damaged concrete homes under my watch, and I do not want observers in this exercise.”

The group is split into teams of four, with each group writing a list of materials they need for their specific building repair task. This teaches them how to do a cost estimate of a construction process, James says. “After the workshops, the graduates help me with home repair projects.”

James’ sabbatical isn’t your typical sabbatical, which is often defined as a



Students take their newfound knowledge from James’ classes (above) to the job site (left).

One of the country’s scenic beaches (top)

“break or a rest from work.” His year in Haiti could hardly be characterized as restful. With 12 hour days – if he’s lucky – and rarely a weekend off, he doesn’t complain.

But he does worry. “People are living in tents in campsites, even some on streets,” he says. “I worry that since people have been living in tent cities for a year, they may accept them as part of their lives. That would be a very dangerous situation.”

James, who herded cows and goats in his boyhood homeland of Kenya, feels very much at home in Haiti. “People never know that I am not Haitian until I open my mouth, and they realize that I do not speak Creole as well as they do,” he says. “Nevertheless, I feel welcome everywhere I go.”



Big Wins

Dedication, hard work pay off for students in 2011 ASCE competition

Two teams of Cal Poly students walked away with more awards – two first-place wins and two finalist awards – than any other team at the ASCE Charles Pankow Foundation 2nd Annual Architectural Engineering Student Competition. The event was held in conjunction with the 2011 Architectural Engineering Institute Conference in Oakland (see article on opposite page).

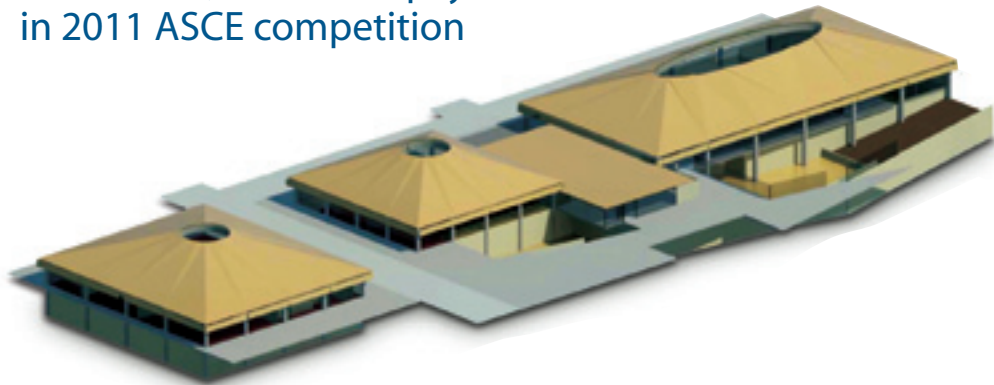
The challenge? To design and build a contemporary art museum in San Francisco, including the building envelope and structural, mechanical and electrical systems, all while addressing seismic and sustainability issues and being sensitive to the local architecture and history.

In the initial phase of the competition, 14 teams from 12 universities submitted 25-page proposals consisting of written summaries and explanations, drawings

and calculations. Of those 14 teams, eight were selected finalists, bringing together competitors from across the country.

All submissions are entered in the Building Systems Integration category and one or more of the following categories: Structural Systems Design, Mechanical Systems Design, Electrical Systems Design, and Innovative Construction Management and Methods.

“It is considered an honor to compete,” said fourth-year ARCE student Julie Bolander, “especially since the entire



The students' museum design and the two winning teams (from left): Brian Croshal, Alexandre Batista, Julie Bolander, Linda Huang, Dan Loesch and Bradley Stevens

ARCE Department – faculty and students alike – supports the teams over the months of preparation.” The students spend hundreds of hours on the projects. Julie estimates her team spent about 800 hours. Fifth-year ARCE student Dan Loesch said each student on his team put in 400 to 500 hours, working six hours a day, five days a week. Their dedication paid off.



Students and faculty at the AEI Conference

And the winners are ...

Cal Poly Team 6, advised by Professor James Guthrie and led by ARCE students Julie Bolander and Linda Huang and ME students Alexandre Batista and Brian Croshal, won the Mechanical category and were runners-up in the Integrated and Structural categories. CM students Sarah Arrin and Philip Ost were also on the team.

Dan and ARCE student Bradley Stevens with Professor Peter Laursen advising led Team 9 to a first-place win in the Structural category. Although Dan said his team felt pretty confident after their presentation and question-and-answer session, they were still “sitting on pins and needles.”

The winning teams are awarded \$1,000; runners up receive \$400.

“But the pride is in the title,” Dan said.

Good ARCE turnout for 2011 AEI Conference

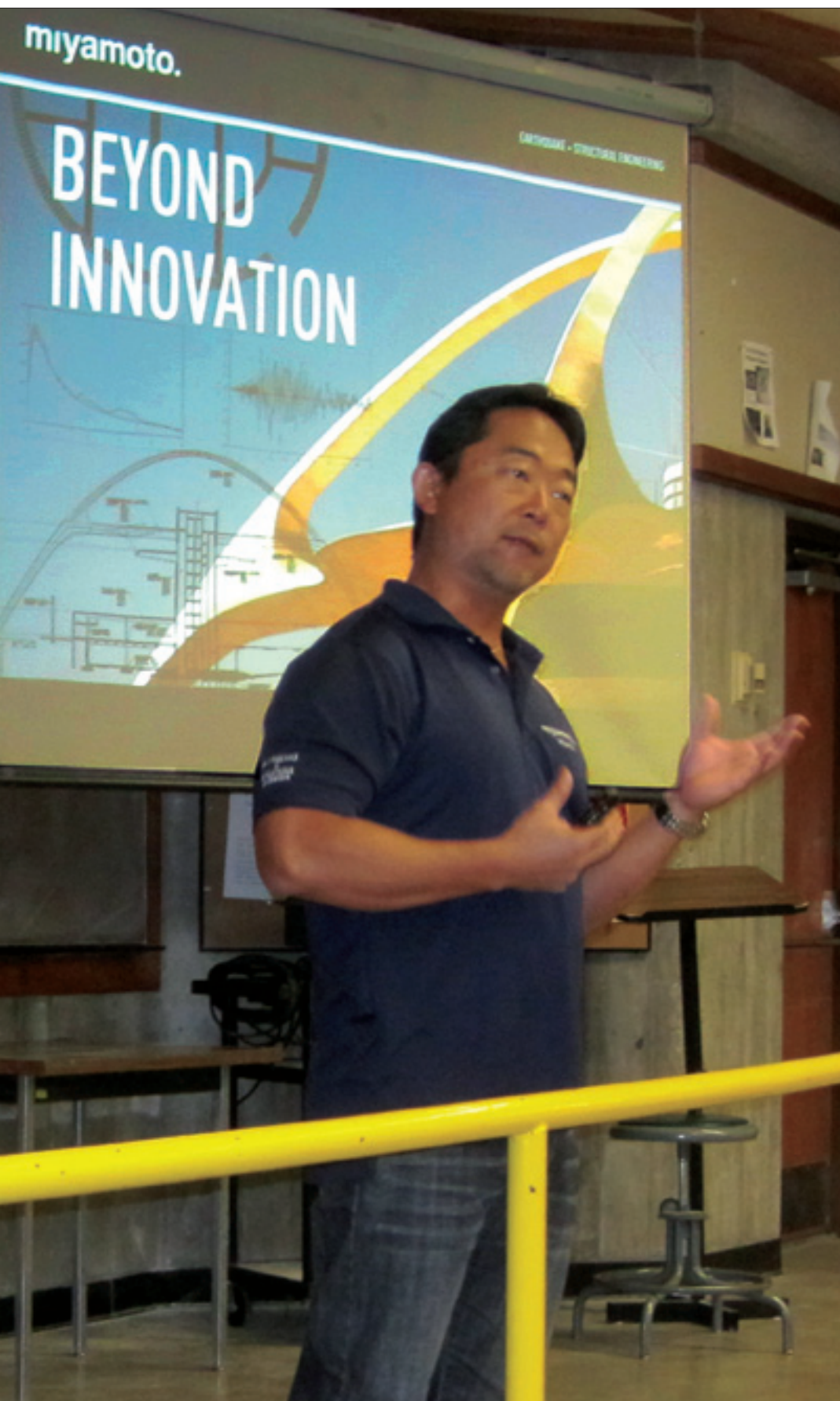
Six ARCE faculty members and 47 students attended the Architectural Engineering Institute Conference in Oakland from March 31-April 1, thanks to funds from Instructionally Related Activities and the Fluor Corp.

Students attended paper presentations, social events and meetings, and networked with students and industry partners from around the country.

Professor Abe Lynn was one of the conference organizers, and professors John Lawson, Graham Archer, Cole McDaniel and Department Head Al Estes presented papers that appeared in the conference proceedings. Professor Craig Baltimore, a member of

the Rules Committee for the national competition, moderated the student presentation sessions.

As part of the conference, the department hosted an alumni get-together at the Lavende East restaurant that drew alums Eric Ahlberg, Rae Arizabel, Lisa Auckman, Michelle Kam Biron, Walt Busch, Loren Byrne, Kate Caffaro, Steve DeJesse, Dago De La Rosa, Heidi Faison, Kyle Glen, Shane Gross, Stefanie Chaprallis Hionis, Melissa Humber, Erica Jacobson, Billy Janhunnen, Mary Bland Knowles, Liberty Lewis, Selinda Martinez, Nina Munj, Petra Shcalla Patton, Lucy Redmond, Emmett Seymour, Yvonne Tsui, Matt Williams, Whitney Woods, Gordy Wray, Taka Yokoyama, and former faculty member Dave Weigel.



Structural Forum '11

No Ceilings theme is a resounding success

Three dynamic speakers – all highly respected engineers who own companies ranging in size from two employees to hundreds – gave sage advice and a good dose of humor to a packed room of students at Structural Forum 2011. The theme for this year's event, held Feb. 12, was No Ceilings.

Structural Forum is held annually to bring the professional world of engineering to students. It is hosted by Cal Poly's student chapter of the Structural Engineers Association of California and the Architectural Engineering Institute.

ARCE senior Jean-Luc D'Abreau, organizer of this year's event, said he chose the theme because he "wanted to create an experience that inspired students to realize their full potential and strive to achieve their dreams."

Luc coordinated the entire event, including a speaker series, a career symposium and an evening banquet. Putting together such an event is a lot of work, Luc admitted. "This is the 21st annual event, so there is a process in place," he said, "but it was equivalent to another class and a half."

Daytime speakers were John A. "Trailer" Martin Jr., CEO of John A. Martin & Associates; Maryann Phipps, founder and president of Estructure; and Kit Miyamoto, president and CEO of Miyamoto International.

These three seasoned professionals offered strikingly similar advice: love what

Kit Miyamoto, president and CEO of Miyamoto International, spoke at this year's forum.

you do, build solid relationships with all constituents, be a team player, be helpful, produce a quality product, and have fun.

Dressed in their Sunday best, the students arrived at the career symposium with smiles on their faces and the hopes of landing an internship. In all, almost 60 representatives from 24 top engineering firms met with the hopeful students.

Ken O'Dell, a principal and partner at MHP Structural Engineers, provided the keynote address at the evening's banquet, held at the Embassy Suites Hotel. He advised students to not allow others to set their ceilings, but rather to have no ceilings.

Miriam Leigh addressed the banquet audience on behalf of Ashraf Habibullah (who was too ill to attend) and Computers and Structures Inc.

Thanks, industry partners

ARCE is grateful to the following companies for their participation in this year's event:

Brooks-Ransom Associates Structural/Civil Engineers - Fresno

Buehler & Buehler Structural Engineers - Sacramento

Crosby Group - Redwood City

Degenkolb Engineers - Oakland

DES Architects + Engineers - Redwood City

Ficcadenti & Waggoner Consulting

Structural Engineers - Irvine

Fluor - Aliso Viejo

Forell/Elssesser Engineers - San Francisco

Hope Engineering - San Diego

Hilti - Tulsa, Okla.

Holmes Culley / Holmes Fire Structural Engineers - San Francisco

John A. Martin and Associates - Los Angeles

JMN Consulting Engineers - Seattle

KNA Consulting Engineers - Irvine

KPFF Consulting Engineers - Los Angeles

Lionakis - Sacramento

MHP Structural Engineers - Long Beach

Miyamoto International - Sacramento

Rinne & Peterson Structural Engineers - Palo Alto

Rutherford & Chekene - San Francisco

Simpson Gumpertz & Heger - San Francisco

Simpson Strong-Tie - Brea

Taylor & Syfan Consulting Engineers - San Luis Obispo

Wiss, Janney, Elstner Associates - Northbrook, Ill.

ZFA Structural Engineers - Santa Rosa



John A. "Trailer" Martin Jr. (above), CEO of John A. Martin & Associates, spoke at Structural Forum, as did Maryann Phipps (left), founder and president of Estructure (shown with Jean-Luc D'Abreau, ARCE senior and 2011 event organizer).

Ken O'Dell (top, left), an MHP Structural Engineers principal and partner, with ARCE student Taylor Case

The team of ARCE students was devastated when they left the EERI (Earthquake Engineering Research Institute) Competition in La Jolla. It was a blow: after nearly nine months of meticulous planning and work, their 5-foot-tall structure failed a key element of the final leg of the competition when its accelerometer fell off.

“When that happens, you get a 90 percent penalty,” explained Abe Lynn, faculty advisor to the group. “That’s huge.”

EERI participants

The ARCE students involved in the EERI Seismic Design competition were Daisy Chee, Kevin Chen, Stefan Chiose, Garrett Hagen, Dave Martin, Mirian Martinez, Jennifer Roth, Jonathan Sadka and Michael Spangenthal. The CE students were Brent Clavin, Gordon Danke, Deborah Davies, Richard Guenther, Michael Kagawan, James Myers and team leader Jeannie Tran.

All Shook Up

Students win a surprising second place in EERI’s Seismic Design Contest

The competition, held during EERI’s 63rd Annual Meeting in February, evaluates the seismic performance, financial benefits, structural innovation, and architectural design of a building.

Students must create a poster, a five-minute PowerPoint presentation, and a balsa-wood model that undergoes three separate earthquake simulations.

Competing against teams from 27 other universities, including three international institutions, the Cal Poly team of nine ARCE and nine civil engineering students performed extremely well in the poster session and PowerPoint presentation. They were ready and confident for the simulations to begin.

But as luck would have it, they had a long wait; their model was second to last to be tested. When it was finally their turn, the model performed very well, surviving simulations of the 1940 El Centro quake and the 1994 Northridge temblor. But during the final test, the Davis simulation, the accelerometer came off.

“When that happens, it basically means the building has failed,” explained ARCE senior Garrett Hagen. “We thought there was absolutely no way we could win or even place, although the building performed very well.

“So well, in fact, that after the three ground motions were run, the shake table operator attempted for several minutes to bring the building down. When that failed, a team member gave it a karate kick, knocking it over. That was proof that the building performed very well structurally. We simply hadn’t glued the accelerometer on well enough.”

Thinking they had no chance of winning, several ARCE students returned to campus to attend Structural Forum. “We came back really depressed,” Garrett said.

The remainder of the ARCE students and the civil engineering students stayed for the awards ceremony and banquet. It was there that the students got the news. “They announced the second-place winner was Cal Poly,” Garrett said. “Our team heard ‘Cal Poly’ and thought that meant Cal Poly Pomona. But it was Cal Poly, San Luis Obispo. It was a huge shock.”

Participation in the EERI competition has become an annual collaborative effort supported by the university’s Instructionally Related Activities funds and the student leadership fund provided by the Fluor Corp. The ARCE-CE team for next year’s competition has already begun to form.



The surprised and elated EERI team with their 5-foot-tall, award-winning structure



Students build the foundation for a concrete village in the Concrete Design Lab (left).

Ed Saliklis' advanced structural systems class constructs a Catalan vault (below).



ARCE projects demonstrate the Cal Poly motto is alive and well

LEARN BY DOING



David Martin and Garrett Hagen make and break concrete blocks in the High Bay Lab (top).

Chase Kossack and Kevin Towers test their team's high-rise building for Kevin Dong's advanced steel course on the shake table in the Seismic Lab (above).

Students test a wooden connection as part of the 2011 Open House tours (right).

Brandon Dong (far right) prepares to test a concrete cylinder in the Concrete Lab.



Smokin'!

SEAOC/AEI serves up mixed grill of fun, educational activities



This year the student chapter of the Structural Engineers Association of California/Architectural Engineering Institute (SEAOC/AEI) enjoyed a delectable blend of professional development activities and entertaining events, starting with the annual WOW week barbecue welcoming incoming freshmen.

Professor Abe Lynn, faculty advisor to SEAOC/AEI, joined a group of 23 students on a trip to Los Angeles to visit the offices of John A. Martin & Associates, Degenkolb Engineers, and MHP Structural Engineers.

These trips give students an opportunity to see professional engineers at work at every level, from entry level to advanced. "They get exposure to professional practices and see the career path they will experience," Abe said. This year Ken O'Dell (ARCE '89), vice president and MHP partner, hosted a barbecue for the students and MHP engineers at his Long Beach home.

Weekly speakers from industry are a highlight, said newly elected SEAOC/AEI President Laura Rice. Students heard from:

- Michael Parolini of Smith Structural Group, LLP, who gave a presentation on the Simpson Strong-Tie Demonstration Lab



Students Caelen Ball (above, left) and Chris Lockridge participate in the SEAOC/AEI pumpkin-carving competition at Halloween.

Student members celebrate Thanksgiving with a traditional feast (top).

Student and club member Brian Planas grills during campus Open House festivities (left).

- Hilti representatives, who helped dedicate the Hilti Lab and spoke on how Hilti impacts the realm of structural engineering

- Rob Down of Earth Systems Pacific, who discussed his involvement in Nicaragua with Engineers Without Borders



- ARCE staff member John Lawson, who spoke about his involvement with FEMA and Urban Search and Rescue

- Carole Moore of Cal Poly Career Services, who gave tips on building résumés, networking and interviewing

- Jan Douglas of KPFF, who shared successful interviewing techniques

- Mark Sinclair and Taka Yokoyama of Degenkolb, who spoke about their work in rebuilding Haiti

- Garrett Mills of Taylor and Syfan, who explained his work with Engineering Ministries International in Haiti.

ARCE student Paul Kim attended the ASCE Workshop for Student Chapter Leaders in Anaheim, where he learned leadership skills and shared ideas on club fundraising, activities and outreach.

“Everyone had a ‘ghoulishly’ good time at SEAOC/AEI’s annual pumpkin carving competition,” said outgoing SEAOC/AEI President and ARCE senior Caelen Ball.

Cal Poly club members visited the El Camino Community College construction site in Torrance as part of a visit to MHP in Long Beach.

The week before Thanksgiving break, SEAOC/AEI board members cooked a traditional Thanksgiving feast for over 100 members that included seven turkeys, two hams, green beans, mashed potatoes and pumpkin pie.

During winter quarter, 20 students got hands-on experience as volunteers with People’s Self-Help Housing, an organization that builds homes for low-income families.

At Open House, the club worked from 7 a.m.-5 p.m. setting up the booth, preparing ribs and garlic bread for more than 100 people, and selling ARCE and SEAOC/AEI merchandise. Every quarter the club holds a “7th-week stretch” barbecue, showing off the board’s culinary skills.

“We also have an end-of-quarter party at SLO Brewing Co. the Friday of dead week,” Laura said.

2010 Scholarships

Recognizing Excellence

The ARCE Department’s annual awards event reflects the successes of our students and the generosity of our supporters. 2010 award and scholarship recipients are:

Erika Peterson | Academic Excellence - BS

Erica Jacobsen | Academic Excellence - MS

Grace Rose | Department Service Award

Brian Planas | SEAOSC Scholarship

Melissa McKinney | SEAONC Scholarship

David Martin | Degenkolb Engineers Scholarship

Kimberly Bowen | Emanuele Barelli Structural Engineer Scholarship

Zhilong Liu, Manuel Ureno, Nicholas Weeks
Herbert E. Collins Scholarship

Bridge House Team Brian Planas, Nick Herskedal, Megan Hanson, David Martin, Emma Ronney, Charles Weir | CYS Gene Cole Senior Project Award

Matthew Kidd | Fluor Foundation Lower Division Scholarship

Devin Daniel | Fluor Foundation Upper Division Scholarship

Garrett Hagen | Forell/Elsesser Engineers Scholarship

Jean-Luc D’Abreau | Paul F. Fratessa Memorial Endowment

Shawn Wade | KNA Consulting Engineers Senior Project Grant

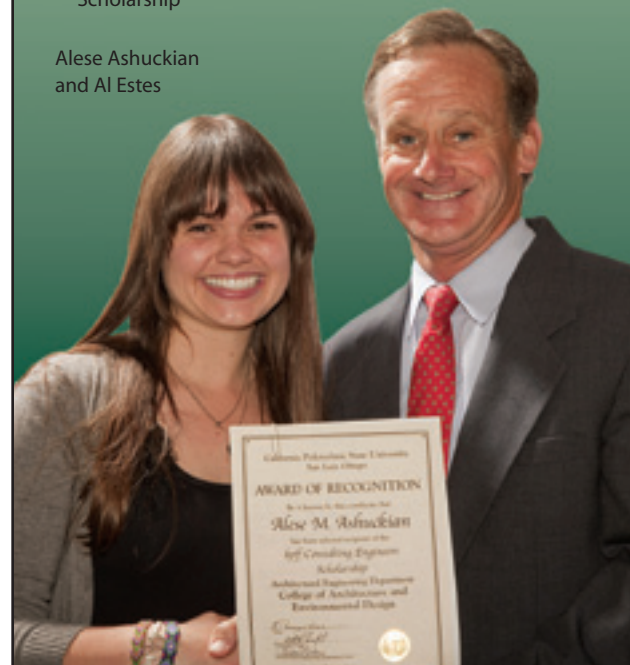
Alese Ashuckian | KPFF Consulting Engineers Scholarship, Los Angeles

Garrett Hagen | Hans Mager Scholarship

Emily Carlip | John A Martin & Associates Scholarship

Nicholas Herskedal | Simpson Gumpertz & Heger Inc. Scholarship

Alese Ashuckian
and Al Estes



The ARCE Department hosted another well-attended reception for alumni and friends attending the annual Structural Engineers Association of California (SEAOC) Convention in September 2010.

The reception, held at the Indian Wells Golf Course Club House, is an annual tradition that began in 2006. This year's event drew almost 50 people, according to ARCE Department Head Al Estes. "We are the only university that goes to the convention and hosts a party for alumni," Al said. "We are the one program that is truly responsive to industry. We serve the structural design industry of California, and this is their annual convention."

Along with the customary hors d'oeuvres and beverages, Al provided an update on lab renovations, the master's program and interdisciplinary experiences. This year a group of students also attended the reception. "The students brought a lot of life to the event," Al said, "particularly to the pool party."

The highlight of the event, Al said, was seeing C.K. Allen ('63 ARCE) win the largest door prize, a gift basket. C.K.

From left: David Martin, Megan Hanson, C.K. Allen and Brian Planas



Catching Up

Alumni and friends gather at 2010 SEAOC Convention Reception

was the structural engineer of record at the hotel where the conference was held. "C.K. has been a consistent donor and friend to the ARCE program," Al noted. "It was great to see him win the big prize."

A special nod goes to Administrative Assistant Melissa Minor, who drove the four students down in a van and arranged the reception.

Jerry Lohr, owner and CEO of J. Lohr Vineyards & Wines, generously donated wine for the event. Now an award-winning winemaker, Jerry is a structural engineer by education, having completed all the coursework for a Ph.D. in civil engineering in the early '60s.

Maryann Phipps, founder and president of Estructures, has been attending the receptions since the onset. "At one time, they were pretty wild," she said. "Then they got pretty tame, but they're getting better. The Cal Poly group is breathing new life into them."

ARCE Advisory Board '11

The ARCE Advisory Board met on the last day of class, marking the ninth board meeting since it was re-constituted in 2007. Board members attended the department scholarship award ceremony and assessed student presentations for senior projects, interdisciplinary courses and master's thesis proposals.

ARCE thanks Bob DeSautels, Chris Manning, Jonathan McMurtry and Jake Feldman as their terms of service end. The Board leadership transfers to Grace Kang (Forell and Elsesser), who assumes duties as chair, as Ken O'Dell (MHP) steps down and serves as past chair.

ARCE Advisory Board '11

- Bob Desautels**
ATI Architects & Engineers
- Jonathan McMurtry**
Lionakis
- Chris Manning**
Overaa Construction
- Jake Feldman**
Cal Poly – ARCE Emeritus Faculty
- Ken O'Dell** | Chair
MHP
- Steve Pelham**
Barrish-Pelham
- Dave Lambert**
Arup
- Jorn Halle**
Degenkolb – Oakland
- Art Ross**
CYS Structural Engineers Inc.
- Grace Kang** | Chair-Elect
Forell / Elsesser
- Joshua Moody**
Private consultant – SLO
- Michelle Kam-Biron**
Woodworks
- Paul Kovach**
WJE
- David McMaster**
Hope Engineering
- Steve Schiller**
John A. Martin – Las Vegas
- Geoffrey Neumayr**
San Francisco International Airport
- Hayley Soderlund**
X-L Construction
- Ron Hamburger**
SGH
- Mike Botwin**
Cal Poly – ARCE Emeritus Faculty



Professors Ed Saliklis and John Lawson (above) entertain the crowd (left) with a song that Ed wrote for the occasion.

The Parr family lunches together (below).

'Oh, What a Beautiful Program'

ARCE welcomes parents at inaugural reception

CAED Dean R. Thomas Jones, ARCE Department Head Al Estes, the faculty, staff and students welcomed parents to campus at the department's first-ever Parents Reception held during Parents' Weekend in October 2010.

"I had been meaning to reach out to parents for a long time," Al noted. He thought the reception would provide a good opportunity to involve parents in the program. And, boy, was he right!

"We thought we might get 20 or 30 responses," Al said, "but we had RSVP's for 150, so we made adjustments." They found a larger venue and arranged for more food.

Dean Jones welcomed the parents and their students, SEAOC student officers gave a presentation, and Al spoke and took questions from the guests. But the real highlight was when Professor Ed Saliklis, on ukulele, and Professor John Lawson,



on bass, performed a song Ed wrote for the event: "Oh, What a Beautiful Program."

SEAOC/AEI students barbecued and families toured the renovated ARCE labs and watched a musical slide show of students in action, created by ARCE Administrative Assistant Melissa Minor.

"It was a total team effort that we will certainly do again," Al said, crediting alum

and ARCE parent Ken Stone (B.Arch '80) for "getting me off the dime to do it."

The parents certainly valued the effort. "As parents, we appreciated the opportunity to hear directly from student leaders, the instructors and Al about the program," said Ken and his wife, Jeanne. "It was also good to hear Dean Jones talk about the college and its interdisciplinary focus."

KPFF cares. About its employees, its clients, its projects. And that culture of caring is the basis on which the company has built a reputation as an industry leader in structural and civil engineering.

The company started out small. Albert Kelly founded Albert Kelly & Associates in 1960 in Seattle. Harvey Pittelko joined five years later, and in 1976 Fritz and Forssen came on board, and the company became known as KPFF.

What started out modestly has grown phenomenally. The company now employs some 750 people in 20 offices nationwide. The firm grew rather serendipitously, expanding to follow clients into new markets and to support its employees in new business ventures.

As a result, KPFF designs a wide range of projects including airports; commercial, office, and corporate headquarter buildings; residential and retail facilities; industrial, educational, healthcare and high-tech facilities; seismic retrofit and land development; and bridges and ports. KPFF routinely uses the latest approaches for seismic design, such as performance-

KPFF

A company with heart and soul

based design, non-linear analysis, base isolation and energy dissipation systems.

KPFF provides an outstanding level of service to its clients. This is particularly evident in the seismic retrofit of Saint John's Health Center in Santa Monica following the 1994 Northridge earthquake. Constructed in the early 1960s, the hos-

pital sustained tremendous earthquake damage, causing it to be red-tagged and taken out of operation. KPFF took on the task of designing the seismic retrofit of the damaged buildings. Typically this type of seismic retrofit project takes years to design and construct, but KPFF's dedication to quick design and continuous support during construction enabled the project to be completed in just nine months.

Impressed with KPFF's expertise and commitment, Saint John's once again turned to KPFF to design their new hospital buildings. The new design utilized base isolation technology to design a hospital that could remain operational even after a significant earthquake. These complex projects were designed and constructed

KPFF conducts in-house training for its staff (right).

The PMC West project (below)



in phases to allow the hospital campus to remain operational during construction. In all, the projects that started in 1994 following the Northridge earthquake culminated in 2010 with the completion of the last base isolated building.

“We are technically excellent,” explains Jan Dougalas, an associate who has been with KPFF for 12 years. “But beyond that, we are a very fun, supportive and energetic office. Everyone wants you to be good at what you do and supports you across the board. There is a great deal of trust and respect in our hallways that doesn’t exist in other places.”

This support is evident in the extensive in-house training programs KPFF offers its employees at key points in their careers. Led by KPFF project managers, new employees are immersed in an entry-level training program that encompasses instruction in areas not traditionally covered in school but that are vital to employee development. These programs include instruction on various analytical software, REVIT, construction document detailing, and the engineer’s roles and responsibilities during construction. As an employee’s career progresses, KPFF’s senior leaders provide in-house courses that focus on project management, leadership and business fundamentals.

In addition to sponsoring employee attendance at industry and professional events, KPFF supports its employees’ passions and interests. Employees have published numerous technical papers and presented their work for industry conferences worldwide. KPFF has also supported its employees who have volunteered to provide assistance in areas devastated by earthquakes, such as Haiti and Japan.

KPFF appreciates Cal Poly graduates. In total, KPFF has 17 Cal Poly graduates working in its Los Angeles office alone, including principal Joe Stewart (1981) and associates Dani Paxson (1992), Claudia Imhof (2000) and “Tony” Anthony Nixon (2002). From Cal Poly’s spring 2010 graduating class, the company hired J. R. Aube, Peter Balla, David Carmona, Jamie Jones and Ryan Sandstrom.

KPFF likes to hire Cal Poly grads because “they are focused on what they want their careers to look like,” Jan said. “The



KPFF retrofitted Saint John’s Health Center in Santa Monica and designed the center’s new buildings.

students are able to design components of buildings right off the bat, and they are familiar with architectural language. They make an easy transition from school to work.”

KPFF has consistently been a good friend to the ARCE Department, regularly attending the annual Structural Forum, establishing a \$1,500 annual scholarship, and providing industry speakers for student SEAOC luncheons and guest lecturers for specific course lessons. This

year, for the first time, the company is participating in the industry-sponsored master’s projects.

The company has provided many internships, and alumna Dani Paxson just completed three years of service on the ARCE Advisory Board.



Previously profiled industry partners:

John A. Martin & Associates

Barrish Pelham & Associates, Inc.

Degenkolb Engineers



California Polytechnic State University

1 Grand Avenue
San Luis Obispo, CA 93407-0281

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UNIQUELY CALIFORNIAN

Students David Martin, Hannah Ellis, Brian Planas, Ben Biddick and Tyler Blauvelt enjoy an early morning surf with ARCE Department Head Al Estes (left) and Professor Cole McDaniel (third from left) on the day before graduation.

