

# ARCE

ARCHITECTURAL ENGINEERING DEPARTMENT | COLLEGE OF ARCHITECTURE AND ENVIRONMENTAL DESIGN | SUMMER 2014

## Toys As Tools

ENGAGING STUDENTS'  
ENGINEERING PROWESS

CAL POLY  
SAN LUIS OBISPO



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**On The Cover**  
Students in ARCE 316 use K'NEX building systems to design and build large-scale projects. See page 3.

## Department Head's Message

### A Structurally Sound, Ever-Productive ARCE

I am pleased to present the latest edition of the Cal Poly ARCE magazine for your information and enjoyment. While much of the year was dedicated to an upcoming accreditation visit, a mandated reduction in units, and the perpetual quest for greater efficiencies without compromising the quality of the program, there is a more exciting and compelling story to be told.

As you will read, our year is a story of laboratory improvements through creative faculty and student initiatives, an energetic and engaged student structural engineering chapter, our first international experience in Lithuania, generous support from industry and alumni, innovation in the classroom — especially by bringing structural engineering faculty directly into architecture studios — and faculty attendance at prestigious national and international conferences. It is a story of scholarships, faculty promotions and selfless service from faculty, staff and students.

Despite a turnover in staff, we were still able to host the Parents Weekend festivities, ARCE receptions in San Francisco and at the SEAOC convention in San Diego, Structural Forum, Open House, Advisory Board meetings, a scholarship luncheon, and our first-ever personalized department-level graduation ceremony. We have welcomed the two largest freshmen classes in ARCE history, and the program is growing rapidly.

I thank J. Lohr Wineries and Jerry Lohr in particular for sponsoring this edition of our magazine. Since Jerry was a structural engineer before he became a world-class vintner, I am happy to welcome him back to his roots and remain grateful for his support. My gratitude extends as well to the Concrete Masonry Association of California and Nevada for officially sponsoring our Masonry Design course. I thank all of you who continue to support this program with your time, energy and financial gifts.

ALLEN C. ESTES, DEPARTMENT HEAD

## Dean's Message

### CAED Changes Prompt Strategic Goal-setting

As I reflect upon my second year as dean of this college, I feel that this has been a strong period of rebuilding. After 40 years on the job, Associate Dean Dick Zweifel retired. I split his position, selecting architecture Professor Michael Lucas as the associate dean for academics and architectural engineering Professor Kevin Dong as the associate dean for administration.

Additionally, there are many new faces on the college staff. This has been a year of strategic planning, and we have a solid list of specific activities that we plan to accomplish over the next three years.

The Architectural Engineering Department continues to thrive and take advantage of the unique interdisciplinary opportunities of being housed in a college of architecture.

The students receive an unparalleled education in this rigorous program. The richness of their educational experiences has been enhanced by the financial contributions of so many of you. Private funding for program enhancement is critical to higher education. I thank you for your continued support.

CHRISTINE THEODOROPOULOS, AIA, PE, DEAN, COLLEGE OF ARCHITECTURE & ENVIRONMENTAL DESIGN





## Learning by Doing

# K'NEX Connection

## Students Play with Toys, Learn About Structures

ARCE faculty member Craig Baltimore has a novel approach to teaching large-scale structures to architecture students: he has them play with toys — K'NEX building materials, to be precise. The K'NEX toys become a vehicle to illustrate the entire design-construction process.

“In ARCE 316, Large Scale Structures, students learn to apply engineering book work to actual projects,” Baltimore said. “They begin to look at the complexity of large projects from an engineer’s perspective.”

And it wouldn’t be Learn by Doing without them actually building a large structure.

“They have 10 weeks to design and engineer the project, coordinate teams, obtain permits, assemble it off site to see if it works, assemble it on site, tear it apart, and put it away,” Baltimore said. “It’s a tremendous amount of work, but the students eat these K'NEX projects up.”

This year the students used 13,000 K'NEX pieces to create a structure with “viewing” tubes that allowed people to

Above (from left): Architecture students Elizabeth Hanna and Danielle Juare work on the telescopic aspects to frame the ‘Poly P.’

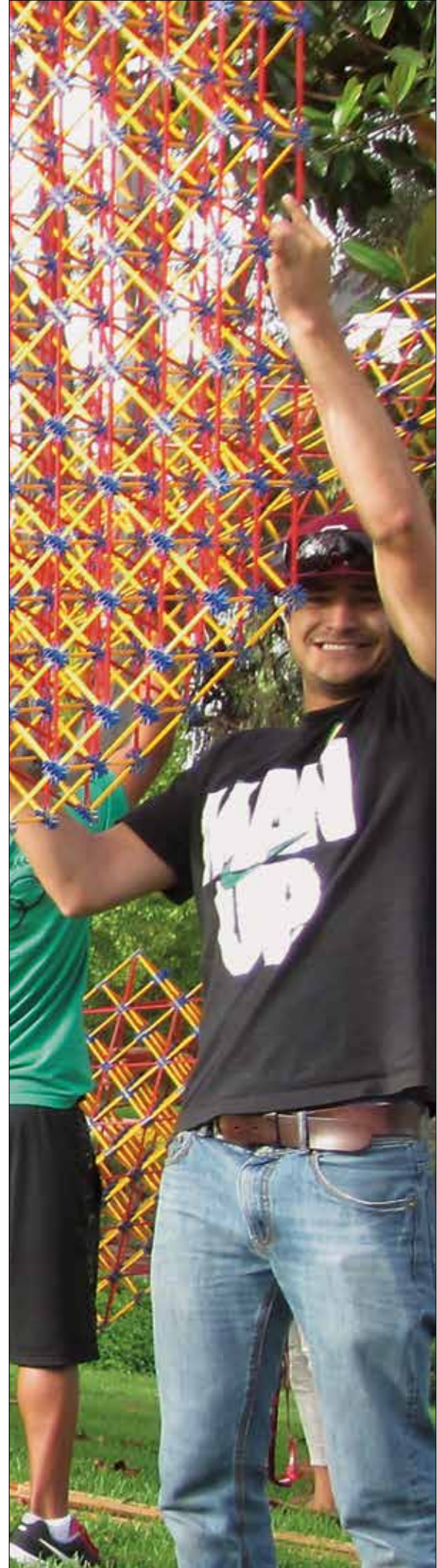
Architecture student Jose Sanchez deconstructs the project (right).

see three iconic objects while blocking out surrounding distractions: the Poly “P,” the top of Bishop Peak, and the bronze Mustang statue between the Administration Building and University Union.

The department is grateful to the K'NEX Corp. for its \$10,000 donation of 44,000 K'NEX pieces that allows students to participate in this exercise.

These hands-on endeavors teach students firsthand that what looks good on paper doesn’t always transfer to real projects. “When the structure was completed, the students noticed it waffled in the wind, so they had to put in another brace,” Baltimore said. “These are the things you don’t appreciate on paper.”

For more project information, go to: [rshunte5.wix.com/arce316calpolyslo#!meet-thegroup/c1yk9](http://rshunte5.wix.com/arce316calpolyslo#!meet-thegroup/c1yk9).







With a blow torch, concrete and classmate Mathew Kidd's help, Evan Gerbo (left and below, left) builds a sizable structure in the Seismic Lab to assess its reaction to shaking tests.



## GRAD STUDENT EVAN GERBO SHAKIN' THINGS UP IN THE SEISMIC LAB

What if there was an easy way to immediately inspect a building after an earthquake — without tearing down walls or otherwise destroying it — to determine the extent of its structural damage?

Grad student Evan Gerbo (B.M.S., ARCE, 2014) thinks he knows a way, and he aims to prove it with his master's thesis. Under the guidance of co-advisors Graham Archer and Cole McDaniel, Gerbo constructed a two-story structure in the ARCE Department's Seismic Lab. Although "shrunk down to lab-size," the structure is considered huge; its concrete floors weigh a whopping six tons.

A "shaker" placed on the structure gently vibrates the two-story building, while an accelerometer measures the acceleration caused by the shaker. "If we hit the right frequency and crank it up, that little shaker could take the whole structure down," Archer said.

Next Gerbo will attach braces to the structure, shake it, and measure those responses on the accelerometer. "The whole point is to detect analytically how the building behavior changes when a brace fails," Gerbo explained.

In post-disaster recovery, engineers often have to tear down walls to assess the condition of a building.

"Our method doesn't require destroying a building to see if it's damaged," Archer said. "When we add a brace, we can detect its presence. When we refine the experiment, we will be able to detect its absence. Adding a brace is the same problem as removing a brace. If we can detect a brace has been added, we can detect if it has been removed or damaged."

Gerbo designed the structure. He predicted the response to the shaker and verified it responded as predicted. Then he attached the braces and detected them throughout the experiment.

"The natural manner in which the building moves will change, and we should be able to predict how much — and we hope — where the change is," Archer said. "The goal is to quickly identify if and where a building is damaged. Visual inspection takes weeks. If shakers were installed in buildings when they were constructed, we could remotely access the information and quickly determine if the building is safe."

Gerbo will attend the University of Notre Dame to start work on his doctorate. This summer he presented a paper in Brazil at the International Association for Shell and Spatial Structures Symposium based on his work with Associate Professor Ed Saliklis on genetic algorithms.

Gerbo partially financed his trip using the \$1,000 he won for the university's best three-minute Thesis Award. The rest was covered by a grant from the university graduate program and the department's Fluor Leadership Fund and Parent's Learn by Doing Fund. ▲

ETHAN MEIER

# SALMON RUN

When Ethan Meier (B.S. ARCE, 2014) pulls an all-nighter, he is as likely to be in the waters of Prince William Sound fishing for salmon as he is in the library cramming for final exams.

For the past four summers, Meier has worked as a commercial fisherman in Alaska, first as a deckhand, and last year as captain of his own boat, "Sockeye High."

He was lured into the lucrative-but-dangerous business his freshman year by a student from Homer, Alaska. "Our first year was ridiculous," he recalled. "We bought two new engines. We didn't know what we were doing; neither of us is mechanical. We thought it would be like a car engine, but boats are completely different."

Coming from Learn by Doing backgrounds, they soon figured things out. So much so, that last year Meier bought his own boat

and hired a deckhand. And in one glorious day, they caught 15,000 pounds of salmon.

Turns out, there was a downside to that much salmon. "The heavy load caused the water to rise, popping out a plug," Meier said. "We delivered the fish but didn't notice the plug. We anchored and slept."

"When I woke, the bow was sticking straight up," he continued. "I went below. There was almost four feet of water in the bilge — an inch away from the battery terminals. The bilge had malfunctioned, so I started bailing water with a five-gallon bucket. We bilged it out and sealed it up."

Meier said the work is more mentally taxing than physically. By mid-June, the sun never sets. "It just circles in the sky above us."

"They'll open the water for three days, then close for two. When it's open, we'll fish 20 to 22 hours, then sleep two to four hours. Come that 72nd hour, I'm exhausted; I'll sleep 24 hours."

The rewards seem sweeter because of the challenges and long hours. "We work our butts off," Meier said, "I go, go, go, but when I finally turn off the engine, I'm struck by the quiet and beauty."

In the fall, Meier will look for architectural engineering work. "When you're not working in the field, it's hard to stay competitive because the industry changes rapidly."

But this summer, one last time, he'll chase salmon. ▲

Ethan Meier (below, right) and Matthew Van Wagenen, a Cal Poly construction management student, with their bountiful salmon catch





# 18

## Scholarship Winners Announced for 2013-14



This year 18 deserving students were awarded scholarships from the College of Architecture & Environmental Design (CAED), the Architectural Engineering Department (ARCE), and the Structural Engineers Association. "We congratulate these hard-working students and know they appreciate the scholarships and the individuals and organizations that made them possible," said ARCE Department Head Al Estes. The scholarship recipients are listed below alphabetically.

### COLLEGE OF ARCHITECTURE & ENVIRONMENTAL DESIGN SCHOLARSHIP RECIPIENTS

Jesse Fowler | Carson Starkey Memorial Scholarship for Merit - \$4,750

Georgine Mooney | RRM Scholarship - \$2,700

Georgine Mooney | Herbert E. Collins Scholarship Undergraduate - \$1,200

Anthony Tiapon | Herbert E. Collins Scholarship Undergraduate - \$1,200

Joshua Raney | Herbert E. Collins Scholarship Graduate - \$1,200

Andrew Stephens | Herbert E. Collins Scholarship Graduate - \$1,200

Sheela Vedula | Herbert E. Collins Scholarship Undergraduate - \$1,200

### ARCHITECTURAL ENGINEERING DEPARTMENT SCHOLARSHIPS

Shannon Abeling & Cristina Chilin | CYS Eugene Cole S.E. Senior Project - \$1,425

Vicente Acuna | Hans Mager Scholarship - \$1,200

Elena Good | John A. Martin and Associates Scholarship - \$1,500

Lyndsi Halvorson | Forell/Elsesser Engineers Scholarship - \$1,000

Kion Nemati | Fluor Foundation Upper Division Scholarship - \$1,250

Simon D. Jardel-Menno | Simpson Gumpertz & Heger Inc. Scholarship - \$2,000

Anthony Keshishian | Fluor Foundation Lower Division Scholarship - \$1,250

Connor Hanlon | Emanuele Barelli Structural Engineering Scholarship - \$1,050

Nicole O'Hearne | Degenkolb Engineers Scholarship & Internship - \$2,500

Jared Parker | KNA Consulting Engineers Senior Project Scholarship - \$1,000

### STRUCTURAL ENGINEERS ASSOCIATION SCHOLARSHIPS

Tyler Poucher | Structural Engineers Association of Southern California - \$2,000

Shannon Lee | Structural Engineers Association of Northern California - \$5,000

ARCE Department Head Al Estes and scholarship recipient Elena Good (left)

## Congratulations, June 2014 Grads!

The ARCE Department held its first-ever, department-level graduation ceremony in the rear courtyard in lieu of the longer, less personal college ceremonies of the past. Each graduate was limited to a 140-character tweet that was read as they crossed the stage to pick up their certificates. Right: Department Head Al Estes congratulates Heather Isobe.



# Living Building CHALLENGE

## FIRST-PLACE WIN FOR CAL POLY INTERDISCIPLINARY TEAM

An interdisciplinary team of six students in the College of Architecture and Environmental Design won first place and \$1,500 in the Getting L.A. to Zero Competition hosted by the Living Building Challenge Los Angeles Collaborative in May 2014.

The students were instructed to “imagine a building designed and constructed to function as elegantly and efficiently as a flower; a building informed by its bioregion’s characteristics and that generates its own energy with renewable resources, captures and treats all of its water, and operates efficiently and for maximum beauty.

“Imagine a city block or a college campus sharing resources from building to building, growing food, and functioning without a dependency on fossil fuel-based transportation.”

The contest further sought innovation in design, product and strategy.



The team, which included ARCE students Sinhui Chang and Chris Maulino, competed against 20 undergraduate and graduate teams from public and private Southern California universities. Umut Toker (City and Regional Planning) and Robert Arens (ARCH) were the faculty advisors.

The winning team created Villa Verde, an urban center located near Dodger Stadium in Los Angeles, consisting of

The award-winning team (from left) includes Binh Q. Nguyen (ARCH), Kyle Bell (CRP), Samantha Plete (LARCH), Professor Robert Arens, Sinhui Chang (ARCE), Professor Umut Toker, Chris Maulino (ARCE) and Michael Aguilar (ARCH).

mixed-income residential units, retail shops, a community center, and a historic industrial museum.



## ARCE Gets Wet & Wild

At the annual SEAOC Convention, the President’s Cup competition is a crazy race against each regional SEAOC section, full of fun and always water! Four Cal Poly ARCE students won first place on behalf of the Southern California branch in September 2013 in San Diego. But not all was fun and games. Students attended cutting-edge technical presentations, and the department hosted its annual Alumni and Friends Reception. Pictured (from left) are: Daniel Jardel-Menno, Georgine Mooney, Department Head Al Estes, Ricky Stewart, Assistant Professor John Lawson, and Caleb Dunne.



## STRUCTURAL FORUM 2014

# 'TOTALLY

### ANNUAL EVENT CELEBRATES 'ENGINEER AS ROCK STAR'

**C**alling in a structural engineer to assess damage caused by an earthquake is not unusual.

Having an engineer rappel down a building to do the work is.

That's what happened in August 2011 when a 5.8-magnitude earthquake hit the East Coast: An engineer with Wiss, Janney,

Elstner (WJE) Associates Inc. rappelled down the Washington Monument to evaluate the situation. The monument remained closed for almost three years.

That's just one example of an "Engineer as Rock Star," the theme of the 24th annual Structural Forum, held on campus and at the Embassy Suites Hotel in San Luis Obispo on February 8.

The event's morning speakers took the theme to heart as they sought to debunk the myth that "engineers are all nerdy guys wearing pocket protectors sitting in their cubicles," said event organizer Caleb Dunne, an ARCE senior.

The speakers, all rock stars in their own rights, included David Mar of Tipping Mar, who spoke on "Finding a Creative Voice in Structural Engineering."

Terrence F. Paret of WJE explained how the company assessed the earthquake-damaged National Cathedral in Washington, D.C.

Bob Glasgow, Miyamoto International, talked about Cal Poly ARCE graduates and



#### ATTENDING COMPANIES

Brooks Ransom Associates  
Buehler & Buehler Structural Engineers  
Crosby Group  
DCI Engineers  
Degenkolb  
DES Architects + Engineers  
Englekirk  
Ficcadenti Waggoner and Castle  
Structural Engineers

Fluor  
Hilti  
Hinman  
Holmes Culley/Holmes Fire  
Hope-Amundson  
John A. Martin & Associates  
KNA Consulting Engineers  
KPFF Consulting Engineers  
Lionakis  
MHP Inc. Structural Engineers

Miyamoto International  
Nucor  
Rinne + Peterson Structural Engineers  
Rutherford + Chekene  
Sideplate Systems  
Simpson Gumpertz & Heger  
Simpson Strong-Tie  
Taylor & Syfan  
WJE  
ZFA Structural Engineers



# ROCKED'

Ashraf Habibullah (left), CEO and president of Computers & Structures Inc., delivered the keynote address at the evening banquet.

Below, left: Associate Professor Ed Saliklis and Assistant Professor John Lawson entertained.

the types of projects they are involved in working for Miyamoto around the world.

And the always colorful Ashraf Habibullah, CEO and president of Computers & Structures Inc., delivered the keynote address at the evening banquet.

Dunne estimates that about 150 ARCE, civil engineering and architecture students attended the morning session.

"Each of the speakers had different perspectives," Dunne said. "It was an interesting mix. Talks ranged from technical engineering material to more general engineering concepts and ideas, providing something for all class levels to understand and enjoy."

Later that day, before the evening banquet, representatives from 30 companies were on hand at the Career Expo to set up appointments with students to talk about potential internships and job opportunities.

"The Career Expo was a sellout event," Dunne said. "Lots of interviews were set up for over spring break."

The banquet featured two notable events. The first helped drive home the "Engineers as Rock Stars" theme. Associate Professor Ed Saliklis and Assistant Professor John Lawson performed "Structural Forum," an original song by Saliklis, sung to the tune of "Twist and Shout."

The second highlight was Habibullah's keynote talk, in which he presented his

views of the structural engineering industry and the overall image of engineers.

"Ashraf appeared in his trademark lighted jacket and urged the impressionable students to tell the remarkable story of their profession, take public speaking and acting classes, to come out of their shells, and appreciate the intersection of engineering and the arts," recalled Department Head Al Estes. "He gave away iPads to students willing to come forward and join him in singing Katie Perry songs. The students left inspired, believing that engineers could be rock stars."

Structural Forum is an annual fundraising event organized by the Cal Poly student chapter of SEAOC (Structural Engineers Association of California). Dunne, who was elected Structural Forum chair in spring 2013, had the summer to mull things over. "The work kicked in fall quarter," he said. "The month leading up to it was crazy; the week leading up to it was intense."

As organizer, he selected a date, a theme and a venue. He found the speakers and the companies to attend the Career Expo. He helped the speakers with their travel plans and hotel accommodations, and decided on the banquet details — from selecting linen colors to making meal choices.

"I would do it again," Dunne said. "It was a great event. When I first told people I was organizing a professional conference for more than 200 people, it sounded daunting. Now I know I can do this."

The event provided Dunne with a level of professional exposure he had not experienced before. "Now I feel like I know how to act around professional engineers. It's nice to realize it isn't scary; I got quite comfortable with it." ▲



Top: Recent ARCE graduate Lisa Henry returned to campus to help ZFA reps recruit at Career Expo.

Middle: ARCE senior and event coordinator Caleb Dunne with guest speakers (from left) Bob Glasgow, Terrence F. Paret and David Mar

Bottom: With student Amy Burruss assisting, Ashraf Habibullah rewards Matthew Birkeland with an iPad for singing a Katy Perry song.

# Reflecting on SEAOC/AEI 2013-14: Activities



Members of Cal Poly's student chapter of the Structural Engineers Association of California/Architectural Engineering Institute (SEAOC/AEI) enjoyed another year of activities and trips to cities near and far.

Faculty advisor John Lawson traveled with 22 students to Northern California in November. Simpson Strong-Tie provided lunch and a private tour of its Stockton facility, where prefabricated shear walls and joist hangers are made. In San Francisco, students toured the offices of Degenkolb; Rutherford & Chekene; and Simpson Gumpertz & Heger.

Rutherford & Chekene's Timothy Lucido (ARCE '03) arranged access to an

after-hours event at the new Exploratorium, including a behind-the-scenes tour of this hands-on museum.

Simpson Gumpertz & Heger took the students 65 feet underground at the Transbay Terminal site. "We learned about the excavation, shoring and waterproofing and got to walk on the 5-foot rebar cage at the bottom of the hole," said incoming SEAOC President Nicole O'Hearne. As vice president in 2013-14, she arranged the trip.

During spring break, Lawson and 25 students visited Chicago, birthplace of the modern skyscraper. "Private tours of the earliest and most-modern high-rises and everything in between were fascinating for the students," Lawson said. "Students visited Oak Park's Unity Temple, giving insight into Frank Lloyd Wright's early work in concrete."

Design firms Thornton Tomasetti; Skidmore Owings & Merrill; Wiss, Janney, Elstner; and JAHN and HOK opened their doors for student tours.

"We had a fantastic spring break and learned a lot about structures and various firms," O'Hearne said.

More recently, Lawson took 20 students to Los Angeles, where ARCE alumni Kal Benuska (1985) and Kurt Clandening (1987), principals of John A. Martin & Associates, showed students projects they are working on, including Emerson College's Los Angeles campus and structural glass work for Apple's flagship stores.



A series of large rebar hooks at the basement of the Transbay Terminal site in San Francisco (top)

Students toured the work-in-progress Broad Museum in Los Angeles (left).





At Englekirk Structural Engineers, principal Tom Sabol (ARCE 1979) spoke to the group. Margaux Burkholder (B.S. 2009, M.S. 2012) led them to an underground concrete parking structure being built. They saw the shotcreting of 60-foot deep basement walls, installation of steel rebar, and installation and stripping of concrete forms.

At Nabih Youssef Associates, Youssef spoke about attaining success. Danny Ahkiam and Ryan Wilkerson gave a presentation and tour of the Broad Museum, under construction.

Closer to campus, students stayed busy planning beach barbecues, carving Halloween pumpkins, preparing the annual Thanksgiving dinner — and attending weekly presentations. Presenters included:

Damon Ho of Simpson Strong-Tie spoke about personal finance and what financial benefits to look for when starting out.

Associate Professor Cole McDaniel talked about ARCE's graduate program.

Ray Bligh of Watry Design spoke on the serious design issues and field corrections of the Cal Poly parking structure.

Associate Professor Ed Saliklis gave a presentation about ARCE's study-abroad program in Lithuania. *(See article on pages 12-13.)*

Consuelo Crosby (ARCE 1985) of Nerdynista spoke about the impact of structural engineers.

Cal Poly Career Services' Charlotte M. Rinaldi talked about professionalism.

Michelle Kam-Biron (ARCE 1987), American Wood Council, discussed the variability of wood as a building material.

Lisa Willard, SE Solutions, talked about improving chances to land a great job.

Stephen Hicks, County of San Luis Obispo, spoke about building codes.

Assistant Professor John Lawson and students visited Chicago to look at the city's skyscrapers, many of which are reflected in Cloud Gate, a stainless steel sculpture in Millennium Park. They are joined by Ian Chen from WJE (center).

Ryan Sandstrom, KPFF Consulting Engineers, spoke about the design-build process.

Steve Abernethy (1989), Square Trade, talked about his career path outside of structural engineering.

Billy Janhunnen (2007), Tipping and Mar, provided insight on a current project.

Amber Freund (2000), RISA Technologies, spoke about the career opportunities an engineering degree provides. ▲





Students surveying (top, from left) are Nicole O'Hearne, Greta Miltinyte (VGTU student), Cameron Hempstead and Tyler Poucher.

Professor Ed Saliklis watches a docent demonstrate the milling of grain in an old windmill at the ethnographic museum (above).



# Living & Learning in Lithuania

## FIRST STUDY-ABROAD TRIP IS RICH WITH ACADEMIC AND CULTURAL EXPERIENCES

Imagine planning daily lessons, three meals a day, and several field trips, and finalizing safety, insurance, budgetary and travel details for a group of college students. Now imagine doing that for a trip to a country in the center of Europe!

Professor Ed Saliklis and the 11 Cal Poly students and 10 Lithuanian students who participated in the first ARCE study-abroad experience think it was well worth the effort.

"I designed the program to give our students a rich cultural and academic

experience that actually pushes them ahead," Saliklis said. "Our students have an intense schedule with no electives. Those who go abroad often take general education courses that don't help with the core curricular courses, and this can delay graduation."

Third-year student Tyler Poucher called it "a tactical study-abroad opportunity, catered to ARCE students. It allowed me to progress in my required curriculum while expanding my global horizons."

The students took Structural Analysis, Structural Computing and Surveying at Vilnius Gediminas Technical University in the country's capital, Vilnius. "The best part was that we got to teach the Lithuanian students structures, and they taught us surveying," said

Nicole O'Hearne, also a third-year student. "There was a great deal of collaborative work."

And a great deal of Learn by Doing. "We did so much surveying, rain or shine," Poucher said. "It was a great way to learn."

But the six-week trip wasn't all academics. "We got to know the city," said Saliklis, who speaks the language with near-native proficiency. "Vilnius is an astonishing city — very old and modern at the same time."

"It's a blood-soaked land that for centuries has been ruled by an oppressor. The most recent occupation by the Soviets, from 1940 to 1990, still resonates today. That's why I wanted the students to learn about this period."





Students found the countryside beautiful and the lakes inviting near the town of Trakai (top).

ARCE students enjoyed working with their Lithuanian counterparts (above). From left are Georgine Mooney, Greta Miltinyte (VGTU), Osvaldas Striukas (VGTU) and Daniel Menno.

A castle in Trakai was on the visitors' list of historic destinations (left).

They visited the KGB Museum, “with its torture cells and padded, creepy rooms that didn’t let sound escape,” and an underground bunker, a hideout for Lithuanian resistance soldiers.

The students embarked on three weekend field trips, providing them with a greatly expanded perspective of this beautiful country. Many agreed their favorite trip was to the 19th century spa town of Druskininkai.

“We stayed in a bed and breakfast that was secluded and beautiful,” O’Hearne said. “The owner, Big Romas, was awesome.” He had a museum filled with his own wood carvings. He made soap, butter, wine and other spirits. He built his own wine cellar from stones he lifted and set himself.

“Big Romas’ estate is a popular destination for marriages,” Poucher added. “He was a great host and made us an unforgettable, enormous meal.”

Also in Druskininkai, the students took a four-hour bike ride. “It allowed us to move around quickly and see the sights of the city,” Poucher said. “And it was a good workout.”

Afterward, what better way to relax than at a spa, where they could take a mud bath, soak in a shallow pool while listening to relaxing music played under water, visit a steam room or sauna, or take a shower that simulates a tropical storm.

O’Hearne found her Lithuanian counterparts to be “extremely kind and willing to help others,” she said.

Poucher enjoyed sharing the classroom with them. “We developed strong friendships with the Lithuanian students. They participated in nearly every activity we did outside the classroom, acting as our personal tour guides.”

Tears flowed when they said goodbye, Saliklis said. “The kids saw a commonality. It was a life-changing experience; they returned more mature with a wider world view.”

Next year Saliklis plans to take 20 Cal Poly students and to welcome at least 15 Lithuanians. Including Lithuanian students is central to this study-abroad experience, making it a true academic and cultural exchange between two countries and two similarly focused institutions. ▲



# A Collaborative Structure

## ARCE AND ARCHITECTURE STUDIOS OVERLAP TO BENEFIT STUDENTS IN BOTH MAJORS

**A**RCE faculty members Kevin Dong and Jim Guthrie helped usher in the first significant curriculum change to the architecture degree program in 10 years by reconfiguring ARCE 316, Structural Integration for Architects, into architecture students' third-year studio experience. Tom Fowler and Mark Cabrinha, who coordinate the studios, wanted to integrate more structural design into the third-year studios.

In the studio, which spans winter and spring quarters, students build models that incorporate the structural system, completing early planning and design during winter term. "In spring, when the buildings are somewhat formed, they begin to focus on systems and a finer level of detail," Guthrie said.

That's when Dong and Guthrie step in. "The students need to demonstrate an

understanding of the structural systems and how structure can help inform their designs," Dong said.

Five integrated courses are taught during the two-quarter series. The first courses focus on sustainability and passive-design strategies. "Then the focus shifts to systems integration involving structural systems and enclosures, and 316 becomes integral," Cabrinha said.

The building facade — or skin — is one such integral structural system, Dong said. He has students build a skeletal frame of their model and show how the façade will attach to it.

"The beautiful thing about structures for architecture students at Cal Poly is they



Kevin Dong (above, right) assists a student during the Design Village portion of ARCH 133.







have an engineer teaching them,” Cabrinha said. “Sometimes students see architectural engineering and design as two different worlds. In 316 we give them a building to design with floor plans and structural systems. It gives ‘structure’ to their thinking ... in more ways than one.”

### Blurring the Lines Between Architecture and Architectural Engineering

In another classroom switch, faculty members Ed Saliklis and Kevin Dong are teaching ARCH 132 and 133, respectively. The course, Design & Visual Communication, is a three-quarter series for freshmen architecture and architectural engineering majors.

The course offers ARCE students, especially, a chance to think problems through differently. “Architectural engineering problems are framed so much

differently than architecture problems are,” Dong said. “In architecture, the problems are open-ended. ARCE students don’t think they have a big palette of skills to work with.” But in this series, they find out otherwise.

As an educator, Saliklis finds teaching 132 fascinating. “I am interested in how much we push freshmen and challenge them to reach upper levels of the cognitive domain,” he said. “In engineering, the first-year courses focus on low-level learning objectives. It’s difficult to get to the high levels of cognitive domain — analysis, synthesis and design.

“In this studio, the freshmen are doing real synthesis — big-picture ideas,” he continued. “They are thinking creatively and working out problems at a very high level. It’s difficult for architectural engineering students to get that kind of

Student models are placed on the shake-table to demonstrate dynamic principles such as natural frequency and resonance.

experience early because we present our knowledge systematically, one step at a time. For undergraduates, the opportunity to synthesize design and analysis concepts usually occurs only at the senior year capstone project experience.”

Department Head Al Estes said, “I find it amazing that Ed and Kevin are willing to teach freshman architecture studios. I personally lack the skill set and could not do it. There is no better way for us to remove barriers with the architecture faculty, especially when Kevin and Ed tell the rest of us about the experience. No other engineering students participate in these highly creative, artistic, right-brained experiences. It helps define who we are.” ▲





James Mwangi and Peter Laursen

## Promoted!

### Mwangi, Laursen Celebrate

Peter Laursen and James Mwangi were among 58 Cal Poly faculty members to earn promotions, effective fall 2013. Laursen was promoted to associate professor and attained tenure. Mwangi was promoted to full professor.

Laursen has been teaching at Cal Poly since fall 2007. He earned a master's degree in engineering sciences from UC San Diego in 1995 and a doctorate in civil engineering from the University of Auckland in New Zealand in 2003. He was one of four faculty members in the College of Architecture & Environmental Design to be promoted to associate professor and to receive tenure. He is a licensed civil engineer in California.

Mwangi, the only faculty member in the CAED to be promoted to full professor this year, joined the ARCE faculty in 2003. He earned a bachelor's degree in

civil engineering from the University of Nairobi in Kenya in 1984, a master's in civil engineering (structures) from the University of Lagos in Nigeria in 1985, and a doctorate in structural engineering from UC Davis in 2001. Mwangi is licensed in California as a civil and a structural engineer. He became a U.S. citizen several years ago.

Department Head Al Estes is justifiably proud of these accomplishments.

"In the span of seven years, we have gone from a principally non-tenured junior faculty to one that will soon be fully tenured and promoted," Estes said. "We have gone from one full professor to eight, with more on the way.

"Peter has become a great teacher and been the most effective user of our laboratories in his collaborative research. James spent a sabbatical year in post-earthquake Haiti and has done some remarkable work in support of the rebuilding effort. Both of them are highly deserving of this promotion."



## Faces of ARCE

The 2014 ARCE Department faculty (front row, from left): Department Head Al Estes, Pamalee Brady, Cole McDaniel, CAED Dean Christine Theodoropoulos, Erika Clements (staff) and James Mwangi. In back (from left): Jim Guthrie, Melissa Minor (former staff), Graham Archer, John Lawson, Craig Baltimore, Ed Saliklis, Jill Nelson, Christine Cobb (former staff) and Brent Nuttall.





# Seismic Activity

Peter Laursen Lends Expertise to Consulting Firm in Denmark

Associate Professor Peter Laursen spent the 2013-14 academic year on sabbatical in Copenhagen, Denmark, as the “seismic expert” at COWI A/S, a global engineering consulting firm.

Laursen, who had worked for the company from 2002 to 2007, used his expertise in seismic structural analysis and seismic design of reinforced concrete structures to consult on the Puente Nigale project, a 10-kilometer long bridge across Lake Maracaibo in Venezuela. In addition to his work on the cable-stayed main bridge, Laursen also gave seven seminars on earthquake engineering to colleagues.

His 10-year-old son and 8-year-old daughter attended public schools, where they quickly mastered Danish reading and writing. “Both kids were born in Denmark, and we have visited every summer, but this time we were really submerged in the culture,” Laursen said.

“My wife, Jill, worked part time at the Copenhagen International School. We got to hang out with my family, and we visited



Ansgar Neuenhofer (*see story, page 18*) in Bonn, Germany.”

The family also traveled to Paris and to the Canary Islands to “soak up a few rays of sun” in the winter.

Laursen returns to full-time teaching at Cal Poly in fall 2014.

Peter Laursen in Copenhagen with his children (above)

Laursen’s work in Denmark included consulting on the Puente Nigale project, a bridge across Venezuela’s Lake Maracaibo (rendering, top).



Ansgar Neuenhofer and his wife, Beate

## The Pull of Two Countries

### ANSGAR NEUENHOFER RETURNS TO GERMANY ... FOR GOOD

Relocating is never easy, yet Professor Ansgar Neuenhofer and his family have moved back and forth from their birth country of Germany to California three times in 25 years. "Our dearest piece of furniture — a kid's rocking chair bought at a Berkeley flea market — has traveled through the Panama Canal five times," Neuenhofer said.

After a three-and-a-half year absence, Neuenhofer returned to Cal Poly to teach winter and spring quarters. This summer he returned to Germany — his final move.

The decision to permanently return to Germany did not come easy or quick, but the pull of family — especially of aging parents — was too strong to ignore.

"I like Cal Poly and San Luis Obispo," Neuenhofer said. "It's not to be beat — the weather, the proximity to the ocean, and most of all, ARCE."

Ultimately, though, Neuenhofer is at home in Germany and in a university setting. He returns to his position in the Civil Engineering Department at the University of Applied Sciences (UAS) in Cologne.

"Cal Poly and the UAS in Cologne are comparable in size, about 20,000 students," he said. "They're both very hands-on, very applied. Faculty at both campuses have strong ties to industry."

There are notable differences, too. German classrooms are much bigger, with up to 100 students in a class, compared with Cal Poly's 24 to 32. "On average, Cal Poly students are better equipped academically and better disciplined," Neuenhofer said. "German students tend to talk in class."

Soon other Cal Poly ARCE professors might bear witness to these differences. Neuenhofer and Department Head Al Estes are working on a summer exchange program that would allow Cal Poly ARCE students to study in Cologne, while students from the Cologne campus would come to Cal Poly. They hope to have the program in place by summer 2015.

"We will all miss Ansgar and the entire family," Estes said. "He has been a wonderful colleague, teacher and friend. He is the master of Matlab and ping pong. We wish there was a way to keep him at Cal Poly."

### John Lawson Recognized for Teaching Excellence ... Again

Assistant Professor John Lawson (ARCE '83) was honored by the American Society of Civil Engineers (ASCE) for his effective and engaging teaching style.

Lawson received the organization's ExCEED (Excellence in Civil Engineering Education) New Faculty Excellence in Teaching Award at the ASCE's annual banquet, held during the American Society of Engineering Education (ASEE) conference in Atlanta. Given annually, the award recognizes outstanding engineering faculty who have five years or less full-time teaching experience.

Lawson began teaching at Cal Poly in fall 2009 after serving as vice president in a Southern California structural engineering firm. A graduate of Cal Poly and of Stanford University, Lawson brings 25 years of professional experience to the classroom.

Last year he won the California Faculty Association's Distinguished Educator Award, which honors and recognizes the best non-tenured teachers at Cal Poly.

"John is the complete package," says Department Head Al Estes. "He establishes wonderful personal rapport with the students. He brings his real-world experience into the classroom in a compelling manner. He is clear, engaging and enthusiastic. The students love his classes, even at 7 a.m."

John Lawson







Christine Cobb (left) and Melissa Minor

## Hellos & Goodbyes

**WELCOME, ERIKA,  
AND FAREWELL TO  
CHRISTINE & MELISSA**



Erika Clements

The ARCE Department welcomed Erika Clements (B.S., Industrial Technology, 2007; M.S., Industrial & Technical Studies, 2009) as its new administrative assistant in fall 2013.

Clements previously worked for Disneyland and the Federal Aviation Administration. She and her husband, Edward “Tres” Clements (B.S., Manufacturing Engineering, 2007), operate the Rutan Boomerang ([www.rutanboomerang.com](http://www.rutanboomerang.com)).

“We’re busy tinkering with all manner of mechanical things — airplanes, motorcycles and dune buggies,” she said.

Sadly, the department bid farewell to Christine Cobb and Melissa Minor, who accepted positions elsewhere on campus this year. Christine, who won the university’s Outstanding Staff Member Award in 2010, is the executive assistant to the dean in the College of Agriculture, Food & Environmental Sciences.

“She spent nine years in the ARCE Department and will be sorely missed,” said Department Head Al Estes. “Melissa served three years as administrative assistant and has moved to Admissions. Her energy and enthusiasm were unbounded and infectious. Along with Erika, we are very grateful to Kathy Lehmkuhl and Lori Ann Walters for helping see us through this difficult year.”

# Model Parents

## ARCE’S ACE LAB TECH RAY WARD & WIFE HONORED FOR FOSTERING KIDS

Ray Ward has enjoyed helping kids — both hardworking college kids and troubled foster kids — for a quarter century.

The ARCE Department’s lab technician since 1989, Ward has lent a hand in a variety of Cal Poly student projects. He’s helped on a Rose Float; human-powered submarine; and Da Vinci, the first human-powered helicopter to get off the ground. It set a record in 1989, flying for 7.1 seconds, and made international news.

In 2011 Ward and his wife, Ann, made local news — for their remarkable work with foster children. They took in their first in 1986 and have since taken in 89 more. They foster mostly females from 10 to 17; their stays range from overnight to several years. Twice they took in 14-year-old girls with 2-year-old babies.

Ann and Ray Ward



“Young pregnant girls and young mothers are hard to place,” Ray said. “But it sure makes Christmas interesting.”

As a “therapeutic family,” the Wards now care for very fragile and traumatized youth with special needs. Therapeutic families must be experienced and are required to take special courses.

“We try to get the kids to a place where they can go to a regular foster family or back to their family,” Ray said.

The Wards’ efforts were recently recognized. They won an all-expense-paid trip and scholarship to attend the Foster Family-Based Treatment Association’s annual conference on Treatment Foster Care last summer in Nashville, Tenn.

And while that was certainly rewarding, it didn’t compare to a call Ray received one night from one of his kids.

“She asked, ‘Remember me?’ ‘Of course I do,’ I said. ‘I’m getting married. Would you walk me down the aisle?’ ‘Just tell me where and when,’” I replied. “She said I was the only father figure she’s ever had.”

## Friends & Industry Partners



### ▲ Thank You, Advisors

The ARCE Department is grateful to the ARCE Advisory Board for giving generously of its time and expertise. 2013-14 board members are (front row, from left): Rick Ransom (Brooks and Ransom), Michelle Kam-Biron (American Wood Council), Ken O'Dell (MHP), Mark Sarkisian (SOM), Ron Hamburger (SGH), Robert Newsom (AC Martin Partners), Steve Schiller (John A. Martin) and John Edmiston (ARCE emeritus faculty). Back row (from left): Robert Gayle (UC Riverside), Consuelo Crosby (Edifice Complex), Paul Kovach (WJE), Luvelyn Benitez (Hope Amundsen), Department Head Al Estes, Maryann Phipps (eStructure) and Ricardo Arevalo (Simpson Strong-Tie). Board members not pictured include: Geoff Newmayr, Hayley Soderlund, Mike Botwin, Colin Blaney, Jan Douglas and Trailer Martin.

### ► Parents Fund Update

Professor Ed Salikliis (left) visits with Florian and Lori Barth, founders of the ARCE Parents Learn by Doing Fund. As encouragement to other parents to donate to the “challenge” grant, the Barths match, dollar for dollar, each gift made, up to \$50,000. To date, \$42,000 has been collected — only \$8,000 away from completing the pledge.

Please consider making a contribution by using the enclosed envelope!







## ◀ Bill Baker Visits ARCE

Students Ian Barth (center) and Chris Maulino welcomed feedback on their project from William F. “Bill” Baker when he attended an ARCE 446 Advanced Structural Systems lab.

A structural engineering partner at Skidmore, Owings & Merrill LLP, Baker is best known for developing the “buttressed core” structural system for the world’s tallest building, the Burj Khalifa in Dubai. His expertise has also been recognized on the GM Entry Pavilion, Millennium Park’s Jay Pritzker Pavilion, the BP Pedestrian Bridge, and long-span roof structures such as the Korean Air Lines Operations Hangar and the Virginia Beach Convention Center.

“Bill Baker is an engineer rock star,” said Department Head Al Estes. “It was a thrill to both the students and the faculty to have him join our classroom.”



## Parents Weekend Fun

ARCE hosted the fourth annual Parents Weekend on Oct. 25-26, 2013. Third-year student Tyler Poucher welcomed his mom and dad, Pam and Wayne, at the Saturday luncheon (above). ARCE parents attended the Friday night wine and cheese reception, which included a lecture by faculty member Ed Saliklis and exhibit of student work (left).

Watch for information on the next ARCE Parents Weekend festivities, planned for Oct. 24-25, 2014, to coincide with the university’s Parent and Family Weekend.



Award-winning wine producer Jerry Lohr

# A Satisfying Blend

STRUCTURAL ENGINEERING,  
WINE PRODUCTION & PHILANTHROPY  
HAVE KEPT JERRY LOHR'S  
GLASS BRIMMING

## Industry Partner

Jerry Lohr, founder of J. Lohr Vineyards and Wines, has a knack for getting things done.

“Two of my greatest passions,” he said, “are running a successful operation and making things happen through philanthropy; I am willing to make the lead gift then bring in others to get a project completed.”

That’s what happened at his alma mater, South Dakota State University, where the Jerome J. Lohr College of Engineering was named in recognition of his extraordinary support. In addition to being the lead donor for five buildings, one that includes a structural engineering laboratory, he has established 31 annual scholarships.

At UC Davis, he established the J. Lohr Fermentation Room and the J. Lohr Wine Sensory Lab.

While looking to establish an architecture college at South Dakota State University, Lohr met up with Al Estes, head of Cal Poly’s ARCE Department.

“I met Jerry when he dropped by my office with his calling card — a three-bottle pack of wine,” Estes said. “He wanted to see how an architectural engineering program might fit into a college of architecture. As head of one of the few engineering programs housed in a college of architecture, I was happy to oblige.

“I was fascinated that Jerry was a structural engineer prior to becoming a vintner. He has generously donated wine for the past four ARCE receptions at the Structural Engineers Association of California annual convention. It has become the official wine of the department.”

Cal Poly is one of the latest beneficiaries of Lohr’s largesse. In addition to pledging \$1 million for a teaching and research winery for the Wine & Viticulture Department, Lohr has a disciplinary link to the ARCE Department as well. “Jerry remains a friend of the department, and I hope that we can include him in more activities,” Estes said.

Lohr, an enthusiastic supporter of education, said, “The minute I stepped onto the Cal Poly campus, I knew it was a special place. I wanted to be part of it. The genuine interest the professors have in their students’ success and the Learn by Doing approach are key elements in a premier educational experience that prepares students to make a difference their first day on the job.”

Lohr grew up on a South Dakota farm. When it came time for college, he stuck close to home, earning his bachelor’s degree in civil engineering from South Dakota State University in 1958. He then pursued a doctorate at Stanford.

After a stint in the U.S. Air Force, he worked as a research scientist for NASA Ames Research Center for nearly six years. In 1964, while still working for NASA, he started a residential building business, completing 51 sub-divisions, 962 high-end homes, and 15 multiple projects before closing that shop in 2003.





J. Lohr's Hilltop Vineyard in Paso Robles (above)  
Joining Jerry in winery and vineyard operations are his children  
(from left): Lawrence, Cynthia and Steve Lohr.

While most people might consider retiring after a 40-year career, Lohr, now 77, was gearing up for his second act: wine producer. His first 280 acres in Monterey County produced 6,500 cases of wine in 1974. Last year, the company produced 2 million cases of wine from grapes grown on 5,000 acres in three different counties.

Farming attracted Lohr to the wine business. And passion.

"The building industry and vineyards are complementary; both are based on people, land and relationships. You build homes on land; you grow grapes on land. You have to respect the land, nurture it, and take care of it."

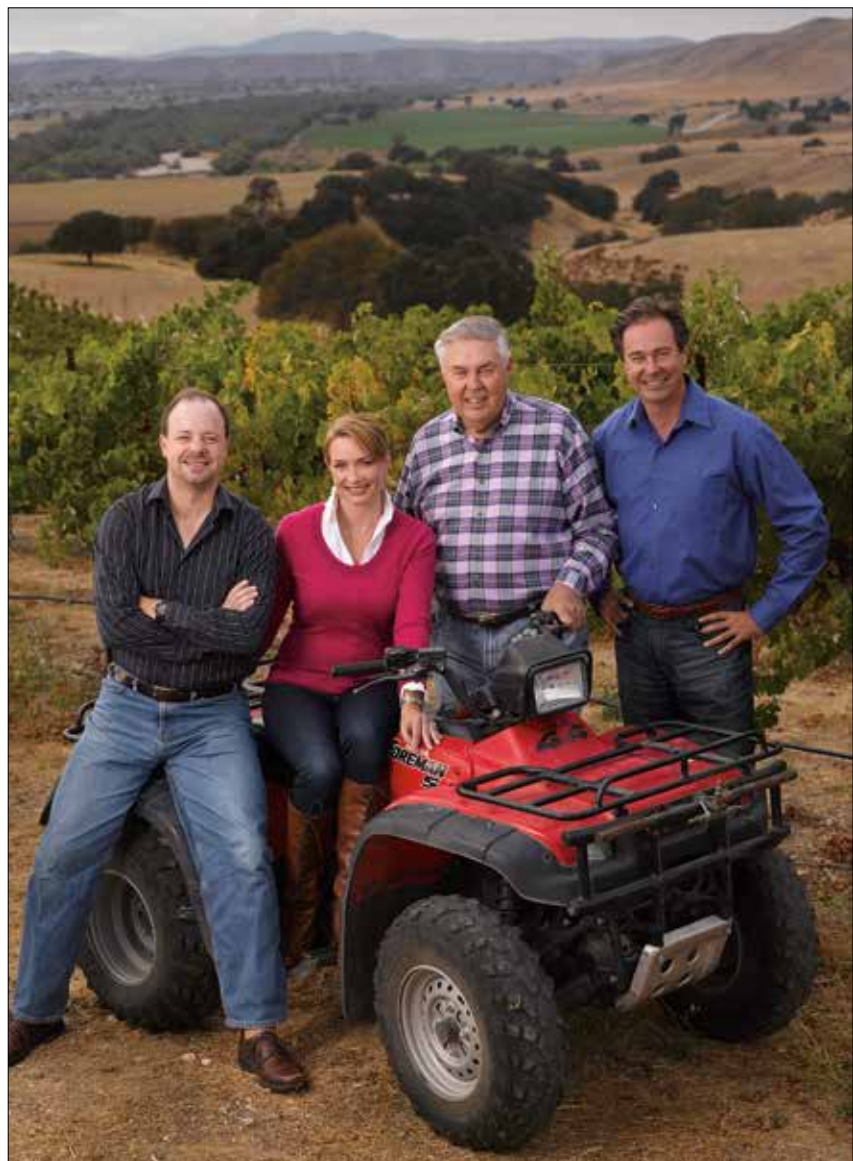
Lohr's vineyards have earned the Certified California Sustainable Wine-growing distinction, and his wines have won countless awards, including the 2010 American Winery of the Year award from Wine Enthusiast magazine.

After 40 years as president of J. Lohr Winery, Lohr stepped down in August 2013, leaving the company in the capable hands of his three children. He remains founder and chief financial officer of J. Lohr Winery and president of J. Lohr Vineyards.

Lohr said he has used his background as a structural engineer every step of the way. The building business was always a design-build process, and he did almost all the design of the homes and much of the design of the multiple projects. He continually used his structural engineering interest on these projects as well as during eight building phases of the J. Lohr Winery in Paso Robles and three in Greenfield in Monterey County.

He and J. Lohr Winery President Jeff Meier are currently remodeling an adjacent 33,600-square-foot building for a winery in Greenfield and planning a 67,000-square-foot addition to be completed in the next 18 months.

One of the fun parts of that project, Lohr said, is working with Cal Poly alumni: architect Steve vonRaesfeld, design-build contractor Mike Avila, and Csilla Foss (B.S., ARCE, 1984), structural engineer at Howard Carter Associates in Monterey. ▲



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## LOVE THAT ARCE

ARCE students tested the structural integrity of this sculpture on their visit to Phoenix, Ariz., in February 2014. Attending a two-day workshop for SEAOC/AEI student chapter leaders, the potential student officers were provided with the tools and insights necessary to run a successful club, while benefitting from the ties to a professional engineering organization. Clockwise, from top left are: Kristina Lam, Sydney Patrick, Kendall Johnson and Daniel Jardel-Menno.