A commitment to change the world

Cal Poly and CENG incorporate sustainability in theory, in practice and in the classroom

On Earth Day 2004, Cal Poly President Warren Baker signed the Talloires Declaration, an action plan for incorporating sustainability and environmental literacy in teaching, research, operations and outreach at colleges and universities. Today, the university and the College of Engineering (CENG) have made sustainability a top priority.

CENG Dean Mohammad Noori comments, “We are serious about sustainability, and not just because we believe in the need for environmental literacy, which is vital, but also because resource limitations are a reality in our rapidly changing global landscape. Engineering that is practical and economical requires consideration of societal, ethical, political, environmental, and sustainability issues. I believe the College of Engineering can once again emerge as the national leader of this new engineering paradigm.”

This article explores CENG’s wide-ranging sustainability efforts, including projects, clubs, coursework, and the establishment of the Center for Sustainability in Engineering (CSiE).

Recyclability Index for Automobiles

When Alex Tsuji looks at a pile of junked old cars, he sees enormous possibilities for parts and resource recycling. “New cars are graded on fuel efficiency; why not also post a grade for recyclability? That would em-

Alex Tsuji (ENVE) received a $10,000 grant for his proposal to establish a recyclability index for automobiles. An index “would empower consumers to make environmentally responsible decisions,” Tsuji says.

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Engineering plaza set to break ground

While Engineering IV and the Bonderson Student Project Center are taking shape dramatically around it, Phase I of the Engineering Plaza is scheduled to break ground this spring. Designed by award-winning landscape architect Jeffrey Gordon Smith to honor the past, celebrate the present and impact the future, Engineering Plaza allows CENG students, alumni and boosters to purchase and inscribe tiles to express their thoughts, appreciation and thank-you’s.

Three hundred and twenty-two friends of the college became Plaza Members in Phase I, contributing more than a quarter-million dollars to get this remarkable project off the ground. For those interested in Phase II who missed the initial paving stone offering, an interest list is now forming. To place your name in the queue, contact Michelle Jenkins at mjenkins@calpoly.edu or visit ceng.calpoly.edu.

Below: Concrete workers smooth the concrete foundation of Engineering IV, a three-story, 104,000 square foot building that will include classrooms and labs for the CE/ENVE, ME and IME departments.
Dean Mohammad Noori is exhilarated by the sounds of construction resounding throughout the College of Engineering. To his ears, pneumatic drills and hammering not only mark the rise of the Bonderson Projects Center and Engineering IV, but they also signal a new level of prominence—and new funding needs—for the College of Engineering.

“To fully equip our new learning centers and to meet our goals as a preeminent engineering college, we have outlined a set of immediate funding priorities for our annual, $10-million, Maintain the Momentum campaign,” says Noori.

According to the dean, the following priorities have been identified in consultation with the university, faculty, and key industry leaders and alumni who serve on the Dean’s Advisory Council and Maintain the Momentum campaign committee:

- State-of-the-art equipment and technology for the Bonderson Projects Center and Engineering IV;
- Student scholarships, especially merit-based freshmen grants to help CENG attract top-notch students;
- Graduate student fellowships and scholarships to strengthen CENG’s master’s degree programs; and
- Endowed professorships and faculty research support grants to nurture outstanding faculty.

“State funding allows us to turn on the lights and hire teachers, but it does not cover those areas that mark us as an institution of distinction,” explains Noori. “I know, however, that the college can realize its potential as a national leader in engineering education with the support of our loyal alumni, and generous friends and industry partners.”

Clockwise from upper left: painters work on the frame of the Bonderson Student projects center; ironworkers erect the Bonderson Building’s skeleton; Paul Bonderson (EE, ’75) and his wife Sandra check out the construction; a large elm tree was incorporated into the site; a view of the construction from the roof of the Kennedy Library.
New engineering building named for refrigeration pioneer

Recently completed Engineering III is now the “Grant M. Brown Engineering Building”

Last fall, young Brown family children skipped and squirmed in the halls of Cal Poly’s newly opened engineering building, but they seemed impressed when a veil was pulled to reveal a plaque memorializing their family predecessor, Grant M. Brown.

Engineering III, distinguished by its curved glass facade, became the “Grant M. Brown Engineering Building” in honor of the generous donations of the Brown Family Foundation.

The Brown gift includes $200,000 to fund student scholarships and $300,000 in equipment. In addition, the multidisciplinary project-based learning. Over 60 family members and university representatives were on hand for the dedication.

The Grant M. Brown Engineering Building contains...
Poly Canyon Village to double on-campus student housing

Impressive for its historical size and cost, Poly Canyon Village will usher in a new era of student housing at Cal Poly when the first half of the project opens in the fall of 2008.

With an estimated cost of $239 million, the 2,670-bed dormitory project is the largest ever approved in the 23-campus California State University system.

“This is a very exciting project for the future of the university, as it will double the on-campus student housing currently available,” said Cal Poly president Warren Baker at the groundbreaking ceremony in March. “This state of the art village will allow us to assure every sophomore and freshman will have housing on campus.”

Poly Canyon Village, which was initially proposed in 2003 and was approved by the CSU trustees in 2005, will be built on 30 acres north of Brizzolara Creek at the southwestern edge of Caballo Peak. Among the project’s highlights:

- Nine separate buildings with 822,000 square feet of housing.
- Two parking structures with room for approximately 1,900 cars.
- 2,670 beds divided among 619 four-, five-, and six-person apartments.
- An Olympic-sized swimming pool and a Recreation Center.
- Retail space for a market, student store and other businesses.

Poly Canyon Village apartments will be delivered in two phases, with occupancy scheduled for fall 2008 and fall 2009.

Cal Poly SHPE wins national competition — again

For the fourth straight year, Cal Poly’s student chapter of the Society of Hispanic Professional Engineers (SHPE) has earned first place in a national design competition.

Cal Poly teams finished first, third and fourth in the student chapter design contest at the SHPE National Technical Career Conference in Orlando, Florida, in January. The first-place team, which included mechanical engineering students Frank Lopez and Flavio Acosta, business student Daisy Cisneros, and electrical engineering students Bruce Lozano, Enrique Quijutero and Ruben Rodriguez won for their design for a Sound-Activated Baby Mobile.

“Along with providing a sound monitoring system for parents, our all-in-one system utilizes a sound sensor to determine when a baby is crying and activates a motorized mobile, crib light and music,” says Acosta. “The judges liked our idea, our implementation and the presentation of our marketing plan.”

Acosta says inspiration for the project came from Lopez, the team leader, who has a sister who recently had a baby, and says Cal Poly’s history of success at the conference served as motivation for his group. “We definitely wanted to keep our winning tradition,” he says. “The conference is huge for us, with hundreds of workshops and lots of networking with Hispanic engineers from all over the country. We’re proud to have kept the winning streak going at such an important event.”

The third-place team from Cal Poly designed a “Universal Vibrating Foot Sleeve” and was comprised of team leader Miguel Cabrera, Miguel Hernandez, Lucas Oliveira, Mark Welch, Aric Stone and Jarubutr Dansilasiriathavorn. The fourth-place team, which designed “The Ultimate Motorcycle Navigation Kit,” included Alex Padilla, Veronica Cuevas, Richard Gomez and Jesus Diaz.

Information on Cal Poly’s SHPE chapter is available at www.csc.calpoly.edu/~shpe. The national SHPE site is oneshpe.shpe.org.
power consumers to make environmentally responsible decisions and push the manufacturers to design for recyclability,” says the environmental engineering grad student.

That’s the gist of Tsuji’s 4+1 B.S./M.S. project, to create a “recyclability index” for automobiles, a rating system for the ecological impacts of vehicles based on recyclability, toxic material content, and ultimate disposal.

Tsuji’s idea won a $10,000 grant from the EPA as part of its P3 Award: “A National Student Design Competition for Sustainability focusing on People, Prosperity, and the Planet.” Tsuji is using the money for data collection and to travel to conferences around the world. Last fall and winter he met manufacturers at the Automobile Recyclers Association Conference in Tucson and the Eco Design Conference in Tokyo. In March, Tsuji traveled to Amsterdam for an international congress, and in June, he will attend the Air & Waste Management Association meeting in New Orleans, where he’s been asked to present a paper on his findings.

“It blows my mind how big this issue is,” says Tsuji. He explains that each year 10 to 11 million vehicles are “retired” in the United States, producing 4.5 to 5 million tons of Automotive Shredder Residue (ASR), which is disposed in landfills.

Tsuji is developing his rating system with guidance from industry professionals and a multidisciplinary team of Cal Poly professors, including Yarrow Nelson (ENVE), Hal Cota (ENVE), Andrew Kean (ME), Linda Vanasupa (MATE), Sam Vigil (CE/ENVE), Margo McDonald (Arch) and Deanna Richards, director of CENG’s Center for Sustainability in Engineering (CSiE). The project will be included into an eco-product/life-cycle-assessment class in the Materials Engineering Department and in a senior-level ENVE pollution prevention class.

In May, Tsuji will join more than 350 other P3 Phase I grant recipients in Washington, D.C., for the National Sustainable Design Expo. The P3 Award winners will receive $75,000 in additional funding to further develop their projects.

Cal Poly Engineers Without Borders works on water project in Thailand

This winter, Cal Poly’s Engineers Without Borders (EWB) successfully completed its first international project — installation of a drinking water treatment system for the hill tribe village of Mae Nam Khun (MKN) in Thailand.

EWB at Cal Poly was founded in 2004 to undertake projects that bring sustainable, long-term benefits to impoverished communities. The group’s Thailand project began in March 2005 with an assessment of MKN’s drinking water system by project managers,

Michael Borger and Eileen Mick. After reviewing the data, Borger did a second assessment before the entire EWB team came up with a solution.

“In order to reduce the incidence of illness among children of Mae Nam Khun and to improve the sanitation of the village, we decided to construct a slow sand filtration system,” explains current EWB president Tricia Compas. “We installed a prefabricated system, but we hope the village will be able to construct its own design one day using locally available environmental and economically sustainable materials.”

The Mae Nam Khun Project was entirely financed through fundraising events and the gracious support of friends, family and local engineering firms, including Gregg Drilling, Wallace Group, Boyle Engineering, and Unocal.

Sustainable Power for Electrical Resources (SuPER) Project

SuPER began with an epiphany: “While watching a PBS program, I suddenly realized that sustainable energy is key to raising the standard of living for the world’s poor people,” says EE Professor Jim Harris. This led to a project to develop a low-cost, sustainable source of electrical power with a 20 year life cycle that can be owned by a family unit.

“This technology will provide access to electrical power through free market mechanisms, as opposed to governmental aid,” explains Harris. “The technology is based on solar photovoltaic source, battery storage, and a standard DC output.”

The project involves system engineering, embedded system design, controls, power electronics, digital design, and power protection, making it ideal as a focus for master’s theses and senior projects. In fact, three EE graduate students and four undergrads have worked on SuPER so far, working to build a system prototype. In addition, the EE and CPE faculty researchers, including Harris, Ahmad Nafisi, Ali Shaban, and Taufik, are also working with the Orfalea College of Business, which has made the project available as a senior project. BUS 454 students are considering how to get the SuPER systems to “the bottom of the pyramid,” among the two billion people in the world who don’t have access to electrical power.

New courses in sustainability

While the Environmental Engineering degree program is devoted to topics such as air pollution control, water and wastewater engineering, hazardous waste management, solid waste management, and “industrial hygiene,” sustainability is also the focus or a component of many courses in other departments. The following provides a sampling:

- MATE 222 “Materials Selection for the Life Cycle” is a course introduced by materials engineering professors Kathy Chen and Blair London that is designed to provide engineers and architects with the knowledge and analytical tools to select materials for optimum sustainable performance over the product life cycle.

Working in teams, students developed ideas for environmentally sound products, such as packing “peanuts” made out of vegetable-based material, shampoo bottles that organically break down in landfills, and a Starbucks cup made entirely of recycled paper.

“I think this class is vital for all engineering students because we, as a society, have to come up with real-world solutions to the ecological cliff we’re about to go over,” says MATE student Stephen Meredith, who worked on “Bottle on the Cobb,” a new shampoo container made entirely from corn. “It’s estimated we throw more than 1.5 billion shampoo bottles away every year in the U.S. alone, and with our bottles, which are made with zero petroleum products, we have a container that completely breaks down in less than a year. It’s a win-win for our landfills and, more importantly, decreasing our petroleum dependency.”

- CE 527 “Sustainable Mobility” is a civil engineering lab taught this spring by Eugene Jud that could directly affect campus. Its purpose is to “design a mobility system that reduces the campus community’s automobile dependency and improves its environment, economy and social equity.”

“The class will look at parking reduction objectives and design a bicycle network on and around campus, including a mobile and LEEDS certified Bicycle Center,” says Jud. “We also want to consider a pedestrian zone between the Engineering core and the library, and traffic calming along Grand, East Perimeter and parts of North Perimeter roads.”

Addressing the class at its first meeting, President Warren Baker said, “Cal Poly should get out in front and create an environment that is influenced by thinking about sustainability in everything we do. I look forward to hearing your ideas about mobility on campus.”

- MATE 210 “Materials Engineering” has students participate in Hewlett-Packard’s Planet Partners Program for recycling inkjet cartridges. “I have been integrating sustainability concepts into MATE 210 since spring 2004,” says materials engineering Associate Professor Richard Savage. “The HP program gives the class an opportunity to discuss life cycle analysis concepts for polymer materials.”

In addition, the course requires that students inves-
Center for Sustainability in Engineering (CSinE)

Sustainability may be the buzz, but making it an integral part of the curriculum and culture takes advocacy, specific proposals and practical support. That’s why the Center for Sustainability in Engineering (CSinE) was established.

Says CSinE Director Deanna Richards, “Our vision is to provide engineers with the interdisciplinary perspective needed to inspire, develop, and implement practicable methods for sustainability.”

According to the CSinE website (www.csine.calpoly.edu), the organization aims to:

- Serve as a resource for faculty to integrate sustainability practices into the curriculum;
- Coordinate and fund multidisciplinary projects with sustainable components;
- Increase community awareness of the need for sustainable solutions.

“CSinE is a clearinghouse of practical tools,” explains Richards. “On our website, for instance, faculty can access goals and learning objectives for promoting environmental stewardship and then download a specific ‘roadmap’ for curricular integration.”

To catalyze a new approach to engineering, CSinE sponsors applied multidisciplinary projects that advance sustainable practices. One such project is the Campus Mobility and Transportation Project, the goal of which is to reduce the campus community’s automobile dependency while improving the economy, environment, and social equity. Faculty involved include Doug Cerf, associate dean in the Orfalea College of Business, Eugene Jud from Civil Engineering, and Materials Engineering Chair Linda Vanasupa.

CSinE is also active in outreach and has worked with departments across campus to sponsor presentations by renowned speakers. In January, CSinE and the Biological Sciences Department hosted Pete Myers, founder and CEO of Environmental Health Sciences. Karen Peabody with the Green Chemistry Institute came at the invitation of CSinE and the Orfalea College of Business, while her colleague, Green Chemistry Institute director Paul Anastas, was co-hosted by the Chemistry Department. Political Science partnered with CSinE to bring Julie Zimmerman with the EPA’s National Center for Environmental Research.

Alex Sloan was hosted in conjunction with the Society of Women Engineers. Sloan is a partner in Backwell Partners, Ltd., a venture capital firm that specializes in investing in the clean tech sector. His provocative talk was titled, “How Can We Profit from Sustainability: Balancing economic, social and environmental opportunities.”

IME turns 50 with Golden Jubilee celebration

The Industrial and Manufacturing Engineering Department blows out 50 candles on the birthday cake in May with a Golden Jubilee celebration in San Luis Obispo. Co-chairs of the event, which is scheduled for May 19-20, are Bill Swanson (IE ’73), CEO Raytheon, and Kathleen Holmgren (IE ’80), VP Sun Microsystems.

Persons hoping to attend should call (805) 756-2341 or email imeGJC@calpoly.edu for more information.

Cal Poly Society of Women Engineers again named nation’s best chapter

For the fourth straight year, the Cal Poly Society of Women Engineers was named the Outstanding Student Section in the nation. Cal Poly SWE, which finished ahead of the University of Texas at Austin and Purdue University for the 2005 award, also won the Team Tech competition and received four other honors at the SWE National Conference Nov. 4-5 in Anaheim.

“It was thrilling,” said Helene Finger, director of Cal Poly’s Women’s Engineering Program. “When you realize there are more than 300 SWE student sections in the country, and all the top engineering schools are at the conference, you really feel the significance of the award. Cal Poly SWE students continue to do amazing work, building on the success of the past and continuing to improve every year.”

Cal Poly received six awards and two scholarships at the final awards banquet. They included:
- First place in Team Tech
- Multicultural Award for large student sections
- Career Guidance Scribe award
- Membership program award for large sections (Cal Poly leads the nation with 484 members)
- Mechanical Engineering student Rachel Santee won the $2,500 Rockwell Automation Scholarship.
- Civil and Environmental Engineering alum Seema Shah, currently a graduate student at Colorado State, received the $2,000 Lydia I. Pickup Memorial Scholarship.

Cal Poly’s winning Team Tech project involved working with Walt Disney Imagineering on the design of a maintenance vehicle for a new Disney World ride called “Expedition Everest.” The annual Team Tech competition enables students from all disciplines and levels of engineering to gain hands-on experience beyond the classroom.
National Engineers Week roundup

What’s N.E.W.?

N.E.W. is National Engineers Week, a 55-year-old celebration founded by the National Society of Professional Engineers to honor the role engineers play in our daily lives. Cal Poly’s College of Engineering joined the national celebration in February with a week of activities, free food and outreach to the community of San Luis Obispo.

Enjoying some punch

Kate Van Dellen (AERO) of the Society of Women Engineers and Pete Diaz (CENVE) of the Society of Hispanic Engineers flank referee Gino Valderrama during the N.E.W. Club Boxing Tournament. Above right: Van Dellen and Diaz model their oversized gloves.

Hitting the pool

Free food, drink and open pool tables were available at McPhee’s for College of Engineering students like Kelly Seiler (EE) on opening night of National Engineers Week.
Seniors Matt Brood (Industrial and Manufacturing Engineering), left, and Gino Valderrama (Materials Engineering) were co-commissioners of National Engineers Week activities on campus. The theme for Cal Poly’s N.E.W. activities was “Back to Basics,” hence the light bulb.

Having a blast on Dexter Lawn

Three... two... one... fire! Engineering clubs built various forms of catapults to fling things across Dexter Lawn during the N.E.W. Ballistics Competition.

Market forces

Engineering clubs took to Higuera Street in downtown San Luis Obispo during National Engineers Week. At left: Robert McInturff, Dylan Ross and Jenny Roeckx represented the American Society of Mechanical Engineers. Below: Kate Van Dellen, Rachel Severn and Amber Iraeta represented the Society of Women Engineers.

SWE 4th-Grade Outreach

Computer Science students Andrea Graser, above, and Jeffrey Bergamini, left, participated in the Society of Women Engineers’ 4th Grade Outreach at Pacheco School in San Luis Obispo.

At left: Lia Noble, Lisa Rotty and Chris Donnelly of the Society of Environmental Engineers took to their tent on the chilly night at Farmers Market.
Fall Commencement ’05

Some 265 engineering students—259 bachelor’s degree candidates and six M.S. candidates—received diplomas at the Fall Commencement on December 9, 2005.

The newly minted grads heard from keynote speaker Blake Irving, vice president of the MSN Communication Services and Member Platform group at Microsoft. Irving is responsible for driving and managing Microsoft’s Internet communications services. He earned his bachelor’s degree from San Diego State University and his master’s degree in business administration from Pepperdine University.

Irving is an active volunteer and consultant to Cal Poly. Not only is he a member of the President’s Cabinet, a senior advisory group of state and national leaders in business, industry, government and the community, but he is also a member of the College of Engineering’s Women’s Engineering Program Advisory Committee.

Improving the K-12 STEM pipeline:

EE professor teams with the College of Education to prepare middle school students for science, technology, engineering and math

Sylvia Liddicoat knows that too many California students—especially girls and low-income students—are graduating from high school unprepared to take college-level math, science and engineering. In fact, the crisis in math and science education in all states has resulted in a national shortage of qualified workers in STEM (science, technology, engineering, math) fields.

To address the problem, the EE lecturer is collaborating with Shirley Magnusson, the College of Education’s Cotchett Professor of Science and Mathematics Teacher Education, on two STEM “pipeline” projects.

The mission of the STEMLITES (Science, Technology, Engineering, Mathematics, and Literacy Integration in the Elementary School) project is to advance science instruction in the elementary school by developing curriculum materials that integrate STEM and literacy, including engineering design experiences. “We hope to increase
Cal Poly students top CSU system in math, English proficiency

When the California State University (CSU) announced the results of its annual proficiency report on first-year students’ readiness for college, Cal Poly students ranked at the top of the list for proficiency in both mathematics and English and hold the highest mean entering grade point average in the CSU system: 3.74.

The CSU report shows the percentage of students proficient in English, mathematics and in both subjects, as well as the percentage of students requiring remediation in their first year.

Some 95 percent of first-year Cal Poly students were proficient in mathematics and 91 percent were proficient in English. Mathematics remediation was necessary for only 5 percent of first-year Cal Poly students and English remediation was necessary for only 9 percent.

Last year, of those students requiring remediation, who were admitted to Cal Poly, 98 percent were proficient by the end of their first year of study.

STEM Program

STEM student pipeline by focusing on under-represented populations,” explains Liddicoat, “therefore, we are co-collaborating with Santa-Maria Bonita school district teachers.”

STEMLITES is supported by Cal Poly’s Center for Excellence in Science & Mathematics Education (CESaME) through a $150,000 grant from S.D. Bechtel, Jr. in association with the S.D. Bechtel, Jr. Foundation.

“I have real concerns that the United States is losing ground in developing and retaining engineers,” says Stephen Bechtel. “I am pleased to provide funding for this program, as I believe it will help us determine how children learn best and how teachers can best teach these important and challenging subjects.”

Liddicoat’s and Magnusson’s second project is focused on bringing more girls into STEM disciplines. It also received private funding: Boeing provided $8,500 for the joint College of Engineering/College of Education “GEMS” (Girls in Engineering, Math, and Science) project.

Working with four science teachers, Magnusson and Liddicoat hope to positively influence local eighth graders, particularly girls, by engaging and challenging them with a curriculum that includes engineering-related experiences. “We want to open the eyes of these young students to STEM fields by exposing them to the excitement of engineering design,” comments Liddicoat.
Industry partner Lockheed Martin to award four new scholarships

Lockheed Martin, a longtime industry partner with Cal Poly, has announced it will give the university four $2,500 scholarships for new aerospace engineering freshmen selected on the basis of academic excellence.

The announcement was made at an all-day Lockheed Martin campus recruiting event by Mark Crowley, vice president for the company’s Military Space Programs. “We hire many Cal Poly grads from all different majors; in fact, Cal Poly now ranks as our No. 2 supplier of new employees worldwide,” he said.

Lockheed Martin has helped establish a productive distance learning program—the Space Systems Masters program—with the College of Engineering and has provided support for numerous departments and programs, such as the Multicultural Engineering Program.

“Now we would like to start cultivating relationships with outstanding students from their freshman year onward, because we’re very aware that we’re in competition for Cal Poly’s best with Boeing, Northrop Grumman, Raytheon and other companies,” Crowley said.

Because the competition for top students is great, the Lockheed Martin scholarships give Cal Poly a new incentive to offer to the very best and brightest, added Aerospace Engineering Chair Jordi Puig-Suari. “We’re delighted, as always, to partner with Lockheed Martin in a shared commitment to excellence.”

Multicultural Engineering Program scholars honored

Thirty CENG students received more than $75,000 in scholarships at the Multicultural Engineering Program awards banquet in late January. In addition, the Society of Black Engineers and Scientists honored seven students with $6,000 in scholarships, the Society of Hispanic Engineers presented four students with $6,000 in scholarships and the American Indian Science and Engineering Society awarded three $1,000 scholarships. Among the companies presenting scholarships at the dinner were ChevronTexaco, Boeing, Northrop Grumman, Lockheed Martin and Raytheon. At left: Richard Margarito and Jesse Duenas were all smiles after receiving scholarships from the Society of Hispanic Engineers.
Cal Poly EE receives award from Hitachi for innovation

The Cal Poly Electrical Engineering Department has received the "Partners in Innovation" Award from Hitachi Global Storage Technologies, Inc. for a sponsored project by EE master's degree students Chris Ackles and John Carlin.

Working on the project for about six months, Ackles and Carlin designed and developed a "Verilog simulation model," a key component of the Developer's Kit for Hitachi micro hard drives used in portable electronic devices.

"Micro drives are now being used in a wide variety of applications, from cell phones to the larger I-Pods, and this kit is designed to help hardware designers integrate the Hitachi drives into their new consumer electronic products," says EE Professor Al Liddicoat, faculty adviser for the project. "Hitachi was pleased with how the students were clever in how they stored the data and implemented the interface of the project."

Hitachi Global Storage Technologies Inc., which began in 2003 with a partnership with IBM, sponsored the project at Cal Poly with a $7,000 grant. One of five divisions of Hitachi Electronics, the company has developed a full line of 1-inch, 1.8-inch, 2.5-inch, and 3.5-inch hard disk drive storage devices.

New website promotes Project Based Learning

Ever wonder how "hands on" learning translates into real-world projects across the College of Engineering? Now you can survey project activities, learn about college facilities dedicated to applied research, and see how student-faculty-industry collaboration furthers faculty professional development and student learning. Go to www.pbl.calpoly.edu and see how you can get involved!
Old discipline made new: The rebirth of HVAC&R

Cal Poly’s Heating, Ventilating, Air Conditioning and Refrigerating (HVAC&R) program dates back to 1937. Thirty-one years later, Air Conditioning and Refrigeration became Environmental Engineering, and in the 1980s, the HVAC&R courses were moved into Mechanical Engineering.

Today, with a growing endowment, student scholarships, and an active Industry Advisory Board (IAB), HVAC&R has undergone a rebirth, emerging as an official “concentration” in ME this year.

According to IAB chair Larry Sun (ENVE ’85), Cal Poly has a history of close interaction with the HVAC&R industry, which is facing a shortage of good engineers. “The industry is unique in that it seeks people with not only sound technical skills, but also strong inter-personal skills to deal with the many aspects and individuals involved in the built-environment,” he says.

In response, Associate Professor Jesse Maddren sought to revamp the HVAC&R program several years ago by organizing an advisory board. “The primary goal of the Board has been to re-invigorate the HVAC&R related coursework and interest at Cal Poly,” he states, “with the ultimate goal of providing industry with a wealth of talent for the long term future.”

To help attract new “talent” into the program, dedicated alumnus John Wingate (ENVE ’50) established a scholarship fund that provides grants of $4000 to ten promising students per year. Maddren notes, “Each of the recipients does a summer industry internship, which primes him or her for successful entrance into the field.”

Another focus of Maddren, his department colleague Chris Pascual, and the IAB is the development of a cutting-edge HVAC&R curriculum. “One of our biggest emphases today is sustainability,” explains Maddren.

IAB Chair Larry Sun is likewise acutely aware of this aspect of the business. As a principal with Tsuchiyama Kaino Sun & Carter, an HVAC&R company with an emphasis on energy efficiency and optimum system operation, Sun is involved in the Leadership in Energy and Environmental Design, or “LEED” Program, created and administered by the U.S. Green Building Council. He says, “We are in a unique time with the awareness of energy and the environment growing so rapidly. I believe this offers an opportunity for academics and industry to come together through the introduction of new thought processes and technologies to tried and true industry practices. The IAB hopes to build this bridge by continuing to generate interest in the HVAC&R industry and assisting Cal Poly in developing curricula that produce the engineers for our future.”

Building a better bike rack

When the Air Pollution Control District gave Cal Poly $12,000 in 2002 to reduce engine emissions, district officials hoped to see more bike parking on campus. The grant did more: it presented a “learn by doing” opportunity for industrial and manufacturing professors Kurt Colvin and Rod Hoadley.

Rather than purchase “old style” bike racks, Hoadley proposed that his students design and manufacture something more functional. After two years, they produced 50 new racks, which were placed around campus.

The cycling community loved them, “It was one of the most successful projects I have ever worked on,” Hoadley claims. “Because the vertical stagger design allows every other bike to be raised, more bikes can park tangle-free in less space. Plus, a unique locking bar allows easy access locking of the wheel, frame, and rack with a small diameter lock.”

The rack’s back bar donation plaque also helps San Luis Obispo place more bike racks around town without taxing city revenues. The “Racks With Plaques” donation program initiated last year encourages cyclists and other community supporters to donate a bike rack and receive permanent recognition.

After seeing Racks With Plaques work downtown, IME’s Colvin suggested introducing the program at Cal Poly and setting up a manufacturing plan to supplement students’ “hands-on” learning. He and Hoadley together manage Cal Poly’s Racks With Plaque’s program.

To sponsor a bike rack that features a name or organization on a permanent plaque, contact Kurt Colvin at kcolvin@calpoly.edu or (805) 756-2633.
Two CENG student-athletes reach the top of their game

The College of Engineering has a rich history of students who have excelled in athletics, but 2005 may have marked a watershed year thanks to the sports exploits of two student-athletes. Baseball pitcher Garrett Olson and football defensive end Chris Goconc garnered headlines, school records and future professional dollars for brilliant seasons on the diamond and gridiron.

Olson, a mechanical engineering major, led the NCAA Division I-A in innings pitched and became only the second Cal Poly baseball player to be selected in the first round of the Major League draft when he was the 18th pick by the Baltimore Orioles. The left-handed Olson, who finished the season with a 12-4 record and an earned run average of 2.71 in a school-record 136 innings, signed a contract with the Orioles worth more than $700,000.

Goconc, a biomedical engineering major, won the Buck Buchanan Award as the best defensive player in Division I-AA after recording a school-record 21.5 sacks, 98 total tackles and returning a fumble-recovery for a touchdown during the Mustangs’ 9-4 season.

According to Cal Poly football coach Rich Ellerson, Goconc’s accomplishment was a result of “the effort he produces from snap to whistle, and the effort in the classroom and the weight room. He’s getting a degree in biomedical engineering from one of the most respected programs in the country in that field. All of his success is due to his consistency and effort in all that he does.”

Imagining a “zero waste” Open House

Cal Poly Open House is always a ton of fun—and it produces a ton of trash. But this year, thanks to environmental engineering master’s student Andrea Ramirez, much of the waste from Open House will be recycled or composted.

“For my master’s thesis, I am working on a program to make Open House a zero waste event,” says Ramirez. “Our goal is that eventually none of the waste generated from Open House will be sent to the landfill.”

Ramirez has worked with a wide variety of on- and off-campus constituents on the project, including ASI, Facilities, Campus Dining, the Open House Committee, the College of Science and Mathematics, university faculty and staff, and the SLO County Integrated Waste Management Board (IWMA), which has donated the use of two in-vessel food composting units.

“We’re excited about clubs displaying the Cal Poly Zero Waster logo on their booths during Open House,” says Ramirez. “These groups have participated in a zero waste seminar, and will be able to answer questions and give fun facts about recycling.”

Designing the Cal Poly Zero Waste logo was an assignment for the Graphic Communications Advanced Typography Course, taught by Brian Lawler and Lorraine Donegan. The designer of the winning logo was Ismael Moran-Montero.
New website promotes student clubs

Frustrated by the inability to access information about clubs on campus quickly, Cal Poly students Shasta Palmer (Industrial Technology), Jason Schulberg (Mechanical Engineering) and Edward Clements (Manufacturing Engineering) have developed a one-stop on-line directory — www.PolyClubs.com.

“When we started at Cal Poly, we thought finding information about clubs would be easier,” Palmer says. “There were fliers everywhere and events posted on various websites, but some of those hadn’t been updated in years. Just finding out the basics — like where and when club meetings were scheduled and what projects the clubs were currently working on — was difficult. Because so many club projects are multidisciplinary, there seemed like a real need for one central site with all the key information.”

Schulberg, president of the Cal Poly Society of Automotive Engineers (SAE) Formula Car Club, says the primary purpose of the site is to improve club projects and increase club participation. “Most projects benefit from a multidisciplinary club membership, and PolyClubs.com is designed to make it easier for students of all majors to get involved with clubs they might not have considered open to them before.”

Along with an updated calendar and a club contact directory, PolyClubs.com includes forums where visitors can post questions or comments to club officers. The site currently features 22 clubs, ranging from the Society of Women Engineers and the American Marketing Association to the Cal Poly Line Dancing Club and Vines to Wines.

“The site is not intended to take the place of the club’s own website,” says Palmer, “only to support the clubs by providing a central location where it’s easy to access info with a couple of clicks.”

Developers of PolyClubs.com are, left to right: Jason Schulberg (ME), Shasta Palmer (IT) and Edward Clements (ME).

Five named Outstanding Women in Engineering

Cal Poly’s Society of Women Engineers, in cooperation with Hewlett-Packard, has chosen five members to receive the Outstanding Women in Engineering and Technology Award.

Selected from 15 nominees, the winners are: Eileen Mick, master’s student in civil and environmental engineering; Jennifer Overgaag, computer engineering senior, Andrea Ramirez, master’s student in civil and environmental engineering; Betsy Sale, civil engineering senior, and Teresa Su, electrical engineering senior.

Student candidates for this award were ranked using four criteria: faculty recommendations, demonstrated leadership, related work experience and grade point average. The five winners of the award each had a long list of SWE participation and academic accomplishments: Mick was founder and president of the Cal Poly chapter of Engineers Without Borders; Overgaag was Team Tech co-director for SWE and vice president of the IEEE Computer Society; Ramirez was co-director of the Civil & Environmental Career Fair and public relations director for the Society of Environmental Engineers; Sale was SWE president, director for SWE’s Evening With Industry and participated in the Cal Poly at Sea program; and Su was vice president and secretary of the IEEE Student Branch and was the Cal Poly “Week of Welcome” orientation leader.

Winners of the Outstanding Women in Engineering and Technology Award were, left to right: Jennifer Overgaag (CE), Eileen Mick (CENVE), Andrea Ramirez (CENVE), Teresa Su (EE) and Betsy Sale (CENVE).
Faculty Notes

- **Multidisciplinary**

  **Ed Sullivan** (CE) and **Jim Daly** (Statistics) received a best paper award at the annual Washington, D.C. meeting of the National Transportation Research Board Committee on Safety Data, Analysis and Evaluation for a recently published paper “Investigation of Median Trees and Collisions on Urban and Suburban Conventional Highways in California.”

  **Linda Vanasupa** (MATE), **Lynne Slivosky** (EE, CPE), and **Kathy Chen** (MATE) presented “Global challenges as Inspiration: A classroom strategy to foster social responsibility” at Ethics and Social Responsibility in Engineering and Technology 2005: Linking Workplace Ethics and Education held in Los Angeles.

  **Sema Alptekin** (IME), **Dianne DeTurris** (AERO) and co-authors published “Development of a Flying Eye: A Project Based Learning Experience” in the proceedings of “Looking Forward: Innovations in Manufacturing Engineering Education” Conference (pp: 155–166, June 2005, Cal Poly).

- **Aerospace Engineering**

  **David Hall** gave three invited talks and presented “Executive Summary of Cal Poly/NASA Extreme STOL Takeoff and Landing (ESTOL) Work” at the AeroTech Congress & Exhibition in Grapevine, TX. The paper was published in the 2005 Society of Automotive Engineers Transactions. Because of the ongoing exceptional performance of Hall’s students in the Society of Allied Weight Engineers annual student international paper competition, the group has allocated $1000 for an AERO scholarship. Hall, **Mark Waters** and a dozen Cal Poly AERO students assisted NASA in C-17 noise measurement tests at Edwards Air Force Base.

- **Civil & Environmental Engineering**


  **Gregg Fiegel**, a Professional Engineer (PE) since 1999, recently passed the State’s rigorous Geotechnical Engineering Examination, authorizing him to use the title Geotechnical Engineer (GE).

  **Damiam Kachlakov** and **Nirupam Pal** received two research grants through the university’s National Pool Industry Research Center (NPIRC): “Etching detioration of plastered swimming pools (Phase three): Materials durability, porosity and compression strength of various plastering mixes and their relation to durability,” $210,347; and “Water test kits study,” a $54,360 project involving five different U.S. universities and led by Cal Poly’s NPIRC to evaluate the performance of the water test kits currently used by the pool industry.


  Kachlakov and Pal were keynote speakers at a Seminar held for the Western Show in Long Beach and at the 17th Annual National Conference of the National Plasters Council held in Amelia, FL. Kachlakov was also the invited keynote speaker at an industry seminar held in Atlantic City, NJ.

Rakesh Goel has been appointed Associate Editor of the *Journal of Structural Engineering* and has also been certified by the California Governor’s Office of Emergency Services as a Disaster Service Worker for the post-disaster (earthquake, floods, etc.) assessment of structures.

Goel authored one paper and co-authored three others, all published in the peer-review journal *Earthquake Spectra* published by the Earthquake Engineering Research Institute. The papers include: “Evaluation of Modal and FEMA Pushover Procedures Using Strong-Motion Records of Building” (Vol. 21, no. 3: 653-684, August 2005); “Response to Discussion of ‘Evaluation of Modal and FEMA Pushover Analyses: SAC Buildings’ by Bruce Maison” (Vol. 21, no.1: 277-279, February, 2005); “Extension of Modal Pushover Analysis to Compute Member Forces” (Vol. 21, no. 1: 125-139, February, 2005); and “Role of Higher-Mode Pushover Analyses in Seismic Analysis of Buildings” (Vol. 21, no. 4: 1027-1041, November, 2005).


At the International Symposium on Urban Disaster Risk Reduction and Regeneration Planning held at Cal Poly, Goel moderated a session, presented a paper, and served as the CENG representative. His paper was on “Masonry buildings in seismically active regions: Engineering approach to risk reduction.”

**Ashraf Rahim**, **Gregg Fiegel**, and K.P. George (University of Mississippi) received a $135,500 Caltrans grant for a project titled “An Evaluation of Crack, Seat, and Overlay in California.”

Rahim also receive a $44,000 C3RP grant to research “Recycled Waste Materials As Additives to Improve the Performance of Soil-Cement – A Laboratory Investigation,” and he participated in the

[Continued on following page.]
**Annual Transportation Research Board meeting in Washington, D.C.**

Jim Hanson attended the 16th ICSMGE (International Conference on Soil Mechanics and Geotechnical Engineering) in Osaka, Japan to present two papers that were published in the conference proceedings: “Integrated Temperature and Gas Analysis at a Municipal Solid Waste Landfill” and “Characterization of Surface Topography of Sand.” Hanson also co-authored “Heat Generation in Landfills” published in the ASCE Journal of Geotechnical and Geoenvironmental Engineering (Vol. 131, no. 11, p. 1330-1344). He received a C3RP grant for an investigation regarding optimization of compaction practices for municipal solid waste using GPS technology.

Robb Moss presented two papers at the 8th National Conference on Earthquake Engineering in San Francisco, including “Tsunamigenic Probabilistic Fault Displacement Hazard Analysis For Subduction Zones” and “Incorporating Parameter Uncertainty into Attenuation Relationships.” He has also been awarded research grants: “Variance Analysis of Strong Motion Attenuation Relationships” from the Pacific Earthquake Engineering Research - PEER (NSF) Lifelines NGA Project; “Evaluation of the effects of soil aging on liquefiable deposits” funded by C3RP; and “Using a Bayesian Framework to Quantify Parameter Uncertainty and Model Optimizations for Strong Ground Motion Attenuation Relationships” from the National Earthquake Hazard Reduction Program – NEHRP (USGS) Project.

Moss serves on the NSF panel that is evaluating the recent levee failures in New Orleans due to hurricane Katrina.

**Computer Science & Software Engineering**

Diana Franklin co-authored two workshop publications, including “Exploiting Non-Uniform Memory Access Patterns Through Bitline Segmentation” for the Workshop on Memory Performance Issues held at the 12th International Symposium on High-Performance Computer Architecture in Austin, TX. The article was chosen as one of five papers to be published in SIGMICRO newsletter. The second publication, “Reliability Requirements of Control, Address, and Data Operations in Error-Tolerant Applications,” was given in the Workshop on Architectural Reliability at the 38th Annual IEEE/ACM International Symposium on Microarchitecture held in Barcelona, Spain.

Joe Grimes refereed “Review of Team-Based Learning: A Transformative Use of Small Groups” published in the online journal, CSU Exchanges. He also refereed two presentations, including: “The Web as A Gathering Place: Examining POD’s Web Site” at the Professional and Organizational Development Network in Higher Education International Conference in Milwaukee, WI, and “University Success: The Need for an Excellent Learning Climate” at the 2005 CSU Regional Symposium on University Teaching held at Cal Poly, Pomona.

Grimes serves as president of the CSU Faculty Development Council and member of the CSU Academic Technology Advisory Committee representing the Faculty Development Council.

Lew Hitchner attended the Association for Computing Machinery - Special Interest Group in Computer Science (ACM SIGCSCE) 2006 conference in Houston. SIGCSCE is the main professional society for university level computer science educators. Hitchner also participated in a workshop on Algorithm Visualization.

Fred DePiero published “Assessment and Program Improvement in a Resource-Constrained Environment, Including Web-Based Tools” in the Proceedings of Best Assessment Practices VIII held in Terre Haute, IN.

Dennis Derickson presented a short course on “Lightwave Component Measurements” at the Optical Fiber Communications/National Fiber Optic Engineers (OFC/NFOEC) conference in Anaheim. OFC/NFOEC is the premier world conference for optical fiber communications.

Xiaomin Jin and Shun-Lien Chuang from the University of Illinois at Urbana-Champaign presented “Injection-Locking in Fabry-Perot Quantum-well Lasers” at the 2005 International Semiconductor Device Research Symposium (ISDRS) in Bethesda, MD.


Albert Liddicoat received a Fellowship Award from NASA and ASEE (American Society for Engineering Education) as part of the NASA Summer Faculty Research Opportunity program. Under the grant, Liddicoat and electrical engineering student Jackson Pang integrated...

***Sylvia Liddicoat*** and ***Al Liddicoat*** were invited to participate in the Lockheed Martin LightSpeed Workshop in Palm-dale, an event designed to expose middle school students to advanced technologies and encourage them to consider STEM (Science, Technology, Engineering, Math) careers.

***Xiao-Hua (Helen) Yu*** presented the paper on “An integrated model for signalized traffic intersection control” at the IEEE international conference on control applications held in Toronto, Canada.

***Fei Wang*** presented “Chemical alloying computer hardware that enables the accurate transmission of images from deep-space (known as the Gondola Project) into the Protocol Test Lab at the Jet Propulsion Laboratory (JPL) in Pasadena.

Liddicoat, Pang, and EE graduate student ***Shawn Cary*** presented a paper on “FPGA-Based High-Performance Arithmetic Pipeline Synthesis for DSP Applications” at the Society of Photo-Optical Instrumentation Engineers’ 50th Annual Conference in San Diego. In addition, Liddicoat attended the Stanford Computer Forum Annual Meeting at Stanford University and the 4th annual RFID World Conference in Dallas, TX with Tali Freed, Larry Rinzel, Lynne Slivovsky and 10 Cal Poly students.

Under a C3RP grant and in collaboration with NASA’s Jet Propulsion Laboratory, Liddicoat has undertaken a project on “Delay and Disruption Tolerant Network Implementation with Reconfigurable Hardware Support.”

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**Lynne Slivovsky named Hood endowed professor**

When Richard and Julie Hood established an endowed professorship in the Electrical Engineering Department in 2003, they hoped to encourage outstanding young faculty members like ***Lynne Slivovsky*** (EE, CPE).

Slivovsky arrived at Cal Poly in 2003 with a Ph.D. from Purdue and an interest in human-computer interaction, computer vision, and engineering education. Since that time, she has embraced a variety of projects in these areas, work that the $20,000 Hood Professorship will fund over the course of a year.

She speaks eagerly of her applied research: “I’m continuing work in haptics, or touch-based interfaces. With an EE master’s student I’m working on a Sensing Chair that classifies the sitting posture of the occupant. I’ve also had a few senior project students work on haptic devices, including an arm-wrestling device.

“I also want to develop courses in haptics and human-machine systems. I’ve just started working with ***Lou Rosenberg*** (ME/EDU) and ***Bob Crockett*** (BME/IME) to develop a multidisciplinary, project-based course on human-machine systems, with an emphasis on human perception, cognition, and motor control.

“Another research area is engineering education and I plan on bridging the gap between my ‘technical’ research and ‘pedagogical’ research with these new courses and the students I supervise. I have been active in the area of service-learning, which I’ve introduced into the new CPE Capstone sequence. Students reflect on engineering design, ethics and societal implications of engineering, and teamwork.”

Slivovsky is one of eight endowed professors in the College of Engineering. They include Bently Endowed Professors ***Jim Meagher***, ***Julia Wu***, and ***Kim Shollenberger***, all in mechanical engineering; Lockheed Martin Endowed Professors ***Kathy Chen*** (MATE) and ***Scott Patten*** (ME); and Forbes Endowed Professors ***Al Liddicoat*** (CPE, EE) and ***Diana Franklin*** (CPE, CSS).

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**Robb Moss joins CE/ENVE faculty**

Dr. ***Robb Moss*** comes to Cal Poly with extensive experience in geotechnical engineering. He has undertaken research on probabilistic assessment of attenuation relationships, probabilistic liquefaction triggering, acquisition of liquefaction field case histories, pile design for dynamic induced collapse of reversibility windows in ternary As-S-I glasses” at the American Physical Society (APS) meeting in Baltimore, MD. She was also awarded a $5,000 State Faculty Support Grant for a project titled “Investigation of Intermediate Phase in Chalcogenide Glasses.”

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**Industrial & Manufacturing Engineering**

***Dan Waldorf*** was awarded a $44,000 Office of Naval Research-C3RP grant for a project on “Nano-Grain Cutting Tool for Machining High-Temperature Aerospace Materials.”

***Jianbiao Pan*** co-authored a paper with IME graduate student ***Tzu-Chien Chou*** and ***Wesley J. Dee*** (IE ’05) on “Effect of Reflow Profile on SnPb and SnAgCu Solder Joint Shear Force,” published in Proceeding of IPC Printed Circuits Expo, APEX and the Designers Summit 2006 in Anaheim. At this conference, Pan also presented “Effect of Reflow Profile on SnPb and SnAgCu Solder Joint Shear Force.” At the IPC/JEDEC 12th International Conference on Lead Free Electronic Components and Assemblies in Santa Clara, Pan presented “Lead Free Soldering Backward Compatibility.” Pan was invited to speak on “Soldering Mechanism and Joint Reliability of Lead-free Components with SnPb Paste” at the Surface Mount Technology Association (SMTA) Silicon Valley Chapter Meeting.
Linda Vanasupa, department chair, was invited as a participant and speaker at the “Green Chemistry and Engineering Workshop” convened at the National Academies of Science and Engineering by the Green Chemistry Institute. She presented a paper titled, “Where do we go from here? Addressing the Human Dimension of Curricular Design.” Vanasupa also gave a presentation on “The future of materials undergraduate programs: Can we avoid extinction?” at the Materials Research Society Fall 2005 meeting in Boston.


Chen spent fall quarter at Northwestern University with the NSF National Center for Learning and Teaching (NCLT) in Nanoscale Science and Engineering helping develop science modules and activities on nanoscale for high school students (http://www.ncvl.us/). She gave a NCLT webinar seminar on “It’s a Nanoworld After All: Using Nanotech Consumer Products to Engage Student Learning” (http://www.nclt.us/docs/Nano%20World_kathychen_121405.pdf).

This spring, Chen served on the External Advisory Board for the Expanding Pathways to Science, Engineering, and Mathematics at UC Santa Barbara.


Richard Savage received a U.S. Patent #6,955,720 for “Plasma Deposition of Spin Chucks to Reduce Contamination of Silicon Wafer.” He presented “Integrating Project Based Learning throughout the Undergraduate Curriculum” at the American Society for Engineering Education (ASEE) Pacific Southwest Conference held at Cal Poly Pomona. Savage received $5,000 donation from Olympus MEMS Technology Division to support the Micro Systems Technology program and donations from Griswold Industries and Innov-X Systems that enabled MATE to purchase a portable X-ray Fluorescence based Metals Analyzer.

Mechanical Engineering

Charles Birdsong, Peter Schuster, and student co-authors John Carlin, William Thompson, and Daniel Kawano presented “Test Methods and Results for Sensors in a Pre-Crash Detection System” (Paper Number 06AE-19) at the SAE World Congress 2006 in Detroit, MI. The group also presented “Evaluation of Cost Effective Sensor Combinations for a Vehicle Pre-Crash Detection System” at the SAE Commercial Vehicle Engineering Congress and Exhibition in Chicago. Birdsong and Schuster received a $10,000 grant from Lockheed Martin to continue research on the Pre-Crash Detection System project.

Ron Mullisen has nine thermodynamics experiments in the DVD supplement to the worldwide bestseller Thermodynamics by Cengel & Boles (5th Ed., McGraw-Hill). Each experiment consists of a video clip, a complete write-up, and data in an Excel file. A preview of the DVD may be found at http://highered.mcgrawhill.com/sites/0072884959/information_center_view0/.

William Murray presented “Autonomous, Line-Tracking Vehicles: A Mechatronics Term Project” at the American Society of Mechanical Engineers (ASME) International Congress and Exposition in Orlando, FL; the paper was published in the Conference Proceedings. Murray and Tom Carpenter received a $53,400 C3RP-Office of Naval Research project grant for the “Development of a Hybrid Rocket Motor Facility for Advanced Nozzle Research.”

Chris Pascual and Glen Thorncroft presented “Hydrodynamic Study of a Water-Propelled Rocket: An Undergraduate Experiment in Fluid Mechanics” at the 2005 ASME International Mechanical Engineering Congress & Exposition in Orlando, FL.

Peter Schuster was issued a U.S. patent (#6,950,014) for “Method for operating a pre-crash sensing system in a vehicle having external airbags.” Schuster also received a grant from the American Iron & Steel Institute for research on “An Exposed Steel Bumper Beam for Pedestrian Safety.”
Alumni Notes

Alumni updates

The Engineering Advantage prints alumni updates as space permits. Notes not included will appear in a future issue.

1950s

William V. Botts (EL and Math ’59) is active in several businesses, serving as Chairman of the Board of Directors for SmartConnect, Director for Buck Knives, Director for HK Plastics Engineering, and Treasurer for Vegas Valley Angels.

George Liviakis (EL/EE ’52) worked on many aerospace related projects during his career, such as space vehicle command and control and rocket engine instrumentation. During the last 35 years, he lead his own company engaged in the development of biomedical related products. He notes, “We were pioneers in clinical laboratory information systems, developing systems for the medium to large hospital and reference laboratories and for specialty labs handling dialysis information.”

Jim Locke (ME ’59) and his wife Betty Mae recently attended “Cal Poly On the Road” in Sacramento, where he was “inspired” to hear how Cal Poly is committed to incorporating “hands-on learning” in all majors. Believing that this philosophy “makes Cal Poly different and superior to most other engineering universities” and “worthy of ongoing support,” the Lockes gifted a Charitable Remainder Uni trust. Jim notes, “My decision to go to Cal Poly in 1955 was driven by that emphasis on lab courses. The hands-on learning has served me personally very well.”

1960s

Dan A. Bathker (EL ’61) recently retired after 40+ years at the Jet Propulsion Laboratory in Pasadena, where he was Technical Group Supervisor of the Antenna and Microwave Group for 25 years followed by 10 years as NASA’s Deep Space Communications representative to the International Telecommunications Union - Radiocommunications (ITU-R) in Geneva, a radio-rulemaking agency of the United Nations. His activities involved high performance Earth Station antennas and the international Radio Regulations concerning interference protections for such Earth and associated Space (probe) Stations. He was elected Fellow of the Institute of Electrical and Electronics Engineers (IEEE) in 1998.

Dan Malone (EL ’68) and his wife Star retired in March 2005 after 35 years at IBM and two years at Hitachi. They recently moved to the Central Coast. They have three sons, one who is a Cal Poly staff member, and five grandchildren, with another one on the way. Dan says, “We look forward to making all the Cal Poly football games.”

Peter M. Smith (ME ’65) spent 30 years in municipal public works, most recently as the Public Works Director for Quincy, WA, and as the PWD and City Administrator for George, WA. His company, Smith Engineering, provides contract operation and consulting services for water systems. He has five children, seventeen grandchildren and four great-grandchildren. He is very involved in church and community activities, including serving as head of the Quincy Commission on Cultural Relations. He writes, “I send my best wishes to all classmates, and invite you to contact me.”

Dennis Woodson (EE ’62) retired after 18 years with the Los Angeles Dept. of Water & Power as an electrical distribution engineer followed by 16 years with Bechtel Corporation as a project support engineer. He now consults in construction management, repairs antique clocks, and sings in a barbershop quartet. Since graduating from Cal Poly, Dennis has been active in the Barbershop Harmony Society.

1970s

Douglas Boyer (MET ’73) serves as Principal Engineer in Materials Engineering for Northrop Grumman in Sunnyvale, CA.

Weston Clark (CSC ’77) is working at Guidewire Software, a San Mateo pre-IPO, creating software solutions for the Property and Casualty Insurance industry. He says, “I have returned to my roots as a software engineer, helping to create the infrastructure for the application development. We’re a 100% Java2EE solution, with our own frameworks for persistence and the UI. I’m thrilled to be coding all day again. I will always be grateful for the solid foundation that Cal Poly gave me.”

David Ingram (ET ’73) is working as a Welding Engineer in the Quality Assurance Department at Marvin Engineering in Inglewood, a government defense contractor and manufacturer specializing in military hardware.

Craig Lewis (ME ’78) extols "Value Stream Mapping," a tool that uses symbology for describing a particular value stream/production line from customer to supplier. Craig explains that by following up with lean manufacturing techniques such as kanban, supermarkets and visual manufacturing users can eliminate waste from the value stream. “I have implemented this process across four production lines in the last two years at Rheodyne LLC,” he says.

Jeff Porges (ET ’75) has been with Appleton Papers in Ohio for 12 years. He is the Utilities Superintendent responsible for operations in the plant, specifically providing the steam, gas, water, electricity, and compressed air to the paper making facility. Additionally, he is responsible for the paper process waste treatment facility.

Bill Ryder (ET ’77) has served as president of Ryder Engineering since 1993. The company provides mechanical design and development services.

Mike Seibol (EL ’79) left HP/Agilent in 2001 after more than 20 years of working on RF and Microwave Instrumentation. Since then, he has been the Senior Manager of HW Test Engineering at Turin Networks. He and his wife Annette have a daughter, Stephanie (16), and son, Derek (21), who is a junior at Cal Poly in Aerospace Engineering.

Dave Vickerman (ME ’72) is a Senior Engineer at Raytheon UTD in Virginia, where he has projects involving improvements for underwater Remotely Operated Vehicles (ROV). Dave lives with his wife of 33 years Carol (Taylor) (Child Development ’72), who has taught Kindergarten for 21 years. He is retired from the Naval Reserve. Daughter Amy graduated from Cal Poly (Recreation
Administration ‘03). Son David is Band Director for Lodi High School.

John Waidner (EL ’73) works as a Six Sigma Principle at Delphi Corporation in Kokomo, IN. He is working on certification as a Master Black Belt.

1980s

Christopher Cabaj (ENVE ’80, ET ’82) owns Mendham Design & Construction, a small contracting business that does solar installations. Chris wonders “how many Cal Poly alumni have furrowed the solar option? It seems the technology has caught up with the need.”

Mark Kollmann (ET ’82) has been with ARCO (now BP) since graduation. As a Global Category Manager, Mark oversees the procurement of engineered and fabricated equipment for refining and chemical facilities worldwide. He reports, “During my career, I’ve had numerous assignments in Engineering, Project Management, and Procurement. I was Procurement Manager for North American Major Capex Projects until switching to my new position.” Mark and his wife Jill (Brashear) (CRP ’79) have two boys: Ryan a freshman at CSU Monterey Bay and Brett a high school freshman. They live in Fountain Valley.

Bob Miller (ET ’82) is Director of Information Technology at Chomerics, a division of Parker Hannifin Corporation, near Boston. His most recent project was development of decision support systems for strategic pricing. He relocated to New England in 1998 with his wife and four children. He “would love to hear from any Cal Poly grads in the area – better yet, he’d love to get back to the Wild West!”

Edward Neary (ET ’89) is a Senior Project Engineer at Dolby Laboratories Inc. in San Francisco developing products for the Cinema and Broadcast industry, such as cinema processors, digital adapters, cinema automation controllers and professional transcoders. He was awarded a Technical Oscar in 1998 for his part in the development of the CP500 Cinema Processor. He lives in Pleasant Hill with his wife Kelly, son Bryan and daughter Leelah.

ENVE alumna helping to bring clean water to Afghanistan

Most of us would be undone by the problems: inadequate construction materials, a lack of national professional expertise and management know-how, poor communications and shipping delays, and, oh yes, the constant possibility of real personal danger. But after two years of living and working in Afghanistan, Jacqueline Buratovich (ENVE ’80) has discovered that she enjoys the “challenge of trying to work in a developing country recovering from war.”

Jackie is president of Entropy Consulting, LLC, based in Louisville, KY and presently contracted to CDM Constructors Inc., the construction and design-build subsidiary of Camp Dresser & McKee. “In-country,” she serves as the Project Director of the Afghanistan Urban Water and Sanitation Program, a USAID-funded program focused on developing the drinking water supply system for three urban communities in Afghanistan and one water distribution system in Kabul.

Commenting on the project challenges, Jackie says, “While our systems are very simple compared to Western standards, there is little quality construction materials available and a serious lack of design and construction experience – since the Afghans have not built anything technical in over 25 years. It takes months to bring adequate quality materials and equipment into the country, and everything takes at least twice as long as expected to build. Couple this with a lack of understanding of how utilities function, or the ability to measure and record usage or means to collect revenues to operate a viable utility...and the traditional village governance structures...it’s an amazing adventure. Wish I’d stumbled on overseas work years ago!”

Thomas Riddle (ET ’85) was promoted to Colonel in the U.S. Army, becoming Director of Technology and Analysis for Joint Task Force Global Network Operations in Arlington, VA. His department helps to evaluate and select cutting-edge technology to protect Department of Defense computer networks.

Kyle Shepard (AERO ’88) started Interoperable Systems Group after nearly 20 years in the defense business working on
CSC alum tackles website in Mongolia

When Adrian Mummy (CSC ‘03) joined the Peace Corps after graduation, he was assigned to teach English in the town of Ondorkhaan, a day’s trip east of the Mongolian capital of Ulaanbaatar. However, when Adrian was approached by the governor of Khenti Aimag, Jargal, to discuss the possibility of creating a website in English to promote tourism, he felt it was the perfect opportunity to use his CSC skills.

The project proved “easier said than done,” given Adrian’s limited access to books and the Internet, antiquated equipment and frequent power outages. But with the help and cooperation of the local government, NGO, Peace Corps, and the Environmental Protection and Resource Conservation Project (EPRCP), he persevered and posted the successful site at www.khentii.net.

Says Adrian: “I believed so much in the success of this project because we had great enthusiasm around the community. It was also mildly amusing to realize I was working on the highly technical project on a laptop that might serve better use as a paperweight, alone in a ger in the outer reaches of Mongolia. Funny how life gets you in these situations.”

Adrian Mummy (CSC ‘03) sometimes commutes on a camel while working with the Peace Corp in Mongolia on a website to promote tourism.

launch vehicles, satellites, and military communications. His company works in Communication Systems specializing in the design, development and test of Interoperable Data Links and Networks with the objective of improving warfighter effectiveness by assuring platforms (F-16, Aircraft Carrier, etc.) have interoperable communication systems. Kyle was married last year to Mary Sullivan.

David Taggart (MATE ‘85) recently founded Interleaf Composites Engineering, a professional engineering consultancy committed to immediate and sustainable improvements in the energy efficiency of mobile platforms via intelligent integration of advanced materials, systems engineering, and structural design. Clients are primarily from the automotive and aerospace industries, though some recent projects have been focused on the energy industry.

Andrew Tait (ME ‘85) serves as Project Controls Supervisor for Bechtel National, Inc. working at Aberdeen Proving Grounds on Chemical Weapons Stockpile Reduction Program for the U.S. His work helped make Aberdeen the first site in the continental U.S. to safely complete disposal operations, and earned him a memo of commendation from the director of the Chemical Materials Agency.

1990s

Elizabeth (Palmero) Adams (CE ‘93) worked at the City of Milpitas for seven years as a Transportation Planner. For the past five years, she managed Pleasanton’s Transportation Demand Management programs, mainly working with local employers and schools. She is “married with two beautiful daughters.”

Laura Bevill (IE ‘99) has returned to school for an M.B.A. at the University of Bath in the UK after working in technology, healthcare and management consulting. “Homesick for the sunny beaches after living in Boston and now abroad for the last six years,” Laura plans to write her dissertation “back in SoCal.”

Michael Cefola (CE ‘98) is in his fourth year of practice as a licensed general contractor in the S.F. Bay Area (www. cefolaconstruction.com).

Jeff Dankworth (IE ’91) says, “My biggest news is that I married Katherine Monahan on May 14, 2005. We live in San Mateo and work for Kaiser Permanente. I am currently the Sr. Operations Leader for the Claims Administration department.”

Victor Glover (GENE ‘99) is a Naval Aviator and was recently selected for the Air Force Test Pilot School exchange program. He says, “I get to go to TPS and live in California again. I am very excited!”

Jason Spencer Graham (ME ‘99) is a Senior Systems Engineer II for Raytheon Vision Systems and has been awarded two patents.

Thomas Harvey (ME ‘91) joined the Boeing Company in 1997 to work in Integrated Defense Systems in Seattle as a structural analysis engineer. Last July, he received his M.B.A. from the University of Washington and transferred to Boeing Commercial Airplanes to work in Configuration Design & Engineering Analysis on the 787 program. He focuses on supply chain integration and engineering operations in aircraft final assembly & delivery.

Christopher Knight (CSC ‘96) is working as a Software Engineer in the Science Operations Center (SOC) for NASA’s Kepler Mission. The SOC will process the four years of observational data from the Kepler space telescope searching for earth-sized planets orbiting other stars in our galaxy. He has been elected to be the 2nd Vice President for Negotiations of the Ames Federal Employees Union.

Jason Mansfield (CE ’95) was recently named manager of the Redwood City and Pleasanton offices for Triad/Holmes Associates providing civil engineering and surveying services to the Bay Area. “My wife, Megan Mahar, (History ’96) and I reside in San Carlos with our two new beagle puppies.”

Steven Schimmel (IE ’99) recently finished working for Ashland Chemical in Europe. In June, he will receive his M.B.A. from IESE University in Barcelona, Spain. He will head home to California following an expeditionary trip to China.

Alien Seraile (M.S. CSC ’99) is serving as an active duty Major in the U.S. Air Force assigned to the Air Force Research Laboratory at Kirtland AFB, NM. Next fall, he will begin work on a Ph.D. in Space System Engineering at the Naval Postgraduate School in Monterey, CA.

David Whitaker (AERO ’92) is working at Newark Beth Israel in Newark, NJ as an Emergency Medicine Physician and teaching faculty for the emergency medicine residency.

2000s

Marco Bafan (M.S. BME ‘04) is working as an Engineering Research Analyst for Nerac Inc.

Kristen Klesser (CE ’04) earned an M.S. in Structural Engineering from UC San Diego and was recently hired by Degenkolb Engineers.

Kristen (O’Halloran) Cardinal (GENE ’03) is working on her Ph.D. in Biomedical Engineering at the University of Arizona, where her research involves cardiovascular devices and is focused on evaluating the cellular response to coronary stents. She says, “I always enjoy any email from anyone at Cal Poly!”

Shane Meyers (EE ’03) is working as a Software Quality Assurance Engineer for a company located in San Mateo, CA.

Pablo Paster (Mfg ’04) will complete his M.B.A. in Sustainable Management from the Presidio School of Management in June. He is currently working as Chief Engineer for Natural Capitalism Solutions, consulting for Clif Bar. This summer Pablo will marry Kristina Downer (Social Science 05).
CENG golfers tee it up May 5

Enjoy dinner, wine tasting, and a day on the links with fellow alumni and corporate colleagues at the College of Engineering Corporate Challenge Golf Tournament, held May 5, 2006 at Avila Bay Golf Resort in Avila Beach. The event celebrates the relationships between the College of Engineering and its corporate partners.

This special tournament is open to corporate teams of Cal Poly alumni and offers an opportunity to re-connect with the college, network with fellow grads and professional colleagues, and have fun! For more information on costs and how to sign up for the CENG Corporate Challenge, contact Michelle Jenkins at (805) 756-5374, mjenkins@calpoly.edu.

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College of Engineering Directory

<table>
<thead>
<tr>
<th>Department</th>
<th>Contact Information</th>
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<tbody>
<tr>
<td>Aerospace Engineering</td>
<td>(805) 756-2562</td>
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<tr>
<td>Biomedical &amp; General Engineering</td>
<td>(805) 756-6400</td>
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<tr>
<td>Civil/Environmental Engineering</td>
<td>(805) 756-2947</td>
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<tr>
<td>Computer Engineering</td>
<td>(805) 756-1229</td>
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<tr>
<td>Computer Science &amp; Software Engineering</td>
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<td>Electrical Engineering</td>
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<tr>
<td>Industrial &amp; Manufacturing Engineering</td>
<td>(805) 756-2341</td>
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<tr>
<td>Materials Engineering</td>
<td>(805) 756-2568</td>
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<tr>
<td>Mechanical Engineering</td>
<td>(805) 756-1334</td>
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<tr>
<td>Mechanical Engineering</td>
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<tr>
<td>Engineering Advising Center</td>
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<tr>
<td>Stacey Breitenbach, Director</td>
<td><a href="mailto:sbreiten@calpoly.edu">sbreiten@calpoly.edu</a></td>
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<tr>
<td>Applied Research/Development (ARDFA)</td>
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<tr>
<td>Thomas Mackin, Chair</td>
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<tr>
<td>MESA Engineering Program</td>
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<td>David Cantu, Director</td>
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<tr>
<td>Women’s Engineering Program</td>
<td>(805) 756-2350</td>
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<td>Helene Finger, Director</td>
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Parents please note: If your son or daughter is no longer at this address, please report his or her current address to the College of Engineering.