The entrepreneurial landscape is filled with thicket and dead ends; the harsh truth is that nine out of 10 startups fail. But entrepreneurs are preternaturally optimistic, and scores of Cal Poly engineering students, alumni and faculty work doggedly against the odds to launch businesses and bring new innovations to market. Many have forged paths to stability, success and profits, including the following going concerns:

**AxonVR**

Although **Bob Crockett**’s first love is teaching in the Biomedical Engineering Department, he also recognizes Cal Poly’s unique niche for innovation and entrepreneurship. “Our engineering students excel at addressing systems problems,” he said. “They can pull components off the shelf and put them together in new ways.”

To take advantage of this talent and provide part-time jobs for students, Crockett founded Proof of Concept, LLC, which develops client technology and prototypes, literally providing
A Moment with Dean Debra Larson

What’s Up? Strategic planning guides the College of Engineering

At the start of each academic year, students return, faculty members polish their syllabi, and the facilities workers buff the university’s physical plant and literally repaint the street lines.

Likewise, the college draws the lines around the goals and key actions that will guide nearly every decision we make as an institution.

Done right, strategic planning is a detailed, months-long process that involves the faculty, staff and administration. Inclusion of these 300 or so individuals may sound cumbersome, but it’s very important to recognize that we all have a stake in planning the future of the college.

Moreover, I strongly believe that we have a great team of leaders who are able to balance their role as unit advocates against the inherent interdependencies and needs of the college.

Our finished product communicates our priorities and highlights our strengths to all our constituents, including students, parents, alumni and corporate and foundation partners; and it also motivates us to act coherently and strategically.

The College of Engineering 2016-17 Strategic Plan tells you a lot about who we are and where we’re going. At the top of the list, for instance, is our imperative to raise awareness and funds for the new Engineering Projects Center.

I hope you’ll take a moment to read our strategic plan for the year — and to learn more about the Engineering Projects Center, a facility that encapsulates our history and our future (see page 4).

With student success as our guiding principle and strong lines delineating our path forward, I foresee tremendous accomplishments ahead. ■
Every student who competes in Roborodentia, the robotics competition hosted annually during Open House by the Computer Engineering Program (CPE), builds a robot from scratch. Not every student, however, can afford the materials and electronic components they need.

A new endowment established by Professor Emeritus Joe Grimes and his wife, Mary, will help defray the costs of competing for all students who wish to put their engineering skills to the test.

CPE’s annual Roborodentia competition — established in 1995 with the first competition in 1996 — has provided an arena in which the students can fine-tune their robotics skills and showcase their knowledge of computer engineering.

“Roborodentia has been a well-structured activity for the past 21 years, exemplifying the essence of CPE and Cal Poly’s Learn by Doing tradition,” said Grimes, who served as an adviser to Roborodentia participants. “This wonderful learning experience helps students achieve CPE’s educational objectives and learning outcomes.

“Our goal in creating the Professor Joe and Mary Grimes Family Endowment is to reduce some of the financial burden that might prevent dedicated students from participating in Roborodentia.”

As the endowment evolves, he hopes it will have a positive impact on an activity that has been invaluable to so many.

“I want to ensure that Roborodentia is and will continue to be an enriching experience for students as well as visitors to the campus, showing prospective students that the CPE program is truly about Learn by Doing.”
Invest in the Best

Engineering Projects Center takes Learn by Doing to the next level

Learn by Doing is hardwired into Cal Poly’s project-based curriculum, and a campaign is underway to bring a new epicenter for Learn by Doing to new generations of students: the Engineering Projects Center.

The shop experience, learning ground for countless multidisciplinary clubs and project teams, fosters graduates who are renowned worldwide for their ingenuity, know-how and ability to get things done. Students learn about safety, design and fabrication in an inclusive, welcoming shop environment. These hands-on facilities nurture teamwork, problem solving and leadership skills that prepare students to be Day One-ready.

Strategically located at the northeast corner of the Engineering Quad across from Kennedy Library, the Engineering Projects Center will create a crossroads for STEM (science, technology, engineering and mathematics) and liberal arts disciplines. It will create new opportunities for convergence and collaboration between students, faculty and industry. The Engineering Projects Center will be the new gateway to campus and to Cal Poly’s unparalleled Learn by Doing education.

The new Engineering Projects Center and Bonderson Projects Center will be fully integrated to enhance synergy, efficiency and student-learning opportunities.

To become a part of the legacy and future of Learn by Doing, contact: Richard LeRoy at 805-756-7108, Amanda McAdams at 805-756-5711 or Meredith Brynteson at 805-756-5047.

Highlights of the student-operated facility include:

- Advanced manufacturing and fabrication shops
- A design and ideation environment
- Flexible workspaces for clubs, project design and assembly
- State-of-the-art technologies
- Faculty and student research
- 24/7 access for all students and faculty

A Lofty Vision Opens Downtown

Cal Poly Lofts offer students a place to live, collaborate and innovate

Nine College of Engineering students are among the 36 Cal Poly students living in the new Cal Poly Lofts, a residential community in downtown San Luis Obispo for students who have an entrepreneurial perspective and are engaged in Learn by Doing programs focused on fostering creativity and innovation.

Located in the newly renovated Blackstone-Sauer Building on Monterey and Chorro streets across from Mission San Luis Obispo de Tolosa, the lofts are the university’s first off-campus residential community. The project, which includes include 32 one- and two-bedroom apartments, was created in partnership with the Cal Poly Center for Innovation and Entrepreneurship (CIE) and is just steps away from the SLO Hothouse startup incubator, making it easy for students to access that facility as well as other community resources.

“The idea and the vision for the Cal Poly Lofts was to bring focused, innovative students together in order to provide opportunities for them to build community and support each other in their creativity,” said Carole Schaffer, associate director of university housing. “Innovative ideas can spring to mind at any time; this community allows students to discuss, explore and build on their ideas in the moment.”

The plan is working according to computer science student Kevin Vincent. “The lofts encourage conversations and collaboration with business students on a daily basis,” he said. “There’s a strong entrepreneurial environment that’s very different from a regular dorm.”

Opening in September, the lofts feature exposed brick walls, large windows, and generous views of the city. Adjacent to the lofts are new office spaces where the Cal Poly Alumni Welcome Center will open by the end of the year.

“I am thrilled to have the opportunity to live with so many incredible student entrepreneurs,” said Matt Maxwell, senior business administration major and founder of BoltAbout.com. “The Cal Poly Lofts provide an environment that is conducive to collaborating with a diverse group of students from all colleges. My company is at a vital growing point, so I am excited to be surrounded by go-getters like myself who are focused on building great businesses.”

Cal Poly President Jeffrey D. Armstrong called the lofts a perfect representation of Cal Poly.

“The lofts are an illustration of the comprehensive polytechnic Learn by Doing education, focused on real-world, can-do experiences for our students,” Armstrong said. “We now have creative, entrepreneurial students living in the heart of San Luis Obispo, creating new opportunities for hands-on learning and earning, side by side with San Luis Obispo’s business community.”
Courtyard Transformed

Built in 1985, Engineering Building 13 has always had a rather dark, industrial feel. But this past summer, the courtyard got a makeover.

“A small windfall of one-time dollars made it possible to transform the courtyard,” said Dean Debra Larson. “Our hope is that it will yield a space for students and faculty to gather, relax and collaborate.”

Judging by the numbers of students now enjoying the cheerful, comfortable chairs and spots of sun, the project has already proved popular. Above, environmental engineering student Audrey Fremier relaxes in the courtyard near the concrete canoe before class.

“Occasionally we find small pots of dollars that allow us to take on college improvement projects,” explained Larson. “In this case, we spent $225,000 to create a welcoming space.”

Cal Poly Engineering Helps Put ‘Best’ in University’s ‘Best in the West’ Ranking

Cal Poly boasts the best state-funded undergraduate engineering program — and the top environmental engineering program — in the nation, according to the latest edition of the U.S. News and World Report’s America’s Best Colleges guidebook.

Cal Poly as a whole enjoys its 24th straight year as the best public, master’s-level university in the West. In overall listings, the College of Engineering moved up two spots, placing fifth behind private institutions Rose-Hulman, Harvey Mudd College and Olin College and the federally funded U.S. Military Academy. Among state-funded schools, Cal Poly’s civil, electrical and mechanical engineering programs maintained their No. 1 positions.

“It is so exciting and such an honor to see Cal Poly Engineering’s continuing and growing prominence in the prestigious U.S. News rankings,” said Debra Larson, dean of the College of Engineering. “Our engineering programs exemplify the innovation, staying power and success of Cal Poly’s Learn by Doing model, which attracts those who like hands-on experimentation, complex projects, and dreaming — and doing — big.

“What we’re doing is all the more notable when you factor in scale,” said Larson. “Based on 2015 data, Cal Poly Engineering’s undergraduate enrollment was 5,974, while the combined enrollment for the top four schools totaled 4,070.”

The 2017 guidebook lists Cal Poly in a tie with...
New careers in Energy

PG&E, Cal Poly partner to train students in nuclear and carbon-neutral systems

This fall, Cal Poly students have the opportunity to train for careers in energy via a university partnership with Pacific Gas and Electric Co. (PG&E).

Designed to educate students on nuclear and carbon-neutral renewable energy systems, the educational program takes advantage of the proximity of Diablo Canyon Power Plant for class tours, projects and paid internships.

“As we continue our focus on safe operations through 2025 and the decades-long decommissioning period ahead, we will need new employees with new skills,” said Ed Halpin, PG&E chief nuclear officer.

Initially, the program will adapt and enhance online courses from Texas A&M University and later will fund a dedicated tenure-track faculty position and specific laboratory equipment.

Mechanical engineering Professor Mason Medizade worked with PG&E to develop the educational partnership. “This grant is very unique,” he noted. “Our students can benefit a great deal from these courses. In the area of nuclear engineering, their knowledge will be in demand whether a nuclear plant is in operation or scheduled for decommissioning. I estimate that our working relationship with Diablo Canyon Power Plant will be more than 30 years. Plus, there are more than 90 U.S. nuclear reactors.”

Mechanical Engineering Department Chair James Meagher noted that California’s mandate for renewable energy is to be 50 percent by 2030, requiring that the energy industry acquire new tools and new staff.

“Our partnership with PG&E will help Cal Poly prepare engineers equipped to meet the challenges of reducing carbon, meeting energy needs, and expanding renewable energy systems,” he said.

Three Cal Poly students, including Niven Prasad, far left, did an internship with PG&E at the Diablo Canyon Power Plant.

EPIC Presents Possibilities for Migrant Students

This summer, in a Cal Poly materials engineering lab, eighth grade students took a hands-on approach to biomimicry — the science of using designs in nature to solve human problems — by making a claw-like mechanism inspired by the sloth to augment the human hand.

Their exploration of adaptive technology was one of many dozens of lab offerings at the EPIC (Engineering Possibilities in College) summer camp held July 10-29 on the Cal Poly campus. In its 10th year, the program introduced 500 seventh through 12th graders to a wide range of Learn by Doing labs and experiments in a variety of disciplines.

This year, for the first time, the event collaborated with three regional offices of the state- and federally funded Migrant Education Program. The joint effort expanded access to EPIC for 79 students who are the sons or daughters of migrant workers in California’s agricultural, dairy, lumber or fishing industries.

“By design, 30 percent or more of our campers are from low-income and underrepresented communities where college education is often thought to be beyond reach,” said Maria Manzano, EPIC director. “Part of the EPIC experience is getting the students excited about all the interesting things they can do with math and science, to imagine themselves in careers like engineering, and then showing them the steps to get there — starting with how to get into college.”

Largely as a result of the partnership with the Migrant Education Program, 46 percent of this year’s campers represented underserved minorities, up from 31 percent last year.

Saint Mary’s College for ninth place overall in the West for regional universities, public and private, up from 10th place last year. The Western regional list includes 124 public and private institutions in 15 states that provide “a full range of undergraduate and master’s-level programs but few, if any, doctoral programs.” (Universities that grant doctoral degrees, such as those in the University of California system, are listed in a separate category.)

Cal Poly ranks in the Top 10 behind (in order): Trinity University, Santa Clarita University, Loyola Marymount University, Gonzaga University, Mills College, Chapman University, University of Portland, and Seattle University.

Cal Poly also ranks sixth in the West (up from 10th last year) for most veteran-friendly universities — a listing that shows military vets and active-duty service members which top-ranked schools offer benefits that can help them make pursuing a college education more affordable. Cal Poly is also the top-ranked public university in this category.
“We model hands-on, get-stuff-done engineering — that’s also the Cal Poly brand of entrepreneurialism.”

— Bob Crockett

Elizabeth Rowins is a 1995 mechanical engineering graduate who took the very first mechatronics class offered at Cal Poly. After 12 years working in the oil industry, she is delighted to be back in San Luis Obispo at Axon. “The product and the environment are really exciting,” she said. “Everyone here is collaborative, committed and ‘all in.’”

“Every employee has a stake in the company and the opportunity to take on new skill sets,” said Crockett. Although admitting that AxonVR’s technology “will be expensive for a while,” Crockett said that the company is on a solid trajectory, having moved from prototyping to product development for clients.

“We model hands-on, get-stuff-done engineering — that’s also the Cal Poly brand of entrepreneurialism,” he said.

Visit the company website at www.axonvr.com.

Bishop Peak Technology

Formed in 2012 by Zach Negrey (B.S., Computer Engineering, 2012), Jeff Brown (B.S., Business Administration, 2011; MBA, 2015), and 2010 engineering alumnus John Osumi, Bishop Peak Technology (BPT) develops software for the transportation industry, specifically for cities, including San Luis Obispo. Its first client, though, was Apple, which used the app for its internal bus system.

The company grew out of Negrey’s and Brown’s senior project, an Android app that would allow users to track bus locations and schedules in real time. When it proved popular with Cal Poly students, they produced an iOS version, which caught the attention of Apple representatives visiting campus.

Mobile apps are now the smallest part of BPT’s business. “Our first realization that this could become more than a one-off bus tracking app happened after winning the Central Coast Tech Pitch competition in 2013,” said Osumi, BPT’s chief executive officer. The company now produces software tools that allow transit managers and operators to track vehicle fleet hours, locations, mileage, average speed, fuel consumption, status and overall performance — data that can help streamline operations and make them more efficient.

As its portfolio of products and clients has grown, the company has likewise expanded. “We had seven employees a year ago — now we have 15,” said Osumi. “With the exception of Joel Heinrichs, our chief operating officer, all of our employees are Cal Poly students or alumni, and all except four are from the College of Engineering.”

San Luis Obispo uses BPT’s software for its transit fleet. Other clients include a large crane operator in the New York area; an Ohio-based company that provides public transit and transit management throughout North America; cities including Vacaville, Calif.; Visalia, Calif.; Carson City, Nev.; Missoula, Mont.; and Ulster County, N.Y.

“We recently signed on with an international project in Pune, India, where we'll help a conglomerate of tech parks manage its bus fleet,” said Osumi.

For more information, see www.bishoppeaktech.com.

Empirical Systems Aerospace, Inc.

As members of the Cal Poly Space Systems Club, Andrew Gibson (B.S., Aerospace Engineering, 2004), Trevor Foster (B.S./M.S., Aerospace Engineering, 2008) and Ben Schiltgen (B.S. Aerospace Engineering, 2004) discovered their passion for subscale design. They founded Empirical Systems Aerospace Inc. (ESAero) in

ESAero leadership includes (left to right) Ben Schiltgen, Trevor Foster and Andrew Gibson.
ENTREPRENEURS  From Page 7

2003 and now serve as president, vice president of operations and vice president of finance.

Over the years, the company has become increasingly involved in distributed electric propulsion systems, gaining industry recognition for its expertise in the field.

“Our original focus on building subscale prototypes grew in new directions as we took advantage of evolving opportunities,” said Gibson. “For the past eight years, we’ve been working on electric aircraft concepts — planes that won’t be built until the 2030s and 2040s.”

NASA recently awarded ESAero an initial contract of up to $8 million to demonstrate new electric propulsion aircraft concepts as part of the agency’s experimental (X) plane program. The program has developed some of the most advanced aviation prototypes in the past 70 years, the latest being the X-57 “Maxwell,” which, if successful, will be the first distributed electric propulsion airplane ever flown.

ESAero is the prime contractor, responsible for all system integration and instrumentation while also helping to push electric air vehicle propulsion concepts forward as quickly as possible.

As a computer engineering student in 2011, Ian Alexander ran a computer repair business out of his room, but he became frustrated by the process.

“Technicians have to manually run dozens of software utilities on each computer as they go through their repair checklist,” he said. “On average, this takes 887 clicks for a single computer. Imagine what that’s like when trying to service 12 computers at the same time. It’s horribly inefficient!”

Alexander’s hands-on experience led to TechSuite, software that automates the repair process, so techs can simply select what they want to run, click start, and come back to a report that details the results, cutting turnaround-time in half.

Alexander and a team of four other engineering students developed the first TechSuite prototype in 2011 for Cal Poly’s Innovation Quest contest. They won the $15,000 first-place award. One year later, RepairTech was selected as an incubator company at the Cal Poly Center for Innovation and Entrepreneurship’s HotHouse Program. “We rode the wave of all the campus resources that became available to students interested in starting a business,” said Alexander.

RepairTech launched commercially in October of 2012. Since then, the company has been talking to techs, selling software, and coming up with new ideas.

“Our team has grown to eight Cal Poly alumni who have worked at places like Western Digital, Amazon, the CIA, NetApp, Tapestry Solutions and CrowdFlower,” said Alexander.

“We have launched two products and brought in over $400,000 in revenue. Today we have 1,000 customers; half of our team works from an office in San Jose, while others work from San Luis Obispo, Orange County, Napa and Japan.”


Software engineering professor David Janzen didn’t intend to found a company. But one of his students, Andrew Hughes (B.S., Computer Engineering, 2011; M.S., Electrical Engineering, 2011), was researching Active Pens, a handwriting note-taking app that Hughes realized had untapped commercial potential.

“In 2011 Andrew was accepted to the first class of Cal Poly’s HotHouse Summer Accelerator program,” said Janzen. “I provided lots of advice during the first year, and he asked me multiple times to join him as a partner.

“In 2012, when Samsung approached Andrew about his project, I agreed to co-found Steadfast Innovation. I had become excited about the product. In addition, I saw that starting an app company would allow me to learn things that I could bring back into the classroom.”

Janzen and Hughes launched Steadfast Innovation LLC with Papyrus, an app that you use just like paper, but with the flexibility and advantages of modern technology. The Android version on Google Play earned an honorable mention in a Samsung app contest.

Steadfast Innovation LLC proved profitable almost immediately. Today the company supports two full-time employees and has employed at least six Cal Poly students along the way. Papyrus evolved into Squid, which has over 2 million downloads, a 4.2+ (out of 5) rating and over 31,000 reviews. Currently pre-installed on the Nvidia Shield Tablet, it has been featured as a top app in Google Play, Samsung Appstore and Amazon Appstore.

Steadfast Innovation LLC, meanwhile, attained Google’s Top Developer designation.

Reflecting on Cal Poly’s entrepreneurial environment, Janzen said, “Cal Poly has a great culture that supports innovation. Faculty are involved in creating new courses like my Android class that produced several student startup companies. I probably oversee close to 20 teams on large projects every year, many of which have the potential to become startups.

“With pitch competitions, hackathons, the iQ contest, and the HotHouse summer accelerator program, the Center for Innovation and Entrepreneurship has made the possibility of participating in a startup highly visible on campus.”

In every student entrepreneurial project, however, there comes a time when the students must make a decision to take a significant risk. “Those who accept the risk and are willing to work really hard are entrepreneurs,” said Janzen.

For more information on Steadfast Innovation, see: www.steadfastinnovation.com.

“Cal Poly has a great culture that supports innovation. Faculty are involved in creating new courses like my Android class that produced several student startup companies.”

— David Janzen
Cal Poly again made an impressive showing at the Grace Hopper Celebration of Women in Computing, the world’s largest gathering of women technologists. Held in Houston, Texas, in October, the 2016 conference hosted 15,000 attendees, 5,000 of whom were students. Cal Poly sent 80 female students majoring or minoring in computer science, software engineering or computer engineering.

The event provides powerful inspiration to women in a field largely dominated by men. For instance, second-year computer science student Charvi Bhardwaj realized how little she sees women in a technical setting. “And it made me better appreciate the technical women I do have around me,” she said.

The women leading the way from Cal Poly include computer science faculty members Marian Pantoja, Theresa Migler and Zoë Wood, and Gudrun Socher, a visiting professor from Munich University of Applied Sciences.

For more information on the conference, see: ghc.anitaborg.org/

Cal Poly’s Grace Hopper Conference Contingent is 80 strong

Eighty women from the Cal Poly College of Engineering attended the Grace Hopper Celebration of Women in Computing in Houston, Texas. The students are studying computer science, software engineering or computer engineering.

The women leading the way from Cal Poly include computer science faculty members Marian Pantoja, Theresa Migler and Zoë Wood, and Gudrun Socher, a visiting professor from Munich University of Applied Sciences.

SLO to Munich @ Internet Speed

Longtime academic partners in engineering education, Cal Poly and the Munich University of Applied Sciences are developing a high-tech creative connection that will soon cross the Atlantic at the speed of the internet. In October, students at both universities began work on a web camera system between the school’s creative hubs: Cal Poly’s Innovation Sandbox and Munich University’s C (Creative) Lab.

“Since we found their space very similar to ours in scope, hardware and abilities, the connection between us seemed natural,” said Cal Poly mechanical engineering student Kirby Ransberger. “So we’ve developed a touch-screen window between the two universi-
Project Solar Advances a Sun-Powered Cal Poly

A new student group is setting its sights on the sun. Project Solar has two principal objectives: Install photovoltaic solar energy systems on campus to bring Cal Poly closer to carbon neutral operation, and allow students to get involved with the design and installation of solar technologies.

“Before Project Solar was founded, there was very little opportunity for students to develop an interest in solar power,” said student Maxwell Muscarella. “We hope to fill that void.”

Formally known as an “instructionally related activity” or IRA, Project Solar partners with GRID Alternatives, a nonprofit that installs solar electric systems for low-income families on the Central Coast. “GRID provides safety training for rooftop solar installations to our student volunteers, and last May, we took part in our first installation,” said Muscarella.

This fall, Project Solar hopes to complete work on a portable, trailer-mounted solar energy system. The group has also submitted a service request proposal to Facilities Services for an installation on Cal Poly’s Beef Cattle Evaluation Center.

“In the long run, we hope to have multiple systems built on campus that will assist Cal Poly in its long-term goal of being a carbon neutral campus,” said Muscarella.

Founded by Rubin Girling, a bioresource and agricultural (BRAE) engineering senior, with assistance from Carlton Bjork, also in BRAE, and electrical engineering students Muscarella, Courtney Elliott and Michael Djaja, Project Solar has more than 20 active members.

For more information, contact cp.project.solar@gmail.com.

Cal Poly Supermileage Vehicle Team Places Third at 2016 Eco-Marathon

Cruising along at 1,215 miles per gallon, Cal Poly’s gasoline-fueled prototype vehicle was the top-scoring American entry and placed third overall at the 10th annual Shell Eco-marathon Americas, a competition focused on energy efficiency.

The event, held April 22-24 in Detroit, drew more than 1,000 students and a record 124 teams from seven countries to see which ultra-energy-efficient vehicle would travel the farthest using the least energy. First and second place were claimed by Canadian teams, the Université of Laval in Quebec and the University of Toronto.

Teams entered one of two vehicle categories. The Prototype class, which is for futuristic, streamlined vehicles, such as Cal Poly’s entry, and the UrbanConcept class, which focuses on fuel-efficient vehicles aimed at meeting the real-life needs of drivers. On the track, the cars were driven 10 laps, for a total distance of six miles, at an average speed of 15 miles per hour.

Cal Poly Supermileage team members credit their use of telemetry, a technology used to transmit data in real time, for much of their success this year.

“We integrated a telemetry system into the vehicle that collected all of the car’s data and streamed it over the internet,” said electrical engineering senior Alex Pink, vice president of the club and lead electrical engineer. “It was a huge benefit. We could watch the car’s GPS location and data live as the race was happening, allowing us to quickly diagnose and fix any issues that popped up.”

The Shell Eco-marathon is held annually in Europe, Asia and the Americas.

For more information: http://supermileage.calpoly.edu/

Cal Poly Supermileage Team Facebook page: www.facebook.com/supermileage
Electrical Engineering Student Receives 2016 CSU Trustee Award

On the door of Salvador Cortes’ bedroom is a poster of Nikola Tesla. Cortes, a Cal Poly electrical engineering sophomore, not only finds inspiration in Tesla’s genius, but he also relates to the challenges Tesla faced as a young immigrant.

Cortes was honored with the 2016 California State University (CSU) Trustees’ Award for Outstanding Achievement, one of the system’s highest student distinctions. The award, which recognizes outstanding students who have overcome adversity, includes a $6,000 scholarship.

“It will allow me to focus on the most important aspects of a Cal Poly education — learning in class as well as through real-world, hands-on applications,” said Cortes.

Brought by his family to America at a young age, Cortes was raised by his mother. Though she had no formal education, she was unwavering in her support of his dreams.

“The hardships my mother and my siblings have faced, and my mother’s belief in a better future for her children, is what emboldened me to pursue a career in engineering,” he said.

“In seventh grade, I wrote a paper on Tesla, who was already a hero of mine because of his role in making long-distance electricity more efficient and creating the first alternating current electric motor. What I learned, however, were the hardships he faced as a young foreigner in America. Learning about the challenges he faced, which were much like my own, further inspired me to dream big and do what I love.”

With the financial support from the trustee award, Cortes plans to expand his involvement in the Future Fuels Club and become more fully engaged in the multitude of professional, leadership, academic and outreach activities and resources offered by Cal Poly’s Society of Hispanic Engineers.

Engineering Studies South of the Border

Cal Poly, Mexican university partner to give young engineers international experience

Many students today are more globally aware than perhaps any generation preceding them, and droves of them from across the U.S. travel abroad to participate in international study programs during their junior year. Not so much engineering students, however, because it is difficult to accommodate engineering students without significantly slowing their academic progress.

The key to making immersive international study available to more engineering students, reasoned Professor Charles Chadwell (Civil and Environmental Engineering), is to tailor a program to their academic needs. Specifically, he suggested redirecting the experience to the sophomore year when many engineering majors take similar core courses.

Chadwell championed a CSU pilot program, Engineering in Mexico, located at Tecnológico de Monterrey in Querétaro, Mexico. In 2015-16, five Cal Poly students took advantage of the yearlong opportunity.

“The engineering program at Tecnológico de Monterrey is accredited and known internationally,” explained Chadwell. “It made an ideal partner where students could make progress toward their degrees, and have the language and cultural exchange that articulates with general education requirements.”

Representing five different engineering majors — civil, mechanical, architectural, electrical, and industrial and manufacturing — the Cal Poly participants reported enthusiastically on their yearlong adventure.

“One of the things I learned was that engineering is universal. The concepts, thought processes and calculations transcend any language barrier,” said Matt Balboni.

Balboni and the other participants (Krystal Ferreira, August Messano, Jordan Holmes-Ford and Vitek Harvey) also expanded their professional horizons as a result of Engineering in Mexico. “Santiago de Querétaro is booming with new industry from major companies, which made me realize that my professional options are not limited to the United States,” said Balboni.

“I believe communication is key to good engineering,” said Messano. “Being a part of this international program bred my aspirations to work as an engineer on a global scale.”

For information see www.calstate.edu/ip.
Last June, Cal Poly students joined student researchers from Harvey Mudd and archaeologists from the University of Malta to develop new shipwreck search and mapping technology. Led by Cal Poly computer science Professor Zoë Wood and Harvey Mudd engineering professor Chris Clark, the team included Cal Poly students Sara Bilich, computer science sophomore; Katherine Davis, computer science graduate student; and Sebastian Seibert von Fock, computer science sophomore; and Harvey Mudd engineering students Zayra Lobo, Jessica Lupanow and Vaibhav Viswanathan.

The expedition is the fifth joint International Computer Engineering Experience (ICEX) funded by the National Science Foundation.

At left: Cal Poly computer science graduate student Katherine Davis and Harvey Mudd student researchers Zayra Lobo and Vaibhav Viswanathan work on the AUV. Right: The AUV dockside in Valletta, Malta’s capital city.
Engineered to go 65 mph on only two kilowatts of sun power, the Cal Poly PROVE Lab car will be constructed of carbon fiber composites and be light enough to be lifted by two people.

For a video and more, see: www.provelab.com

“Doing computer science abroad is a pretty rare experience and getting to do it in a cross-disciplinary research context is so unique.”

— Katherine Davis

Located in the Mediterranean Sea between continental Europe and northern Africa, the island nation of Malta and its coastal waters are home to a large number of historical wrecks.

The ICEX project goals included developing an autonomous underwater vehicle (AUV) system for intelligent shipwreck search, mapping and visualization.

“Doing computer science abroad is a pretty rare experience and getting to do it in a cross-disciplinary research context is so unique,” Davis said. “Some of my favorite things from the trip were getting to learn about completely different fields and spending hours assembling, disassembling and debugging hardware problems on the AUV made me appreciate that technology ever works.”
Cal Poly is Top U.S. Team at Steel Bridge Competition

Cal Poly’s Steel Bridge Team was tops among national competitors and finished second overall at the annual American Society of Civil Engineers (ASCE) National Student Steel Bridge Competition, which brought together 48 student teams from across the world.

École de Technologie Supérieure of Montreal placed first and the University of Florida finished third at the competition, hosted by Brigham Young University in Provo, Utah, in late May.

Cal Poly’s strong showing marked the school’s sixth consecutive year of placing in the event’s top 10, and its second straight year as runner-up.

“The way we look at it, we’re first in the nation, second in the world,” said Drew Glover, senior captain and welding lead for the team. “In that sense, we’ve come home, for the second year in a row, with the best finish Cal Poly has ever had.”

Cal Poly Steel Bridge Team captains for 2016 were, from left, Drew Glover, Tyler Van Iderstein, Elizabeth Coffey, Jimmyhee Quach and Steven Haugaard. At right, Quach and Haugaard work on assembling the bridge during a practice session in the Bonderson Projects Center.

Garrett Hall and Eric Kasper are faculty advisors.

The competition — which celebrated its 25th anniversary this year — is designed as a comprehensive, real-world student project that includes structural design, fabrication, construction planning and execution, and load testing. It’s an extreme test of teamwork and project management as students race to produce a scale-model bridge that satisfies stringent requirements in the categories of stiffness, lightness, construction speed, display, efficiency and economy.

Student Scores Big Win With Big Data

Industrial engineering grad wins Cisco Data Science Competition

Top executives named Ben Buell as the top winner of the Cisco Data Science Competition. Buell, who graduated in June with a bachelor’s degree in industrial engineering and a master’s in integrated technology management, received the grand prize and $15,000 for his project to determine the potential shipping cost and carbon footprint reductions when implementing a flexible manufacturing system (FMS) into each of Cisco’s production facilities.

“Basically, what Cisco did was send out massive amounts of data related to the shipping of the products, and that was it,” said Buell. “The task was to use data science to find a problem in their supply chain and present an innovative way to solve it.”

FMS is a facilitywide strategy that enables flexible processes to permit rapid, low cost production variation. Buell’s project focused on the potential transportation benefits — financial and environmental — of implementing flexible manufacturing systems to produce all of Cisco’s products at any production facility. This would enable sourcing every customer order from the geographically closest Cisco manufacturing site.

To estimate these transportation cost savings, Buell developed an algorithm and code to merge Cisco shipping data with airport location data, and came up with new, shorter shipping routes.

“As a result of the new routes, aggregate shipping distance for the quarter was reduced by over 50 percent, resulting in an estimated shipping cost savings of roughly $1.5 million,” reported Buell. “Additionally, the reduced number of air miles required led to a dramatic 722-million pound reduction of CO2 emissions.”

Cal Poly SWE President Named Outstanding Collegiate Member at National Conference

Rebecca Kandell, president of Cal Poly’s Society of Women Engineers (SWE), received the Outstanding Collegiate Member Award at the organization’s national conference held Oct. 27-29 in Philadelphia.

The biomedical engineering senior was recognized for her passion for encouraging women in engineering. Due in part to Kandell’s active development of SWE’s outreach programs, the number of incoming first-year female engineering majors at Cal Poly has increased more than 3 percent since fall 2013, to approximately 27 percent of the class.

“This well-deserved recognition is for Rebecca’s dedicated and inspiring leadership, effectively overseeing scores of outreach events that engaged thousands of K-12 students, and for advancing corporate relations,” said Helene Finger, Cal Poly SWE advisor.

In addition to holding several top positions within SWE and being part of the chapter’s award-winning Team Tech project team, Kandell has also held officer positions in Cal Poly’s Society of Hispanic Professional Engineers, the Biomedical Engineering Society, and the Multicultural Engineering Program. She is also a member of the Tau Beta Pi engineering honor society.

Kandell credits her mother, a first-generation electrical engineer and Cal Poly alumna, as well as her Latina heritage, family, and strong work ethic, with inspiring her.
As part of a $1.5 million Department of Energy grant, at least 20 Cal Poly undergraduate and eight graduate students will participate in a four-year project that will concentrate on growing algae in the lab and testing it outdoors as a source of biofuels and biofeed stock.

Awarded in July, the grant funds research and development of advanced biofuel and biomass technologies. The award went to three algae research companies: Global Algae Innovations (San Diego, Calif.), Algenol Biotech LLC (Ft. Myers, Fla.) and MicroBio Engineering Inc. of San Luis Obispo. The Cal Poly students are teaming with MicroBio Engineering on growing algae in labs on campus and at the San Luis Obispo Water Resource Recovery Facility.

Other companies participating in the study include Heliae (Gilbert, Ariz.), Sandia National Lab (Livermore, Calif.), and Pacific Northwest National Lab (Richland, Wash.).

“The goal is to grow more algae per land area and with a higher content of substances that can be converted to fuels — starch for ethanol and lipids for hydrocarbons,” said environmental engineering Professor Tryg Lundquist. “Improved algae strains will be developed in the lab through selective enrichment, and these will be tested for performance in outdoor raceway ponds, which are the standard method for cultivating microalgae.”
CENG in Motion

Cal Poly Human Motion Biomechanics researchers undertake project for the Department of Defense

Combat safety advances such as battle armor and armored vehicles have saved lives, but more soldiers are returning home with below-knee — or transtibial — amputations. And although prosthetic limb design has advanced rapidly, even state-of-the-art prostheses do not completely restore natural biomechanics. As a result, veterans who use a prosthesis often develop osteoarthritis and joint pain in their remaining limb when they follow common fitness exercise regimens.

A group of Cal Poly researchers hope to improve the quality of life for military transtibial amputees by identifying exercises that maintain intact limb knee and hip joint and cartilage tissue loads at safe levels and, consequently, prevent the onset of osteoarthritis. Their three-year, $513,000 project is being funded by the Department of Defense’s (DOD) Army Medical Research Acquisition Activity.

Cal Poly mechanical engineering Professor Stephen Klisch is the principal investigator on the project. Collaborators include Scott Hazelwood in the Biomedical Engineering Department, Brian Self and Hemanth Porumilla in Mechanical Engineering, and Robert Clark in Kinesiology.

Additional researchers include Matt Robinson of Hanger Prosthetics & Orthotics in St. Cloud, Minn.; Otto Schueckler, Central Coast Orthopedic Medical Group; and David Tuttle, Radiology Associates, Templeton, Calif. The investigation done by Orekhov and the other mechanical engineering students are also being funded to lead the DOD research: Alejandro Gonzalez-Smith, Greg Orekhov, Nina Yadlowsky, Jordan Skaro, Michael Rumery and Greg Lane. The project budget includes funds for student stipends and travel money for students to attend conferences.

“The army project and the Human Motion Biomechanics Lab have given me an opportunity to apply and expand the skills that I’ve learned while pursuing my undergraduate degree in ways that are impossible to achieve in the classroom,” said Orekhov. “Since I joined the army project, I’ve had multiple instances when I was at a loss on how to do something. I would go back to the skills that I learned from Dr. Klisch — how to deconstruct a problem to its basics and work up to a global solution.

“I’ve learned exactly how to approach a problem and how to effectively communicate my intentions and solutions to others.”

The investigation done by Orekhov and the other Cal Poly human motion biomechanical researchers has implications beyond the military. “Considering the estimate that there are approximately 100,000 lower limb amputations each year in the U.S., this proposal possesses the broader impact of enhancing quality of life among the substantially greater number of civilian amputees in addition to military amputees,” Klisch said.

Class in Microgrids Becomes a ‘Living Lab’ of Sustainable Energy

Microgrids — a small-scale version of traditional power grids — loom large in the field of renewable energy. That’s why the CSU’s “Campus as a Living Lab” (CALL) program provided a $31,300 grant for the initial phase of the development of a microgrid as well as the redesign of two alternative energy courses in Cal Poly’s Electrical Engineering Department.

“The modern microgrid draws energy from clean, sustainable sources, such as wind and solar power, as well as from conventional technology,” said electrical engineering Professor Dale Dolan, faculty lead in securing the grant. “It not only integrates with the larger electric grid, it also has the ability to function independently when required. Microgrids have evolved into smart grids that can contribute to reliability, resiliency and energy independence."

The energy courses funded by the grant will make use of an isolated microgrid within the Electrical Engineering Building. Students will study energy storage and balancing generation and load within the microgrid, and also monitor and analyze energy consumption. The second course, taught by electrical engineering Professor Ali Shaban, will demonstrate protective relaying, coordination and relay calibration within the microgrid.

The project will result in the addition of renewable energy resources that will increase the university’s on-campus power generation and contribute to the 2020 goal of having 33 percent of the campus’ annual electricity needs met by clean energy.

“The CALL grant allows us to modernize and enhance our curriculum so that our graduates become invaluable assets to the sustainable energy generation and utility sectors,” said Dolan.

Two Cal Poly Engineering alternative energy courses and the development of a microgrid have been funded by a grant from the CSU’s “Campus as a Living Lab” program.
Able to locate and listen to a tiny CubeSat 600 miles in the sky traveling at seven-and-a-half kilometers per second, a new ultra-high frequency ground station called FRIIS has been installed on the roof of Engineering IV and marks a dramatic upgrade for the Cal Poly Cubesat/PolySat Program.

The 22-foot tall antenna joins two other ground stations on campus tracking the five Cal Poly CubeSats currently in orbit: CP-III, CP-IV, CP-V, CP-VIII and CP-X. Listening to CP-X, also known as ExoCube, became a problem when its antenna failed to deploy in space. “The signal coming out of ExoCube is extremely weak, but with this new quad-phase system — we already have single-phase and double-phase ground systems on the ATL (Advanced Technology Laboratories) — we have the gain (sensitivity) we need to operate the satellite,” said Justin Foley, systems engineer for the Cal Poly Cubesat/PolySat program. “It’s working really well.”

Cal Poly was named a top school for the aerospace and defense industries (A&D) in the 2016 Workforce Study compiled by Aviation Week & Space Technology.

The magazine compiled its list of top schools based on preferred suppliers of skills, the school from which the most graduates were hired in 2014, and the top schools as identified by young professionals who believe their alma mater and its reputation have a direct correlation to their career success.

In the category of preferred supplier universities as identified by employers on the basis of previous graduates; success, reputation and collaboration, Cal Poly tied for fourth in the nation. Cal Poly was joined in that ranking by the Massachusetts Institute of Technology and the University of Maryland. Penn State, Embry-Riddle and Purdue ranked first, second and third, respectively.

Repeating it’s 2015 standing, Cal Poly ranked first in the category in which young professionals assessed the reputation and impact of their alma mater on their careers. Cal Poly shared the top spot with Georgia Tech. Embry-Riddle was second, University of Michigan third and Penn State fourth.
Faculty Notes

- **Multidisciplinary**

  John Chen (Mechanical Engineering), David Janzen (Computer Science and Software Engineering), James Widmann (Mechanical Engineering) and two co-researchers received a $500,000 grant from the National Science Foundation for a research project titled “Does Active Learning Build Grit?”

  Kathy Chen (Materials Engineering) and Roberta Herter (School of Education) presented “Self-Directed Learning: Transitioning from College to the First Engineering Job” at the American Society of Engineering Education (ASEE) Pacific Southwest Conference hosted at Cal Poly Pomona.

  Chen, Liz Schlemer (Industrial and Manufacturing Engineering), Jane Lehr (Women’s and Gender Studies), Emily Liptow (AmeriCorps VISTA), Jaclyn Duerr (Multicultural Engineering Program), Helene Finger (Women’s Engineering Program) and Jeffrey Cabanez (CSU STEM VISTA) co-authored “PEEPS: Cultivating a Cohort of Supportive Engineering Students and Building a Support Team for Institutional Change,” presented at the ASEE Annual Conference in New Orleans.

  Chen, Liptow, Duerr, Robin Parent (Center for Teaching, Learning and Technology) and Dylan Henson, a statistics student, co-authored “A Sense of Belonging: Creating a Community for First-Generation, Underrepresented Groups and Minorities through an Engineering Student Success Course,” presented at the ASEE Annual Conference.

  Thomas Katona (Biomedical Engineering), Lynne Slivovsky (Computer Engineering) and Jonathan York (Orfalea College of Business) received an extension of a grant from VentureWell for The Innovation and Entrepreneurship Capstone Bootcamp. The grant will expand the joint engineering and business senior project class to include design students from the College of Liberal Arts.

  Katona, York and Robert Crockett (Biomedical Engineering) co-authored and presented “Innovation Sandbox: Examining the Impact of Interdisciplinary Innovation Spaces on Diverse Disciplines” at the ASEE Annual Conference.


  John Pan and Xuan Wang (Industrial and Manufacturing Engineering), and Malcom Keif and Xiaoying Rong (Graphic Communications) received a $557,000 grant from NextFlex, America’s Flexible Hybrid Electronics Manufacturing Innovation Institute. The Cal Poly team will develop an assembly method for attaching ultra-thin chips onto printed flexible textiles for wearable medical/human monitoring systems.

- **Aerospace Engineering**


  Graham Doig received a $63,000 grant from the American Honda Foundation for a Central Coast middle school program in which underrepresented students build small-scale solar-powered cars. Cal Poly faculty and engineers mentor 80 students in the program.

- **Biomedical Engineering**

  Thomas Katona presented “Why LEDs Will Change the Game and What’s Needed” to the Department of Energy Working Group for Animals and Lighting in Chicago. He and co-inventors were awarded two patents: “Methods and devices for light extraction from a Group III-nitride volumetric LED using surface and sidewall roughening” (U.S. 9,406,843) and “Power light emitting diode and method with uniform current density operation” (U.S. 9,293,644).

Mechanical engineering professors Brian Self, back row left, and Jim Widmann, back row right, were named Learn by Doing Scholars by Cal Poly. Engineering students pictured above include, back row from left: Benjamin Kraw, Alexa Coburn, Lindsey Chase and Natasha O’Connell-Mackay (Photo: Robin Osgood)

Self, Widmann Named Learn by Doing Scholars

Mechanical Engineering faculty Brian Self and James Widmann were named 2016 winners of Cal Poly’s Learn by Doing Scholar Awards, along with Chemistry and Biochemistry faculty Alan Kiste and Gregory Scott.

Self and Widmann were recognized for their work on “Inquiry-Based Learning Activities in Dynamics.” The research identifies activities that help students better understand complex subjects. They received funding for the project from the National Science Foundation.

Widmann noted, “What has been particularly exciting for us is seeing how ‘Learning by Doing’ can have a direct impact on conceptual understanding of difficult topics for our students.”

“It has been especially rewarding working with our great team of undergraduate researchers,” said Self. “We’ve enjoyed seeing them gain confidence running the activities in our classes and then presenting papers at regional and national conferences. Working with the inquiry-based learning activities has given them an entirely new insight into their own learning.”

Kiste and Scott were recognized for their work “Cal Poly Studio Chemistry: An Examination of Student Outcomes.”

Linda Vanasupa Recognized as Leader in Inclusive Engineering Education

Materials Engineering Professor Linda Vanasupa received the 2016 Women in Engineering ProActive Network (WEPAN) Leader in Engineering Education Award, which honors individuals who have created new approaches to engage and create an inclusive environment for engineering undergraduate students.

Vanasupa received the award at the WEPAN Change Leader Forum on June 14 in Broomfield, Colo. WEPAN is a nonprofit educational organization founded in 1990 to be a catalyst for change to enhance the success of women in the engineering professions.

For more information, visit the WEPAN website: www.wepan.org.
Honored for Leadership
Cal Poly recognizes Dennis Derickson for leading the Electrical Engineering Department

Dennis Derickson, chair of the Electrical Engineering Department, was recently honored by Cal Poly for his role in leading the department’s strategic programming, new laboratory development, and alumni outreach and engagement. In all three areas, he worked effectively with donors, industry partners, alumni and the university’s development staff.

The Provost’s Leadership Award for Partnership in Philanthropy was presented to Derickson by Provost Kathleen Enz Finken, President Jeffrey D. Armstrong and College of Engineering Dean Debra Larson at Cal Poly’s annual Fall Conference event held Sept. 14.

Among his accomplishments, Derickson’s work with faculty, staff and Industrial Advisory Board members led to the creation of the Keysight Advanced Communication Systems Laboratory.

The new laboratory allows students to do research using present 4G wireless technologies, as well as help create next-generation 5G wireless communication systems.

Derickson has fostered alumni engagement by launching regional receptions, soliciting the involvement of advisory board member firms, and establishing a reunion program for electrical engineering and computer engineering alumni. These activities led to the establishment of the EE Project Fund to offset project costs for students in the department.

“His efforts have been marked by enthusiasm, optimism, commitment, inclusion, dedication, and a spirit of collaboration and partnership,” said Larson. “At events, he’s been known to use anything from marching bands to Arduino boards to convey the joy of electrical engineering.”

Derickson earned a doctorate from UC Santa Barbara in 1992. He has served at Cal Poly in 2005 and has served as department chair since 2010.

Civil and Environmental Engineering
Eugene Jud, lecturer, gave a keynote address and chaired a session at the International Conference on Transportation and Traffic Engineering in Lucerne, Switzerland.


Moss received a research grant for lab testing and geotechnical analysis from the Department of Defense.

Rebekah Oulton presented “Achieving Zero Waste on California Polytechnic State University’s San Luis Obispo Campus” at the National Air & Waste Management Conference in New Orleans.

The study was developed from a student project in which students examined unique waste streams and developed plans to divert the waste away from landfills. Oulton participated on a panel at the conference regarding zero waste.

Oulton and Tryg Lundquist have undertaken research on a novel ozone generation technology and its efficacy at preventing algal growth and breaking down emerging contaminants during water treatment. Graduate student Lisa Vance assisted in the project.

Oulton also presented “Using Current Events to Stimulate Critical Thinking” at the CSU Teaching and Learning Symposium. The talk provides a Science of Teaching and Learning framework in developing critical thinking assignments.

Ashraf Rahim was awarded a subcontract from CSU Long Beach to develop technician training curriculum for soil/aggregate courses. Lecturer Nephi Derbidge is assisting in the curriculum development.

Computer Science / Software Engineering

Janzen received a $32,000 Google CS4HS grant to help area high school computer science teachers develop and teach the new Advanced Placement Computer Science Principles course. His software engineering capstone project students are working with Microsoft and PicMel Games to develop a pen messaging app and implementing iOS and Android versions of the game “Snaption.”

Aaron Keen, John Seng and graduate students Lana Hodzic and Kevin Ly published “The Bumblebee: A Robot Controller Board for STEM Education” at the ASEE Pacific Southwest Conference.

Computer Engineering / Electrical Engineering
Andrew Danowitz was selected as a New Faculty Fellow for the 2016 Frontiers in Education Conference, where he presented at the Player Modeling workshop at the Artificial Intelligence in Interactive Digital Entertainment Conference in Burlingame, Calif. He also delivered a guest lecture on Cal Poly student research in artificial intelligence and games at the American University in Washington, D.C.

John Seng created “Crime Tracker,” an online form for San Luis Obispo residents to learn about crime near their homes. See https://goo.gl/mSnKW9.

Electrical Engineering
Dennis Derickson, Michael Harriman (B.S., Electrical Engineering, 2015) and Bradley Hutchinson (B.S./M.S., Electrical Engineering, 2015) presented “Small
College Welcomes New Faculty

Five professors joined the college this fall to teach and conduct research in areas of strategic importance:

In Aerospace Engineering, Amelia Greig will contribute to Cal Poly’s internationally known CubeSat Program. She earned her doctorate at the Australian National University and has research interests in plasma propulsion, micropropulsion for CubeSats and applied plasma physics. Greig teaches courses in spacecraft propulsion and space environments.

“I am excited to be joining Cal Poly due to the excellent reputation of its students,” she said. “Not only are they some of the best, but they are all so eager!”

Biomedical Engineering has added Benjamin Hawkins, who looks forward to working on multidisciplinary student and faculty projects. With a doctorate from Cornell University, Hawkins teaches electricity and magnetism, mass and heat transport, circuits and design. He conducts research in microfluidics, electrokinetics and biomedical devices.

With a doctorate from Santa Clara University, Maria Pantoja joins the Computer Science and Software Engineering Department as an expert in parallel programming, computer architecture and operating systems. She strengthens Cal Poly’s growth in high-performance computing.

“Parallel implementation is revolutionizing scientific fields, including data science, computer graphics, computer vision, robotics, medical imaging, security systems and scientific computation,” said Pantoja. “There is an emerging, urgent need to train parallel programmers so they can face the vast changes ahead.”

Mechanical Engineering added Sthandu Mahadev and Elthary Elghandour. With a strong hands-on experience in composite manufacturing/processing techniques, Mahadev adds to the new manufacturing focus in the Mechanical Engineering Department. He will equip more students to incorporate manufacturing concerns into product and component design decisions.

Cal Poly’s Society of Automotive Engineers (SAE) may also benefit from Mahadev’s expertise: He served as the SAE racecar design and manufacturing lead while earning his master’s and doctorate at the University of Texas at Arlington.

No stranger to Cal Poly, Elghandour has taught as a lecturer on campus since 1993 in Aerospace Engineering, Computer Science, Civil and Environmental Engineering, and Mechanical Engineering. Like Mahadev, Elghandour has expertise in composite materials — his research interests include examining the mechanical behavior of sustainable materials, stress analysis of composites, and experimental and numerical analysis of structural dynamics.

Elghandour earned his doctorate through a joint program between Cal Poly and Helwan University in Cairo.
Alumni in the News

2010s

Sean Pringle (B.S., Civil Engineering, 2016) has started as an early career engineer at PG&E’s Diablo Canyon Nuclear Power Plant in Avila Beach, Calif.

Kate McMahon (B.S., Civil Engineering, 2016) has been hired as the newest estimator for Sundt Construction Inc. McMahon will be responsible for assisting bidding efforts and providing administrative support for the rest of the team. http://bit.ly/2dSRYpo

Eric Adler (B.S., Mechanical Engineering, 2015) and James Fazio (B.S., Software Engineering, 2016) have founded a company, Flume Inc., which started out as a senior project. Adler and Fazio, together with current electrical engineering student Jeff Hufford, created an intelligent water management system that enables homeowners to monitor their water consumption, check for leaks and analyze water trends. The product is expected to launch in 2017. http://bit.ly/28LX3k1

Cody Hunter (B.S., Computer Engineering, 2014) is a singer-songwriter in the Seattle music scene. He released his first solo album last November, titled “Surge of Confidence,” and another album is on the way this year. Hunter says he can attribute everything he knows about music to the people he met at Cal Poly and one quarter of Music Theory 101.

Rory Aronson (B.S., Mechanical Engineering, 2013) launched his student project-turned-startup in July. FarmBot, an open-source computer numerical-control farming machine, is designed for at-home automated precision farming, operating much like a giant 3D printer. But instead of extruding plastic, FarmBot plants seeds, waters them and uses sensors to learn about the soil, plants and environment — bringing smart farming to home gardeners and literally yard-size farmers. The company’s first product, FarmBot Genesis, is a do-it-yourself kit for a 1.5-meter by 3-meter growing area. Aronson lives in San Luis Obispo.

Will Fletcher (B.S., Civil Engineering, 2010; M.S., Fire Protection Engineering, 2012), one of the first graduates of Cal Poly’s fire protection engineering master’s program, was among the top “40 Under 40” young building and engineering professionals honored this year by Consulting-Specifying Engineer magazine for professional excellence, personal accomplishments and community involvement. At 27, Fletcher is the youngest recipient of the award, which was presented at a ceremony in Chicago on Oct. 4. http://bit.ly/1TSBeKW

Karen Bartleson, second from left, is the 2016 Cal Poly Engineering Honored Alumna. Bartleson, the 2017 president of the Institute of Electrical and Electronics Engineers (IEEE), is pictured with Cal Poly IEEE members, from left, Natalie Lizama, Loren Kline, Gurinder Rai and Darius Holmgren.

Rex Blodgett Jr. (B.S., Industrial Engineering, 2013) wed Moriah Tenney on June 17. Blodgett is employed in reporting and analytics at Workday in Pleasanton, Calif., and his wife teaches fourth grade at Montclair Elementary School in Los Altos.


2000s

Surag Patel (B.S., Computer Engineering, 2004) has been appointed chief strategy officer at Contrast Security, a leader in finding vulnerabilities and blocking attacks on software applications. Patel is responsible for developing...
and leading the execution of cross-functional strategic initiatives, assisting in developing the company’s go-to market strategy, and focusing on developing key partnerships. He will also lead the company’s newly unified global product and marketing organizations. http://bit.ly/2e96kGb

Tricia Compas-Markman (Civil Engineering, 2009; M.S., Civil and Environmental Engineering, 2009) and her company, DayOne Response, were the subject of an article in the August issue of Forbes.com called “How a Bag of Clean Water Helps Save Lives.” http://bit.ly/2dQviug

Matt Vaillancourt (B.S., Mechanical Engineering, 2009) won a $5,000 prize from the Bureau of Reclamation for an idea that may lead to breakthroughs in the study of invertebrates in river and estuary systems. His concept of an examination chamber with the capability to electronically identify and quantify various drift invertebrates in the water will be further explored and tested by the federal government. http://bit.ly/29RrAdG

Daniel Ho (B.S., Computer Engineering, 2008) and his wife, Lara, a Cal Poly psychology graduate, have their next trip to San Luis Obispo all planned: It will involve picking up a Cal Poly onesie for their first child, born this summer. Ho, an iOS developer at GoFundMe, led the company’s effort to release its first native iPhone app earlier this quarter.

### 1990s

Victor Glover (B.S., General Engineering, 1999), a NASA astronaut, spoke at a film festival in July, praising “Hidden Figures,” an upcoming film that shares the untold story of three black women – Katherine Johnson, Dorothy Vaughan and Mary Jackson – who were a crucial part of NASA history in the 1960s. “Without them, we might still be trying to figure out how to get a shuttle into space,” he said. The film is scheduled for release in January; it is based on Margo Lee Shetterly’s book of the same title to be published this fall. http://bit.ly/2dfUWSV

Alessandra Lapadula (B.S., Civil Engineering, 1997) was recruited by BNBuil- ders as senior project manager for its San Diego office. The firm, which is doubling its operations in the area, specializes in construction projects for leaders in the biotech, life science and healthcare industry. Lapadula, a LEED-accredited professional, has 17 years of experience in construction, including handling numerous complex projects at Stanford University, such as the $160 million Huang Engineering Center. At BNBuilders, Lapadula will be working on a major research center expansion project for Vertex Pharmaceuticals, one of the nation’s largest biotech companies, as well as mapping out schedules, budgets and subcontractors for new pursuits. http://prn.to/2bP899P

Harold Miller (B.S., Electronic Engineering, 1993) retired in June after 23 years with Apple, most recently as a senior engineering manager in the imaging division. Miller has 19 patents, which, he points out as a current city councilmember in Saratoga, Calif., is the most of any elected official in Silicon Valley.

Cal Poly's College of Engineering. Leb- ens has been a member of the council since 2011 and served as secretary for the past two years. http://bit.ly/2dhnGe4

Don Wilmot (B.S., Aerospace Engineering, 1990) was featured in the June 2016 issue of Bakersfield Life Magazine for leading the way in youth engineering education. A teacher at Bakersfield High School for 22 years, Wilmot finds it a perfect fit for Learn by Doing — the school is home to one of the first high school science, technology, engineering and math programs in the United States. He recently received an award for his outstanding involvement in education, issued by Rep. Kevin McCarthy. http://bit.ly/2dMOaxA

Tom Lebens (B.S., Electronic Engineering, 1989) was appointed chair of the Dean’s Advisory Council for Cal Poly’s College of Engineering. Leb- ens has been a member of the council since 2011 and served as secretary for the past two years. http://bit.ly/2dhnGe4

### 1980s

### Making Waves

Cal Poly grad Ben Nielsen stoked on projects that combine environmental restoration with sport of river surfing

It was as a student at Cal Poly that Ben Nielsen first discovered the joys of surfing, without knowing he was already getting his feet wet in his future career. Now living and working in Denver, Nielsen may be far from the ocean, but he’s making waves — that’s his job. As project engineer for McLaughlin Whitewater Design Group (a division of Merrick & Co.), he designs and engineers river projects with recreational whitewater, including the Boise River Park “which was ground zero for river surfing projects in America,” he said.

“The recent explosion of river surfing has required a totally fresh approach to wave design,” said Nielsen, “and that’s where Learn by Doing kicks in: Surfing requires a much higher-performing wave, and our wave designs are an innovative application of fluid dynamics theory, with no manual or criteria to draw from.”

The projects are known not only for their innovative “pure wave” hydraulic jump engineering, but also for design, which complements the river environment.

“Our focus is urban river revitalization,” said Nielsen. “There’s been a huge push throughout the nation to re-engage these rivers and enhance them for people and the environment. Most of the features we design, such as the South Platte River Run project near Denver, are integrated into other infrastructure and perform multiple objectives such as diversions, river stabilization, fish passage and flood control.”

A presenter at many U.S. and international conferences on various topics related to river recreation design, Nielsen recently spoke on the future of river surfing wave design at the prestigious Forum Flusswellen in Germany.

Cal Poly civil engineering graduate Ben Nielsen hits the water at the South Platte River Run project near Denver. (Photo: Dan Mateer)


William Swanson (B.S., Industrial Engineering, 1973), former chairman and CEO of Raytheon, was appointed to the board of directors of Boston-based Pwinie Express, the leading provider of device threat detection for wired, wireless and internet of things devices. (http://bit.ly/2e8rh3R) Though his prime residence remains in Boston, Swanson spends at least a third of his time in San Luis Obispo, where he serves as chairman of the Cal Poly Foundation board of directors and is a member of the Cal Poly President’s Cabinet. In an interview with the executive editor of The Tribune newspaper in San Luis Obispo, Swanson shared some advice for building a strong working relationship between management and a board of directors, among other topics. http://bit.ly/29mcWu9

Frank Chandler (B.S., Aerospace Engineering, 1969) is introducing himself to a new Cal Poly – and a new career. He’s making a new home in the Aerospace Engineering Department at Cal Poly Pomona after a career in private industry in launch vehicle and space vehicle design. Chandler followed up his undergraduate degree at Cal Poly, San Luis Obispo, with a doctorate in aerospace engineering from USC. From there, he enjoyed a long career at Rockwell International, involved in both the aircraft and space industries. http://bit.ly/1ok7k9I

Jim Gravitt (B.S., Electronic Engineering, 1962) was grand marshal for the Sept. 25 Los Alamos, Calif., Old Days Parade in honor of his many contributions to the “small town with an Old West heritage.” Gravitt worked for Boeing until his retirement in 2002.

1950s

Eugene Wallock (B.S., Aeronautical Engineering, 1957) recently celebrated his 60th wedding anniversary. He retired from Boeing in 1996 and moved to Oklahoma in 1998.

1960s

1970s

Chuck Black (B.S., Computer Science, 1979; M.S., Computer Science, 1989) has joined the education services team of SDNE, a leader in software-defined network (SDN) training and management services. Black has more than 35 years of experience in the field of computer networking, working in research and development labs for Hewlett-Packard (HP) for most of that time before becoming co-founder four years ago of startup Tallac Networks. At HP he was an innovator and creator of multiple networking products related to network access control and security, and he holds 11 patents in those areas. In the early days of local area networking, he was the author of some of the first network topology discovery applications in the industry. More recently, he co-authored the process, he has learned a great deal about what it takes to make startups successful, and he’s now giving back by mentoring young companies growing out of Cal Poly’s Center for Innovation and Entrepreneurship. Prout reported that he’s also Cal Poly Proud of his oldest son, who graduated from Cal Poly last June with a B.S. in industrial technology.

Frank Hepburn (B.S., Electrical Engineering, 1982) was presented the Silver Snoopy Award for his years of supporting NASA’s Space Launch System by none other than his fellow Cal Poly alumnus Victor Glover (B.S., General Engineering, 1999), a NASA astronaut. The Silver Snoopy award recognizes outstanding performance in flight safety and mission success, with fewer than one percent of the aerospace workforce receiving the award. The presentation took place June 14 at the George C. Marshall Space Flight Center in Huntsville, Ala. http://bit.ly/295CD46

Chris Hagler (B.S., Electronic Engineering, 1980), as hardware engineer director at Lab 126, is a major force in shaping Amazon’s Echo and Fire TV product lines, among others. On May 6, Hagler was the keynote speaker at the Cal Poly Electrical Engineering Department annual spring banquet, where he shared his thoughts and experiences relating to the event’s theme of mobile computing.

Racing Legend: Bob De Bisschop

While a mechanical engineering student at Cal Poly, Bob De Bisschop built a hot rod that now resides in the Boyertown, Pa. Museum of Historic Vehicles. He also built one of the first dragsters at Al’s Brake Shop in downtown San Luis Obispo, where he worked part-time.

The 1952 graduate went on to make significant contributions to the aviation and automotive industries, including building the first turbocharger for a passenger car in 1961, the Oldsmobile Jetfire. Four years later, he revolutionized Indy car racing with a turbocharger for an Offenhauser engine.

De Bisschop started his race car career at Kurtis Kraft. “I went to Indianapolis and worked on the pit crew of one of the cars, and we won the Indy 500 in 1955 with Bob Sweikert,” recalled De Bisschop. “I also worked on the crew of the John Zink car, and we won the Indy 500 with Pat Flaherty. That’s two in a row. I know some mechanics who went to Indy for years and never won the race.”

It was while working for Garrett AirResearch that De Bisschop refocused his turbocharger design experience from passenger cars to race cars using an Offenhauser (“Offy”) engine.

“The first year, 1966, I had three cars in the Indy 500; the second year, 1967, I had eight cars; and the third year, 1968, I had 16 cars in the race,” said De Bisschop. “Bobby Unser won the race with a Turbo Offy, and that engine continued to win races for 12 years, when it was replaced by the Turbo Cosworth.

“Since then, there have been Turbo Fords, Turbo Chevys, Turbo Hondas, Turbo Buicks and others. I started a trend in racing that continues today.”

1950s

Eugene Wallock (B.S., Aeronautical Engineering, 1957) recently celebrated his 60th wedding anniversary. He retired from Boeing in 1996 and moved to Oklahoma in 1998.
#Giving Tuesday — Tuesday, Nov. 29 — is a special call to action on the national day of giving.

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