

ARCE

ARCHITECTURAL ENGINEERING DEPARTMENT | COLLEGE OF ARCHITECTURE AND ENVIRONMENTAL DESIGN | SUMMER 2020

HANDS-ON HEAVY METAL

THE STEEL STRUCTURES
DESIGN LABORATORY



CAL POLY



Rising to 2020's Challenges

This has been a wacky year. I welcome you to this edition from atop the southern tower of the Golden Gate Bridge — in March — just before the lights went out. My thanks to Jorge Lee (ARCE, '72), the bridge's senior facilities engineer, for this private tour. We profile Jorge, who is retiring this year, along with prominent ARCE grads Steve Pelham and Ricardo Aravelo, who also retired this year. Sadly, we also profile ARCE grads John Edmisten and Jim Troxel who passed away this year.

We were operating at full throttle through fall and winter quarters in 2019-20, and with very little notice, we shut down the campus and taught spring quarter in a virtual format, despite never having done it before. We did not cancel any classes, and this issue explains how we did it. We finished the academic year with our first and hopefully last-ever virtual graduation. In mid-September we were able to reopen our labs and activity courses for face-to-face instruction.

Nevertheless, this issue is filled with great stories about student trips to Myanmar and Tanzania, faculty and students presenting papers at conferences, the dedication of the newly renovated

▲ Department Head Al Estes takes in views of San Francisco Bay and the Pacific Ocean from a tower of the Golden Gate Bridge.

KPFF Computer Laboratory, winning performances at the Timber Strong and EERI Seismic Design student competitions, the award of a National Science Foundation grant, three alumni receptions, a unique tall buildings course, and continued generous support from those who believe in this program.

I want to thank ZFA Structural Engineers for sponsoring this edition of our magazine. Headquartered in Santa Rosa, California, it has four other Northern California offices. Almost one-third of the firm's employees are Cal Poly ARCE graduates. Read about ZFA projects, people and culture on Pages 30-31.

ALLEN C. ESTES | DEPARTMENT HEAD

DEAN'S MESSAGE

Achievements That Brighten Our Outlook

As we all make adjustments to living our lives meaningfully and doing our best work within the context of COVID-19, I hope that you are well and safe.

In the College of Architecture and Environmental Design (CAED), we continue to congratulate our students' achievements and are especially proud of their stellar performance in the Earthquake Engineering Research Institute Student Competition. We also congratulate those students in our housing skyscraper studio, mentored by the SOM engineer-architect team of Mark Sarkisian and Leo Chow, for placing in the ACSA/AISC Student Steel Design Competition.

We celebrate our dedicated faculty for all they are doing to enrich Learn by Doing by distance and for their leadership in obtaining an NSF grant award to purchase actuators for our High-Bay Testing Lab. Through their efforts and your ongoing support, our architectural engineering program continues to thrive and prepare graduates for the challenges of engineering practice.

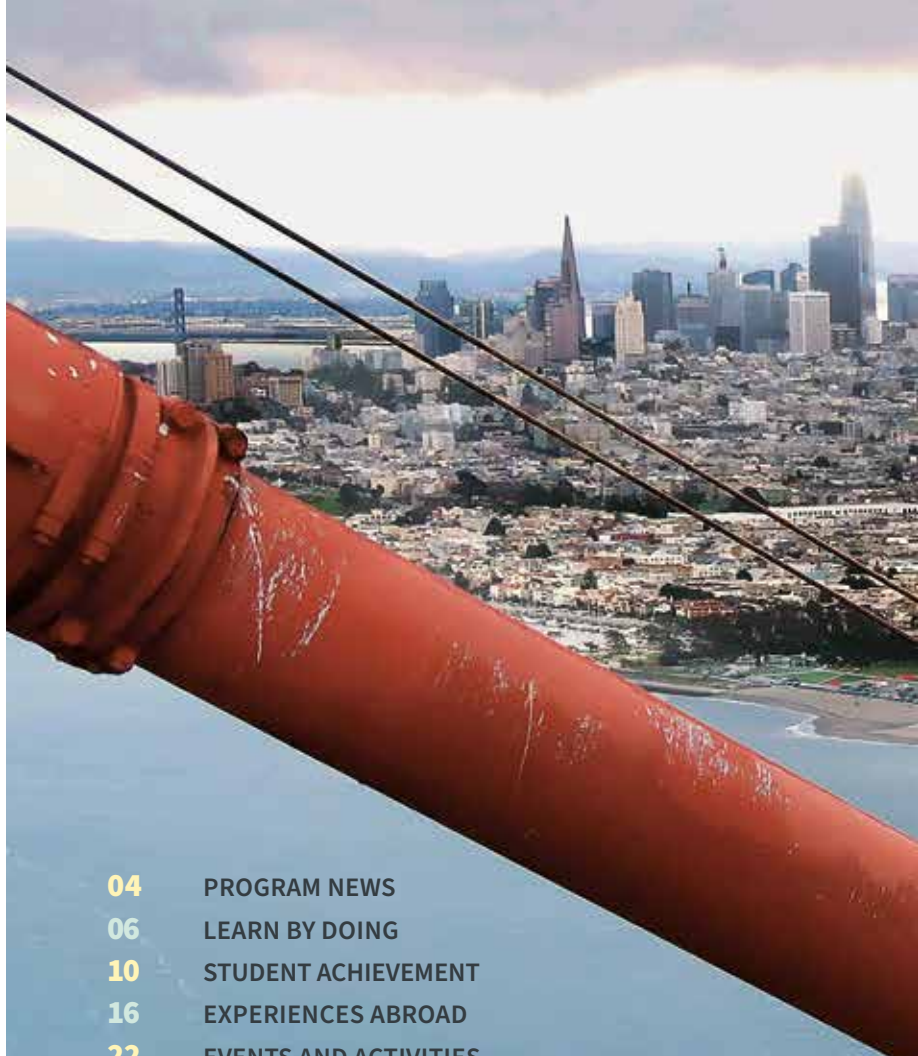
Now more than ever, our students need your advice and perspective. I invite you to join the CAED community and connect with our students on the Cal Poly Career Connections networking and mentoring platform. Find us at: <https://careerconnections.calpoly.edu/hub/calpoly/group/caed-community/about>.



CHRISTINE THEODOROPOULOS
AIA, PE | DEAN
COLLEGE OF ARCHITECTURE
AND ENVIRONMENTAL DESIGN



► Dean Christine Theodoropoulos



04	PROGRAM NEWS
06	LEARN BY DOING
10	STUDENT ACHIEVEMENT
16	EXPERIENCES ABROAD
22	EVENTS AND ACTIVITIES
24	ALUMNI UPDATE
28	FACULTY AND STAFF NEWS
32	THANK YOU, DONORS
33	INDUSTRY PARTNERS

ON THE COVER

ARCE majors Lilliann Lai and David Colman fabricate "Shark Fin" to provide stability for steel-braced frames during testing in ARCE 372: Steel Structures Design Laboratory. Read about the students' large-scale project experimentation in this lab and in ARCE 451: Timber and Masonry Structures Design and Constructability Laboratory on Pages 8-9.

THIS PAGE

A view of San Francisco from a tower of the Golden Gate Bridge.

ARCE MAGAZINE

Your content contributions are welcome for this annual publication. Please contact Jamie O'Kane at 805-756-1314 or arce@calpoly.edu.

Content Manager Department Head Al Estes

Project Coordinators Erika Clements; Jamie O'Kane

Writer Jo Ann Lloyd

Designer Shirley Howell

Photography Josef Kasperovich; courtesy photos

Copy Editing Jo Ann Lloyd; University Communications

Printing Poor Richard's Press

IN THIS ISSUE

VIRTUAL LEARNING PROVES MORE VITAL THAN EVER IN THESE SHELTERING TIMES

THE COVID-19 PANDEMIC has upended lives and changed the world, but it has also led to some unexpected benefits, including the implementation of unique, creative teaching methods.

The campus learned in mid-March that winter quarter final exams and all spring quarter classes would be entirely virtual. Spring break was extended to two weeks to allow time for faculty to prepare, and spring quarter was reduced to nine weeks.

“The details changed daily,” said Architectural Engineering (ARCE) Department Head Al Estes. “Our first priority was to get the faculty the equipment they needed, such as document cameras, headsets with microphones, webcams and computer tablets.

“ARCE’s faculty came through brilliantly,” Estes continued. “We didn’t cancel a single class, despite having experimental, computer and design labs scheduled. The faculty was able to deliver high-quality instruction and maintain student interaction on short notice.”

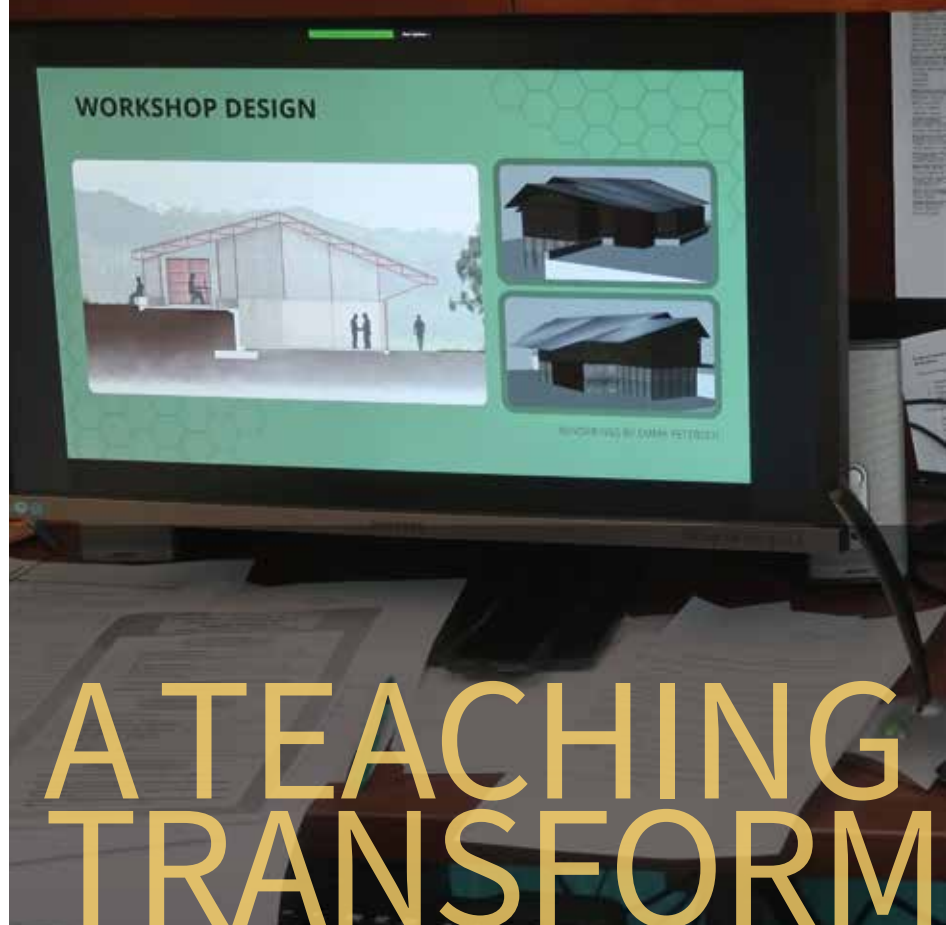
Professor Craig Baltimore successfully switched from in-person to online teaching. His student assistant Nicole O’Connor videotaped and edited the labs in advance of teaching ARCE 224: Mechanics of Materials Laboratory.

According to Baltimore, it took “a lot, lot, lot of time to create, edit and upload. It was extensive in preparation, camera angles and lighting. There was also the extra work of creating props and supports.”

Starting from scratch, he learned screen casting, storyboarding, camera setup, recording and Zoom. “We had to switch to a new paradigm of online teaching/learning,” Baltimore said. “It takes specialization and expertise and it’s labor intensive.”

Lecturer Radu Popescu also recorded ARCE 421: Soil Mechanics and taught the lab synchronously, integrating videos into the class. The process was lengthy and involved.

“I taught one lab experiment a week,” Popescu said. “The process included going to the Soils Lab, gathering equipment, taking pictures and making videos describing the equipment, the



▲ Professor Peter Laursen teaches a virtual class from his office using two computer screens, a WACOM tablet, a camera and a document camera.



components and how the apparatus is assembled. Then I'd prepare the soil sample, and again, take photos and produce a video of the experiment and record the results. I'd head home to prepare the lesson — usually a PowerPoint to be presented in a synchronous three-hour Zoom class."

The students' reactions were positive. "Given the difficult nature of online classes ... Radu really stepped up to the plate and hit a home run," said a student. Another said, "This was a really chill class because we'd go over how to do the labs step by step."

Professor Michael Deigert used Autodesk BIM 360 to teach ARCE 257: Structural CAD for Building Design, ARCE 372: Steel Design Lab, and to support other design labs. He had wanted to integrate BIM 360 — software that allows students to work together on 3-D models, in real time, from different locations — into these courses.

"Given the situation, ARCE 257 and the design labs had to be taught online," Deigert said. "I contacted Autodesk, explained our situation, and they provided us 150 BIM 360 licenses."

"BIM 360 was designed for remote work, and it was the perfect tool," he said. "There was a learning curve to get the students up and running, so it should be easier fall quarter. BIM 360 was

vital for the online classes and will be beneficial in face-to-face classes as well. It's becoming the industry standard, and giving students the opportunity to learn it, gives them a distinct advantage when entering the job market.

Estes added, "The ARCE Department is grateful to Autodesk, RISA Tech Inc., Computers and Structures Inc. and American StructurePoint for supporting our teaching efforts by giving us special licenses so that students could access software at home." ■

▲ Student assistant Nicole O'Connor videotaped and edited teaching materials for Professor Craig Baltimore's online version of the Mechanics of Materials Laboratory.

▲ Lecturer Radu Popescu shoots photos and videos for a Zoom version of his Soils Lab.

LEARN BY DOING

ARCHITECTURAL ENGINEERING (ARCE) Professor Kevin Dong, architecture Professor Tom Fowler, and a team of professional structural engineers and architects from the firm Skidmore, Owings & Merrill (SOM) LLP collaborated on an innovative new course last year focusing on high-rise design.

The two-quarter course, Highrise!, allowed ARCE and architecture students to investigate the role of tall building design in urban areas and how it is used to address densification, community and environment.

High-rise design is a new area of study for ARCE and architecture students, Dong said. The students were challenged to design a 400-unit residential tower with a commercial podium at the ground level. The design had to address infrastructure issues, such as public transportation access; include vertical communities, such as common outdoor spaces; and had to consider the impact of wind as an engineering concern and as a comfort issue for pedestrians.

“Towers are iconic in nature, but the students learned how tall buildings — in this case, 800 feet tall — help address population density and create a sense of community while also changing the landscape and fabric of a city,” Dong explained. “With invaluable insights from SOM-San Francisco and SOM-Chicago, the students gained knowledge on topics not covered in our curriculum.”

Live and virtual lectures were presented on high-rise buildings and urban growth. The lectures were delivered and viewed by architects and engineers, providing an interdisciplinary perspective.

“The course integrated core design for planning and structure, building massing and its effect on wind engineering, and building optimization when shaping buildings with mathematical algorithms,” Dong said. “The class was organized as building exploration, form finding, and building



▲ Students Alejandra Bravo (foreground) and Kristen Blowes tap the high-rise design expertise of Skidmore Owings Merrill (SOM) lead partners Leo Chow (foreground) and Mark Sarkisian.

systems selection during the winter, and design refinement and deeper analysis was covered during spring.”

The students periodically presented their work to a SOM jury, typically two architects and two structural engineers. The students learned how to present their story while also learning the value of a sketch, a section and a clearly drawn plan.

“Kevin and Tom put together a fantastic experience; our students are not exposed to tall buildings to this degree,” noted Department Head Al Estes. “The students were critiqued by Mark Sarkisian and Leo Chow — two of the best in the world in this area. Thanks to support from SOM, the value of this class far exceeded the tuition price that the students paid.”

One of the Cal Poly student teams won an honorable mention in the 20th annual Steel Design Student Competition for the 2019-20 academic year, which is administered by the Association of Collegiate Schools of Architecture and sponsored by the American Institute of Steel Construction. ■

HIGH-RISE!

NEW TEAM-TAUGHT COLLABORATIVE COURSE INTRODUCES STUDENTS TO TALL BUILDING DESIGN

THANK YOU, SOM TEAMS

Professors Kevin Dong and Tom Fowler and their students thank the Skidmore Owings Merrill (SOM) teams that made this project possible: SOM-San Francisco's Jessica Lim, Michael Temple, Paul Cambon, Chris Horiuchi, Kristen Blowes and Jacqueline Li; SOM-Chicago wind/structural engineers Bradley Young, Austin Devin and Rishabh Moorjani; and SOM lead partners Leo Chow and Mark Sarkisian.



- ▲ In a critique session, students get feedback about their 400-unit residential tower designs from Chow and Sarkisian (top and above).
- ◀ Students participate in a prologue activity at SOM-San Francisco.

GREAT-BIG

LEARN BY DOING OPPORTUNITIES



PROFESSOR MICHAEL DEIGERT ADDS LARGE-SCALE DESIGN-LAB PROJECTS TO STEEL AND WOOD COURSES

ALMOST THREE YEARS AGO, architectural engineering (ARCE) Professor Michael Deigert had an epiphany: “I woke one morning, realizing that students in our concrete labs were exposed to large-scale project experimentation, but students in the steel and wood labs were not,” Deigert recalled. “That very day I challenged my students to design, build and test a large-scale steel-braced frame.”

They accomplished that very ambitious task in just three-and-a-half weeks.

That early-morning realization has resulted in new Learn by Doing opportunities for Cal Poly ARCE undergraduates — opportunities rarely, if ever, afforded to undergraduates at other U.S. universities.

He has since taught that course, ARCE 372: Steel Structures Design Laboratory, three times, integrating new hands-on projects each time. In fall 2019, he brought that same ingenuity

to the ARCE 451: Timber and Masonry Structures Design and Constructability Laboratory.

“I totally commend Michael’s creativity and initiative in bringing more hands-on experiences into the classroom,” said Department Head Al Estes. “They enhance the undergraduate educational experience, but they also cost money. My thanks to the ARCE Parent’s Learn by Doing Fund that supports this.”

During his more than 25 years in private practice, structural engineer Deigert learned how dependent the design, fabrication and construction processes are on each other.

“I thought allowing students to experience this firsthand would be invaluable,” he said. “Designing, fabricating and testing their own large-scale structural steel frame leads to a deeper understanding of the complete system.”

In conventional design labs, students design a steel frame or a plywood shear wall with paper and pencil. This doesn’t provide a deep understanding of the complete design, fabrication and construction process, according to Deigert.



“When they build and test these structures themselves, they learn how much more there is to the design process,” Deigert said. “It’s common for them to think they have completed their design and proceed with the fabrication, only to have to revise the design several times because of something they discovered during the fabrication process.”

“The testing of the structures is the icing on the cake,” he continued. “It provides students validation beyond a professor telling them what happens when a structure is loaded a particular way. Lots of things happen, not all according to plan, and those turn into the most memorable lessons.”

“I have a saying,” he continued: “Failure is the greatest opportunity to learn, unless you don’t.” ■

OPPOSITE PAGE: Students in ARCE 372 built a large steel-braced frame to test for strength and endurance.

TOP LEFT: Working from their prepared design drawings, students in ARCE 451 framed a full-scale plywood shear wall that they will test to failure.

TOP RIGHT: Tony Nguyen makes last-minute checks before the plywood shear wall testing begins.

ABOVE, LEFT: Serena Reeves, Tracy Doan, Devin Williams, Marin Govett and Wesley Chan review their design with professor Deigert and discuss how it will fail.

ABOVE, RIGHT: ARCE 372 students install the student-built buckling restrained brace for testing. From left: Ryan Thornton, Tony Nguyen, Lilliann Lai and Anna Luehrs.



SHAKE, RATTLE 'N' ROLL

A TEAM OF CAL POLY architectural engineering (ARCE) students took second place overall at the largest undergraduate seismic design competition in March.

The team excelled at the 2020 Undergraduate Seismic Design Competition, held in San Diego in conjunction with the Earthquake Engineering Research Institute (EERI) annual meeting and the National Earthquake Conference.

Qualified design proposals were submitted by 51 teams from eight countries, including Canada, Ecuador, Egypt, Malaysia, Mexico, Romania, Turkey and the U.S. Forty-six teams attended the event, which was won by Romania's Technical University of Cluj-Napoca.

Cal Poly's team also placed second in presentation and poster sub-categories, third in proposal and fifth in architecture. "Our top 10 performance in the sub-categories led to significant bonus points for our team," said Anahid Behrouzi, team advisor and ARCE assistant

CAL POLY ARCE TEAM TAKES SECOND PLACE AT INTERNATIONAL SEISMIC DESIGN COMPETITION

professor. "Their quality construction and the model's outstanding seismic performance under shake-table testing helped the team rank second overall."

The students built a 5-foot-tall balsa-wood prototype structure, representative of a 19-story mid-rise building in San Diego that is built to withstand maximum acceleration and displacement of two earthquake ground motion recordings.

Behrouzi credits their excellent results to hard work and the department's rigorous undergraduate coursework.

"Construction quality — 'craft' — and graphical communication is introduced in the Architecture 131-133 sequence: Design and Visual Communication, as well as in ARCE 257: Structural CAD for Building Design," Behrouzi said. "Seismic design principles are the cornerstone of our design labs in timber, masonry, steel and concrete. Seismic analysis principles are the focus in our structural dynamics and earthquake engineering courses."

Team captain and veteran competitor Ryan Millward said the team's biggest challenge came from the prompt they were provided. "Each year the competition assigns a different set of construction and design parameters," he said. "This year, the shape and floorplan requirements created inherent issues with the structure that our classes teach us to avoid. Because we couldn't avoid them, we had to learn



- ◀ Cal Poly ARCE graduate student Jenna Williams (second from right) and fellow members of the EERI Student Leadership Council evaluate models' performance.
- ▼ Students collaborate in the project's early stages. From left: Keiko-Ann Sanders, Garrett Barker, Thomas Little and Audrey Hoang.



how to mitigate the negative effects those issues would have on our structure.”

Behrouzi also acknowledged the hard work of previous teams. “In past years, the team was led by highly motivated, very capable students who set an example of excellence,” she said.

One such student is Jenna Williams, who had competed several times as an undergraduate. Now a graduate student, she served as a member the EERI Student Leadership Council, an international group of graduate students who run the seismic design competition. As lead seismic design competition chair, she led the charge in creating this year's design challenge and the ground motions.

“I had the amazing opportunity to work with students from across the globe who are just as excited and fascinated with earthquake engineering as I am,” Williams said. “Having a group chat where I could ‘nerd out’ about recent earthquakes was a dream come true.”

◀ The ARCE team (opposite) cheers on its model's performance during a seismic test.

▲ Proud 2020 team members pose with their award-winning structure.

These competitions provide students with another dimension in learning. “I am significantly more confident in my classes and can translate the theories we are taught into real-world application much easier,” Millward said. “I'm a visual learner, so getting the chance to connect words with visuals helped immensely.”

Behrouzi added, “The competition allows students to practice an array of seismic design and analysis skills that we teach in our courses. They are capable of conveying their ideas through calculation packages and drawing sets, but developing a written proposal, oral presentation and poster help them share their ideas through other modes valuable to the engineer-client relationship.” ■

THE TEAM AND ITS SUPPORTERS

Assistant Professor Anahid Behrouzi took 12 ARCE students to the 2020 Undergraduate Seismic Design Competition: seniors Ryan Millward (captain), David Colman, Riley Denis, Sophia Ha, Tony Nguyen, Nick Slavin and Ryan Thornton; juniors Owen Anderson, Tomlinn Cox, Thomas Little, Autumn Wagner; and sophomore Garrett Barker.

The EERI team thanks ARCE professors Anahid Behrouzi, Peter Laursen, Graham Archer, Kevin Dong and John Lawson, as well as professors Robb Moss, Charles Chadwell and Xi Shen from the Civil Engineering Department for their help and guidance.

The ARCE Department also extends its thanks to industry sponsors David Cocke of Structural Focus, Alex Mueller (ARCE, '15) of KPFF, John A. Martin & Associates, KNA Structural Engineers, Harris & Sloan and FTF Engineering, plus Cal Poly's Instructionally Related Activities program.

STUDENT ACHIEVEMENT

DELIVERING A CURVE AT TIMBER-STRONG



CAL POLY TAKES TOP HONORS AT THE NATIONAL COMPETITION

A TEAM OF FIVE Cal Poly architectural engineering (ARCE) students and one construction management student won the national Timber-Strong Design Build Competition held in Anaheim in November 2019 as part of the National Council of Structural Engineers Association (NCSEA) annual conference.

ARCE Professor Kevin Dong served as faculty advisor for the team, which was led by fourth-year ARCE major and team captain Lilliann Lai. Additional team members included fourth-year ARCE majors Dolores Herrera, John Leone and Anna Luehrs; second-year ARCE major Audrey Luu; and third-year construction management student Jonathan Lin.

The success led to Lai's recognition on the floors of the state Assembly and Senate in Sacramento in early March 2019, when she traveled with Cal Poly President Jeffrey D. Armstrong and a group of 16 students who were introduced to the Senate by Majority Leader Bill Monning and to the Assembly by Assemblywoman Megan Dahle.

Six teams competed in the Timber-Strong competition, which charged the students with designing and constructing a two-story timber structure. Students produced design drawings, a technical report and a poster, and constructed a structure on site in 90 minutes. They also calculated the structure's carbon footprint and delivered a 10-minute presentation.

"The competition provides an excellent platform for students to

◀ ARCE team members showing off their winning timber structure are (top, from left) Lilliann Lai and Audrey Luu; and (bottom, from left): Dolores Herrera, Jonathan Lin, John Leone and Anna Luehrs.



▲ John Leone (left) and Jonathan Lin work on the curvacious roof.

◀ Dolores Herrera buttons down the interior.

showcase Learn by Doing," said Professor Dong. "The multidisciplinary team translated an idea from design inception to building on a one-to-one scale, and their entry was judged and juried by practitioners from across the county."

To prepare, the students met weekly with Dong for guidance. "We developed a schedule and delegated tasks based on student strengths, interests and maximum opportunity for personal or technical development," Lai said. "Though all students were involved with design, fabrication and assembly, they each chose an area to specialize in."

According to Lai, the competition establishes a bridge between learned classroom concepts and hands-on practice for engineering and construction management students. "The opportunity to translate numbers and lines into a physical product provides an invaluable experience for students to develop as engineering and construction management students," she said.

ARCE Department Head Al Estes attended the conference and saw the students in action. "I could not have been prouder of our student team," he said. "They used balloon framing; that was their secret weapon. Their structure featured a curved roof and an architectural protuberance on the front wall that added to the aesthetic quality of the building.

"The team was honored by NCSEA President Jon Schmidt at the conference reception," Estes continued. "We are grateful to C.W. Howe Partners Inc. in Culver City and Lionakis in Sacramento for generous donations that covered the team's expenses."

The event's sponsors are the American Wood Council, the American Plywood Association and Simpson Strong-Tie. ■

STUDENT ACHIEVEMENT

2020-21

ARCE SCHOLARSHIP RECIPIENTS

The Architectural Engineering Department is proud to announce the students who were awarded scholarships for the 2020-21 year. A total of nearly \$120,000 was awarded to the students listed below, thanks to our many generous scholarship sponsors.

COLLEGE OF ARCHITECTURE AND ENVIRONMENTAL DESIGN SCHOLARSHIPS

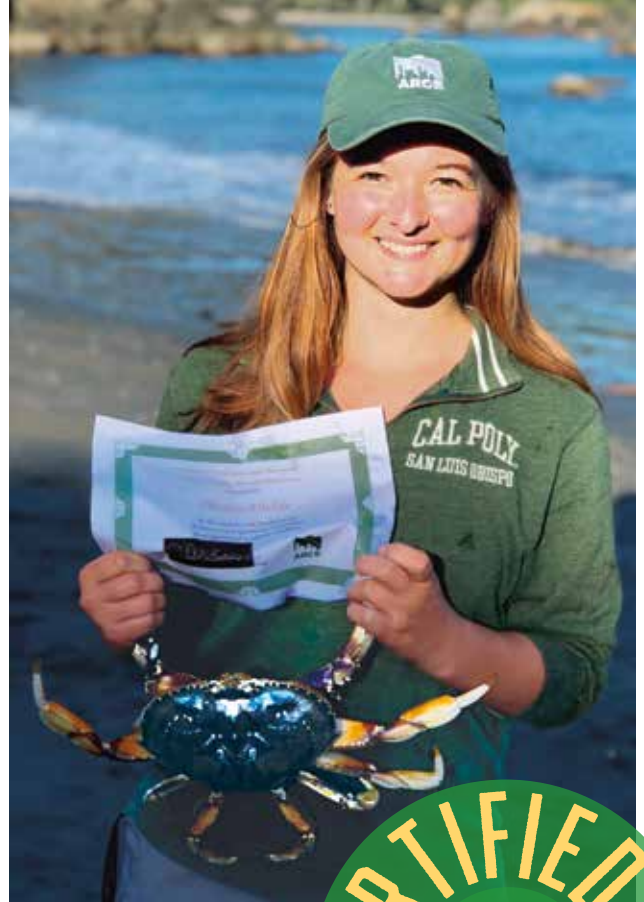
- Garrett Barker** (\$1,500) — Riddle Scholarship Endowment
- Maria Boyle** (\$1,000) — Robin L. Rossi Award
- Elizabeth Claypool** (\$1,000) — Robin L. Rossi Award
- Hester Lui** (\$1,800) — Herbert Collins Scholarship
- Payton McGee** (\$15,000) — Castagna Architectural Scholarship
- Gilbert Muñoz** (\$1,800) — Herbert Collins Scholarship
- Emmanuel Corona Navarro** — (\$15,000) Castagna Architectural Scholarship
- Faith Sharp** (\$15,000) — Castagna Architectural Scholarship
- Brandon Watrin** (\$1,800) — Herbert Collins Scholarship
- Eva Wieczorek** (\$1,000) — Robin L. Rossi Award

ARCHITECTURAL ENGINEERING DEPARTMENT SCHOLARSHIPS

- Reiley Akkari** (\$1,000) — CYS Eugene E. Cole Senior Project Scholarship
- Teagan Allen** (\$1,500) — Flour Corp. Foundation
- Michael Ayers** (\$1,000) — Hans Mager Scholarship
- Maria Boyle** (\$2,500) — Carson Starkey Memorial Scholarship
- Tomlinn Cox** (\$1,000) — Paul F. Fratessa Memorial Scholarship
- Aaron Dewey** (\$2,500) — Carson Starkey Memorial Scholarship
- Shaina Dickey** (\$2,500) — Carson Starkey Memorial Scholarship
- Bryan Garcia** (\$1,000) — CYS Eugene E. Cole Senior Project Scholarship
- Kennedy Gomez** (\$2,500) — Carson Starkey Memorial Scholarship
- Dolores Herrera** (\$1,500) — KPFF Consulting Engineers Scholarship
- Thomas Little** (\$1,500) — John Labib and Associates Scholarship
- Sophia Looney** (\$1,000) — CYS Eugene E. Cole Senior Project Scholarship
- Ryan Millward** (\$3,000) — Simpson Gumpertz & Heger Scholarship
- Gilbert Muñoz** (\$1,000) — Emanuele Barelli Structural Engineer Scholarship Endowment
- Faith Sharp** (\$1,500) — John Labib and Associates Scholarship
- Joshua Shockey** (\$1,500) — D'Abreu Family Foundation Scholarship
- Roberta Veliz** (\$1,500) — KNA Consulting Engineers Senior Project Scholarship
- Autumn Wagner** (\$1,000) — Forell/Elsesser Engineers Scholarship
- Eva Wieczorek** (\$2,500) — Degenkolb Engineers Scholarship

OUTSIDE SCHOLARSHIPS

- Dolores Herrera** (\$500) — Concrete Masonry Association of California and Nevada Scholarship; (\$2,000) — CCICC: 2020 Fred H. Schott Memorial Scholarship
- Sophia Looney** (\$500) — Concrete Masonry Association of California and Nevada Scholarship; (\$2,000) — CCICC: 2020 Fred H. Schott Memorial Scholarship; (\$1,500) — Structural Engineers Association of Southern California
- Anna Luehrs** (\$5,000) — Structural Engineers Association of Northern California — CSI Scholarship
- Nicole O'Connor** (\$1,500) — Structural Engineers Association of Southern California
- Nicholas Slavin** (\$1,000) — Concrete Masonry Association of California and Nevada Scholarship; (\$10,000) — ACI Foundation Tribute to the Founders Fellowship; (\$5,000) — Structural Engineers Association of Northern California — SCI Scholarship; (\$2,000) — Structural Engineers Association of Southern California Foundation Scholarship
- Roberta Veliz** (\$500) — Concrete Masonry Association of California and Nevada Scholarship
- Elista Vutova** (\$500) — Concrete Masonry Association of California and Nevada Scholarship
- Eva Wieczorek** (\$2,000) — CCICC: 2020 Fred H. Schott Memorial Scholarship



▲ Shaina Dickey shakes claws with her surrogate department head.



NO SCHOLARSHIP CEREMONY? NO PROBLEM!

IT'S AN ANNUAL TRADITION: Architectural Engineering (ARCE) Department Head Al Estes emcees a ceremony in which he presents scholarship certificates to deserving ARCE students and thanks their generous sponsors. He shakes every recipient's hand and poses for photos with each of them.

But this year's social distancing guidelines challenged that. So in lieu of the ceremony, Estes offered to meet the students individually and, practicing safety precautions, award their certificates. Two students accepted, but the others couldn't make it, given the limited time frame.

And then one student offered to provide a photo of himself with the certificate that he got in the mail. That sparked Estes' enthusiasm and inspired a more creative alternative.

"What a great idea," he said. "I invited each of them to send a photo of a surrogate department head presenting their scholarship certificate to them. I encouraged them to come up with something I would never think of myself." And he said he would reward the most creative idea.

The challenge inspired a bunch of fun photos, to Estes' delight. He expressed his appreciation for them all, but as promised, declared a winner.

"It's Shaina Dickey," he said. "I liked that she chose a crab as my replacement to present her certificate." ■



A Joshua Shockey is measurably moved when accepting his certificate from Al Estes.



B

B Maria Boyle gets a warm and fuzzy handshake.

C Brandon Watrin certifies himself in paradise.



C

D Al Estes hangs out with Dolores Herrera.



D

E Faith Sharp diagrams her path to enrichment via professors Jill Nelson and John Lawson.

F Thomas Little's furriest family member extends congratulations.

G Payton McGee ventures out with her mom for a sanitized celebration.

H Michael Ayers manages a well-engineered acceptance.

I Hester Lui gets a distanced thumbs up from Al Estes.

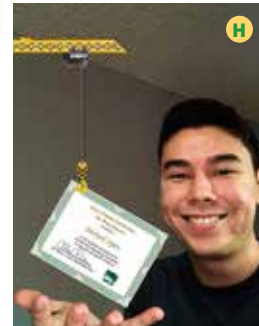
J Teagan Allen and Al Estes mask their enthusiasm, as does their witness.



F



G



H



I



J



BRIDGING THE DIVIDE

PROGRAM GIVES STUDENTS UNPARALLELED OPPORTUNITIES IN A DEVELOPING COUNTRY

- ▲ Cal Poly students put finishing touches on a pedestrian bridge they designed and installed next to an old one in Tanzania, Africa.
- ▶ Residents of the nearby village had long relied on a less reliable structure.





◀ Local children join the student team in flying a Cal Poly banner from the completed bridge. From left are: Nicole O'Connor (ARCE), Lauren Selover (ARCH), two primary school students, Maja Sagaser (ARCE, '19), Chaomin Chen (ARCH, '20), Bryce Gagner (ARCE, '19), Jerry Luong (M.S., ARCE, '19), Marco Di Piazza (ARCH) and Erick Vasquez (ARCE, '19).

“DESIGNING, RE-DESIGNING, building, learning another culture, meeting new friends, providing a literal path for education in a developing country — all of that is the essence of Build Tanzania,” architectural engineering (ARCE) Professor Kevin Dong said. “This adventure provides students an opportunity to apply their classroom skills, design for emerging countries, build what they sketched, and discover and become part of communities abroad.”

A team of ARCE and architecture students traveled with Dong and architecture Professor Tom Fowler to Tanzania for the third time in summer 2019. They completed the design for a pedestrian bridge linking two halves of a local village and providing a safe and reliable path for children to attend primary school.

Alumnae Maja Sagaser and Karina Rosales (both ARCE, '19) designed a steel-framed pedestrian bridge to span a 30-foot-wide ravine.

“The existing bridge was constructed with fallen tree trunks as bridge rails and arbitrarily spaced 2x4 members to form the deck,” explained Dong. “Working with the Majevu Primary School, local builders, and the nonprofit organization Mbesese Initiative for Sustainable Design, the students designed and built the bridge in 12 days.”

The students learned the value of site investigation, researching material availability, constructability and sequencing, Dong said. “The original design developed at Cal Poly was modified slightly based on items that could easily be purchased in town, minimized material usage, and considered installation across a 20-foot-deep



ravine,” Dong said. “As is common with building projects, a hurdle soon presented itself. The local builder hired to work with the group delivered faulty equipment, and the workers were not prepared for the project scale.”

This unforeseen obstacle, however, gave the students a greater understanding of the linkage between their ARCE curriculum and the practicalities of construction. Students helped fabricate and shop weld steel, mix concrete on the ground, place concrete by wheelbarrow, and apply the steel trowel finish to the concrete.

In addition to their work, the students visited a local Masai village, met the district commissioner, and toured a national park to better understand the environment, the overarching goals of the government and the culture. ■

▲ Working in a hotel courtyard, the ARCE students adjust the bridge’s design for site conditions and discuss fabrication options. From left: Erick Vasquez ('19), Jerry Luong (M.S., ARCE, '19), Nicole O'Connor, Karina Rosales ('19) and Maja Sagaser ('19).

CAL POLY STUDENTS HEAD TO MYANMAR ON A 2019 HUMANITARIAN TRIP

► Nick Slavin and Marin Govett (foreground) navigate busy Yangon, Myanmar, with Michael Ayers, Hester Liu and the others following.

▼ Students rented motorcycles in Bagan, Myanmar, to visit historic temples and the ancient city of Mount Popa. From left: Isela Dye and Tony Nguyen, Alejandra Bravo, Chase Stewart, Leah George and Rob Garner.

IN SUMMER 2019 — just like every summer since 2011 — Cal Poly architectural engineering students in SESH (Structural Engineering Students for Humanity) embarked on a community service learning project in a developing country.

The latest mission to Myanmar involved 14 students, including co-leaders Robert Garland, an ARCE senior, alumna Leah George (ARCE, '19), and Professor James Mwangi, serving as advisor.

They traveled in August to Yangon, a lively city of more than 7 million people. The region still suffers damage from a 2016 earthquake. The students' overarching goal was to "provide seismic retrofit solutions for under-designed structures and to teach the locals how to engineer and construct safe buildings," Garland said.

Working with Miyamoto Relief, a global structural engineering firm, the students formed two teams to create as-built drawings, damage maps and retrofit plans for Yangon University Library and the Yangon Technical University main building.

"We took measurements of all parts of the buildings, performed basic strength calculations,



and photographed the damage," Garland explained. "Then we created the as-built drawings since plans did not exist for those structures. We also presented viable structural retrofit solutions to university officials and submitted a formal report to Miyamoto Relief and both universities."

George added, "We collaborated with local university students. Brainstorming design ideas became more interesting with their insight because they had a completely different perspective. It was a great way to learn about Myanmar culture and provide sophisticated solutions in our report."

The effort was a success. "We accomplished what we set out to do," Garland said. "We provided the universities with information about their



MISSION POSSIBLE



buildings and effective strategies to reduce the risk of collapse in a seismic event.”

After the group finished in Yangon, they embarked on a 17-hour train ride for a “cultural experience” in Bagan, Myanmar, where they toured historical temples, including one on a cliff at the ancient city of Mount Popa.

“We were pleasantly shocked by the beauty and culture of this unfamiliar country,” George said.

The overseas adventure was not without its obstacles. “The language barrier and cultural differences made it difficult to do anything,” Garland said. “Just to get lunch, we had to haggle with taxi drivers, find a place that served food we could eat, try to read a Burmese menu and communicate with the waiter.”

The rewards of the trip far outnumbered the challenges. “We were greeted with love and happiness by everyone we met,” Garland recalled. “It was rewarding to observe a different world and to experience a vastly different culture.”

George said the trek to Myanmar was the “trip of a lifetime. “If I ever have the chance to go back, I would take it in a heartbeat. It was the epitome of Learn By Doing.”

ARCE Department Head Al Estes added, “The SESH students raised \$10,000 on behalf of Miyamoto Relief and this project. For the third year, SESH students’ travel expenses were covered through a generous donation from Computers and Structures Inc. and CEO/Founder Ashraf Habibullah. Unfortunately, the SESH trip to Puerto Rico scheduled for summer 2020 was canceled due to the COVID-19 pandemic, but we are excited to continue the outstanding relationship with the SESH students and Miyamoto Relief.” ■



2019 SESH TRIP PARTICIPANTS

The ARCE students — plus one alumna and one civil engineering major — who participated in the 2019 SESH trip included: ARCE alumna Leah George (ARCE, '19); fifth-year ARCE student Marin Govett; fourth-year students Sara Ahrens, Michael Ayers, Alejandra Bravo, Isela Dy (civil engineering); Robert Garland, Sophia Looney, Hester Lui, Tony Nguyen, Nick Slavin, Chase Stewart, Amber Sutherland and Elista Vutova. ARCE Professor James Mwangi served as faculty advisor.

- ▲ Students (top, from left) Chase Stewart, Sophia Looney, Robert Garland and Tony Nguyen visit The Temple of Dhammayangyi in Bagan, Myanmar. (All graduated in 2020).
- ▲ Professor James Mwangi (top, right) dons a hand-crafted shopping bag at a street market.
- ▲ The Cal Poly group visits the Shwedagon Pagoda (officially known as Shwedagon Zedi Daw) with Mark Broughton of Miyamoto International, their host in Myanmar.

An Invigorating Path

SUMMERTIME STUDY TRIPS
TO LITHUANIA RECHARGE
THIRD-YEAR STUDENTS

CAL POLY'S ARCHITECTURAL ENGINEERING (ARCE) students face a very challenging academic third year, but thanks to Professor Ed Saliklis, students can temper that challenge by participating in the Lithuania summer study program.

Saliklis started the six-week program in 2012, and it has been offered every summer since. In 2019, 25 third-year ARCE students traveled with Saliklis and professors Brent Nuttall and Peter Laursen to the country in Europe's Baltic region.

Lithuanian students also take part in the classes. "They are an essential part," Saliklis said. "Without their presence, we would not have the program."

Three professors took part last year "to keep the faculty-student ratio the same as it would have been at Cal Poly," Saliklis explained.

The program is geared to third-year students because, according to Saliklis, it is the perfect cohort. "They are mature enough to be self-sufficient," he said. "They jump ahead in the longest prerequisite chain in the department. It is designed to make an extremely challenging third year more forgiving, and the pairing of ARCE 302 and ARCE 371 — core courses in the ARCE curriculum — makes it hugely attractive."

To prepare for the trip, Saliklis manages massive amounts of paperwork, plans the trip, books the hotels and handles a host of other details. He said the extra work is worth it. His reward is seeing his students bond with peers in Lithuania. "Close friendships also develop among the Cal Poly students, and a disparate group becomes very tight knit," he said.

Once there, the students rise at 7:30 a.m., walk to campus from their hotel and work until noon. After lunch, they return to campus until 6 p.m., break for dinner and study until midnight.

"But weekends are free," Saliklis emphasized. "No homework, and flights to Liverpool were just 20 euros."

ARCE student Sophia Looney, already a seasoned traveler, chose to study in Lithuania because "It wasn't necessarily a country that I would have been inclined to visit ... unless I had a purpose to go. Lithuania intrigued me, and I thought it was an amazing way to experience life outside my comfort zone."

Looney was not disappointed. In addition to advancing her knowledge of architectural engineering, she grew in other areas as well.

"The most enjoyable aspects of the trip were when we realized we were having an experience of a lifetime — whether it was stumbling upon a fireworks show on

◀ The 2019 ARCE students from Cal Poly spend their first day in Vilnius exploring the picturesque city.



- ▲ The 2018 study group saw locals parading in celebration of the 100th anniversary of Lithuanian Independence.
- ▲ Students (at right, from left) Sara Ahrens, Sophia Looney and Amber Sutherland visited the tiled wall memorial of the Baltic Way in 2018. The installation commemorates a 1989 event when 2 million people held hands in a peaceful protest for independence.
- ▶ A statue of Vilnius founder Gediminas watches over the 2019 visitors from Cal Poly.

the riverbank, being in a parade celebrating the 100th anniversary of Lithuanian Independence, or simply enjoying gelato with close friends,” she said.

She thinks travel abroad enriches Cal Poly’s hands-on education by turning “Learn by Doing into ‘learn by going.’ We still received the amazing Cal Poly education we all expect, but it was enhanced by learning outside the classroom, learning about the country we were in, learning about our fellow classmates, and most importantly, learning about ourselves,” Looney said.

Saliklis admits the experience is not always a bed of roses. “Some students get homesick, some students of color feel ‘different,’ as Lithuania is very homogeneous and white,” he said. “And vegetarians are flummoxed by Lithuania’s fascination with different ways to eat a pig!”

Overall, the benefits far outweigh any negatives the students encounter. “Vilnius is an astonishing city, ancient and modern, Jewish, pagan and Christian,” Saliklis said. “It was the cultural capital of Europe. It is a sophisticated, urban place surrounded by dense green forests.”

Department Head Al Estes added, “The students love this program. We have tweaked it several times, and this was the first year that we sent three ARCE faculty members. If this model is sustainable, this program could become the preferred path to graduation. Unfortunately, the COVID-19 virus forced cancellation of the program this summer.” ■



Sharing Research

FACULTY, STUDENTS PRESENT PAPERS AT SEAOC CONVENTION

ONCE AGAIN, Cal Poly's Architectural Engineering (ARCE) Department had quite a presence at the Structural Engineers Association of California (SEAOC) Convention, held in September 2019 at The Resort at Squaw Creek in Olympic Valley, California.

SEAOC student officers Douglas McArthur, Tomlinn Cox, Tia Kelly, and Nolan McWhorter accompanied Department Head Al Estes, Professor John Lawson and Assistant Professor Anahid Behrouzi to the annual event. The students assisted the conference staff in return for free registration and access to all technical sessions and conference social events.

At the conference, Lawson presented "Improving the Accuracy of Wood Diaphragm Deflection Computation and its Impact on ASCE 41 Pseudo-Lateral Force Estimates." ARCE graduate students Sydney Gallion and Abby Lentz presented "Interlocking Rocker CLT Shear Walls with Viscous Dampers," and Behrouzi and graduate student Rory de Sevilla presented "Feasibility of a Fiber Reinforced Polymer Retrofit for Non-Ductile Concrete Walls."

True to tradition, ARCE hosted a successful alumni reception (*see Page 24*), participated in the annual President's Cup competition and offered a great experience for the students who attended to mingle with industry professionals.

"Cal Poly's ARCE is the only university program that brings students to this professional event," said Department Head Al Estes. "My thanks to the Parents Learn by Doing Fund and Instructionally Related Activities program for their support." ■



◀ SEAOC student officers (clockwise from top left) Tomlinn Cox, Tia Kelly, Nolan McWhorter and Douglas McArthur.



An Ongoing, Invaluable PARTNERSHIP

STRUCTURAL FORUM 2020 MARKS 30 YEARS OF STUDENT-INDUSTRY MATCHMAKING

NOTHING WAS GOING to dampen enthusiasm — or attendance — at the Architectural Engineering (ARCE) Department's 30th annual Structural Forum, not even the keynote speaker's delayed flight into San Luis Obispo.

About 200 students heard four industry insiders speak at the February event, including keynote presenter Marc Guberman, a design partner at Foster + Partners. Erin Andes from RDH Building Science, Brian Katz of Hinman Consulting Engineers, and Troy Morgan from Exponent also spoke.

This year's theme, Designing Visions. Building Reality, "reflects the thoughts that many structural engineers share every day," said Douglas McArthur, committee chair and senior ARCE major. "It's our

▲ Mackenzie representative Sohaila Starks talks with potential future employees at the 2020 Structural Forum job fair.

role to find the balance in making innovative designs that work within our practical means."

Guberman, a member of the ARCE Advisory Board, spoke about the importance of interdisciplinary work among architects, engineers and construction managers. A graduate of Yale University's School of Architecture and Yale's School of Management, where he earned an MBA, Guberman joined the New York office of Foster + Partners in 2008, relocating to California three years later to help build the firm's Silicon Valley office. There he worked on the design and construction of Apple's new campus. Since then, he has



worked on several forward-thinking projects, including the Mars Habitat for NASA.

This year, a record-breaking 56 companies participated, completely filling the Madonna Expo Center. Planning and organizing the annual event is no small undertaking. “Structural Forum is a monumental task, especially for students with a full-time ARCE workload,” McArthur said. “I prepared as much as possible, but in the end, there is always something unexpected.” ■

- ▲ Representatives from companies participating in the job fair (top, right) discuss employment opportunities with ARCE students.
- ▲ Keynote presenter Marc Guberman (left) and Structural Forum Committee Chair Douglas McArthur mingle at the job fair.

PARTICIPATING COMPANIES AT STRUCTURAL FORUM 2020

Structural Forum is a student-run event hosted by the Cal Poly student chapter of the Structural Engineers Association of California (SEAOC). The event receives wide support from the ARCE Department and would not be possible without the generous support of its sponsors. The department thanks the following 56 companies (listed alphabetically) for their continued support.

- 4 S.T.E.L. Engineering Inc.
- Advanced Structural Design Inc.
- Bevier Structural Engineering
- Biggs Cardosa Associates
- Brooks Ransom Associates
- Buehler Engineering
- C.W. Howe Partners Inc.
- Coffman Engineers
- Daedalus Structural Engineering
- DCI Engineers
- Degenkolb Engineers
- Englekirk Structural Engineers
- Harris and Sloan
- Hilti
- Hohbach-Lewin Inc.
- Holmes Structures
- IDA Structural Engineers
- IMEG
- JCE Structural Engineering Group Inc.
- John A. Martin & Associates
- John Labib & Associates
- KNA Structural Engineers
- KPFF Consulting Engineers
- KPW Structural Engineers Inc.
- Kurt Fischer Structural Engineering
- Lionakis
- LPA Inc.
- Mackenzie
- Mar Structural Design
- MHP Inc. Structural Engineers
- MKM & Associates
- MME Civil + Structural Engineering
- Nous Engineering
- PARADIGM Structural Engineers Inc.
- PCS Structural Solutions
- RDH Building Science Inc.
- Rinne & Peterson Inc.
- Saiful Bouquet Structural Engineers
- SidePlate Systems Inc.
- Silman
- Simpson Strong-Tie
- Stantec
- Strandberg Engineering
- Structural Engineers Incorporated
- Summit Engineering Inc.
- Taylor & Syfan
- TEECOM
- TETER LLP
- Thornton Tomasetti
- TKJ Structural Engineering Inc.
- Tuan and Robinson Structural Engineers
- Van Sande Structural Consultants Inc.
- Walter P Moore
- Watry Design Inc.
- Wiss, Janney, Elstner Associates Inc.
- ZFA Structural Engineers



THREE ARCE RECEPTIONS BRING ALUMNI TOGETHER

NUMEROUS ALUMNI statewide gathered at three separate receptions hosted by the Architectural Engineering (ARCE) Department during the 2019-20 academic year, before the COVID-19 pandemic temporarily halted in-person events.

The first reception was the social event that the department hosts during the annual SEAOC (Structural Engineers Association of California) Conference, held last September at Squaw Valley near Lake Tahoe, California. It attracted about 50 alumni and friends.

“As usual, we were Ashraf Habibullah’s warm-up act, as we often get scheduled before his big event,” said Department Head Al Estes referring to the president and CEO of Computers and Structures Inc. (CSI), who hosts lavish events at every opportunity.

The second reception, in Anaheim, California, at Splitsville Lane at Disneyland, was held in November in conjunction with the National Council of Structural Engineers Association annual conference. This marked the department’s first reception in the Los Angeles area. Estes thanks ARCE Advisory Board members Margaux Burkholder and Chris Haight, who organized the event that drew approximately 35 attendees.

The final reception, held in March at Schroeder’s Restaurant in San Francisco the night before Habibullah’s CSI extravaganza, has been an ongoing event since 2012.

“This was our last major event before the lights went out,” Estes said. “The mayor of San Francisco canceled the CSI party while our event was in progress. To keep spirits up, the College of Architecture and Environmental Design’s Dean’s Leadership Council organized a dinner the following evening.

“These receptions are a great way to bring together colleagues, alumni, friends and students. We look forward to a post-COVID-19 world where we can start up again.” ■





Fun!

▲ Approximately 50 alumni and friends (top) attended the SEAOC reception last fall in Squaw Valley.

▲ Splitsville Lane at Disneyland bustled last fall with alumni that included (from left) Adrian Saraf ('17), Chris Gateley ('18), Lacy Williams ('16), Chris Haight ('96) and an unidentified guest.

◀ The reception in March at Schroeder's in San Francisco attracted ARCE alumni (from left) Alex Remiticado ('18), Jennifer Ton ('11), Stella Bates ('18) and Rachel Chandler ('19).



IN MEMORIAM

Jim Troxel, 84

ALUMNUS ESTABLISHES \$160,000 ENDOWMENT FOR INTERDISCIPLINARY STUDIES

ALUMNUS JIM TROXEL (Architectural Engineering, '58) passed away on March 13, 2020, leaving a \$160,000 endowment to the ARCE Department for interdisciplinary studies.

Troxel was born in 1935 in Dayton, Ohio. While at Cal Poly, he played the double bell euphonium in the marching band. After graduating from Cal Poly in 1960, Troxel married Nancy Ann Moore, settling in Long Beach, California. The couple had two sons.

Troxel had a long, successful career that included moving several times within California and to Georgia and Washington, all the while refining his expertise in the development of large commercial properties — generally

▲ Department Head Al Estes (left) and alumnus Jim Troxel caught up during a visit in 2015.

large malls and “big box” stores as anchor properties.

“The newly established Jim Troxel Interdisciplinary Endowment is a testament to Troxel’s loyal devotion to Cal Poly,” said ARCE Department Head Al Estes. “I enjoyed visiting Jim several times at his senior living home in Bellevue, Washington.

“Interdisciplinary collaboration is a top priority of the CAED, but it is very difficult to execute,” Estes continued. “Jim’s generous endowment will provide a steady source of revenue to promote these valuable experiences.” ■

ALUMNI UPDATE

IT COULD BE SOMETHING in the water. Perhaps it's "The COVID Effect." Or maybe it's just a good time to stop working and stroll into the proverbial sunset.

For whatever reason, three alumni and longtime industry friends of the Architectural Engineering (ARCE) Department have decided to retire.

Here, in alphabetical order, ARCE shares its appreciation of Ricardo Arevalo, Jorge Lee and Steve Pelham.

"Ricardo, Jorge and Steve all had distinguished careers," said Department Head Al Estes. "Retirement means more time to visit campus and hopefully stay engaged with the ARCE program."

RICARDO AREVALO (ARCHITECTURAL ENGINEERING, '85)

Ricardo Arevalo, chief operating officer at Simpson Strong-Tie, has embarked on the next chapter of his life: retirement. Initially he and his wife, Ana, had planned to travel the globe but, due to COVID-19, they have happily refocused on home projects, local activities and more time with their extended family, including their three adult sons.



The Next Chapter

THREE OF ARCE'S LONGTIME INDUSTRY PALS RETIRE

"Simpson Strong-Tie is a huge supporter of the ARCE program, and Ricardo was the impetus behind it," said Estes. "Ricardo was the COO, but he never missed a lab dedication ceremony, a Simpson symposium or a Structural Forum — and he was a great

- ▲ Ricardo Arevalo and his wife, Ana (middle), enjoy the 2019 reunion at Schroeder's in San Francisco with alumni Enrico Alvaro (2018) and Onessa Anastasio (2017).
- ▼ Jorge Lee walks a cable on the Golden Gate Bridge — his breathtaking "office" for 20 years.



member of the ARCE Advisory Board. We wish him the best in his retirement.”

Arevalo had his own Southern California structural engineering private practice before joining Simpson in 1999 as a branch engineer. Over time, he was promoted to manager, vice president of engineering, and finally as the company’s first chief operating officer. He also taught a timber design course at Cal Poly Pomona for several years.

“My Cal Poly education set the table for a world of opportunities for me: engineering, education and management,” Arevalo said. “Undoubtedly, the most gratifying part of all those experiences were the relationships developed with my peers, fellow employees, students and the community. Even in retirement, I hope to continue my special and valued relationship with Cal Poly.”

JORGE LEE (ARCHITECTURAL ENGINEERING, '72)

“I will retire from this world icon on Sept. 25, 2020, after 20 years,” said Jorge Lee, senior facilities engineer at the Golden Gate Bridge (GGB), Highway and Transportation District.

Before joining GGB, Lee spent two years rebuilding his house, which had been destroyed by fire in Sausalito, California. “When I applied at the GGB, they did not have an engineering position, only an inspector position,” he recalled. “I took it — and a loss in pay, since I was overqualified. But working five minutes from home could not be too bad.”

Lee admits his retirement will be emotional, but “I am eight years over the standard retirement age of 65, so it is time.”

Lee shared that Cal Poly’s Learn by Doing motto played a large part in his life. “It has taken me to a lot of adventures,” he said. “I rebuilt my house after the fire. I did repairs on my cars, including a Ferrari. I earned third place in an International World Championship Etchells Class race with my three-man sailboat, “Satisfaction.” I have so much to thank Cal Poly for.”

Estes said, “I met Jorge at one of our first Bay Area alumni events, and I don’t think he has missed a single one since. The greatest advantage to having an ARCE grad working at the GGB is the

magnificent tour of the towers that the general public never gets. I wish Jorge the best in retirement and look forward to seeing him at the Schroeder’s alumni reunion again next year.”

STEVE PELHAM (ARCHITECTURAL ENGINEERING, '76)

Cal Poly alumnus Steve Pelham retired this year after a 43-year career. After working for several firms, he joined Jack Barrish in 1987, forming Barrish Pelham & Associates to continue Barrish’s Sacramento-area practice, which originated in 1945.

The company has hired numerous Cal Poly ARCE graduates over the years, with many progressing from intern to structural engineer to principal. In 2018, the firm was acquired by Degenkolb Engineers, and Pelham remained with the company until his retirement.

Pelham served on the ARCE Advisory Board twice and was president of SEAOC (Structural Engineers of Association of California). In 2004-05, he was inducted into the SEAOC College of Fellows in honor of his distinguished service to the association and outstanding contributions in the field of structural engineering.

“Being part of the ARCE community before graduation, after and into today has provided unlimited opportunities,” Pelham said.

Estes expressed his gratitude for Pelham’s long commitment to the department. “Steve Pelham has been a true friend of ARCE for decades,” Estes said. “I am most grateful to Steve for generously sponsoring the Order of the Engineer ceremony, which the department conducts at both the fall and spring graduations. We wish him the best in this new chapter.” ■

◀ After working for several engineering firms, Steve Pelham (foreground) joined Jack Barrish in 1987, forming Barrish Pelham & Associates.





John Edmisten

IN MEMORIAM

John Edmisten, 86

PROFESSOR EMERITUS AND CAL POLY ALUMNUS

CAL POLY ALUMNUS and architectural engineering Professor Emeritus John Edmisten (Architectural Engineering, '65) passed away at his home Aug. 26, 2020.

Edmisten taught in the Architectural Engineering (ARCE) Department from 1968-94, serving as department head for part of 1993. He was an ARCE Advisory Board member from 2015-18.

In retirement, Edmisten remained a consistent donor to the ARCE Department. He and his wife of 54 years, Yvonne, created the Hans Mager Scholarship, which the department awards every year. Yvonne passed away in 2015.

“John stayed in close contact with the department and was still writing and presenting research papers with Sat Rihal up until his death,” said Department Head Al Estes. “The outpouring of remembrances and condolences from ARCE alumni has been overwhelming. We will devote a more in-depth article to John’s life and those memories in the next edition of this magazine. We will all miss him.”

If anyone has remembrances or photos of John Edmisten, please email them to arce@calpoly.edu. ■

Bound to Inspire

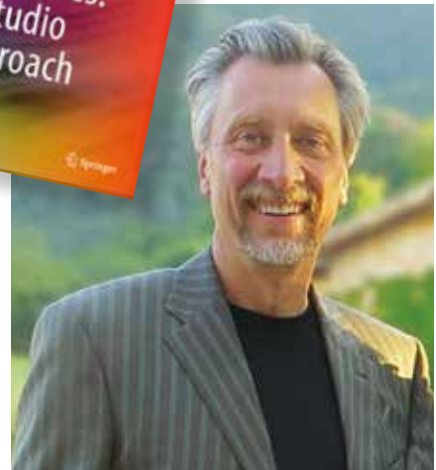
PROFESSOR ED SALIKLIS PENS ANOTHER TOME

ARCHITECTURAL ENGINEERING (ARCE) Professor Ed Saliklis has authored a second textbook in two years, “Structures: A Studio Approach,” published by Springer.

“It’s completely different than the first, but the audience is roughly the same: students and practitioners interested in learning about load flow in buildings without algebraic statics,” Saliklis explained. “The experiences of ARCE and architecture working together in the studio, seeking structural rationalism, has given me an opportunity to learn from my colleagues in both departments and to recreate previously established pedagogical approaches with my own research.”

Saliklis wrote the book as a way to publicize Cal Poly’s ARCE Department globally. “I wanted to reinvent the way we teach structures to architecture and construction management students, and to open the eyes of engineering students who have been exposed mainly to textbooks with very narrow world views,” he said.

Although he had been ruminating about the book for years, the actual



Professor Ed Saliklis

writing — from contract to delivery — was a “blazing fast 12 months.”

Saliklis maintains that his “art and research feed each other.”

And he’s not done feasting. He’s working on a third book, which he calls, “the most important — perhaps the only important — thing I have done in my professional life. It’s a game changer.” ■



A Future Alumnus?

Erika Clements, administrative coordinator for the Architectural Engineering Department, and her husband, Edward “Tres” Clements, welcomed the birth of their son, John, in May 2020. Clements is on leave, with plans to return to work in December.

“Everyone in the ARCE Department offers congratulations and best wishes to Erika, Tres and John,” said Department Head Al Estes. “Erika thought she had her hands full here; this takes her challenges to an entirely new level.”

Outstanding by the Sea

Architectural Engineering Department faculty and staff gathered on a beautiful day in Shell Beach last fall for their annual retreat.

Pictured (from left) are: John Lawson, Jamie O'Kane (staff), Brent Nuttall, Anahid Behrouzi, Craig Baltimore, Pamalee Brady, Radu Popescu, James Mwangi, Kevin Dong, Department Head Al Estes, Michael Deigert, Cole McDaniel, Erika Clements (staff), Dahlia Hafez, Peter Laursen, Mario Esola and Ed Saliklis.

Not shown: Graham Archer, Jill Nelson and Josef Kasperovich (staff), filling in for Erika Clements, who is on maternity leave.



Coming and Going

PROFESSOR KEVIN DONG RETURNS TO FULL-TIME TEACHING; PROFESSOR JAMES MWANGI TAKES ON NEW ROLE



▼

“The college attracts insightful students who are passionate about their education, professional development and current events. I enjoy the conversations and the curiosity students bring.”

PROFESSOR KEVIN DONG



▼

“This college-level position gives me the leadership opportunity that I was seeking. I hope to help support the college’s mission and deliver the Learn by Doing services to staff, faculty and students.”

PROFESSOR JAMES MWANGI

THE ARCHITECTURAL ENGINEERING Department welcomed Professor Kevin Dong back to full-time teaching in fall 2019 after serving more than five years as associate dean of administration in the College of Architecture and Environmental Design (CAED).

“Teaching, working with students, helping people grow professionally and personally, engaging in discussions about current trends and events, pondering the future — this is why I’m engaged as a faculty member,” Dong said. “But it also led me to explore other ways to pursue the same goals.”

In the CAED, Dong provided oversight for college operations, including budget, enrollment, shops development, classrooms, lab spaces and office space allocation, information technology, website, media, student safety and facilities improvements. He also continued to teach part time.

“The purpose for my career change to academia was rooted in teaching, but I also had the pleasure of working with student groups from across the university,” Dong said.

Returning to the ARCE faculty was a welcome change. “It allows me to work full time with students — teaching, experimenting, conducting activities, being part of the energy in the classroom,” he said. “The college attracts insightful students who are passionate about their education, professional development and current events. I enjoy the conversations and the curiosity students bring. It’s contagious, and I’m happy to be back with the department.”

ARCE Professor James Mwangi, who had long been interested in a leadership role, succeeded Dong in the CAED in September 2019. He will continue to teach at least one class a quarter, in addition to his responsibilities as associate dean for program support and operation, and working closely with the dean and the assistant dean of financial and data assessment regarding college expenditures and budget.

“I have been at Cal Poly 17 years,” Mwangi said. “This college-level position gives me the leadership opportunity that I was seeking. I hope to help support the college’s mission and deliver the Learn by Doing services to staff, faculty and students.” ■

Request Granted

ANAHDID BEHROUZI LEADS EFFORT FOR NATIONAL SCIENCE FOUNDATION GRANT

ARCHITECTURAL ENGINEERING (ARCE) Assistant Professor Anahid Behrouzi led an effort to win a \$340,374 National Science Foundation grant to purchase new equipment aimed at improving the seismic performance of the built environment.

The equipment — two actuators with higher force and displacement capacities than was previously possible in Cal Poly’s laboratories, along with the hardware and software for automated control of the system — will be used by students and faculty in the College of Architecture and

Environmental Design and the College of Engineering to better understand the earthquake response of structures.

“The new actuator system will significantly improve the caliber of experimental research that the students can carry out and the ease of performing it,” Behrouzi said.

Team members include ARCE faculty Behrouzi, Peter Laursen and John Lawson; architecture faculty Dale Clifford, construction management faculty Andrew Kline and Department Head Jeong Woo, and Civil and Environmental Engineering

Department Chair Charles Chadwell. Special thanks also go to Andrew Brown, administrative analyst in Cal Poly’s Grants Development office.

“This is a great accomplishment for the department, and Anahid is the hero of the story,” said ARCE Department Head Al Estes. “She did all the heavy lifting to make this grant a reality. She researched the rules, collected the PIs, coordinated the assembly of the grant, got us through the university-level competition, answered the NSF’s inquiries, and worked overtime to meet stringent deadlines.” ■

Peter Laursen Solemnly Swore (Again)

It’s official: Architectural Engineering Department faculty member Peter Laursen is now a U.S. citizen. “Peter traveled to Los Angeles last fall to be sworn in with a bunch of strangers,” said Department Head Al Estes. “Greatly exceeding my authority as department head, I conducted a department-level swearing-in ceremony, with the entire faculty and staff as witnesses, and then we celebrated with cake.” Laursen, who grew up in Denmark, is keeping his Danish citizenship as well.



We're Almost There ...

PARENTS LEARN BY DOING FUND NEARLY REACHES GOAL

THE ARCHITECTURAL ENGINEERING (ARCE) Department's Parents Learn by Doing Fund has nearly reached its goal of \$100,000 goal, thanks in large part to five families who have each donated \$10,000.

"The sole purpose of the fund is to enhance the educational experience of ARCE students," said ARCE Department Head Al Estes. "We are counting on other parents and supporters to match this money."

The department needs to raise an additional \$8,000 to complete the campaign. Everyone who has donated at least \$250 to the effort will be named on a plaque to be unveiled in the ARCE hallway. The goal is to complete the campaign by spring 2021 commencement.

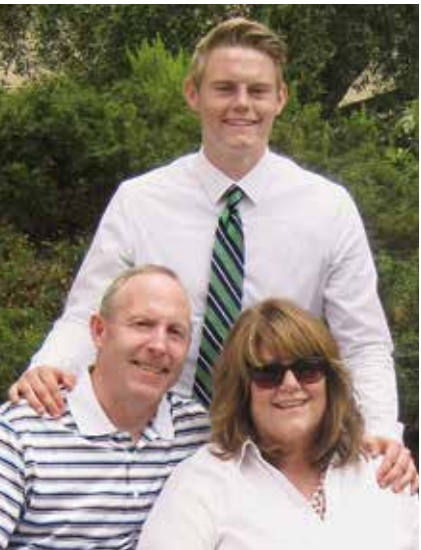
The Parents Learn by Doing Fund has allowed students to attend and present research at conferences and to compete in national competitions. It has also supported senior projects and master's theses, among myriad other activities and events.

Anyone interested in making a secure donation online is welcome to do so at www.arce.calpoly.edu/. For additional information, please contact the department at 805-756-1314. ■



The \$10,000 donors are (shown alphabetically, from top):

- ◀ Roger Antablin, with his daughter, Isabella, and son, ARCE sophomore Richard Antablin. Not pictured: mother Susan Blanton.
- ◀ Dan and Debra Hall, with son, Nate Hall (ARCE, '16).
- ▶ Craig and Esther Navias, with their daughter, ARCE senior Sarah Navias.
- ▶ Samir and Madalyn Rustagi, with their daughter, Dani (ARCE, '16).
- ▶ Ken and Jeanne Stone. Not pictured: their son Daniel (ARCE, '14).





INDUSTRY PARTNERS

DEDICATING THE KPFF LAB

APPROXIMATELY 60 PEOPLE attended the dedication ceremony for the Cal Poly Architectural Engineering (ARCE) Department's newly remodeled KPFF Computer Laboratory. ARCE alumni Nick Murphy (ARCE, '04) and Tyler Krehbiel (ARCE, '08) joined in the celebration on behalf of KPFF's Irvine office. The ceremony included a check presentation, remarks, ribbon-cutting, plaque unveiling, photos, lunch for attendees and a cake-cutting.

The extensive renovations included removing a raised floor, installing new carpet, painting the walls, replacing a projector and screen with big-screen TVs, and installing new furniture and computers.

The remodeled space is one of many sponsored labs in the ARCE Department that are supported by companies and individuals who make a total commitment of \$50,000 for upgrades, supplies and materials. The support comes in five annual installments of \$10,000 and enables the department to continue to offer students the best Learn by Doing education possible.

To celebrate the KPFF culture and heritage, the company created a wall mural that features key projects from the company's offices in Irvine, San Diego, Los Angeles and San Francisco, as



well as Portland, Oregon, and Seattle. "KPFF set a new standard with removable photos and a lighted display," said Department Head Al Estes. "Students are reminded every day of the projects, locations and opportunities available at KPFF.

"KPFF has hired many ARCE graduates over the years. I am grateful that it chose to sponsor this laboratory," Estes continued. "The previous iteration of this space was created as a senior project, which demonstrated our willingness to lift ourselves up when funding is scarce, but it had deteriorated to the point of embarrassment. It is now a facility we can show with pride."

The department also thanks Cal Poly Facilities and Project Manager Dave Norton, who oversaw renovations and participated in the ceremony. ■

- ▲ The lab has an impressive number of iMacs and a photo montage that showcases KPFF projects.
- ▲ Unveiling the lab's plaque (from left) are Department Head Al Estes, Cal Poly Facilities and Project Manager Dave Norton, and ARCE alumni/KPFF engineers Nick Murphy and Tyler Krehbiel.



“S O FAR, MY FAVORITE PART OF working at ZFA is the people,” said Cal Poly architectural engineering (ARCE) alumnus Tommy Sidebottom ('18). “Everyone is willing to help you learn and grow as an engineer. It’s encouraging to know your coworkers have your back.”

Sidebottom is one of 25 Cal Poly ARCE graduates at ZFA Structural Engineers, a 75-person firm with five Northern California offices. A ZFA intern as an undergraduate, Sidebottom returned as a full-time engineer after graduating, working on historic renovations, senior housing and solar array projects.

Sidebottom has faced interesting project challenges in his career, including the revitalization of a historic naval structure that required a completely different approach.

“We had to focus on how the environmental health of the building directly impacted the structural issues we needed to address,” he said. “I learned the tools to do the work at Cal Poly; I’m learning new ways to use those tools at ZFA.”

As an extension of the Cal Poly Learn by Doing philosophy, ZFA’s work is fueled by a team-oriented culture that encourages asking questions and empowering team members.

ZFA

STRUCTURAL ENGINEERS

A Growing Company That Feels Like Family

▲ ZFA staff at 2019 Engineer Training Day, an annual off-site, full-day training and social event.

► Cal Poly alumni at ZFA include (alphabetically, from top): Steven Patton, S.E., senior associate (ARCE, '04); Tommy Sidebottom, designer (ARCE, '18); Angie Sommer, S.E., associate principal (ARCE, '05); Luke Wilson, S.E., associate principal (ARCE, '05); and Kevin Zucco, S.E., executive principal (Civil Engineering, '92).





“A primary focus is our employees,” says Angie Sommer (ARCE, '05), ZFA associate principal and chief marketing officer. “We do our best work when our team members are well trained, challenged, supported and happy. Comradery creates a trusting and collaborative environment that contributes to purposeful engineering solutions.”

This collaboration is an important facet of ZFA's culture. ZFA's shareholder group of 23 employee-owners focuses on internal mentoring of staff and defining the company's vision. A formal coaching program has provided guidance to managers and aspiring leaders since 2018.

Another focus of ZFA's leadership — and a priority in the company's internal near-term goals — is to celebrate and promote diversity and inclusion. “There's great strength in different perspectives and ideas. Diversity fuels innovation, creativity and out-of-the-box thinking,” Sommer said. “This is one way that ZFA adds value to our projects.”

Through the hard work of ZFA's staff and guidance by executive principals Kevin Zucco and Mark Moore, the company has grown significantly over the last decade. Legacy projects, such as the Dominus Estate Winery in Yountville, California, continue to foster a longtime connection with

Northern California, and more recent projects have provided unique and exciting opportunities.

“ZFA is always at Structural Forum and has hired many ARCE grads,” said ARCE Department Head Al Estes. “I am particularly grateful to have Steve Patton (ARCE, '04), a senior associate in the Silicon Valley office, sit on the ARCE Advisory Board. ZFA has been a great supporter of this program and its students.”

“We support the Cal Poly ARCE program because it provides our company — and our industry — with highly qualified, thoughtful structural engineers,” says Zucco (Civil Engineering, '92). “Our new generation of leaders is proud to continue our 20-plus year tradition of attending Structural Forum, supporting student engineering clubs, providing input through the industry advisory boards and maintaining a strong relationship with the university.”

As the company continues to grow, evolving its culture with each new generation of graduates, the feeling of family keeps the group moving forward together. “I picked ZFA because of the people and have never looked back,” said Luke Wilson (ARCE, '05), associate principal and chief operations officer. “Whether it is card games at lunch or everyone pitching in to meet a deadline, ZFA has become part of my family.” ■

▲ **Clockwise, from top left:**

The award-winning Grizzly Peak Residence in Berkeley, California, was the first to use a MiTek DamperFrame™ for supplemental damping. JOE FLETCHER PHOTOGRAPHY

385 Sherman Way in Palo Alto was the first to use eccentric buckling-restrained braced frames. JASPER SANIDAD PHOTOGRAPHY

The College of Marin New Academic Center in Kentfield, California, won the AIA San Francisco Honor Award and AIA Redwood Empire Merit Award in 2016. TIM GRIFFITH PHOTOGRAPHY

Renovation of the Napa County Historic Courthouse in Napa, California, involved using fabric-reinforced cementitious matrix. ERIC RORER PHOTOGRAPHY

PREVIOUSLY PROFILED COMPANIES, IN ORDER OF MOST RECENT:
 BUEHLER ENGINEERING INC.
 HOLMES STRUCTURES
 STRANDBERG ENGINEERING
 COMPUTER AND STRUCTURES INC.
 MHP INC. STRUCTURAL ENGINEERS
 J. LOHR VINEYARDS AND WINES
 NUCOR CORP.
 FLUOR CORP.
 KPFF CONSULTING ENGINEERS
 DEGENKOLB ENGINEERS
 BARRISH PELHAM & ASSOCIATES INC.
 JOHN A. MARTIN & ASSOCIATES



CAL POLY

Architectural Engineering

COLLEGE OF ARCHITECTURE
& ENVIRONMENTAL DESIGN

California Polytechnic State University
1 Grand Avenue
San Luis Obispo, CA 93407-0281



INDUSTRY PARTNERS

All Aboard In 2019-20

The Architectural Engineering (ARCE) Department appreciates the industry partners who generously volunteer their time and expertise to serve on the ARCE Advisory Board. The 2019-20 board members visited campus last December to meet and tour ARCE's newly dedicated KPFF Lab. Pictured (above, from left) are: Margaux Burkholder, Walter P. Moore; Jessica Otten, senior director of development, Cal Poly College of Architecture and Environmental Design; Elisa Suarez, SpaceX; Jennifer Hiatt, Bycor Ltd.; Matt Melcher, Lionakis; Abe Lynn, Degenkolb Engineers; Al Estes, ARCE department head; Evan Reis, Reis Consulting; Ron LaPlante, Division of State Architect; Michael Parolini, SSG Structural Engineers; and Randy Collins, FTF Engineering.

Not pictured: Steve Abernethy, SquareTrade; Chris Haight, Coffman Engineers; Steve Patton, ZFA Structural Engineers; Marc Guberman, Foster + Partners; Steve Pelham, Degenkolb Engineers; and Liz Mahlow, Nous Engineering.

The 2020 spring meeting, held virtually, welcomed David Cocke, Structural Focus; Damen Ho, Simpson Strong-Tie; Lori Ann Stevens, Turner Construction Co.; and Sharon Gookin, Fluor Corp., to the board.