

ENGINEERING Advantage

College of Engineering, Cal Poly, San Luis Obispo, California, Spring 2011

Learn by innovating: Turning engineers into entrepreneurs

Cal Poly has quite an IQ. Not only does the university have bright students, but it has Innovation Quest (IQ) (<http://www.iq.innovationq.org/>), a program that gets students, faculty and the university to think like entrepreneurs.

"Entrepreneurialism is a natural extension of the real-world orientation for which Cal Poly is known," said **Susan Opava**, dean of research and graduate programs, "and IQ has been a catalyst for the creation of an entrepreneurial culture on campus."

Can a university turn innovating engineers into entrepreneurs? IQ thinks so.

"IQ's focus is on 'engineers with ideas,'" said **Jessie Becker**, a business major and IQ's entrepreneur in residence. "The whole inspiration for IQ came from the idea that over 4,000 senior projects get filed away each year. Why don't we do something with this work? And, when there's a viable product, why not start a business? It dovetails perfectly with Cal Poly's Learn by Doing philosophy. Entrepreneurialism is just one step further!"

To help students take their Learn by Doing orientation right into the marketplace, Silicon Valley entrepreneurs **Carson Chen** (EE '73) and **Rich Boberg** (EE '70) along with electrical engineering professor **Mike Cirovic** founded and funded

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Innovation Quest leader Carson Chen (EE '73), right, talks with SanTasti Palate-Cleansing Beverage CEO Andrew Macaluso during an IQ meeting on campus in February.

IQ prizes launch nine commercial projects

Cal Poly's focus on problem solving, interdisciplinary teamwork and creativity has much in common with the culture found in young, fast-growing companies. And nowhere is that more apparent than in the annual IQ competition that now attracts over 100 ideas from students and faculty throughout the campus each year. The

competition has awarded \$500,000 in prizes, which has helped launch nine commercial enterprises. A sampling of recent winners:

■ **Flip Brake** — A bicycle brake that virtually eliminates head-over-handlebar crashes. Recipient:

Andrew Ouellet, mechanical engineering. Advisor: **Michael Cirovic**,

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Q&A with President Jeffrey D. Armstrong

"Learn by Doing is not negotiable — it's who we are"

The new president shares first impressions about Cal Poly and the College of Engineering

Engineering Advantage: What have you learned about Cal Poly since coming to campus?

Jeffrey Armstrong: Cal Poly's level of excellence – the caliber of its students, faculty and programs – is higher than I had imagined. What I've found is a model comprehensive polytechnic university.

Another standout characteristic is the warmth of the Cal Poly and San Luis Obispo communities – everyone has been extremely welcoming of both Sharon and me.

Finally, the pride that alumni, students, faculty and staff have in this institution is remarkable. And it's inspiring to me that at the same time, everyone also wants Cal Poly to continually improve, to raise and exceed expectations.

What distinguishes us?

First and foremost is our commitment to Learn by Doing. The way it's done at Cal Poly is truly distinctive – and it exponentially accelerates students' learning. Second, as a comprehensive polytechnic university, we offer a combination of distinguished colleges and

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Dr. Jeffrey Armstrong

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Mechanical Engineering lab receives \$250,000 gift

Critchfield Mechanical, Inc. donation to fund HVAC&R lab renovation

Cal Poly mechanical engineering students focusing on heating, ventilation, air conditioning and refrigeration (HVAC&R) will receive real-world experience in a newly renovated lab, thanks to a \$250,000 gift from Critchfield Mechanical, Inc. (CMI).

"The new lab will give HVAC&R students exposure to and practical experience with commercial equipment similar to what they will see in the field," said mechanical engineering professor **Jesse Maddren**. "Until now, we have had to structure our lab courses around computer labs, design activities and field trips, primarily because we didn't have a hardware lab for the students. The new hardware sharpens the focus of the lab, which is to teach students the basics that will allow them to innovate for the future."

Joe Critchfield, who started San Jose-based CMI in 1977, is a long-time supporter of the HVAC&R program. He made the lab donation to recognize the contributions of Cal Poly engineers to his company.

"I'm frequently asked how we started CMI and how we

kept it growing," Critchfield said. "The answer is: We hired a lot of great engineers from colleges — predominately Cal Poly — whom we could teach to design and build air conditioning. It just seems that students who come out of Cal Poly are ready to work as soon as they graduate."

Critchfield, who has sponsored the annual Cal Poly HVAC&R golf tournaments for the past seven years, estimates that three-quarters of the 50 to 60 engineers at his firm are Cal Poly graduates. "The company made the gift because we want more Cal Poly students to come work for us," he said. "The lab is one more way to give students a practical, working knowledge of HVAC&R systems."

Work on the Critchfield Mechanical HVAC&R Laboratory started in October and the lab dedication is planned for the spring. Maddren said the current phase of the project incorporates a number of standard energy-saving features, such as a condensing boiler and variable speed drives on the new pumps and fans.

"Future plans for the lab include more 'non-standard' systems and components, such as a chilled beam, an under-floor air system and a ground source heat pump," said Maddren, adding that the renovation should spur continued Cal Poly success in student competitions. ■



Heating, Ventilation, Air Conditioning and Refrigeration student Jeff Wong works with some of the new equipment in the refurbished Critchfield Lab.

Enhancing Learn by Doing excellence

Learn by Doing is the bedrock experience for all Cal Poly engineers.

Our core values include faculty whose primary focus is teaching; early exposure to hands-on engineering projects; laboratory-based instruction; partnerships with industry; and senior projects with capstone courses.

With the resources in place to enhance Learn by Doing, Cal Poly Engineering will provide whole-system thinkers, resourceful professionals and innovative leaders who can change the world.

The Cal Poly Engineering Advancement team is working to secure those resources, with the following fund raising priorities:



When Eric Pulse was a student in mechanical engineering, he spent hours working as a shop technician in the WWII-era Aero Hangar shop. Today, as manager of the Mustang '60 Project Shop, he directs 27 student technicians and oversees more than 100 students per quarter.

Cal Poly Engineering Learn by Doing Priorities

1. New Student Projects Lab

A new state-of-the-art Student Projects Lab will provide the space and technology needed for the next generation of engineering students, and also enable students to discover how to innovate and bring their designs to life.

Funding Opportunities: All the funding for this \$20-million facility must come from non-State sources; a gift of \$10 million would include a naming opportunity and launch of the building.

2. Named Endowed Staff Technicians

Highly skilled technicians are as vital to Learn by Doing as faculty members. Their expertise, guidance and knowledge ensures the highest quality lab experiences for our students.

Funding Opportunity: \$1 million endowment.

3. Named Project-Learning Labs

A world-class, Learn by Doing, engineering education requires state-of-the-art laboratories to ensure that every student has access to the technology and equipment needed to perform hands-on design, build, and test sequences.

Funding Opportunities: \$50,000 (\$10,000 per year); \$250,000 (\$200,000 operating endowment plus \$50,000

one-time lab "refresh").

4. Named Student Project Endowments

Student project endowments enable the creation and realization of students' entrepreneurial ideas and humanitarian-based engineering projects. These ideas and projects foster innovation, and allow students and faculty to step outside the bounds of industry-sponsored projects.

Funding Opportunity: \$50,000 endowment.

5. Named Endowed Student Technicians

Cal Poly's fabrication labs and machine shops set the university apart. Management of these facilities also incorporates Learn by Doing by providing opportunities for student technicians, who oversee safe, effective, and efficient use of equipment and the facilities.

Funding Opportunity: Multiple \$25,000 endowments to provide payout of \$1,125 per student. ■

Cal Poly announces \$1 million gift for waste research

The Global Waste Research Institute is the first institute of its kind established to address the global challenges created by waste and industrial byproduct.

Cal Poly recently confirmed a multi-year \$700,000 commitment to the Global Waste Research Institute from Waste Connections, Inc., bringing the company's total gift to \$1 million.

The Global Waste Research Institute (GWRI) represents the first collaborative effort between a public university and industry to promote the development of sustainable waste and byproduct management technologies and advance current global practices in resource management.

The formation of the Institute was first announced in late 2009, funded with a \$300,000 start-up grant from Waste Connections. Under the stewardship of GWRI's Director Dr. **Nazli Yesiller**, the Institute has since been expanding its service and educational offerings in preparation for its launch.

"This generous gift to Cal Poly's Global Waste Research Institute secures a visionary effort to build on the University's Learn by Doing mission," said Cal Poly President **Jeffrey D. Armstrong**. "Waste management is an increasingly complex challenge, and these are precisely the kinds of 21st century problems that Cal Poly wants to help solve."

"The Institute will provide an educational and practicing platform not only for students and faculty, but also for the professional community, regulators and the general public to discover new technologies and sustainable practices for waste management. Solutions to these challenges will benefit the environment not only in California, but around the globe," Armstrong added.

"GWRI's goal is to act as the central hub to

About GWRI

"Transform waste into opportunities"

The Global Waste Research Institute (GWRI), located in San Luis Obispo, California, is a collaborative effort between Cal Poly and industry to promote the development of sustainable waste and byproduct management technologies and advance current practices in resource management.

Headed by Director Dr. **Nazli Yesiller**, the institute now engages faculty and students in projects that investigate all aspects of wastes and byproducts from initial generation to final disposal. The Institute provides training for students, professional community, regulators, and the general public in sustainable waste and byproduct management and contributes to the overall educational focus and 'learn-by-doing' mission of Cal Poly. To learn more about GWRI, please visit www.gwri.calpoly.edu or call (805) 756-2932.

educate and engage faculty, students and interested parties to address the risk to human life and the environment posed by the world's ever increasing amounts of wastes and industrial byproducts," noted Yesiller. Additionally, the Institute actively promotes international partnerships that help mature and developing countries 'transform waste into opportunities'.

"With the funding provided by Waste Connections, GWRI can advance its goal to develop new strategies and methodologies of existing methods for improved management of wastes and byproducts." ■

Recycling practices are a big part of Cal Poly's GWRI, which is led by Dr. Nazli Yesiller, right, and Dr. Jim Hanson.



CENG ONLINE.....

COLLEGE OF ENGINEERING WEBSITE

<http://ceng.calpoly.edu/>

Cal Poly Engineering alumni are making news — and we are posting and updating their stories daily. Stay in touch by logging on at:

ALUMNI IN THE NEWS

<http://ceng.calpoly.edu/alumni/in-the-news/>

CALENDAR OF EVENTS

You can also keep abreast of all the activities happening on campus at:

<http://ceng.calpoly.edu/event-calendar>

GIVING TO THE COLLEGE

<http://ceng.calpoly.edu/givingback/>

Engineering advancement welcomes new staff

Beth Brenner and Megan Sinton believe in the Cal Poly advantage—and they're taking that belief on the road to advance Cal Poly Engineering.

Brenner and Sinton are new members of the engineering fundraising team. Brenner serves as director of major gifts for the college. A native of San Luis Obispo, she earned her bachelor's degree at Sonoma State and master's at the University of San Francisco. She began her career as director of development at Sacramento Region Community Foundation before joining Allstate Insurance, where she directed the company's community relations programs throughout California.

Previously, Brenner had major responsibility for directing fundraising programs for Cal Poly's Orfalea College of Business, including the newly created University Center for Innova-



Beth Brenner



Megan Sinton

tion and Entrepreneurship.

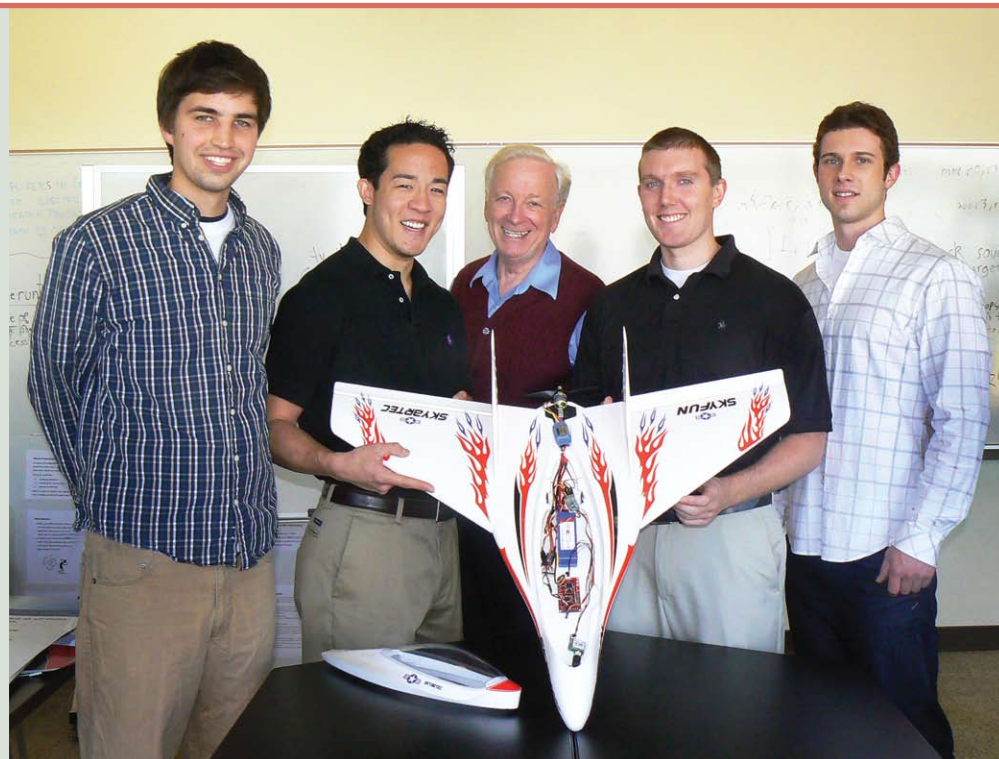
Sinton, the college's new assistant director of Advancement, received her undergraduate degree from Orfalea College of Business and later earned an M.B.A. in non-profit management from the University of San Diego. She brings a valuable mix of experience, having worked with annual fund programs, corporate donors, and campaign supporters.

As a development officer, Sinton's previous posts include Stanford University's annual fund program, the Ronald McDonald Charities, and Scripps Medical Center, where she served as a campaign coordinator. ■

LOOP welcomes its first scholar



In 2008, seven generous College of Engineering supporters spearheaded a unique scholarship aimed at recruiting the top incoming engineering students. The group dubbed themselves the "Loyal Order of Propellerheads." While the scholarship provides financial assistance, the goal of the Propellerheads is to provide guidance, counsel, and mentoring to the recipients during their tenure at Cal Poly. With full funding of the scholarship, LOOP was able to award its first scholarship this year to mechanical engineering freshman Kelsey Engel, pictured above with LOOP donors Dick Hartung, Chuck Terhune, Paul Bonderson, and Paul Martin.



Raytheon's Professor of Practice John Jacobs, center, is advising a group of ME students on a project to design a launcher for unmanned aerial vehicles.

Raytheon's Professor of Practice enjoys collaborating with students and faculty

John Jacobs and his "boss," Raytheon Company, believe strongly in higher education. He and the company are also concerned about the projected future shortage of engineers.

These are some of the reasons he spends three days a week as Raytheon's Professor of Practice teaching, collaborating, coaching, mentoring and advising Cal Poly students and collaborating with faculty. Jacobs also volunteered to serve because it's fun.

"I thoroughly enjoy working with the students," he says. "They are so creative and enthusiastic. We are really having fun on these projects."

A software process engineer with Raytheon Space & Airborne Systems, Jacobs' assignment at Cal Poly is to develop lab programs, assist the computer science faculty, work with faculty and students to develop new and innovative technologies for Raytheon, organize a seminar series on computer/Cybersecurity, and help develop a Cybersecurity lab

to support Learn By Doing in the Cybersecurity curriculum.

Jacobs is the first Raytheon Professor of Practice at Cal Poly. The program lends a seasoned Raytheon professional to the university, who brings an industry perspective and experience to the classroom. For Raytheon, the professorship is a way to strengthen the pipeline of engineers.

"Raytheon highly prizes Cal Poly engineers," Jacobs notes. "The Professor of Practice is our response to all the budget cuts, and we also want to help promote Cal

Poly's Learn by Doing education. My division of Raytheon, for instance, is currently participating in senior/capstone projects in four diverse Cal Poly departments."

The on-campus Raytheon projects include a forest fire early warning system (electrical engineering), a sleep apnea detector (biomedical engineering), a cyber "capture the flag" system (computer science), and a launcher for unmanned aerial vehicles (mechanical engineering). ■

"The Professor of Practice is our (Raytheon's) response to all the budget cuts, and we also want to help promote Cal Poly's Learn by Doing education."

John Jacobs



The 2011 Outstanding Women in Engineering and Technology include (left to right) Jennifer Hughes (CSC), Annie Beug (CSC), Sarah Chang (BME), Anna Hopper (IME), and Laura Dearborn (IME).

Cal Poly Society of Women Engineers honors five outstanding members

The Cal Poly Society of Women Engineers (SWE) announced the recipients of the 2011 Outstanding Women in Engineering and Technology Award.

The awards were announced at this year's Evening With Industry event in late January at the San Luis Obispo Embassy Suites. In addition, SWE named Dr. Jane Lehr from Ethnic Studies as "Most Supportive Professor," and presented \$30,000 in scholarships at the gala.

At the dinner banquet, those students highlighted for their outstanding accomplishments were joined by 70 industry representatives from 32 companies, including Amazon, Northrop Grumman, Chevron, Cisco, Yahoo, Lockheed Martin, Raytheon, Yahoo and the Central Intelligence Agency.

The Outstanding Women in Engineering and Technology winners were chosen using four criteria: faculty recommendations, demonstrated leadership, related work experience and grade point average. Each of the winners is actively engaged in several extracurricular activities.

The five honorees each received a \$50 gift certificate to El Corral from Skyworks. The winners include:

Annie Beug

A computer science master's student from San Luis Obispo, CA who graduated from Cal Poly with

a B.S. degree in 2000, Beug worked as a project manager for AirTreks, Inc., in San Francisco for nine years. Beug, who maintains an overall GPA of 3.671, is active in three clubs: the Association for Computer Machinery (ACM), the Computer Science Graduate Student Association (GSA) and Ignite Cal Poly, which sponsors events for Computer Science students during Week of Welcome. Beug also spearheaded the development of a mentoring program for first-year female students in computer science and software engineering.

Sarah R. Chang

A biomedical engineering senior from Riverside, CA, Chang served as the liaison between Cal Poly students and the QL+ organization for projects in the QL+ Lab to assist disabled veterans. She has also served as an outreach assistant and group leader for SWE's Building an Engineer Day and served in student government as Vice President of the Inter-Housing Council (IHC). Chang maintains a GPA of 3.577.

Laura Dearborn

A senior industrial engineering student from Visalia, CA, Dearborn has served as the treasurer of the Institute of Industrial Engineers for two years. With a GPA of 3.807, she has been named to the President's List for two years and the Dean's List for eight quarters.

Dearborn, a College of Engineering Ambassador, completed internships with both Northrop Grumman in Woodland Hills, CA, and Duncan Enterprises in Fresno, CA.

Ana Hopper

An industrial engineering graduate student from Laguna Beach, CA, Hopper has served as president of the College of Engineering Ambassadors and is a member of the Institute of Industrial Engineering and Alpha Pi Mu, the IE honors society. Hopper also completed three internships: Cisco Systems in San Jose, CA; Boeing in Everett, WA; and REC Solar in San Luis Obispo, CA. At Cal Poly, Hopper has maintained an overall GPA of 3.4.

Jennifer Hughes

A Computer Science graduate student from Camarillo, CA, Hughes is the founder and current president of Women Involved in Software and Hardware (WISH), a group that supports and mentors women engineering students. Hughes has interned at LucasFilm as part of a production systems team and at Amgen, Inc., in the storage and backup department. A member of University Singers Choir for four years, Hughes has also volunteered for Cal Poly Rose Float and her interdisciplinary team was a semifinalist in Disney's ImagiNations design competition in 2009. ■

Innovation Quest

funded IQ in 2003. Shortly after, they were joined by hi-tech veteran **Laura Pickering** (EE '84). The nonprofit philanthropic enterprise they lead is best known for its annual innovation contest, which offers no-strings-attached funding and assistance for the best ideas presented by students and faculty on campus.

"I came out of Silicon Valley, where there's a flourishing culture of harnessing ideas that make sense," Chen said. "Through IQ, we're helping students see the full value of their ideas. They can see that, rather than just work for a business, they can be the business. It's our hope to plant the seed that says, 'You can.'"

To recognize outstanding innovative projects, IQ presents three awards, for \$5,000, \$10,000 and \$15,000. First, participants go through a series of workshops and a concentrated whirl of networking and mentoring designed to inspire them to take their vision from



High-tech pioneers **Laura Pickering** (EE '84) and **Carson Chen** (EE '73) are seeking good student ideas to fund through Innovation Quest.

concept and lab bench to market. Those finalists and winners that exhibit a drive, fortitude and belief in themselves are invited to IQueue, the summer boot camp.

"We give participants a framework for how to present their ideas to business and then we stand back," Pickering said. "It's their passion, drive and commitment that make it happen. They discover they don't have to take the usual path."

Becker agrees: "One of the most valuable experiences I've had with IQ is seeing the thought processes behind these companies and seeing what really does work and what probably won't. It creates one of the best opportunities

around for networking and mentoring from industry leaders. That's what IQ is about—it excites. It's an environment that inspires 'hot market' ideas, and you learn how to market and sell them.

"It's easy to have an idea and lose the fire if there's no encouragement. IQ has fueled my fire and made me want to 'go for it.'"

Kyle Wiens (CSC '05) shares that learn-by-innovating enthusiasm. The 2008 IQ winner is co-founder of iFixit, which posts free, user-friendly repair manuals to its website (<http://www.ifixit.com/>).

"I like doing my own thing," explains Wiens. "That's why I started iFixit between my freshman and sophomore year. Web startups like ours work especially well because they're the kind of thing you can create in your bedroom and have a product launched in six to 12 weeks—iFixit was built in a week. Going from an idea to revenue in a week is the sort of thing you can do in the web world that's much harder and longer in the traditional world."

In many ways that's because the tools to launch a new business have never been more accessible. Falling

bandwidth costs, abundant open source software and on-demand cloud computing make it much cheaper to get a company off the ground. An entrepreneur can create a website, host conference calls, produce slide shows and conduct live meetings and webinars—all online and on a shoestring.

Wiens envisions 100 successful companies like iFixit coming out of Cal Poly over the next five years.

"There are huge opportunities right now for web software and service startups, robotic applications, among many others," Wiens says. "If I'm straight out of college, I don't need \$100,000 to work at Google or elsewhere. What I need is a plan for the future that is going to be fulfilling and allow me to leave my mark on the world."

"If we can convince students to take a risk—take a risk on themselves—it will be the best risk they ever take," he says.

Finally, Chen summarizes, "What drives us is social responsibility. We tell the students that the greatest gift they can give to others is to provide opportunities for doing and creating—what I call the 'living journey' to success. Even greater is the gift of giving back through philanthropy. The IQ founders and participants want to help catalyze innovation and entrepreneurship at Cal Poly in perpetuity." ■

— Galen Ricard

IQ Projects

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electrical engineering. <http://www.slidepadbrake.com/>

■ **Gamers Portal** — The first social networking site for video game players—all 300 million of them. Recipient: **Miguel Gaeta**, computer science. Advisor: **Clark Turner**, computer science. <http://gamersportal.com/>

■ **Grinds Coffee** — Chewing or smokeless tobacco is still one of baseball's (and minor league baseball's) "dirty habits." This "coffee in your pocket" provides an energy boost that's a healthier alternative. Recipients: **Patrick Pezet**, business; **Matt Canepa**, finance. Advisor: **Mitch Wolf**, management. <http://www.getgrinds.com/product.html>

■ **Mobility Powered Wheelchair** — An all-terrain wheelchair that can be eas-



ily adjusted to negotiate the landscape at hand—from street and indoor settings to off-road excursions. Recipient: **Kimberly Todd**, business. Advisor: **Tom Mase**, mechanical engineering. <http://www.qplus.org/page.aspx?pid=350>

■ **Negative Conductance RF Power Amplifier** — Cellphone amplifiers are notoriously inefficient—which is why talk time is so much less than standby time. Enjoy significantly more talk time with this amplifier design. Recipient: **Cody Neslen**, electrical engineering. Advisor: **Vladimir Prodanov**, electrical



engineering.

■ **PolyGrasp Prosthetic Hand** — First in the market to combine all three key features of an ideal prosthetic: low cost, high functionality and lifelike appearance. Recipient: **Max Maloney**, mechanical engineering. Advisor: **Tom Mase**, mechanical engineering. <http://www.qplus.org/page.aspx?pid=350>

■ **SanTasti—the Palate-Cleansing Beverage** — An alternative to sparkling or still water, San Tasti is specifically formulated to cleanse the palate. It's not only for winetasting occasions, it

enhances your savoring other tastes as well, including beer, coffee and spicy foods. Recipients: **Nicole Chamberlain**, agriculture, wine and viticulture; **Nick Marcotte**, aerospace engineering; **Andrew Macaluso**, agriculture, wine and viticulture; and **Preston Parrett**. Advisor: **Joe Montecalvo**, food science and nutrition. <http://www.santasti.com/>

■ **StartupDigest** — (<http://startupdigest.com/>): This members-only guide to the startup world's events, job opportunities and education content will receive \$200,000 from the **Ewing Marion Kauffman** Foundation. In announcing its sponsorship, the Kauffman Foundation said its research shows that high-growth, young companies are key to growing the economy. StartupDigest co-founder **Chris McCann** helped launch Innovation Quest's summer incubation program. ■



UNDER CONSTRUCTION

The Cal Poly Center for Science and Mathematics construction project is now underway. The \$130 million, 197,000-square-foot building was made possible by \$110 million from voter-approved state education bonds and \$20 million in private donations to Cal Poly. The new center is set to open in the fall of 2013.

Armstrong

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programs that work together – and, notably, everyone acknowledges that there needs to be even more collaboration. This collaborative environment provides rich opportunities to address our grand challenges, what scholars have termed “wicked problems” because of their complexity and interdependencies. Cal Poly’s blend of Learn by Doing with a focus on solving real-world problems is what enables our graduates to deliver tremendous service to California’s key industries.

In what ways does Cal Poly address the needs of California, its students, industry and economy? What is our mission?

As a distinctive, Learn by Doing, academic community, Cal Poly has a mission to enhance the California economy and quality of life by generating whole-system thinkers, resourceful professionals who are life-long learners and innovators. Our graduates want to be more than workforce participants – they strive to be leaders in their professions and in their communities.

To fully realize our mission, we need to unleash more research that is connected to student learning and participation. In other words, we need to push Learn by Doing forward. We must ensure that all Cal Poly graduates are adept at working on cross-disciplinary teams. We have to prepare students for jobs in the future that do not yet exist.

To serve our mission fully, we must enhance diversity on campus. I’ve said many times that student success is the

“true North” of my compass. Students need to experience a diversity of ideas to learn how to become good citizens, critical thinkers, difference makers and leaders. Exposure to different perspectives, to different cultures and to people from diverse walks of life prepares students for life-long learning.

Cal Poly Engineering is searching for a permanent dean. What qualities will you look for in the candidates for the position?

Engineering is a core competency of Cal Poly, and we need to recruit a visionary leader for the College, someone with a distinguished record in academia and who also understands the real world. I’m looking forward to working with this individual to increase resources and build endowments. As the largest college at Cal Poly, Engineering has tremendous potential for development. I see the new dean as being able to create a vision that will rally the alumni and stakeholders in order to achieve full funding for this exceptional institution.

How do you see the College of Engineering serving society now and in the foreseeable future?

From the Cal Poly Engineering perspective, the Engineering Grand Challenges represent opportunities for innovation and problem-solving. Our students and faculty are intimately involved and engaged in issues and research that can improve life on the planet.

More simply put, I love the description of Cal Poly engineers as having “two hands on the problem and two feet on the ground!” This is just one reason that Cal Poly Engineering continues to be one of the country’s top-ranked programs. ■





Cal Poly team finishes 2nd in seismic design contest

When their five-foot-high balsa wood model building partially collapsed during the final seconds of the critical third test at the 2011 Earthquake Engineering Research Institute (EERI) Seismic Design Competition in mid-February, the Cal Poly team was more than a little shaken.

"After the accelerometer on top of the building went down and we incurred a huge penalty, the entire team was devastated," said **Kevin Chen**, a fourth-year architectural engineering student who worked on the building as his senior project. "We went through the stages of grief and I personally spent four hours walking around San Diego by myself."

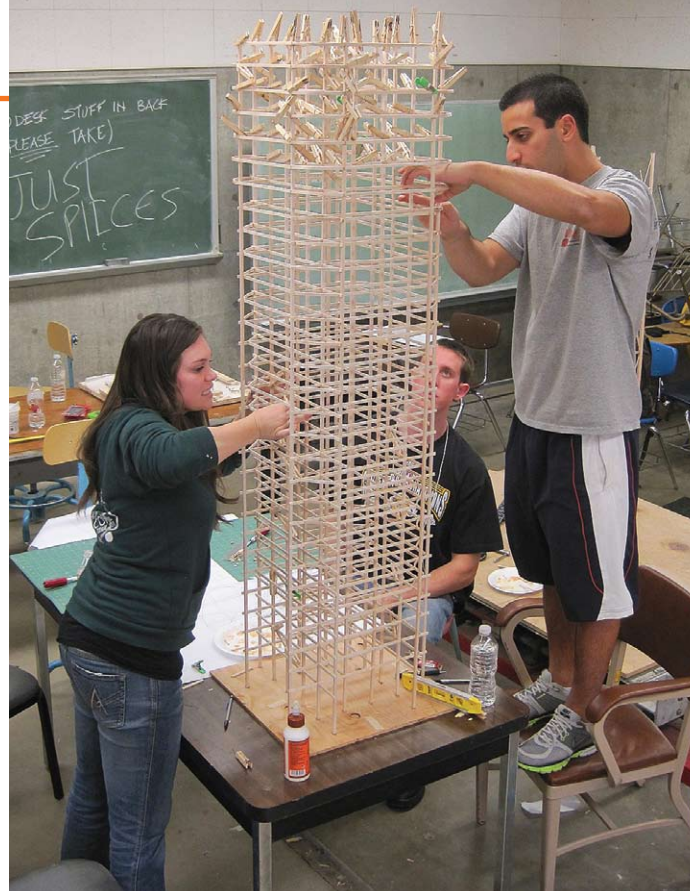
It wasn't until later that Chen, who left before the competition's awards ceremony, learned all was not lost. "Driving home I get a text and then a call," he said. "Despite the penalty and the fact that we were not eligible for any bonus points, we came in second overall. It was a tremendous victory."

Team leader **Jeannie Tran**, a third-year civil engineering student, said the second-place award — Oregon State finished first and the University of Illinois was third in the 28-team competition — came about because the Cal Poly team's 30-story model building called "Diadem" had stood tall through the opening two seismic tests on a shake table that duplicates historic earthquakes and had received nothing but glowing comments from the judges after their oral presentation.

"We stood out in our mastery of the details," she said. "Time and time again, we were complimented on how well we knew our stuff. Plus, our building was beautiful."



James Myers tests the width of the weight connections where the simulated live load will be placed for competition.



Clockwise from top left: Garrett Hagen, Yoni Sadka, Stefan Chiose and Jennifer Roth work on the bracing system of the building. Above left: The Cal Poly Seismic Design Team finished second in the 2011 EERI international design competition.

Tran also credited the interdisciplinary nature of the 18-member team that included 10 civil engineers and eight architectural engineers.

"The key challenge was bringing together students from two different majors and getting everyone on the same page," she said. "I personally learned a lot about seismic design, analytical methods and the amount of collaboration needed for a project this size — it takes a lot of dedication to make it all come together." Blending form and function in an efficient design was the goal of the competition, Tran said, adding: "Cal Poly has one of the top architectural programs in the nation, which you don't usually find at the undergraduate level. The civil engineers learned a lot from the ARCEs technically, and they learned a lot from us practically. We (the engineers) had to tone down their great ideas to show them what was practical and possible."

Chen agreed the collaboration was key to the team's success. "It was completely different working with engineers — there's a lot less fluff and very down to earth," he said. "All their proposals were grounded in logic and very practical. Our entire design was based on performance. From this experience I learned that you need to look at the bigger picture, not just design details. Cal Poly finished high because our curriculum prepared us to match our design to the analysis."

For more information, see <http://slc.eeri.org/seismic.html> ■

Cal Poly SWE leaders receive national awards

Gage, Telford honored for service

Katherine Gage and **Lesley Telford** have had long records of leadership in Cal Poly SWE. In recognition of their years of service, they received two of the coveted Outstanding Collegiate Member Awards from the National Society of Women Engineers.

The Collegiate Member Awards are bestowed upon SWE collegiate members with at least two years of SWE membership, who have made an outstanding contribution to SWE the engineering community, and their campus.



Katherine Gage
(ME)

Among her SWE roles, Gage served as director of internal marketing, and she had a particular impact on Team Tech. In her sophomore year, she served as a project subgroup leader; the team won first in the nation

for designing a weld point inspection device for Walt Disney Imagineering. The following year, she co-directed Team Tech, and the group placed second for its prototype of an endoscopic surgery tool.

Gage graduated from Cal Poly in 2010 with a degree in mechanical engineering and currently works as an engineer for the U.S. Navy.

Telford, a senior biomedical engineering student, was inspired to do outreach work with SWE as a result of her own participation in high school in the group's Shadow An Engineer program—she became the youngest SWE outreach director in her sophomore year. As a junior, Telford served as vice president of community outreach. In this position she not only secured a record \$9,000 to fund four events, but her efforts enabled Cal Poly SWE to reach 1,300 middle and high school students. Elected president for 2009-2010, Telford was responsible for all Cal Poly SWE operations, including meeting with companies and managing leadership training for 48 officers.

Current Cal Poly SWE president, **Stephanie Smith**, commented, "I am very proud of our section for winning so many outstanding awards—Cal Poly SWE has built up a great reputation, attracting hundreds of students each year." ■



Lesley Telford
(BME)

Cal Poly Engineering students help Nipomo homes go solar

Cal Poly Engineering students helped a Nipomo neighborhood go solar in January.

Twenty members of Cal Poly's Power and Energy Society (PES) club put "Learn by Doing" into practice in late January when they helped place seven solar panels on the home of a low-income Nipomo family.

Working with the Atascadero branch office of GRID Alternatives and People's Self Help Housing (PSHH), the PES members installed and wired a solar panel system that will supply about 90 percent of the power needs for the family of Eduardo Ramirez, who helped build the home with the help of PSHH and Habitat for Humanity.

PES Club President **Danny Zepeda**, who first worked with Grid Alternatives volunteer projects last summer when he was an intern with

between classroom theory and practical application of current technology," Zepeda said. "I think all the members of the club enjoyed getting out in the sun and learned a lot."

Electrical engineering students **Ruth Leung** and **James Thornton** helped with four parts of the process: installing metal rails that hold the solar panels in place, sealing holes in the roof tiles to prevent water damage, lifting the panels into place and linking them together with electrical cables and a copper ground wire. Both enjoyed their time up on the roof.

"I'm studying power systems but haven't worked directly on anything like this," Leung said. "I liked the hands-on experience and I hope to volunteer again."

Thornton, an EE graduate student, added: "A project like this exposes me to things I didn't get to see in class. We get a lot of experience in labs, but it doesn't get more real than this."

PES members figure to have more opportunities on the Central Coast working with Grid Alternatives, which helps low-income families access sustainable energy through its Solar Affordable Housing Program. Steven Fernandez, regional director for GRID Alternatives, said the group, working with PSHH and Habitat for Humanity has installed more than 700 solar systems nationwide and that at least two other homes in Nipomo were scheduled to receive systems. ■

San Diego Gas & Electric, said the two-day installation of the 1.5-kilowatt system was perfect for Cal Poly engineering students interested in renewable energy.

"This opportunity to work on a solar panel project bridges the gap



Working with GRID Alternatives and People's Self-Help Housing, 20 Cal Poly Engineering students helped install seven solar panels on a tile roof in Nipomo. The panels are expected to supply about 80 percent of the family's electrical needs.

Dots come together for Patrick McBride

Patrick McBride has a Ph.D. in his future. The materials engineering graduate student and budding expert in quantum dots, has been awarded a Bonderson Fellowship, which will fund completion of his master's degree at Cal Poly and his continuing studies at UC Santa Barbara for a Ph.D.

McBride is the second scholar to receive this distinguished award, established through a \$500,000 gift from Paul and Sandra Bonderson. "The Fellowship enables Cal Poly to build collaborative research opportunities with UCSB and tap into their state-of-the-art facilities and world renowned research faculty," says materials engineering professor **Richard Savage**. "Through Patrick, we'll have the opportunity at Cal Poly to work with UCSB's Transmission Electron Microscopy instrumentation."

Savage directs McBride's graduate work at Cal Poly, which focuses on on nanocrystalline quantum dots and exploring the application of these tiny clusters of atoms as bio-tags for cancer research. At UCSB, McBride will partner with Dr. Chris Van de Walle in the Materials Department and Craig Hawker, director of the UCSB Materials Research Lab.

"Throughout my life I have always had the overlying

goal of understanding how everything works, from the vast continuum of space all the way to the discrete microscopic world of atomic and sub-atomic particles," says McBride. "This goal is obviously impractical because it calls for infinite knowledge—but, still, it drives me to understand all that I can and to never take any piece of information for granted."

By understanding material properties at a fundamental level and using this knowledge to manipulate their properties on the atomic scale, McBride hopes to "make new discoveries and bring about new insights into future technological devices."

In addition to the Bonderson Fellowship award, McBride has participated in two honors research projects at Cal Poly and also completed a Science Undergraduate Internship at Lawrence Berkeley National Laboratory. He recently placed 2nd in the Argonne



Materials engineering student Patrick McBride has been awarded the Bonderson Fellowship which will fund the completion of his master's degree and Ph.D. at UC Santa Barbara.

National Laboratory 2010 US DOE Science & Energy Research Challenge. ■



Return on investment: Cal Poly grads, alumni earn top starting career salaries

Cal Poly graduates and alumni top all other UC and CSU campuses and plenty of private universities when it comes to their median starting career salaries. At mid-career, their median salaries top all UC and CSU grads except Berkeley's and UC San Diego's, and are still ahead of many private university grads. But Cal Poly offers alumni — and parents — a greater "return on investment" than private universities and UCs by delivering that earning power at much less cost.

Those are among the latest findings in a growing evaluation of university costs and benefits compiled by two independent groups: PayScale.com and CollegePortraits.org.

As an example, according to the evaluation, Cal Poly alumni earn just as much as graduates of the private Pomona College or the University of Southern Cali-

SALARY SCALE

Median Graduate Salaries, Bachelor's Degree Grads Data gathered from a nationwide survey of 1.4 million people, compiled by College Portrait and PayScale.com

University	Starting Salary	Mid-Career Salaries
Cal Poly	\$55,000	\$99,200
UC Berkeley	\$53,100	\$109,000
UCLA	\$50,700	\$91,600
UC Davis	\$49,000	\$90,700
UC San Diego	\$48,700	\$99,700
UC Santa Barbara	\$47,600	\$96,400

fornia, at less than half the diploma cost.

The data, which includes only graduates with bachelor's degrees, shows that students with the greatest "return on investment" are those who do well in technical majors at a top public school.

The return-on-investment rankings were featured in a Nov. 14 story in the *San Jose Mercury News*. (<http://www.mercurynews.com/>) ■

The College of Engineering's class of 2014 gathered in Engineering Plaza for a group photo.



WISH members can see themselves in Google VP

WISH (Women Involved in Software and Hardware) is a student group dedicated to promoting women and rectifying the gender gap in computing fields; so they were especially pleased to co-sponsor a visit to campus by Marissa Mayer, Google vice president for consumer products.

Now a highly-placed corporate officer, Mayer was Google's first female engineer when she started in 1999. In her 11 years at the company, her management and engineering efforts have included oversight of products such as Google Maps, Street View and Local Search functions.

In her public address, Mayer talked about product innovation and career success. Afterwards, WISH members got an "up close and personal" opportunity to ask about women in computing at a WISH reception in her honor. ■

Members of Women Involved in Software and Hardware (WISH) probably Googled cupcakes before they met with Google vice president Marissa Mayer, bottom row center, during a reception in February.

Cal Poly CubeSat team disappointed but undaunted after rocket fails to reach orbit

The Cal Poly students who gathered at 2:00 a.m. outside Vandenberg Air Force Base on March 4 to watch the launch of a Taurus XL Rocket were giddy with excitement. Affixed to the rocket was a Cal Poly-built P-Pod, a deployer that would eject three picosatellites or CubeSats into orbit. The tiny research satellites were built by students from University of Kentucky, University of Colorado and Montana State University.

Minutes after the launch, however, elation turned to frustration, when the students learned that the rocket fairing failed to separate, sending the Taurus XL and its CubeSat payload into the Pacific.

"We were fairly disappointed, but we still had a great sense of accomplishment of what we had done," said aerospace graduate student **Ryan Nugent**. "Even though the launch vehicle didn't make it to orbit, we still cleared huge hurdles."

"Even though the launch vehicle didn't make orbit, we still cleared huge hurdles."

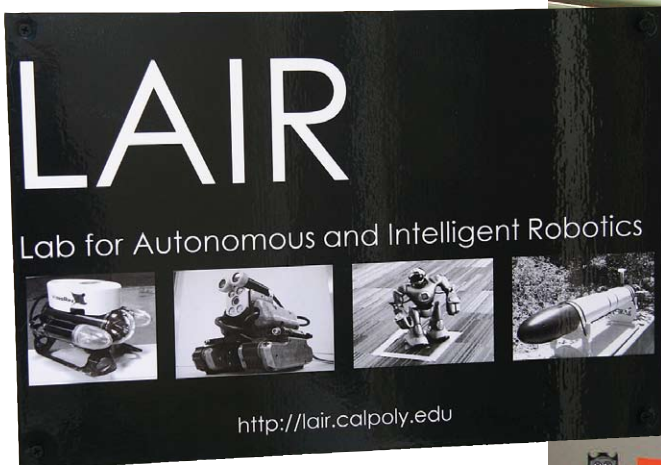
Ryan Nugent
AERO student

The launch followed initiation of a \$5 million, five-year contract between Cal Poly and NASA to provide P-POD services for NASA missions. The rocket was also carrying an earth observation satellite for the space agency. Moreover, while Cal Poly students have traveled to Russia and to Wallops Flight Facility off the coast of Virginia to participate in launches, this was their first "neighborhood" launch at Vandenberg.

They don't have long to wait for the next CubeSat mission, however. Undaunted by the March launch failure, the students are busy preparing for an October launch with the space agency, when three P-PODs are scheduled for launch aboard a Delta Two rocket from Vandenberg. ■

An Orbital Sciences Corporation Taurus XL rocket carrying NASA's Glory spacecraft launched from Vandenberg Air Force Base at 2:09 a.m. (PST) March 4, 2011. (Photo: U.S. Air Force photo/Lael Huss)





Multi-robot systems research taking place in new lab called the LAIR

Computer science and software engineering "hub" draws support from industry, NSF and generous family

When Cal Poly students hole up in the LAIR, they're not chewing the fat around a campfire— they're engaged in highly sophisticated multi-robot systems research.

The Lab for Autonomous and Intelligent Robotics (LAIR) is a research facility founded and directed by computer science and software engineering professor **Christopher Clark**. Funding for the facility and the projects it supports has come from the National Science Foundation, Lockheed Martin, the Office of Naval Research, C3RP, Norwegian Partnerships with North America (NORUS), Agilent Technologies, and Cal Poly parent **Ronda Hruby**.

"LAIR is the hub of all robotics research and pedagogy at Cal Poly," says Clark. "This facility makes it possible to integrate research work with the curriculum."

The cutting-edge technology and platforms used by LAIR student and faculty researchers include ground robots and underwater robots, such as the small scale VideoRay Pro III Remotely Operated Vehicle (ROV), the OceanServer Iver2 Autonomous Underwater Vehicle (AUV), and the Inuktun VersaTrax Crawler, a tethered

bottom crawler.

This equipment supports LAIR's international research partnerships and expeditions. For instance, Clark and Professors **Jane Lehr** (ethnic studies/ women's & gender studies) and **Zoë Wood** (computer science), along with eight Cal Poly students, recently returned from Malta, where they collaborated with marine archeologists from the Aurora Special Purpose Trust and the University of Malta to investigate underwater archaeological sites. See <http://users.csc.calpoly.edu/~cmclark/MaltaMapping/index.html> for information about the ongoing research.

LAIR has also enabled partnerships with NORUS (<http://www.norus-science.com/>), a research-based higher education program that focuses on climate-induced changes on Arctic ecosystems.

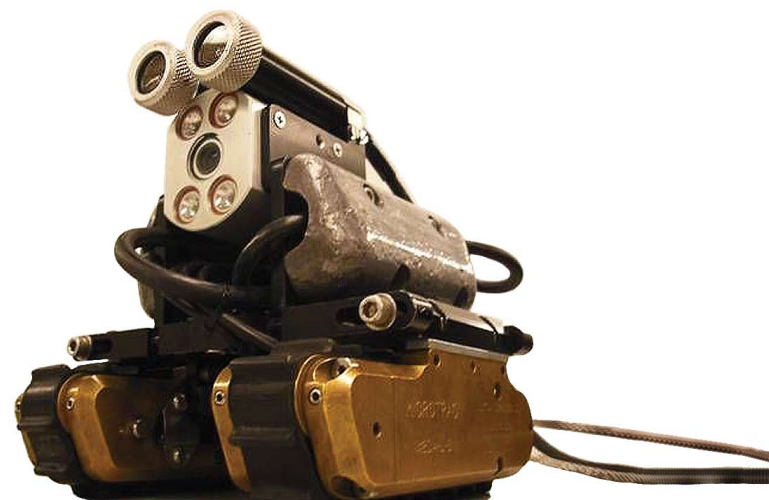
Closer to home, LAIR collaborates with the Cal Poly Center for Coastal Marine Sciences (<http://www.marine.calpoly.edu/>). Clark, center director **Mark Moline** (biological sciences) and investigator **Christopher Lowe** (CSU Long Beach) have just initiated a project to equip AUVs with the ability

to track sharks.

"These expeditions and the LAIR facility itself are incredibly unique in the undergraduate experience," comments Clark; "in fact, because of LAIR and the great work that students are doing here, Cal Poly is creating a niche, especially in underwater robotics. We're becoming known worldwide as a center of robotics research." ■



LAIR Director Christopher Clark displays the OceanServer Iver2 Autonomous Underwater Vehicle and, below, the Inuktun VersaTrax Crawler.



Sponsored turbine project gets off the ground with completion of 70-foot tower

CAL POLY WIND POWER

Professor Patrick Lemieux is leading more than a dozen ME students in building a wind turbine in a project sponsored by the Cal Poly Wind Research Center,



A 3-kilowatt wind turbine project sponsored by the Cal Poly Wind Research Center was getting close to completion during winter quarter with the erection of a 70-foot, custom-designed tower, at left, and the assembly of the three-bladed composite propeller to the nacelle, above. Located on Cal Poly's Escuela Ranch northwest of the main campus, the wind turbine is scheduled to be completed in early summer. Designed primarily for research, the turbine may eventually power a water pump on the ranch. Students participating in the project are learning real-world skills which will prepare them for utility-scale wind energy jobs according to faculty leader Patrick Lemieux.

CPE's Capstone Projects Exhibition

An autonomous golf cart. Radar for the blind. A shark tracking system for an underwater robot.

You might expect to see these examples of sophisticated technology at an industry exposition—or you could have viewed them at the Computer Engineering Capstone Projects Exhibition.

The team-based, two-quarter, computer engineering capstone course is the culminating design experience for seniors directed by Professors **Lynne Slivovsky** and **Chris Lupo**. The senior projects developed this year included:



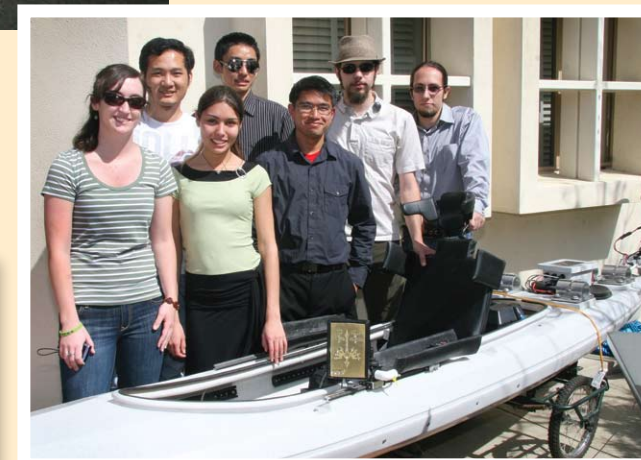
A



B



C



F



D



E

Among the team projects displayed at the Computer Engineering Capstone Exhibition were: **A**. "Live Free, Run Blind" Detector for Blind Runners; **B**. Search and Rescue for Autonomous Helicopters; **C**. Wii-B-Fit Adaptive Wii Remote; **D**. "Engineering 4 Eyes" Detector for the Blind; **E**. "Worm Whisperers" Soil Warmer; **F**. Adaptive Paddling System.

■ **Autonomous Golf Cart Navigation Using ROS** by **David Alender, Justin Kuehn, Adam Miller, Brett Wellman, and Jason Young**: By implementing the Robotic Operating System on a standard golf cart, the team created an autonomous vehicle while becoming fully conversant with the powerful feature set of the ROS. "Implementation and subsequent usage [of ROS] allows for usefulness far beyond home-brew solutions," the students wrote in their project conclusion.

■ **Ultrasonic Range-Finding Assistive Device for Persons with Low Vision** by **Aaron Morelli, Eric Osgood, Francis San Luis, Joseph San Diego, Michael Boyd, and Nathan Helenihi**: With the support of the QL+ Foundation, the "Engineering 4 Eyes" team set out to help people with low vision navigate hazards and obstacles, such as traffic lights, construction zones, and bicyclists. They came up with a functional prototype that costs less and works better than any currently existing product on the market. They concluded that the "next steps for this project are to create a beta prototype that is significantly smaller and lighter and to continue optimizing the code."

■ **Radar for the Blind** by **Kenneth Chee, Xyrus Ferriol, Edmund Ing, Jeffrey Leung, and William Yiu**: This team sought to develop a "white-cane" for the blind that detects obstacles above the waist and is less expensive and more comfortable than existing electronic travel aids. Their Radar for the Blind consists of a hat and white-cane attachment that serve as sensing modules, and a glove that provides haptic feedback to the user.

■ **Search and Rescue Autonomous Helicopter (S.A.R.A.H.)** by **Felix Chung, Philip Kaye, Justin Smith, Chris Vochoska, and Hanson Yu**: Cal Poly's RMAX helicopter donated by Northrop Grumman is being developed into an autonomous vehicle to aid search and rescue efforts. Currently equipped with an autopilot system, it can fly a designated path, but it can't avoid trees, mountains or buildings. The S.A.R.A.H. team sought to develop an obstacle detection system for the RMAX using a micro-controller, but, as in "real world" R&D work, they encountered obstructions: the helicopter is currently non-functional and the micro-controller they purchased was defective. But the team set the stage for completion of the project by other Cal Poly student researchers.

■ **Wii-B-Fit Adaptive Wii Remote** by **Seth Black, Craig Leitnerman, Jamie Nease, Canh Sy, and Mike Tran**: This team designed a Wii Sports product to provide exercise and social interaction for persons with quadriplegia. "Our product did not end up the way we had originally intended," they conclude; "but it still meets the specifications and goals we set out at the beginning." The team's work provided the utilities for a universal design that future groups can build upon.

■ **The Shark Trackers** by **Jason Banich, Ryan DeHaven, Austin Diec, Greg Eddington, and Tim Soppet**: This group is one of several teams to work with Dr. **Chris Clark** (CSC/CPE) on a project funded by the National Science Foundation to develop a solution for actively tracking a mobile acoustic beacon, which is needed so that marine researchers can monitor sharks and other target species without noise and without area restrictions. This team successfully designed and implemented a prototype platform and identified needed refinements and adjustments. ■

Human-powered helicopter team making progress



Now in its second year, Cal Poly's multidisciplinary Human Powered Helicopter team is starting to achieve lift-off. The team, which includes Rebecca Hennings (AERO); James Koch (AERO); Josiah Mayfield (AERO); Sean Miller (GENE); Dave Berry (ME); Josiah Auer (ME); Eric Behne (ME); and Ian Marguardt (ME), is attempting to win a \$250,000 prize by designing, building and flying a human powered helicopter. In order to win the prize, the flight must be for one minute, reach a height of three meters and stay within a 10-meter box by controlled flight. "It's a very challenging engineering problem," said faculty advisor Kurt Colvin. "We are focusing on testing very low ground effects of multiple rotors and we are learning how to build very light, very strong structures using modern composite materials. What we're learning now will drive our decision-making in the future and we're very encouraged about our progress. We believe we're on the path to a successful design."

Cal Poly's EWB chapter receives two awards

Five years of working with the residents of a remote village in Thailand on a water filtration system has earned Cal Poly's student chapter of Engineers Without Borders (EWB) two awards totaling \$5,000.

Cal Poly received both the EWB-USA West Coast Region Outstanding Chapter Award and the first-place award in the inaugural Tyler Palmer Design Competition at the organization's regional conference in October. The Palmer award, which includes a \$3,000 prize, seeks to inspire innovative and sustainable engineering designs. Cal Poly's winning entry was a gravity-fed sand filter developed to provide clean drinking water to the 3,000 residents of the Thai mountain village Huai Nam Khun.

"The Thailand project was selected for the award because it's unique and because of our commitment to the community of Huai Nam Khun over the past five years," said **Aaron Opdyke**, director of

the Cal Poly EWB chapter. "In particular, the team showed exceptional work in creating a scalable technology sand filter that fits the surrounding communities and region. In addition, the system was designed with a user interface that makes maintenance and repairs possible from the local community."

About Engineers Without Borders

Engineers Without Borders is a nonprofit humanitarian organization established to support community-driven development programs worldwide through partnerships that design and implement sustainable engineering projects. EWB-USA maintains 225 dedicated chapters including university chapters on 180 campuses in the United States. For more information about EWB-USA, visit www.ewb-usa.org. ■

Cal Poly's Society of Hispanic Professional Engineers wins national contest

Cal Poly SHPE earned first and third place in the design competition and second in the technical poster competition at this year's Society of Hispanic Professional Engineers (SHPE) National Conference held at the Duke Energy Center in Cincinnati, Ohio. A SHPE team from Stanford University took second place in the design contest.

The design competition challenged participants to design and build robots that would encourage children to be more active. The first place design team presented a Dual Sport Bot, a basketball hoop that uses sonar sensors and infrared technology to detect players within a three-foot radius and then moves away from them. To shoot, children have to run after the hoop.

The team consisted of mechanical engineering senior **Arturo Ayal-Navarro**, computer science junior **Jake Muir**, mechanical engineering senior **Jorge Hernandez**, computer engineering senior



Members of Cal Poly's Society of Hispanic Professional Engineers chapter gather around the Dual Sport Bot, which won a national design competition.

Mishal Shah, and civil engineering junior **Saul Fierro**. Their first place win earned the group \$3,000 in prize money and up to \$5,000 in additional funds for pursuit of a patent.

Muir noted that the team had to put their winning product together quickly: "We had about seven weeks total — two weeks for the proposal and then five weeks to build a prototype, turn in the

final version of the design concept paper and create a 20-minute presentation."

Chris Clark, faculty advisor to the team, emphasized that the students "dedicated a lot of effort in a short time." "I am not surprised they won given they had a fully operational demo of a mobile robot reacting to people and the baskets they scored," he said.

According to **Manuel Ureno**, cap-

tain of the third place team, the Jamm Jumper uses "the power of music to get kids jumping." In addition to Ureno, team members included computer engineering junior **Adam Rizkalla**, mechanical engineering senior **Manuel Carrasco**, mechanical engineering junior **Jeremy Ramos**, civil engineering senior **Christina Ruiz**, and civil engineering junior **Stephanie Reveles**. ■

Cal Poly Society of Civil Engineers chapter dominates regional competition

Cal Poly's Society of Civil Engineers (SCE) brought home the gold — lots of it — from the American Society of Civil Engineers (ASCE) Pacific Southwest Regional Conference held March 23-26.

The group earned six first place awards and was named the overall conference champion for the 15th time since 1995.

Led by club president **Spencer Reed**, Cal Poly brought 90 members to the conference hosted by CSU Los Angeles. Nearly 1,000 students from 18 universities competed in 22 events at the four-day event.

The group won first place in the Concrete, Steel Bridge, MSE Wall, Technical



Cal Poly's concrete canoe team finished first at the ASCE Pacific Southwest Regional Conference.

Paper and Presentation, Geotechnical Competition, Impromptu Design, and Balsa Wood Bridge Design. Cal Poly also

scored third place in Surveying, Environmental Competition, Dog House Design and Construction, and Can-struction.

According to SCE faculty advisor **Gregg Fiegel**, scoring for the conference championship award "wasn't even close."

Because of their first-place finishes, the Concrete Canoe and Steel Bridge teams have qualified for the SCE nationals which will be held at the University of Evansville and Texas A&M later this spring.

Chad Inlow and **Lucas Hoffman** served as project leaders for these two teams, respectively. "These two gentlemen and their teams worked long hours on these projects over the past year, and I'm very happy that their hard work was rewarded," said Fiegel. ■

Formula Hybrid car is where technology meets the road

Electrical engineering major **Gregg Schultz** considers his experience with the Society of Automotive Engineers (SAE) Formula Hybrid race car the “crowning jewel” of his Cal Poly experience.

“I have learned how to engage in a multi-disciplinary project with students of a variety of technical backgrounds and experience,” Schultz said. “I’ve gained a lot of insights from my mechanical engineering teammates, and I have learned a lot about communication in my efforts to teach them as much about electrical engineering as I can.”

Schultz and his teammates have worked for two quarters to fine-tune Cal Poly’s car in preparation for a cross-country trip to the New Hampshire Motor Speedway (Loudon, N.H.) for the SAE Formula Hybrid competition. Scheduled for May 1-4, the SAE event is an inter-collegiate and International competition that tests student teams in speed and endurance races.

Cal Poly’s car, which is powered by two advanced lithium batteries donated by AERO alum **Neal Saiki**’s company Zero Motorcycles and a small gasoline electrical generator, has a unique appearance.

“It’s the negative camber suspension system that really looks different,” Schultz said. “We actually tilt the wheels towards the vehicle at an angle of 22.5 degrees, which enhances cornering performance with lighter, more economical scooter tires. This has allowed us to enter the lightest vehicle at competition for the last two years.”

The out-of-the box thinking was attractive to Schultz. “Working on the Formula Hybrid was one of the main reason that I and many of my teammates were able to get internships and will help me in my search for a permanent job once I graduate.” ■



Formula Hybrid Car team members Gregg Schultz, top, Rachel Brooks and Ricky Lee work on their car near the Cal Poly AERO Hanger.

Urban Concept vehicle aims to get 500 miles per gallon

When the Cal Poly Supermilage Urban Concept Car competes in the Shell Ecomarathon on June 15-16 at the Auto Club Speedway in Fontana, Calif., the goal is 500 miles per gallon and loads of electronic data.

“We will have a pretty sophisticated on-board computer with a 7-inch touch

screen and a GPS system that will be able to give us real-time statistics on just about every aspect of the car’s performance,” said ME student **Johnathon Gorski**. “A new, highly-modified fuel-injected engine, CNC aluminum uprights and new carbon fiber material throughout also distinguish our car this year.”

For more on the Shell Ecomarathon, see: <http://www.shell.com/home/content/ecomarathon/> ■



Computer Science grad student Bob Somers works on electronics in the cab of the Cal Poly Urban Concept Supermilage Car.



David Williams (ME) and Jose Garcia (ME) carry the body of the Cal Poly Urban Concept Supermilage Car.

Faculty Notes

Dean's Office

George Bekey, Research Scholar and Distinguished Adjunct Professor of Engineering, delivered a keynote address on the problems and challenges of STEM education in colleges and universities at the annual "Ethics and Education" conference in Sacramento, co-sponsored by Sacramento State University and Cosumnes College. He also presented "Military Robots: Recent Developments, Risks and Ethical Implications of Autonomous Systems" as part of the Disitnguished Lecture Series at the Navy Postgraduate School in Monterey.

Bekey has also joined other robotics scientists on the Board of Advisors for RoboDynamics Corporation. In this capacity he will work closely with the R&D team at the company while representing RoboDynamics at international conferences.

Matthew Cottle, assistant dean for Advancement, presented "Nonprofit Boards, Corporate Boards: Making the Most of Your Best Connections" at the Council for the Advancement and Support of Education District VII Conference in Los Angeles.

Aerospace Engineering

Rob McDonald, on sabbatical at NASA Langley in Virginia, is working in the Aeronautics Systems Analysis Branch researching aircraft design and advanced aircraft concepts. He presented two papers at the 49th AIAA Aerospace Sciences Meeting and Exhibit co-authored by student **Alejandro Ramos**: "Hermite TLS for Unstructured and Mesh-Free Derivative Estimation Near and on Boundaries" and "A Meshless Finite Difference Scheme for Compressible Potential Flows." McDonald was invited to speak at the conference on "Design Oriented Aero Analysis Using VSP, Mod-elcenter and PMARC."

Mechanical engineering professor helps develop composite Corn Board™

While on faculty at the University of Illinois at Urbana-Champaign (Illinois), mechanical engineering professor **Tom Mackin** helped develop a sustainable, structural composite technology that can remove CO2 from the environment, reduce CO2 emissions, and save millions of trees.

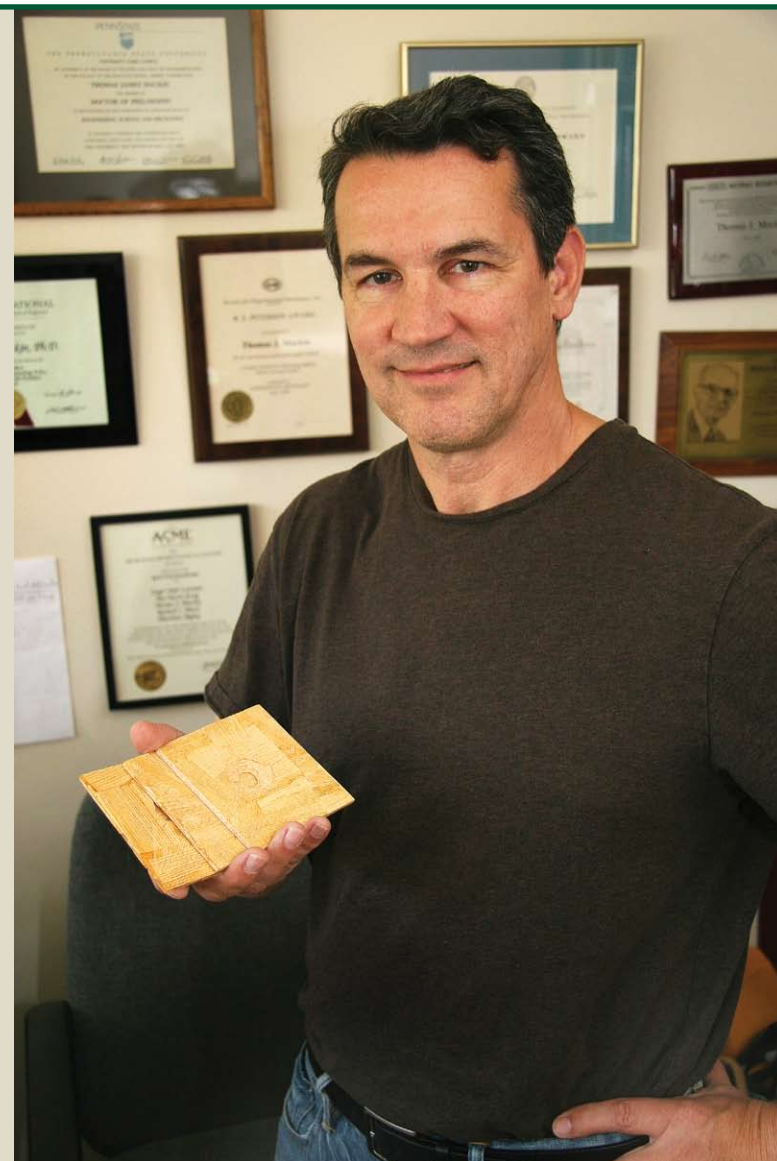
"Corn Board™" is the discovery of Mackin and fellow Univ. of Illinois inventors Dr. Nancy Sottos and Dr. Scott White. The product was recently licensed by Corn Board Manufacturing Inc.

Unlike wood composite board, Corn Board™ uses the husks and stalks (corn stover) remain in the field after corn is harvested. After this material is mixed with a polymer matrix, laminated, heated and pressed, the result is a product that can be used for building homes and making furniture, cabinets, and even longboard skate boards.

With over 86 million acres of corn grown annually in the U.S., and over 4,000 pounds of corn stover per acre left in the field, Corn Board™ offers a sustainable and environmentally-friendly new technology that helps decrease the release of CO2 into the atmosphere while decreasing the demand for precious timber resources.

For more information see <http://innovations.uillinois.edu/features/2010-09-30/illinois-technology-basis-unique-and-versatile-cor> ■

Mechanical engineering professor Tom Mackin holds samples of Corn Board™, a composite plywood-like material made from corn husks and stalks (stover).



Biomedical & General Engineering

Scott Hazelwood co-authored "The Effect of Cox-2 Specific Inhibition on Direct Fracture Healing in the Rabbit Tibia" in the *Journal of Orthopaedic Science* (Vol. 16, pages 93-98, 2011) and "The Biomechanics of Varied Proximal Locking Screw Configurations in a Synthetic Model of Proximal Third Tibial Fracture Fixation" in the *Journal of Orthopaedic Trauma* (Vol. 25, No. 3, pages 175-179, 2011).

Civil & Environmental Engineering

Tryg Lundquist, an affiliate with the Lawrence Berkeley National Laboratory, Cal Poly lecturer **Ian Woertz** (B.S./M.S.

ENVE '08), and others co-authored a widely-discussed report from the Energy Biosciences Institute (EBI) in Berkeley titled, "Algae: Around the corner, or 10 Years Away?" The report posits that development of cost-competitive algae biofuel production will require much more longterm research, development and demonstration. The report can be accessed from the Cal Poly Digital Commons at works.bepress.com/tlundqui/.

Damian Kachlakev co-authored the following papers:

- "Adaptive Distance Learning Programs Based On Feedback Evaluation And Continuous Progress Assessments," in the *International Journal of Management and Information Systems* (Volume 14, Number 2, Second Quarter 2010, pp.27-30);
- "Analytical Model of Reinforced Concrete-Timber Floor System Retrofit-

ted With FRP Laminates in Steel and Timber Structures," Proceedings, UACG, Sofia, Bulgaria;

- "Composite Reinforced Concrete-Timber Floor System Externally Strengthened With CFRP Composites in Structural Faults and Repair," Proceedings (ISBN 0-947644-67-9, Edinburgh, UK);

- "Offering A Smart Learning Environment: Personalized Distance Education Based On Integration With A Holistic Feedback Evaluation And Continuous Progress Assessment" at IADIS International Conference On Mobile Learning, Porto, Portugal.

Kachlakev co-authored the Final Report on "Durability of Plastered Swimming Pool, Phase VII: "Cyanuric Acid Concentrations- Long Term Studies; Evaluation of "Super-Mixes"- Long Term Studies; Calcium Nodule Growth Effects-Long Term Studies" submitted

to the National Plasters Council, and undertook research with Dr. Corinne Lehr on "IPSSA Protocol- Phase One" sponsored by the Independent Pool and Spa Association. He consulted on the seismic retrofit of a railroad bridge in the Euro Corridor E79.

■ ■ ■
Robb Moss published "Reduced Sigma of Ground Motion Prediction Equations through Uncertainty Propagation" in the *Bulletin of Seismological Society of America* (Vol. 101, no. 1). He also co-authored two papers published by the ASCE Geofrontiers Conference in Dallas, TX, including: "Shake Table Testing of Seismic Soil-Foundation-Structure-Interaction"; and "Seismic Response of Peaty Organic Soils as a Levee Foundation Material."

■ ■ ■
Ashraf Rahim and **Dan Jansen** published "Overview of High-Molecular-Weight Methacrylate for Sealing Cracks in Concrete Bridge Decks" in the *Transportation Research Record Journal* (No. 2202, Dec. 2010). Rahim collaborated with researchers from UC Davis and CSU Long Beach on a Caltrans project to develop guidelines on soil stabilization. He also secured a \$48,000 grant from Leonard Transportation Center (LTC) to investigate moisture sensitivity of Asphalt Mixes.

■ Computer Science & Software Engineering

Franz Kurfess, **John Seng** and others co-authored "Semantically-Enhanced Information Extraction" published at the 2011 IEEE Aerospace Conference in Big Sky, MT. Kurfess, Seng and others also published "Partnering Enhanced-NLP with Semantic Analysis In Support of Information Extraction" at the 2nd International Workshop on Ontology-Driven Software Engineering (ODiSE 2010) at the ACM SPLASH 2010 Conference in Reno, NV.

At a Stanford symposium, Kurfess presented "Spatial Interactions between Humans and Assistive Agents" (published in *Help Me Help You: Bridging the Gaps in Human-Agent Collaboration*, edited by Maheswaran R, Schurr N, Szekely P, AAAI Press, Stanford/Palo Alto, CA.

■ ■ ■
David Janzen received a \$10,000 grant from Google to develop educational

materials for App Inventor in Android, and a Google Faculty Research Award, which includes funding and 45 Android Phones, for a project on "App Inventor to Android with WebIDE." Janzen also received two years of cloud computing services as an Amazon Web Services in Education Research Grant for the WebIDE project.

Intuit provided prizes for Janzen's Android App Contest in CPE/CSC409, Janzen's course in "Special Topics in Software Engineering: Android Application Development." His students produced 17 Android apps. The winners included the following:

- **Adriel Fuad** and **Henrietta Wong** won 1st Place for Where's My Book (<https://market.android.com/details?id=wheres.my.book>); each received a Motorola Xoom Android Tablet;
- **Jeffrey Brown** and **Zach Negrey** won 2nd Place for SLO Bus Mapper (<https://market.android.com/details?id=edu.calpoly.android.SloBusMapper>); each received a Kindle 3G;
- **Brian Norman** and **Russell Mezzetta** won 3rd Place for Roomie Tab (<http://www.roomietab.com/android/>); and each received a \$25 Best Buy Gift Card.

■ Electrical Engineering

Dennis Derickson, chair, received a \$21,400 grant from ViaSat Inc. for 140 educational robots. Electrical and computer engineering freshmen will use the equipment to learn basic computer programming skills and to prepare for an Open House robotics competition.

■ ■ ■
Xiaomin Jin and graduate student **Sim-eon Trieu** published "Study of Top and Bottom Photonic Gratings on GaN LED with Error Grating Models" in the *IEEE Journal Quantum Electronics* (Vol. 46, no. 10, pp. 1456-1469, 2010). Jin presented "Top Transmission Grating GaN LED Simulations for Light Extraction Improvement" at the SPIE International Symposium on Integrated Optoelectronic Devices 2009 and at SPIE Photonic West 2011 in San Francisco. The paper was co-authored by Trieu and Bei Zhang, Xiang-Ning Kang, Guo-Yi Zhang, Xiong Chang, Wei Wei, Sun Yong Jian, and Fu Xing Xing.

■ ■ ■
Taufik co-authored "A Review of Sensing Techniques for Real-time Traffic Surveillance" published in the *Journal of Applied Science* (Vol. 11, No. 1, pp. 192-

198, 2011). He also published numerous papers in conference proceedings, including:

- "Comparative Study of 4-Switch Buck-Boost Controller and Regular Buck-Boost" and "A Bidirectional Fly-back Topology for an Off-Line Battery Charger/Discharger" at the International Conference on Advanced Science, Engineering and Information Technology held in Kuala Lumpur, Selangor, Malaysia;
- "Comparative Analysis of Two-Switch and Four-Switch Buck-Boost Controllers" and "Pembangkit Pulsa Tegangan Tinggi Untuk Pasteurisasi PEF Dengan Pengaturan Waktu Dan Tegangan" at the 5th Electrical Power, Electronics, Communication, Control and Informatics Seminar in Kuwait;
- "A New Multiphase Multi-Inter-

leaving Buck Converter With Bypass LC," "A New AC-DC Converter Using Bridgeless SEPIC" and "Application of Differential Evolution to Determine the HEPWM Angles of a Three Phase Voltage Source Inverter" at the 36th Annual Conference of the IEEE Industrial Electronics Society in Phoenix;

- "Optimization Techniques of Hybrid Renewable Energy System: A Review" and "Product Quality Inspection Based on Machine Vision System" at the 2nd Makassar International Conference on Electrical Engineering & Informatics;
- and "Analysis and Simulations of Z-Source Inverter Control Methods" at the 9th International Conference on Power and Energy in Singapore.

Materials engineering chair researches engineering ethics

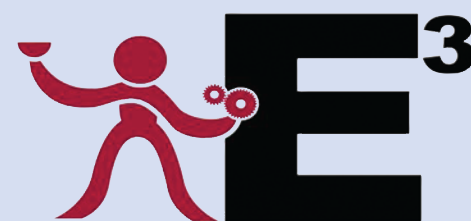
MATE chair **Trevor Harding** has undertaken a project to better prepare students to be ethical professionals. The National Science Foundation is sponsoring the collaboration between Harding and researchers from University of Michigan, Lawrence Technological University, and Carnegie Mellon.

"As educators, we have a duty to make sure our graduates will become ethical professionals when they enter the workforce," said Harding. "It is particularly critical for engineering programs to produce ethical engineers because they protect the health, safety, and welfare of the public."



Trevor Harding
(MATE)

reported Harding. "By providing students with the right opportunities, institutions can produce more ethical graduates. We're also conducting a series of national workshops to increase awareness and hopefully influence institutional policy." ■



Exploring Ethical decision making in Engineering

To determine how universities can improve their students' ethical decision-making capabilities, the researchers conducted the Survey of Engineering Ethical Development (SEED). The project is the first nationwide assessment of engineering ethical development and included focus groups and interviews with hundreds of administrators, faculty and students from 18 diverse partner institutions. In addition, nearly 4000 engineering undergraduates completed the online SEED instrument.

"Our findings suggest that the number and type of curricular and co-curricular (i.e. out of class) experiences influence a student's ethical development,"

Industrial & Manufacturing Engineering

Jianbiao (John) Pan directed graduate students **Ron Sloat** and **Doug Smith** on a project sponsored by Western Digital to develop a non-contact angular system to measure Pitch Static Attitude (PSA) and Roll Static Attitude (RSA) of hard drive slides. Pan and materials engineering graduate student **Patrick Hyland** gave a presentation on "Effect of Gold Content on the Microstructural Evolution of Lead-free Solder Joints under Isothermal Aging and Vibration/drop Conditions" to the Surface Mount Technology Association (SMTA) Silicon Valley Chapter.

Materials Engineering

Kathy Chen was invited to attend the Nanoscale Informal Science Education network (NISEnet) meeting. Chen, Roberta Herta (School of Education), and colleagues from Olin College were awarded an NSF Transforming Undergraduate Education in Science, Technology, Engineering and Mathematics (TUES) grant for a three-year investigation on "Understanding Students' Development and Deployment of Lifelong Learning Skills." This project seeks to improve the STEM educational community's understanding of how students develop the skills and attitudes necessary for self-directed and lifelong learning.

Chen accompanied 20 MATE students to the TMS Annual Meeting in San Diego, where the group took a tour of Solar Turbines and participated in a MATE alumni gathering.

Mechanical Engineering

Russ Westphal and **Rob McDonald** (AERO) received a \$30,000 extension to the grant they have from Edwards Air Force Base for research on a flight test platform project.

Xi Wu, **Jim Meagher**, and graduate student **Andrew Sommer** published two papers at the prestigious IMAC XXIX, a Conference and Exposition on Structural Dynamics sponsored by the Society for Experimental Mechanics and held in Jacksonville, FL: "A Differential Planetary Gear Model with Backlash and Teeth Damage"; and "An Advanced Numerical Model of Gear Tooth Loading from Backlash and Profile Errors." More information can be found at <http://www.sem.org/CONF-IMAC-TOP.asp>. ■



Amelia Earhart touring the Aeronautical Lab in the summer of 1936. From left to right: M.C. "Marty" Martinsen, Head of Aeronautical Engineering; Paul Mantz, Famed Hollywood stunt pilot, Earhart friend, and technical advisor for Earhart's around-the-world flight; Phillip Jensen (AERO '36); Earhart; and Harley Smith (AERO '36).

75th Anniversary of a historic visit to Cal Poly

Seventy-five years ago this June famed aviator Amelia Earhart visited Cal Poly on an "unofficial inspection tour" of the Cal Poly Aviation Department. Although it was not known publicly at the time, Earhart was already planning what would be her last flight, an attempt to be the first pilot to circumnavigate the globe.

To commemorate her visit, faculty from the Aerospace and Mechanical Engineering departments are writing a history of the event and compiling an archive of memorabilia from that day. And we need your help. If you have any information or know of any items related to the event, contact Prof. **Glen Thorncroft** at the Department of Mechanical Engineering, gthorncr@calpoly.edu or 805.756.1334. ■

1960s

Thomas Moran (ME 1965)

ME alum publishes book on engineering and writing

Thomas Moran, a professor at the Rochester Institute of Technology, published *Engineers Can Write! — Thoughts on Writing from Contemporary Literary Engineers*. This IEEE-USA E-Book explores differences and similarities between writing and engineering, and offers tips for conceptualizing writing to improve reports, articles, proposals and other documents. The book examines engineers who became well known writers, such as Henry David Thoreau, Eric Ambler, Nevil Shute, Fyodor Dostoevsky and Norman Mailer. These “literary engineers” have won critical acclaim and include Cal Poly ME graduate **Brad Henderson**. The book is available through the IEEE at <http://www.ieeeusa.org/communications/ebooks/>

A short article on Henderson, who now teaches at UC Davis, is available at <http://writing.ucdavis.edu/news-1/brad-henderson-in-new-ebook-about-writing-and-engineers>



Burt Rutan (AERO 1965)

Poly grad who designed 1st private manned spacecraft is retiring

— *The Tribune*

Aerospace maverick and Cal Poly graduate **Burt Rutan**, who designed the historic globe-circling Voyager aircraft and the first private manned rocket to reach space, will retire next year. Rutan, 67, announced his plans recently on the website of Mojave-based Scaled Composites LLC, which he founded in 1982.

http://www.scaled.com/images/uploads/news/Burt_Rutan_Announces_Retirement_Plans_03Nov10.pdf

ALSO, KCOY, Nov. 3, 2010
<http://www.kcoy.com/Global/story.asp?S=13439173>

IME's Olympic gold medalist named to Cal Poly Hall of Fame

Stephanie Brown Trafton has hurled her way into the Cal Poly Athletic Hall of Fame. The 2004 Industrial and Manufacturing Engineering grad who became the first Olympic gold medalist in Cal Poly history when she won the women's discus at the 2008 Summer Games in Beijing, was named to the Hall of Fame in October.

It was the latest in a long list of honors for Brown Trafton, a three-time state discus champion at Arroyo Grande High School who also played basketball at Cal Poly before an injury ended her hoops career. She received the 2008 Jesse Owens Award as female track and field athlete of the year in the United States after winning the Olympic title with a mark of 212 feet, 5 inches.

At Cal Poly, Brown Trafton set and still holds school records of 57-0 in the shot put and 189-7 in the discus. She was a seven-time Big West champion — four in the shot put and three in the discus — and three times earned NCAA All-America honors in outdoor track and field, placing seventh in the shot put in 2001, fourth in the discus in 2002 and fourth in the shot put in 2003. She was named Cal Poly's Female Athlete of the Year in 2003.

Brown Trafton, currently the director of operations for the Sacramento State track and field teams, also competed in the 2004 Summer Olympics in Athens, Greece, placing 11th in the first of two groups in the prelims and 22nd overall with a mark of 192-1. ■



Stephanie Brown Trafton (IME '04), who won the Olympic gold medal in the discus in 2008, was named to the Cal Poly Hall of Fame.

ALSO, EAA.org
http://www.eaa.org/news/2010/2010-11-04_rutan.asp

1970s

William Gaines (ME 1972)

New life for old engines

— *Chico News Review*

Two years ago, in October 2008, **Bill Gaines**, the chairman of TransferFlow, a Chico manufacturing facility, and some of his engineers began thinking about diesel engines—specifically, stationary and portable engines, the kinds on agricultural pumps and farm equipment. . . . Because of new California Air Resources Board (CARB) regulations, most of these engines are out of compliance. They emit too many particulates, or soot—that lung-damaging, carcinogenic black stuff diesel engines give off. . . . Diesel engines last a long time. Older engines are well worth saving. Gaines and his crew saw an opportunity.

<http://www.newsreview.com/chico/content?oid=1865869>



Jim Hillmann (CSC 1979)

He walks and walks and walks to beat breast cancer

— *Porterville Recorder*

Walking for a cure. That's what former Porterville and Terra Bella resident **Jim Hillmann** has been doing in a big way to benefit the Susan G. Komen organization's effort to cure breast cancer. <http://www.recorderonline.com/articles/walks-2120-pvillevarsity-cure-walking.html>

1980s

John Cummins (EL 1984)

DisplayLink names John Cummins V.P. of Worldwide Sales

— *BusinessWire.com*

With third-generation virtual graphics processors on the horizon and massive existing momentum, DisplayLink Corp. has expanded its leadership team to further accelerate and support global growth. **John Cummins** has been

named DisplayLink's vice president of worldwide sales.

<http://www.businesswire.com/news/home/20101004006554/en/DisplayLink-Names-John-Cummins-Vice-President-Worldwide>



Farzad Nazem (CSC 1981)

Apixio, Inc. appoints new board member

— *Biloxi Sun Herald*

Apixio Inc., the leading provider of search solutions for standards based clinical information, announced the appointment of **Farzad (Zod) Nazem** to the company's Board of Directors and to the newly created position of Platform Thought Leader. . . .

<http://www.sunherald.com/2011/02/17/2871019/apixio-inc-appoints-new-board.html#>

ALSO, Business Wire, Feb. 17, 2011
<http://www.businesswire.com/news/home/20110217005217/en/Apixio-Appoints-Board-Member>

EE grad named fellow of Institute of Electrical and Electronic Engineers

Douglas Baney (B.S., Electronic Engineering, 1981) was named a Fellow of the Institute of Electrical and Electronic Engineers (IEEE). Baney is manager of Agilent Technologies' measurement and sensors department. He is recognized for technical and leadership contributions in a variety of areas, including inventing and developing the world's first laser mouse - a now-common computer accessory. Read more about Baney in *Trading Markets* ■



Douglas Baney
(EE '81)

CE alum Josue Vaglienty named ASCE's Young Engineer of the Year

Josue Vaglienty was named Young Engineer of the Year by the American Society of Civil Engineers (ASCE) Orange County Branch at their annual awards dinner. The ASCE OC award ceremony honored outstanding engineers and civil engineering projects and befittingly kicked off National Engineers Week, February 20 - 26.

Vaglienty, a 2003 Cal Poly civil engineering graduate, is an Associate in RBF's Transportation Engineering service group and devotes many hours of volunteer service. He has served the Orange County ASCE Younger Member Forum (YMF) and is currently the Chair of the K - 12 Outreach Program for the Orange County Branch of ASCE. He is also an active member of Engineers Without Borders, Orange County Chapter and ACE (Architecture, Construction, & Engineering) Mentoring Program, Los Angeles Chapter.

See <http://www.live-pr.com/en/rbf-consulting-s-cindy-miller-and-josue-1048760146.htm> ■



Dan Riordan (EL 1985)

ThinkHR Corporation appoints Dan Riordan as Chief Operating Officer

— 24-7

ThinkHR Corporation, the largest national HR firm specializing in wholesale insurance broker distribution, today announced the appointment of **Dan Riordan** as Chief Operating Officer.

<http://www.24-7pressrelease.com/press-release/thinkhr-corporation-appoints-dan-riordan-as-chief-operating-officer-196774.php>

1990s

John Cole (ENVE 1992)

Alum receives promotion in national CPA and consulting Firm

— *San Francisco Chronicle*

John Cole is one of five new principals for Novogradac & Company LLP, a national CPA and consulting firm headquartered in San Francisco with 12 offices nationwide. Cole was promoted to the company's office in Austin, Texas.

Cal Poly Engineering alumnus named California's Fire Chief of the Year

Douglas A. Williams began his career in fire protection as an Explorer Scout in high school and worked as a firefighter while earning his degree in industrial engineering at Cal Poly.

After 25 years in the field, his contributions have earned him the title of Fire Chief of the Year. The award was presented by the California Fire Chief's Association on September 20 at the annual association conference in Riverside, Calif.

Williams, a 1979 Cal Poly industrial engineering graduate, serves as chief of the Rincon Valley Fire Protection District (RVFPD). In presenting the award, Darrel Mead, chair of the RVFPD Board of Directors, called Williams a "true leader" and "change-agent in the fire service."

A past president of the Sonoma County Fire Prevention Officer's Association, Williams served as Fire Marshal for 11 years, before becoming fire chief in 1996. In those capacities, he helped institute a countywide fire code and lead the effort to require fire sprinkler systems.

Throughout his career, Williams has sought to improve public safety by creating partnerships with other organizations, such as the Redwood Empire Association of Code Officials, and he has been an active member and volunteer leader in a wide variety of community and service groups as well as local, state and national fire service organizations.

Although Williams worked as an industrial engineer for several years after receiving his Cal Poly degree with A. O. Smith Corporation and Hewlett Packard, his senior project reflected his ongoing interest in fire protection. "My senior project was focused on the consolidation of fire protection agencies," says Williams, who credits the support of Professor Don Kahn, who helped put "the theoretical applications into a practical form."

"The late Dr. Don Morgan, department head, was also extremely supportive and helped provide the inspiration needed to progress," Williams notes. "Indeed, every faculty member in the industrial engineering depart-



Douglas A. Williams (IE '79) was named Fire Chief of the Year by the California Fire Chief's Association. He currently serves with the Rincon Valley Fire Protection District.

ment helped support my progress."

In addition to the mentorship Williams received while at Cal Poly, he also explains that his engineering education also provided excellent preparation:

"The industrial engineering degree helped prepare me to solve problems analytically. Some of the core functions of industrial engineering deal with the expected probabilities of various functions that can be used to determine the more efficient outcomes. In the case of fire protection, the events are more or less random, but tend to follow certain patterns. When determining the best methods for deploying resources it is helpful to be able to use the more scientific processes in doing the analysis. Several years ago, an article in one of the fire service magazines included an analysis of the European fire service and noted that every fire chief surveyed had a degree in industrial engineering."

Asked to identify his career highlight, Williams said, "In many ways the highlight has been the ability to participate in productive change at the state and national level and the influence it has in delivering emergency service." ■

Read more about Cole and company in the *San Francisco Chronicle*. <http://www.sfgate.com/cgi-bin/article.cgi?f=/g/a/2010/12/16/prweb8027907.DTL>

2000s

Thomas Akers (AERO 2001)

Unmanned aircraft manufacturer expands in San Luis Obispo

— KCOY/KKFX

One of the world's leading producers of unmanned aircraft is based in San Luis Obispo and Tuesday marked a new beginning for the thriving company. It was the grand opening of its new headquarters. Two Cal Poly students founded Aeromech Engineering in 1999.

<http://www.sanluisobispo.com/2011/03/01/1503488/biz-buzz-aeromech-engineering.html#>

Vanessa Apodaca (CE 2006)

Engineering grad hired as engineer for Angels Camp

— Calaveras Enterprise

Vanessa Apodaca (B.S., Civil Engineering, 2006) has replaced Gary Ghio as the engineer for Angels Camp, Calif. Apodaca was unanimously hired by the City Council and plans to dive right into Angels Camp projects.

Read more at http://www.calaverasenterprise.com/articles/2010/12/20/news/news02_engineer.txt

Angelica Boggs (CSC 2000)

The founder of math learning center is "making math make sense" www.mathnasium.com.

— Santa Clarita Signal

Angelica Boggs explains that she opened her company "to help kids get the most of their math education, so they can feel confident enough to pursue careers in engineering."

Read more at <http://www.the-signal.com/section/45/article/39733/>

EE alum Einar Larsen selected to the National Academy of Engineering

Einar Larsen has had a career of distinction with GE Power System Engineering in Schenectady, NY, where he has worked since graduating from Cal Poly in 1974. His work has included the invention and application of flexible AC transmission systems devices, which have lead to the enhanced performance of the electric power grid.

This achievement has earned him membership in an exclusive club: the National Academy of Engineering.

Election to the NAE is perhaps the highest honor that can be accorded to an engineer. Inductees are those who have made outstanding

contributions to "engineering research, practice, or education," or who have "pioneered new and developing fields of technology, made major advancements in traditional fields of engineering, or developed innovative approaches to engineering education." To date, NAE membership totals 2,267 U.S. individuals and 196 foreign associates.

In addition to his Cal Poly undergraduate degree, Larsen holds a master's degree from Rensselaer Polytechnic Institute. Currently a director for systems engineering at GE, his work has focused on applying new equipment to power grids. Larsen is also a Fellow of IEEE. ■



Einar Larsen
(EE '74)

AERO alum jumps into human-powered helicopter competition



Neal Saiki (B.S. AERO 1990, M.S. AERO 1993)

Founder Neal Saiki leaves Zero Motorcycles

MotorcycleUSA.com

The founder of Zero Motorcycles, Neal Saiki (B.S. AERO 1990, M.S. AERO 1993), is leaving his electric motorcycle startup to venture into an even more innovative project – human-powered flight. The former NASA engineer started Zero in his Scotts Valley, California garage back in 2006, with the company blossoming into one of the industry leaders in the nascent electric motorcycle industry. Saiki's previous accomplishments included successful designs in the mountain bike industry, but before all the bike projects he helped develop the self-propelled Da Vinci III helicopter as a Cal Poly engineering student.

<http://www.motorcycle-usa.com/750/9399/Motorcycle-Article/Founder-Neal-Saiki-Leaves-Zero-Motorcycles.aspx> ■

Neal Saiki founded Zero Motorcycles with his wife in their California garage in 2006. The company produces the largest lineup of electric motorcycles including the new Zero XU. Photo courtesy of Zero Motorcycles.

Michael Brim (EE 2010)

Black Friday is now brimming with possibilities

— Detroit Examiner

Michael Brim created the Black Friday-focused site bfads.net in his dorm room at Cal Poly. He credits the start of his business to his landing a free \$50 Phillips CD burner. While a freshman at Cal Poly, Brim was sought out by television outlets far and wide who wanted to tell the story of a young entrepreneur who was cashing in on Black Friday Deals.

<http://www.examiner.com/city-buzz-in-detroit/google-s-new-hot-trends-tracks-black-friday-hits-and-kmart-lay-away-part-2-of-3>

[tracks-black-friday-hits-and-kmart-lay-away-part-2-of-3](http://www.examiner.com/city-buzz-in-detroit/google-s-new-hot-trends-tracks-black-friday-hits-and-kmart-lay-away-part-2-of-3)

Kyle Wiens (CSC 2005) and Luke Soules (IE 2006)

Is Apple expanding use of new tamper-resistant screw for its iPhone?

— Network World

Apple is switching to an unusual and rare type of exterior screw for its iPhone and other mobile products, making it much harder for users to take them apart and fool around with the internals,

according to a Website that specializes in dissecting popular electronic devices. To counter this "diabolical plan to screw your iPhone," iFixit.com is offering a \$10 kit with a matching screwdriver for the new screws, and standard Philips screws, so end users can remove the tamper-resistant hardware and install tamper-encouraging hardware. ... The Website (iFixit) was launched in 2003 by Kyle Wiens and Luke Soules, then engineering students at Cal Poly, San Luis Obispo, Calif.

<http://www.networkworld.com/news/2011/012011-apple-screws-ifixit-iphone4-macair.html> ■

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Our Friend Clint Schwieker Passed Away in 1995



UNIVERSITY ARCHIVES, CAL POLY

This year he's helping students conduct hands-on experiments in the Thermal Science Lab

In appreciation of the Learn by Doing education he received at Cal Poly, Clint Schwieker (B.S., ME, '69; M.S., Eng, '86) included the College of Engineering in his will. His gift funded a vapor-compression refrigeration system that students use today. The system is equipped with venturi flow meters designed and built by mechanical engineering students, testament to the hands-on culture Clint believed in. Remembering Cal Poly in your estate planning is an effective way to support Learn by Doing, the cornerstone of a Cal Poly education. Our planned giving experts can help friends and alumni like you leave a lasting legacy that will support the next generation of innovative leaders and resourceful professionals.



For sample bequest language you can share with your estate planning advisor, visit www.plannedgiving.calpoly.edu or contact Cal Poly's Planned Giving Office.

PHONE: 805-756-7125 | **TOLL-FREE:** 800-549-2666 | **EMAIL:** plannedgiving@calpoly.edu

ENGINEERING Advantage

Engineering Advantage is a biannual publication of the College of Engineering, Cal Poly San Luis Obispo. Editorial Staff: Amy Hewes, publications director
Photography & Design: Dennis Steers

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