

# XPRESSIONS of CELLENCE

COLLEGE OF ENGINEERING

## DEFENDING AGAINST CORROSION

Fighting the costly aspects of corrosion on land, in space, at sea and even inside the human body. p.18

## FOUNDING A SUPPORTIVE COMMUNITY FOR TOMORROW'S LEADERS

How we are improving recruitment and retention of women in engineering. p. 8

## INSPIRING THE NEXT GENERATION

Promoting national success in a competitive world. p. 24





Learn by Doing: Making Imagination Real

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Photo by Simone Fermin



Cover story photo: Dr. Vilupanur Ravi and chemical engineering student Hannah Leu work on corrosion research.

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# MAKING IMAGINATION REAL

**T**his edition of *Xpressions of Xcellence*, the College of Engineering's annual magazine, provides a preview of the vibrant energy and innovative teaching and research within our college, which operates under the foundational philosophy of Learn by Doing. This 55-year legacy has provided a solid basis for excellence in engineering education and has trained over 25,000 workforce ready engineers since its inception.

The college has been a vanguard in engineering education and has placed itself solidly ahead of the traditional modes of operation by encouraging students to become innovators, who not only learn to appropriately apply engineering techniques, but who also can succeed in the global economy by honing their capacity to determine what is needed in the marketplace and apply the entrepreneurial skills to develop it. We are educating a growing cadre of lifetime learners with hands-on experience who are trained to become experienced problem solvers. Our pedagogy has been adopted in some variation by traditional research universities who have developed newfound respect for our paradigm in the form of a conceive, design, implement and operate model.

In this issue, we illustrate the forward thinking nature of our engineering programs, which have

provided the needed resiliency to adapt to the changes that are taking place in the funding of public higher education as well as the external pressures by the for profit institutions. We also highlight our achievements and acknowledge dedicated alumni and faculty supporters.

The cover story deals with one of the most persistent and costly adversaries, corrosion, which has plagued our nation's infrastructure, costing close to one trillion dollars this year alone. However, Dr. Vilupanur Ravi's research and other works like it have made inroads in this battle by creating effective defenses against corrosion. You will find other stories on fascinating and timely research such as biomimicry and water quality.

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"In this issue, we illustrate the forward thinking nature of our engineering programs, which have provided the needed resiliency to adapt to the changes that are taking place in the funding of public higher education."

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We also share our success stories including the expansion of student support services and an increase in the number of historically underrepresented students, in particular women. Interaction between students and faculty remains essential for us, as evidenced in the articles on student entrepreneurship, real world application of student projects, and the tremendous success of our students in national and international competitions.

This is an auspicious year for the college as we start a yearlong celebration of our

55th anniversary, and the campus' 75th anniversary, in which the college and its greater community will benefit from some special initiatives. We will start the year with the first in our distinguished lectureship series, presenting one of the celebrated leaders in water resource management, the group president at Parsons Corporation, Ms. Virginia Grebbien.

In early 2014, we will honor over twenty of our most accomplished alumni—men and women who are leading large corporations, members of the Academy, entrepreneurs and scholars—in a Dean's Leadership Board sponsored Hall of Fame. The college will conclude the academic year with our annual Project Symposium & Showcase, which provides an opportunity for students across the college to present their projects for review by faculty, industry representatives, other students and guests, and which will include special anniversary events for attendees.

The college is also expanding its diversity and retention programs with an exciting new agenda and closer collaboration between Maximizing Engineering Potential (MEP) and the Women in Engineering (WE) program. Finally, we are developing a new student leadership promotion and training initiative to establish a program framework that enhances leadership training.

I hope you will enjoy the thought provoking and engaging articles, and I invite you to visit our website at [www.csupomona.edu/engineering](http://www.csupomona.edu/engineering) for other programs and events in the college, where we are *making imagination real* through our Learn by Doing philosophy.

*Mahyar Amouzegar*

**Dr. Mahyar Amouzegar**  
*Dean, College of Engineering*





# DISTINCTIONS

**3rd NATIONALLY:** Undergraduate engineering program, among public universities, U.S. News & World Report\*

**7th NATIONALLY:** Bachelor's degrees awarded to minorities, Diverse Issues in Higher Education

**1st IN CALIFORNIA:** Largest civil engineering program, Engineering Workforce Commission

**1st IN CALIFORNIA:** Largest mechanical engineering program, Engineering Workforce Commission

**2nd IN CALIFORNIA:** Largest aerospace engineering program, Engineering Workforce Commission

**2nd IN CALIFORNIA:** Largest manufacturing engineering program, Engineering Workforce Commission

\*Ranking for Universities-Master's Category

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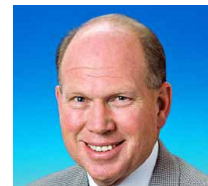
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## 55<sup>th</sup> ANNIVERSARY EVENTS

Distinguished Lectureship

November 7, 2013

Hall of Fame

February 20, 2014

Project Symposium & Showcase

May 30, 2014

# LEARNING FROM NATURE

Dr. Jawaharlal works with students to research the benefits of biomimicry as they look to nature to solve the world's problems.

**F**rom airplanes to Velcro, nature has inspired human invention since the dawn of humanity.

Today, a new breed of innovators is seeking to mimic not only what nature does but also how it does it in order to create a more sustainable world.

Dr. Mariappan Jawaharlal, professor of mechanical engineering, is among the growing ranks of scientists and engineers who have embraced the emerging field of biomimicry.

"Almost every single problem humans try to solve today has been, in some form, solved by nature," says Jawaharlal. "Nature does it as a matter of course."

And, more importantly, nature does it without creating too much waste.

"We create things that are not recyclable," says Jawaharlal. "The whole process is not sustainable. It disturbs the environment, creates waste, destroys other species and

ultimately is not healthy for human beings."

Jawaharlal's favorite question is "What would nature do?" He borrowed it from Ms. Janine Benyus, whose book, "Biomimicry – Innovation Inspired by Nature," spawned the biomimicry movement.

Three years ago, Jawaharlal attended a workshop sponsored by Benyus's Biomimicry Institute in the jungles of Costa Rica. During this trip, he noticed a colony of limpets, little organisms with cone-like shells that adhere to rocks in intertidal zones, on the beach.

Jawaharlal became fascinated with the small creatures, whose grip is so strong they can't be pried off the rocks, yet they move very slowly over the porous, uneven surface.

"I started wondering about how these organisms stick so solidly to the rocks," says Jawaharlal, who is now a fellow at the Biomimicry Institute. "I surmised they must have a system to fill in the gaps and then they apply suction."

He realized that limpets might provide a sustainable and healthier solution for fastening things together instead of using epoxy and toxic glues, some which contain formaldehyde, a cancer-causing chemical.

Jawaharlal and two of his undergraduate mechanical engineering student researchers, Koshy Varghese and Nathan Laidig, started to conduct field research with tanks of limpets at a marine biological station in San Pedro, Calif.

Laidig says they have really enjoyed working with Jawaharlal. "He's taken us under his wing with this project," he says. "We've really learned a lot about the concept of taking nature and applying it to mechanical engineering principles."

Jawaharlal is proud that Cal Poly Pomona is working on cutting-edge biomimicry research similar to Stanford,



Dr. Jawaharlal, professor of mechanical engineering, leads in the college's biomimicry research.

MIT and Caltech, but the research is tied to undergraduate education. He has received some start-up funds from the College of Engineering and the university. Now that he and his students have accumulated research data and resources, Jawaharlal plans to apply for funding from the National Science Foundation (NSF) as well as from private foundations.

In 2013, Jawaharlal spoke at a TEDx event, which focused on his work on sustainability and engineering. In 2012, he was a keynote speaker at the Biomimicry Institute's Education Summit, where he talked about K-12 outreach using biomimicry.

"Biomimicry has the potential to solve most problems we are facing today. But, it's going to take some time and patience," says Jawaharlal. "Nature has had over 3.8 billion years to develop efficient workable systems that we can learn from."



Colony of limpets, little organisms with cone-like shells that adhere to rocks in intertidal zones, on the beach.



# A FRESH APPROACH TO MEETING THE WORLD'S WATER NEEDS

**M**eeting the rapidly increasing global demand for fresh water is one of the “grand challenges” of the 21st Century according to the National Academy of Engineering. Desalination, or the removal of salt and other minerals from water, is widely regarded as a potentially effective way of meeting this challenge.

Dr. Mingheng Li, chemical & materials engineering professor, has developed a mathematical model that is facilitating the creation of efficient systems for desalinating groundwater and seawater.

Li's computational innovations are aiding the design of a highly efficient, reverse-osmosis desalination system to address many of the economic and environmental issues that presently characterize the state of the art in

desalination technology.

“Researchers have long recognized the immense potential reverse-osmosis systems hold for meeting our ever-growing water needs, but traditional experimental methods were simply inadequate for analyzing and optimizing all of the functions of this complex system,” says Li.

In 2012, Li and undergraduate engineering students, Brian Noh and Robin Chan, developed optimized reverse-osmosis processes using Li's computational framework and successfully tested and validated them at the Chino I Desalter Plant. Chino I is a reverse-osmosis facility that serves approximately 35,000 homes. In addition, Li and his student team performed an experiment at the Chino I Desalter Plant, resulting in reduced energy consumption and the

amount of wastewater byproducts generated while maintaining the same water production rate.

Several peer-review journals have published Li's work, including *Desalination and Industrial & Engineering Chemistry Research*, and researchers worldwide frequently cite him. He and four civil engineering faculty—Drs. Seema Shah-Fairbank, Kenneth Lamb, Monica Palomo and Ali Sharbat—constitute the Cal Poly Pomona Environmental and Water Resources Group. Their mission is to create a water sustainable future through interdisciplinary research in such essential water-technology areas as desalination, stream restoration, sediment transport, water reclamation and natural treatment systems.

## RECENT GRANTS & CONTRACTS AWARDED TO ENGINEERING FACULTY

### \$1M to \$3M:

Dr. Dragos Andrei, CE  
*Asphalt Recycling & Reclaiming Association  
California Department of Transportation  
Federal Highway Administration*

Dr. Winny Dong, CME  
*U.S. Department of Education  
National Science Foundation*

Dr. Barbara Hacker, CME  
*National Science Foundation*

### \$150,000 to \$900,000:

Mr. Mikhail Gershfeld, CE  
*NEESR-CR University of Alabama  
Board of Governors of the  
Colorado State University System*

Mr. Frank Smith, ECE  
*Southern California Edison*

Dr. Vilupanur Ravi, CME  
*Ameron International Corporation  
Glenn Research Center  
Intelligent Energy*

### \$100,000 and Under:

Dr. Zekeriya Aliyazicioglu, ECE  
*Raytheon Company*

Dr. Kevin Anderson, ME  
*Jet Propulsion Laboratory (JPL)  
Southern California Edison*

Dr. Donald Edberg, ARO  
*Jet Propulsion Laboratory (JPL)*

Dr. James Kang, ECE  
*Jet Propulsion Laboratory (JPL)*

Dr. Victor Okhuysen, IME  
*Air Resources Board*

Dr. Felipe Perez, CE  
*NEESR-CR: Performance-Based Design  
For Seismic Hazard Mitigation*

## NEW LABORATORY FOR ENERGY EFFICIENCY RESEARCH

A \$250,000 seed grant from Southern California Edison has made possible a new laboratory for energy efficient research. The Energy System's facility will be used to conduct interdisciplinary research on state-of-the-art heating, ventilation, air conditioning and refrigeration equipment in collaboration with local industries and municipalities.

“This laboratory will aid in the research of green technology, including reduction of fossil fuels, which has broad residential and commercial applications,” says Dr. Kevin Anderson, mechanical engineering professor. “Any public-use spaces, such as hospitals, universities, churches and sports arenas, could experience efficiencies of 10 to 15 percent, resulting in millions of dollars in savings.”



# FOUNDING A SUPPORTIVE COMMUNITY FOR TOMORROW'S LEADERS

## How we are improving recruitment and retention of women in engineering

**R**ecent data has brought to light a disturbing fact about the percentage of women entering engineering and technology fields.

The U.S. Census Bureau reports that women constitute slightly more than half (50.8 percent) of the nation's population. At the national level, however, the American Society for Engineering Education reports that women comprise only 18 percent of the total engineering undergraduate student enrollment. The College of Engineering is taking steps to remedy this disparity.

The college's initiative to increase the number of women in engineering features the newly created Cal Poly Pomona Women in Engineering (CPP WE) program. It is also partnering with the local section of the Society of Women Engineers (SWE) to improve both recruitment and retention of women in the college.

Dr. Norali Pernalet, faculty director of the CPP WE program and professor of electronics & computer engineering technology, reports that the CPP WE program is already having an impact on recruitment. "Although CPP WE is fairly new, we have already seen positive results. The number of female applicants has risen, and the number of female incoming freshmen increased by 21 percent in just one year."

Every year, SWE hosts an outreach event called Youth Engineering Success (YES!). This event has grown to include more than 350 students from local schools and has won a national outreach award from SWE National for three consecutive years.

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"The number of female applicants has risen, and the number of female incoming freshmen increased by 21 percent in just one year."

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Andrea Gonzalez, civil engineering student and Cal Poly Pomona SWE president, says, "SWE and CPP WE working together have generated increased numbers of women in engineering and, most importantly, we are retaining and developing them to become successful engineers."

CPP WE enhances retention by providing a supportive community. Once on campus, female students have opportunities for campus housing designated especially for women in engineering, small group interactions with female engineering faculty, and special events where successful

alumnae speak about their experiences.

Female students are being trained to become leaders through participation as CPP WE Ambassadors. They organize and lead events and outreach activities, which provides a foundation for their professional careers as leaders in engineering.

Sevanne Calle, a mechanical engineering student who has taken on an active role as a CPP WE Ambassador says, "CPP WE has definitely strengthened my leadership skills and confidence."

Dr. Mahyar Amouzegar, dean of the College of Engineering, is committed to increasing the number of women in engineering and improving the pipeline of qualified graduates. He is very impressed with the results of CPP WE and SWE.

"We are very proud of the partnerships and new efforts the college is implementing to increase the number of women within engineering, as well as providing a welcoming environment once our students are on campus," says Amouzegar.

"Under the leadership of Dr. Cordelia Ontiveros, the number of female freshmen enrolled has increased substantially over the last three years. I am confident we will achieve our goal of surpassing the national average."



## YOUNG LEADERS IN ENGINEERING SCHOLARSHIP

For the second consecutive year, the Cal Poly Pomona Women in Engineering program has received scholarship support from Ms. Lynne Lachenmyer, chemical engineering distinguished alumna and current senior vice president of ExxonMobil Chemical Company. Her support funds the Young Leaders in Engineering

Scholarship, which recognizes the academic and leadership accomplishments of members of the Cal Poly Pomona section of the Society of Women Engineers with a \$7,500 scholarship for each student.

The 2012 recipients were industrial engineering student Maria Medina-Alva, civil engineering student Nicole Baca and chemical engineering student Karyna Bañuelos (pictured left to right).



g career?



## Why an engi

- Love for math and science
- Fast growing technology
- Stable field, high demand
- Great salary and benefits
- Rewarding and challenging
- Many opportunities



Amanda Bustos (CE '12) speaking to women students at an event coordinated by Society of Women Engineers (SWE) and Cal Poly Pomona Women in Engineering (CPP WE).



# LYNNE LACHENMYER: MAKING A WORLD OF DIFFERENCE



Lynne Lachenmyer (CME '80), senior vice president for ExxonMobil Chemical Company, with her husband, Todd.

Photo provided by Lynne Lachenmyer

**P**resident Barack Obama said that a world-class education is the single most important factor in determining not just whether our kids can compete for the best jobs, but whether America can out-compete countries throughout the world.

Chemical engineering alumna Ms. Lynne Lachenmyer takes this sentiment to heart, knowing first-hand the importance of a quality education. As an accomplished leader in her industry and currently the senior vice president of ExxonMobil Chemical Company, Lachenmyer says it is challenging to find experienced talent in the U.S., especially in the fields of science, technology, engineering and mathematics (STEM).

"The U.S. is lagging in its supply of students with STEM degrees," says Lachenmyer. "To remain competitive, we need to entice young people to pursue higher education in these fields. I spend considerable time ensuring there is a pipeline of young talent to replace us in the future,

including support for STEM education programs in our schools."

Being a female who has made it to the top in a traditionally male industry, Lachenmyer also strives to increase the number of women and underrepresented minorities entering the engineering workplace.

She says the reason for a lack of STEM graduates is that many young people, especially women, aren't aware of the types of career opportunities available in this field. Lachenmyer is changing these assumptions by spearheading the effort to establish a College of Engineering Hall of Fame at Cal Poly Pomona.

"The Hall of Fame will provide potential engineering students with real-life examples of various paths taken by former students, hopefully inspiring them to follow in their footsteps," explains Lachenmyer.

Her many global accomplishments and professional background exemplify the exciting occupations available to engineering

graduates. At ExxonMobil since 1980, she has had the opportunity to travel the world and live internationally while consistently rising through the ranks of the organization.

Lachenmyer attributes her career success to the foundation she obtained in the College of Engineering. She says the practical experience, hands-on labs and Learn by Doing environment at the university mirrored life in the workplace after graduation and gave her the skills required to excel in industry.

Along with her husband, Todd, Lachenmyer recently established the Young Leaders in Engineering Scholarship aimed at encouraging more talented young women to pursue a career in engineering. She also serves on the National Development Council and the Dean's Leadership Board. Her career success, service to the industry and university support earned Lachenmyer the College of Engineering's Distinguished Alumna Award in 2011.



# MOHAMMAD MASSOUDI: A LEGACY OF LOVE

**W**inston Churchill once said, “We make a living by what we get, but we make a life by what we give.” There is perhaps no more of a compelling testimony to the truth of these words than the rich life that Professor Mohammad Massoudi and his late wife Parvin created during their 35 years of marriage.

In the more than three decades since Massoudi joined the faculty in electrical & computer engineering, he and Parvin came to be beloved in the College of Engineering due to their tireless devotion to student success. “I always considered

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“Providing assistance to talented engineering students in need just seemed like a fitting way to honor Parvin’s memory and the work that we did together.”

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my accomplishments at Cal Poly Pomona to be Parvin’s as much as they were mine. She supported me so much in my work, and her generous spirit always inspired me to do more,” says Massoudi.

The support between them clearly ran both ways. Shortly after Massoudi began his career at

Cal Poly Pomona, Parvin was diagnosed with a chronic heart illness that would eventually require her to have heart transplant surgery, extending her life for another 22.5 years, and Massoudi was there with her every step of the way.

After Parvin passed away in 2012, Massoudi set up a \$20,000 endowed scholarship to benefit students in the electrical & computer engineering department. The Professor Mohammad and Parvin Massoudi Scholarship provides awards up to \$3,000 for full-time electrical & computer engineering juniors and seniors.

“Providing assistance to talented engineering students in need just seemed like a fitting way to honor Parvin’s memory and the work we did together. It’s also a way for me to show my gratitude,” says Massoudi, who is himself an alumnus of the College of Engineering.

Massoudi’s dedication to his students has earned him such awards as “Outstanding Professor” from Eta Kappa Nu, Zeta Theta Chapter of the National Honor Society for Electrical Engineers and “Outstanding Advisor” from the College of Engineering. Also noteworthy are the many students who made a public showing of their love for him when Parvin passed away by posting descriptions online of all of the support he gave them over the years.

“Professor Massoudi has spent his life helping to give the best possible engineering education to students at Cal Poly Pomona. He has contributed to the electrical & computer engineering department in many ways, including serving as the department chair. He and his wife Parvin felt strongly about the mission of our college, and we owe them both a tremendous debt of gratitude,” says Mahyar Amouzegar, dean of the College of Engineering.



Photo provided by Mohammad Massoudi

Mohammad Massoudi (EE BS '73, MS '75), electrical & computer engineering professor, with his late wife, Parvin.

# ABDUL RASHIDI: PASSION FOR PUBLIC HEALTH AND EDUCATION

**M**r. Abdul Rashidi grew up in Afghanistan, where the lack of easy access to clean water is a major contributor to the country's high infant mortality rate. The importance of clean water and other public health concerns were common topics of conversation around the dinner table among his family of engineers and physicians.

"The significance of having a clean water supply for the community enticed me to become a public health/environmental engineer, and to devote my life to helping society," says Rashidi.

Today, Rashidi is a recognized expert in managing water resources and a senior consultant at MWH Global, a world leader in environmental engineering. Among many achievements nationally and internationally, Rashidi has worked on key projects benefiting Southern California, including a project for the City of Los Angeles that cleaned Santa Monica Bay and brought it back to life after decades of pollution. The other is a water reclamation project for the Orange County Water District to provide a renewable and sustainable clean source of water for Orange County residents.

Rashidi is also a well-respected

faculty member of the Civil Engineering Department, where students praise him for his expertise and his captivating style of teaching. Rashidi says teaching has broadened his perspective and served to clarify and accentuate the need for social responsibility in his professional

For the past five years, Rashidi and his wife, Shafiq, have donated more than \$40,000 to the College of Engineering to support the nurturing and development of future technical leaders. Rashidi says he has benefited from his time at Cal Poly Pomona and wanted to give something

back to the university to strengthen those programs that properly prepare students to solve future problems.

"I also encourage and challenge my Cal Poly Pomona colleagues to do the same, for this is the best contribution one can make," says Rashidi. "Water is a critically important resource and by supporting Cal Poly Pomona's exceptional engineering programs, all Californians can benefit from superior water systems in the future."

Rashidi and his wife will continue to support the college and its students, and would love to develop an online engineering program for students in Afghanistan.

When asked what advice he has for young engineers, Rashidi says, "Life is about the legacy we leave behind. You should develop career plans early on and follow and live your dreams, remaining

consistent with high moral values. The world is changing rapidly, and so must you—you should never stop learning."



Abdul Rashidi, civil engineering lecturer emeritus, and his wife, Shafiq.

life. As a result, moral considerations have become a more significant part of his approach to problem solving.





Christopher Ohara, engineering technology student, and Thomas Thoen, electronics & computer engineering technology faculty member, with the Blu-Finder.

# MEETING OF THE MINDS

## INTERDISCIPLINARY COLLABORATION ALLOWS ENGINEERING AND BUSINESS STUDENTS TO CREATE AND MARKET REAL PRODUCTS

One of Cal Poly Pomona's innovative educational programs is PolyPresents, a joint program between the College of Engineering and the College of Business Administration. PolyPresents, a year-long course, provides diverse teams of undergraduate engineering and business students with real-world entrepreneurial experiences, giving them the rare opportunity to use what they have learned in the curriculum to innovate, design, build and take a new product to market.

"The class is divided into teams, each tasked with conceptualizing and pitching a different product by the end of fall quarter," says Mr. Thomas Thoen, electronics &

computer engineering technology faculty member. "The class votes on which product is most viable. In winter quarter, the class breaks into groups for marketing and engineering. The spring quarter is for production and sales. As is the case after graduation, students work in cross-functional teams to meet specific financial and strategic objectives."

Students design, build and sell a different product every year. They have consistently made a profit, and the profits go back into the class to supplement the next year's project.

The most recent product to come out of the program is Blu-Finder: a USB flash drive with built-in loss prevention. Blu-Finder,

which is linked via Bluetooth, alerts the owner if he or she forgets the USB flash drive.

"Blu-Finder can be paired with a smartphone and with your laptop so that you'll be notified if you've left your USB flash drive in a computer," explains engineering technology student Christopher Ohara. The Blu-Finder products were sold on campus in spring 2013.

Dr. Winny Dong, a chemical & materials engineering professor, and Dr. Olukemi Sawyerr, a management & human resources professor, developed PolyPresents beginning in 2008. This entrepreneurship course is rare in engineering education across the nation.





First-year students participate in Cal Poly Pomona's annual Mini Rose Float Competition.

# GREAT BEGINNINGS

## STUDENTS LEARN TO THRIVE IN COLLEGE AND FUTURE CAREERS

**W**hen Kimberly Nibungco first came to Cal Poly Pomona, she was unsure about her major and was new to the complexities of the university. She knows now that she is in the right major and feels confident in navigating the university because of advising she received through the college.

"Advising has helped me figure out that computer engineering is the right major for me. I remember being encouraged through an advising session to take Introduction to Electrical Engineering early on to determine if I was in the right major. It was a great course, lots of hands-on activities and completely the right fit for me. Advising has also taught me about all the

policies and resources that Cal Poly Pomona has, making it easier for me to know what to do and where to go when I need help," says Nibungco.

From the moment Cal Poly Pomona engineering students like Kimberly step on campus, they are given the right tools to be successful. The College of Engineering's first-year programs are developing well-rounded students who are able to thrive in college.

The centralized Freshman Advising Program and the First Year Experience (FYE) course, Engineering, Society, and You, are preparing students for academic success and for staying on course to graduate in engineering. Both first-year programs focus on student development with

complementary missions to retain and cultivate accomplished engineering students prepared to enter the technical workforce or to pursue graduate studies.

First-year engineering students are required to attend group advising sessions designed to help them with the transition from high school to college, while also providing accurate and consistent information regarding policies and resources. The FYE course enhances students' commitment to academic and personal achievement in engineering.

Mr. Joseph Berk, who has been teaching the FYE course since its inception, recognizes the importance of such a course. "Many students



think college will be like high school, but the expectations here are much higher. We teach new engineering students critical thinking, engineering creativity, ethics and teamwork,” says Berk.

In the FYE course, students engage in the Learn by Doing philosophy through various hands-on activities and assignments derived from the text book, *Studying Engineering: A Road Map to a Rewarding Career*, by Dr. Ray Landis, a nationally recognized expert in the field of engineering education.

Involved in training the college faculty in his approach to studying engineering, Landis believes Cal Poly Pomona’s FYE course is an exemplary model for other colleges. According to Landis, “Cal Poly Pomona is leading a movement within engineering education to shift from the traditional ‘sink or swim’ paradigm to one of student development, which enhances the academic performance

and retention of first-year engineering students.”

The FYE course includes a lab experience that exemplifies the Learn by Doing philosophy, which partners in industry say is the college’s best asset. In the lab course, students work in teams to design and build a mini rose float. Students engage in a competition simulating the Pasadena Tournament of Roses Parade, where top teams are recognized based on float specifications, presentation and creativity. The annual Mini Rose Float project is a perfect example of strengthening students’ communication skills and ability to work in teams.

According to university data, students who take the FYE course have higher overall GPAs than students who do not. The centralized advising program has yielded positive results from assessments,

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“Our first-year programs provide a great start for preparing our students for success in college and beyond.”

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and students are learning about resources, policies and procedures, and are developing self-awareness through advising.

Dr. Cordelia Ontiveros, associate dean for academic programs & student services in the College of Engineering, believes in the strength of the first-year programs.

“The college is making strides to meet the high demand for engineering graduates,” says Ontiveros.

“We want our students to be competitive candidates for engineering positions and for top graduate programs. Our graduates possess high-level technical skills and are able to communicate effectively and work in teams. Our first-year programs provide a great start for preparing our students for success in college and beyond.”

## FACULTY TEACHING THE FIRST YEAR EXPERIENCE COURSE

ENGINEERING, SOCIETY,  
AND YOU

**CHEMICAL & MATERIALS  
ENGINEERING:**

**Ms. Jody Hamabata**

**Dr. Mary Woods**

**CIVIL ENGINEERING:**

**Dr. William Kitch**

**MECHANICAL ENGINEERING:**

**Mr. Joseph Berk**

**Dr. Mariappan Jawaharlal**

**COLLEGE OF ENGINEERING:**

**Mr. Eric McDowell**

**Ms. Abida Merchant**

**Ms. Patty Mucino**

**Mr. Milton Randle**

**Ms. Bianca Valle**



Selyna Beverly, engineering undergraduate advisor, speaks with incoming freshmen engineers during first-year advising at Cal Poly Pomona.

# SENIOR PROJECT INCREASES BOTTOM LINE OF LOCAL BUSINESS

**W**hile many engineering students have opportunities to gain work experience during their undergraduate careers, they're seldom able to execute a project that helps a specific business speed up production and increase its bottom line. Fruth Custom Plastics in Placentia, Calif., gave two Cal Poly Pomona students the opportunity to do just that.

Company owner Mr. James Fruth, hired Ms. Lucia Horta (IE '12) and Ms. Brenda Saldana (IE '11) to work at Fruth Custom Plastics as part of their senior project to identify ways in which his company's operations could be more efficient and profitable.

Fruth Custom Plastics provides flexible packaging products to many different industries and is known for its commitment to environmentally friendly practices. The company's processes mainly involve

extrusion: creating plastic objects of a fixed, intricate cross-sectional pattern by pushing the plastic through a die. Horta and Saldana were tasked with reducing the time and increasing the productivity of Fruth's processes.

With guidance from their faculty advisor, Dr. Kamran Abedini from industrial & manufacturing engineering, the students used product flow analysis to determine what processes needed attention.

"We collected pertinent data and interviewed personnel to obtain a better understanding of the process, and we were able to diagram the production process from beginning to end," says Horta. They created floor layouts and diagrams and then devised an alternative physical layout that offered a more efficient material flow throughout the system.

The students considered the company's inventory

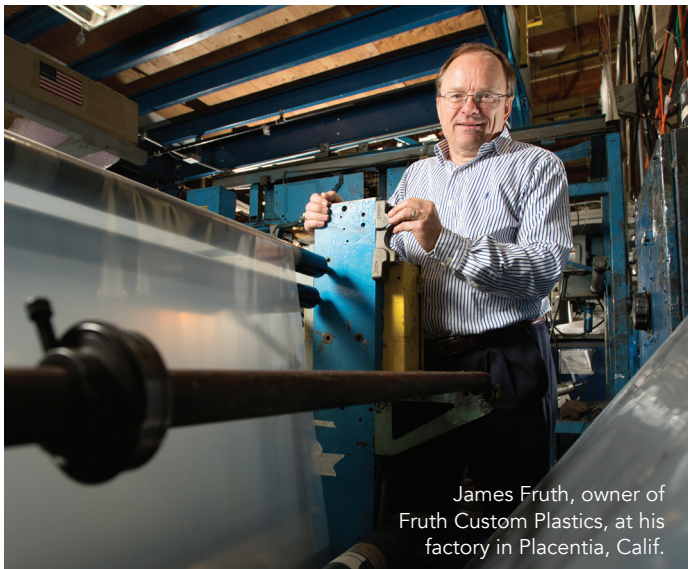
and found opportunity for savings—mainly in the form of more than \$20,000 worth of unused materials. Horta and Saldana recommended selling these assets. Management agreed, and the move added to Fruth's profits and allowed the company to repurpose valuable physical space.

Horta and Saldana also noticed that inaccurate measurement of the plastic to be extruded was creating inefficiencies. To minimize waste, they found and recommended a device that reads thickness of plastic.

"I was impressed by the work ethic of the students and the wide variety and applicable industrial engineering tools they brought to the project," says Fruth. "Their suggestions rendered real benefit to the company. I credit both of them with facilitating the growth curve that we are on, including facilitating our recent expansion through acquisition of a competitor."

The students presented the results of their year-long work at the annual Engineering Project Symposium event, which provided an opportunity for their work to be reviewed by faculty and industry representatives.

"We learned from this experience to carefully examine resources and processes and to think about how to make them work more efficiently," says Saldana. "This project also gave us some good ideas we'll be able to use in our own future careers."



James Fruth, owner of Fruth Custom Plastics, at his factory in Placentia, Calif.

## INDUSTRY PARTICIPATION IS VITAL TO STUDENT SUCCESS

PLEASE JOIN US AT OUR NEXT  
ENGINEERING PROJECT  
SYMPOSIUM & SHOWCASE  
MAY 30, 2014

## STUDENTS SHOWCASE INGENUITY

The College of Engineering held its 13th Project Symposium highlighting research projects of students from various engineering disciplines. The Project Showcase, which consists of seven selected senior design projects, attracted a



Photo by Roger Humes

large number of faculty, staff and members of industry as students presented their research. Concluding the presentations was a round of awards, with a committee of department chairs and deans from the college selecting winners. Industrial & manufacturing engineering received first place, with chemical & materials engineering, and aerospace engineering winning second and third place, respectively.



## EDITORIAL

# BUILDING A PASSION TO PROTECT THE FUTURE OF ENGINEERING

**S**ince graduating from Cal Poly Pomona with a degree in Mechanical Engineering in 1975, I have been fortunate to continuously work on exciting engineering projects around the globe. A number of years ago, our firm adopted an internal mantra that we, as individual engineers and as an engineering organization, only succeed as long as we have a “passion to build.” As I think about the future of engineering as a profession, and the importance of engineering to the healthy progress of society as a whole, that same mantra continues to ring true, but our country and the progressive state of California are losing their “passion to build” and in the process, compromising our nation’s preeminent status as a technological leader.

For more than a century, the United States has been at the forefront of fostering basic research and technological innovation at home and abroad. Yet, external competition is increasingly challenging our country. For the first time, the top ten Asian countries are investing as much as the U.S. in research and development, and they are expected to surpass us in the near future.

This is disconcerting. California has traditionally been at the forefront when it comes to technical innovation and served as the primary training ground for the technical workforce of tomorrow. At the center of the state’s workforce development are Cal Poly Pomona and Cal Poly San Luis Obispo, serving as the driving force in meeting the state’s technical workforce development efforts and needs. Together, these universities educate and train over 10,000 engineering students and annually graduate close to 2,000 highly skilled work-ready engineers, collectively forming the largest engineering education program in the nation.

Unfortunately, California’s leadership role in research and technical workforce development is waning. As this issue persists and as Cal Poly Pomona’s College of Engineering continues to grow in prominence, with new enrollments expected to reach all-time highs, California, and the nation as a whole, is at a crossroads. We must decide whether to “change” and “invest” in engineering as a profession, or accept the impact on our society of not doing so. Although the challenging decisions we have to make can be extremely difficult, the negative impact of not taking action to strengthen our societal commitment to the profession of engineering is even greater. So, where do we begin?

First, a bigger investment in our engineering degree programs is required to meet the demand for work-ready engineers. Engineering technology has rapidly progressed over the last five decades; however, students entering college arrive with the same basic level of science and math knowledge as in the past. Therefore, the College of Engineering needs to cover significantly more material in the same four-year program if our students are to graduate with a marketable level of competency.

Secondly, developing a singular focus on the vision for the College of Engineering is essential. Successful organizations have been proven to benefit both from a singular focus on their vision and by executing a plan to fulfill this vision. More importantly, successful organizations stop actions that support alternate visions or sub-visions.

To develop a singular focus, we need to ask ourselves some tough questions: What is Cal Poly Pomona’s vision for the College of Engineering? Are we focused on that vision to the exclusion of everything else? What challenges need to be faced and overcome to realize our vision?



Mark Stevens (ME '75) is the Senior VP, Corporate Risk, Fluor Corporation.

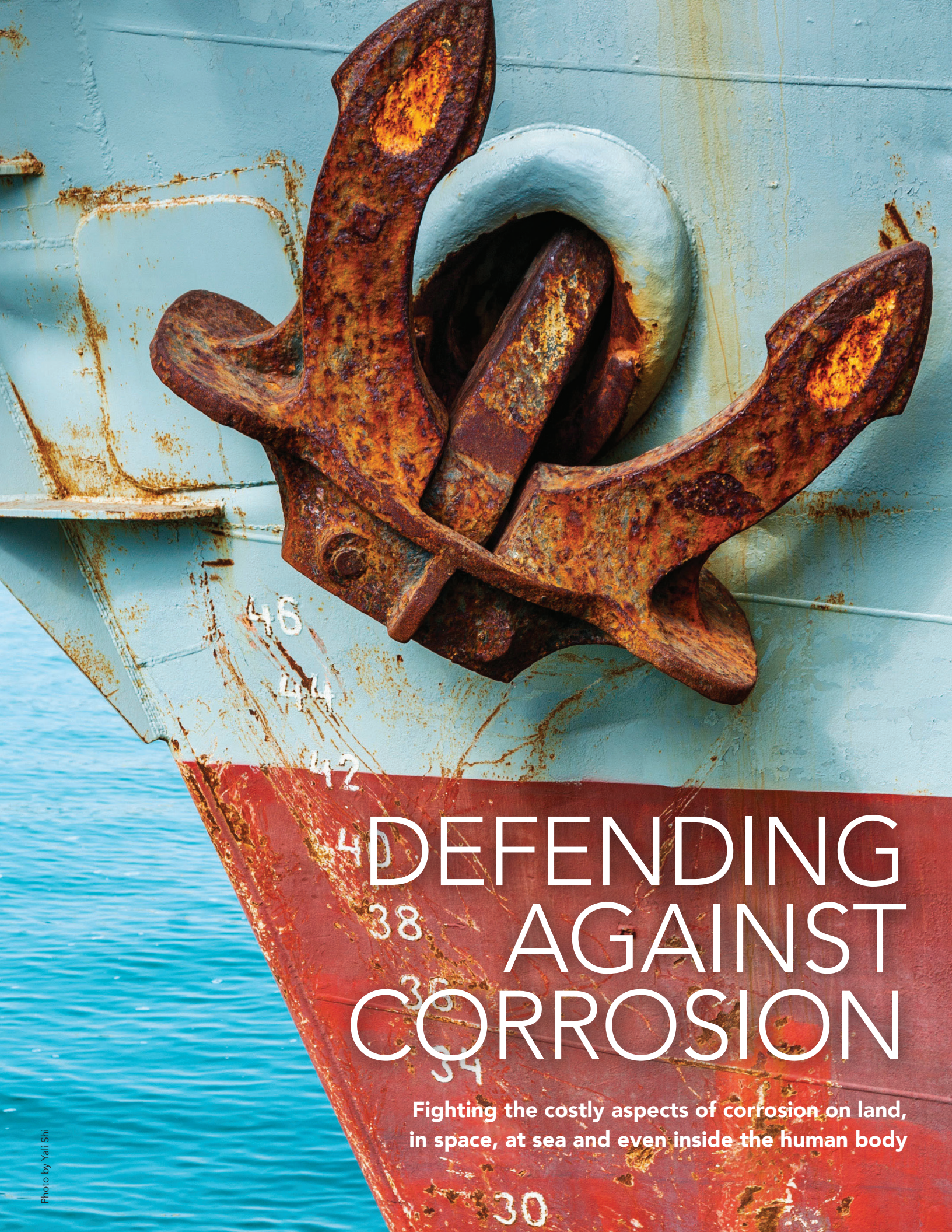
Photo provided by Fluor

Lastly, we must create an effective and cost-efficient method of instruction at Cal Poly Pomona. In addition to continuing the Learn by Doing approach that has been instrumental to the success of the engineering program, we should look at alternative methods to improve efficiency, decrease cost and allow Cal Poly Pomona to invest in more students and enhanced curriculum.

Only by coming together with both alumni and the private sector to transform the College of Engineering from the inside, while simultaneously pushing the state to transform itself, will we protect the future of engineering and reignite the “passion to build” in both our students and our state.

**Mark Stevens is responsible for Fluor’s project risk review processes and identifies opportunities to improve Fluor’s commercial approaches. Stevens also serves on the Dean’s Leadership Board for the College of Engineering at Cal Poly Pomona and is a Distinguished Alumnus.**





# DEFENDING AGAINST CORROSION

Fighting the costly aspects of corrosion on land,  
in space, at sea and even inside the human body



**T**hey say nothing is certain other than death and taxes. But what about corrosion, that pesky chemical reaction affecting nearly all metallic materials in our environment?

“Corrosion is an ever-present problem causing huge economic losses running into the billions of dollars,” says Dr. Vilupanur Ravi, chair of the chemical & materials engineering department at Cal Poly Pomona. “Consequently, this is a major problem for society.”

Internationally recognized in the corrosion and materials engineering community for his advancements in corrosion research, Ravi’s award-winning work with his students and colleagues has helped make Cal Poly Pomona one of only a few universities in California focused on corrosion research.

Ravi found a passion for studying the field of corrosion while working on his doctorate in metallurgical engineering. He says his interest is not only in solving the ravages of corrosion but also in helping society battle this naturally occurring phenomenon.

“Corrosion is one of nature’s inexorable processes,” explains Ravi. “We can try to stop it, but it finds a way to march on. If we can develop new technology and insight, we can help combat corrosion,” explains Ravi.

To achieve this goal, Ravi and his team

“Corrosion is an ever-present challenge for the Navy and always has our attention,” says senior executive Dr. William H. “Bill” Luebke, technical director of the Naval Surface Warfare Center, Corona Division.

of students and faculty in the College of Engineering are researching many different aspects of corrosion, including the behavior of high temperature coatings in molten salts and advanced alloys in environments simulating the human body for medical implant purposes.

“In the coatings area, we have made strong advances in understanding the process,” says Ravi, who served as guest editor for the December 2012 issue of JOM, member journal of The Minerals, Metals and Materials Society. “Our research is allowing us to apply coatings to a broad range of materials, such as iron-based alloys or nickel-based alloys, and we are customizing these coatings for various applications,” says Ravi.

He explains further that power plants, which burn coal or biomass for energy, are one such application that can benefit from the College

of Engineering’s coatings research. “When different materials burn, they give off various gases, which attack the power plant’s metallic smoke stacks differently. Finding options to defend against these different corrosive attacks provides a great benefit to implementing new types of fuel sources.”

Along these lines, NASA has provided Ravi with a grant to research the effect of coatings to stabilize a metallic component to be used in future spacecraft power generators.

“One of the concerns is that the component will be operating at high temperatures in space, which can cause the metal to evaporate like boiling water,” says Ravi. “Our research is helping develop effective coatings, enabling the metal to withstand this extreme heat and high levels of vacuum.”

Another hot topic in corrosion research is molten salt, which has great potential for solar and renewable purposes. The substance can be heated with solar rays and remain molten over a large temperature range. When cooled, the stored thermal energy in the molten salt can be extracted to generate electricity. As the temperature of the salts is increased, corrosion of the containment vessel starts becoming an issue that will need to be resolved.

“Molten salt offers an efficient solution to store energy, but it has to be contained in something that won’t corrode,” says Ravi. “An important part of our current research in this area involves trying to understand how different metals react with molten salt.”

Any conversation about metals and reactions with salts should also include the U.S. Navy, which often sees the corrosive maritime environment and abundant repository of salt affect its myriad ships, submarines and aircraft.

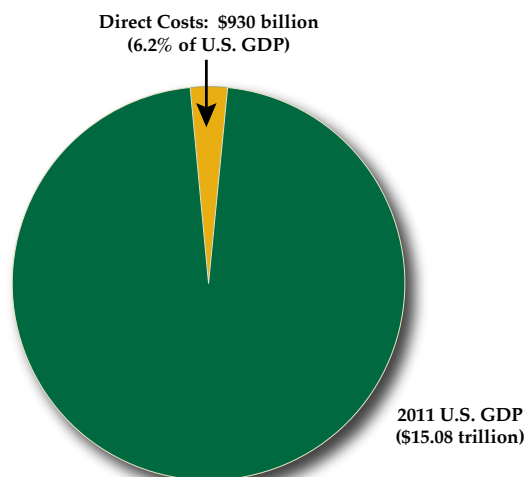
To mitigate corrosion’s negative effects, the Navy is continually interested in materials



Dr. Vilupanur Ravi examines a metal alloy sample coated by utilizing a high temperature process with chemical engineering student Zorineh Megerdichian and mechanical engineering student Brian Stoops.

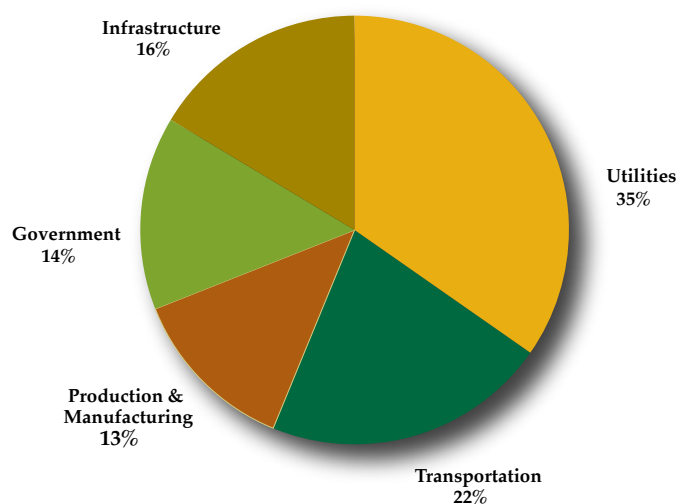
# CORROSION COSTS

## DIRECT CORROSION COSTS



Based on *Corrosion Costs and Preventive Strategies in the United States*.  
Gerhardus H. Koch, Michiel P.H. Brongers, and Neil G. Thompson, NACE International.

## COST OF CORROSION IN INDUSTRY CATEGORIES



Based on *Corrosion Costs and Preventive Strategies in the United States*.  
Gerhardus H. Koch, Michiel P.H. Brongers, and Neil G. Thompson, NACE International.

for potential use in aircraft carriers and airplanes that are resistant to corrosion caused by seawater. Ravi and his team have been working on corrosion studies of titanium alloys containing boron that are lightweight, strong and stiff that could be used in a number of applications by the Navy.

“Corrosion is an ever-present challenge for the Navy and always has our attention,” says senior executive Dr. William H. “Bill” Luebke, technical director of the Naval Surface Warfare Center, Corona Division. “We created a center for the independent assessment of corrosion to ensure we have an objective process to evaluate the effectiveness of methods for combating it.”

Luebke, a retired Navy captain with a doctorate in ocean engineering from MIT, adds that the education partnership agreement between his command and the College of Engineering is a perfect way to bring together the two organizations’ collective expertise to effectively defeat corrosion.

In its annual report to Congress last year, the Defense Department estimated corrosion cost the military \$20.9 billion in 2012, and the Navy estimated its cost to be about one-third of that.

While Ravi and his team’s many advancements in the field of corrosion have yielded significant societal benefits, those related to medical technology are perhaps the most impactful. One such study on a biomedical level is his research team’s titanium alloy work that he hopes will help people who need implants, such as hip replacements and pacemakers, which are normally made of metallic materials.

“These metallic alloys are exposed to a hostile environment in the human body that will eventually influence the material in a corrosive fashion,” says Ravi. “Understanding how corrosion occurs within the human body and developing new materials provide the medical industry with options that will ultimately improve and save lives.”

Currently, Ravi is working on establishing a new corrosion center at Cal Poly Pomona that would serve as a corrosion studies laboratory for local government, the U.S. Navy and private industries in Southern California. Ravi hopes to enlist the help of all businesses and entities with corrosion challenges to join him in the development of this much-needed research facility.

“Not all companies have the resources to solve their corrosion issues,” says Ravi. “It is my aspiration that this center will provide a solution to help those organizations and society as a whole to ultimately win the fight against corrosion.”

Corrosion’s great monetary cost to the overall U.S. GDP and to several industries.



"Corrosion is one of nature's inexorable processes. We can try to stop it, but it finds a way to march on. If we can develop new technology and insight, we can help combat corrosion."





# CONQUERING THE IMPOSSIBLE

Internationally recognized Cal Poly Pomona alumnus Daniel Cheng uses his engineering knowledge to make positive environmental impacts around the globe

**N**othing is impossible. We just have to look and work harder; the solution is always in front of us." Mr. Daniel Cheng's father instilled this philosophy in him when he was a young boy in Hong Kong. This spirit continues to drive him today. After more than three decades of accomplishing what many said could not be achieved, Cheng continues to find solutions for even the most difficult challenges.

Obtaining a degree in industrial engineering from Cal Poly Pomona helped Cheng to enjoy early success in business and empowered him with the belief that he was well prepared to act as a leader in industry. Cheng initially came to the U.S. from Hong Kong to study engineering at the urging of his father. His father understood the important role technology

would play in the future global economy.

"As an 18-year-old foreign student, I had to work full time and attend school full time simultaneously," says Cheng. "I juggled three jobs during the summer in order to save enough to cover the out-of-state tuition costs. But the hard work taught me to be humble and made me more determined than ever to succeed."

Cheng says the biggest value his engineering education provided was equipping him with the skills to become a "technical artist," which Cheng describes as a person with the ability to see the need, then pursue, create and deliver technological solutions for a more prosperous future.

After graduating in 1981, Cheng worked in industry at several companies in Southern

California. In 1984, at his family's request, Cheng returned to Hong Kong, where he turned a struggling VHS components company into the world's largest videocassette stainless steel component supplier within five years. In 1993, he turned his attention to oil recycling and wastewater treatment by serving as managing director of Dunwell Enviro-Tech (Holdings) Limited, a leader in the industry.

Due in large part to Cheng's ingenuity and novel

environmental technologies, Dunwell has received a host of industry awards. In 2006, the company won two prestigious international awards back-to-back for the development of its Vibrating Membrane Filtration System, a technology that increases the energy efficiency of used oil recycling by 90 percent through a process of filtration instead of distillation. Since that time, Dunwell has received several other notable awards for its pioneering "green" solutions.

Recognized as a leader in his field, Cheng was granted the Hong Kong Special Administrative Region Medal of Honor for his valuable contributions to the local environmental industry in 2007.

Cheng is thankful for the opportunities he has been afforded in his educational and professional life. During college, he received a much-needed scholarship from the Institute of Industrial Engineers (IIE). Cheng passed on his good fortune by starting the IIE Hong Kong Chapter scholarship program to help other engineering students since 1985.

"Solving global environmental problems is what makes me most proud," says Cheng. "Many first believed the VMAT system wouldn't work. But it is just one of the many times my engineering education provided me with the problem-solving skills to show that nothing is impossible, especially in the field of engineering."



Daniel Cheng (IE '81) is the managing director of Dunwell Enviro-Tech (Holdings) Limited.

## DISTINGUISHED ALUMNUS 2013 MARTIN J. COLOMBATTO

Martin J. Colombatto discovered his passions early in life and committed to them by studying engineering technology at Cal Poly Pomona, where the extensive hands-on curriculum helped him make a seamless transition to the workforce.

"It's the way my brain is wired. If I learned how to build a circuit in a book, I sort of got it. But, if I had the chance to build and test the circuit in a lab, I really understood it," says Colombatto.

He has also given back to the College of Engineering, resulting in the Colombatto Family Laboratory. Colombatto now serves on the Dean's Leadership Board to continue scoping out opportunities to support the college in partnership with Dean Mahyar Amouzegar.



Martin Colombatto (ET '82) speaks during the dedication of the Colombatto Family Laboratory in the engineering building.



## ALUMNI BRAINPOWER PUTS CURIOSITY ROVER ON MARS



The Curiosity rover positioned at the site for its first rock-drilling activities.

When NASA's Curiosity rover successfully landed on Mars, it captured the attention and imagination of the world. But, the brainpower behind Curiosity's mission is right here in California and it includes more alumni from Cal Poly Pomona than from any other CSU - seven out of 18 total:

**Ekko Burt (EE '00)**  
*Electrical Engineer*

**Michael Cayanan (EE '02)**  
*Software Engineer*

**Martin Greco (ARO '00)**  
*EDL Activity Lead*

**Jose Guzman (EE '04)**  
*Integration and Test Engineer*

**Ted Iskenderian (ME '84)**  
*Senior Mechanical Engineer, Cognizant*

**Alfred Khashaki (EE '96)**  
*Design Engineer*

**Peter Xaypraseuth (ARO '00)**  
*Mission Planner, Mars Reconnaissance Orbiter Project*

# THE POWER OF EDUCATION

Electrical engineering alumna Rebecca Rhoads uses her foundation in education to power her career in global defense and technology

**M**s. Rebecca Rhoads chose to study electrical engineering in the late 1970s because she believed electronics would play a significant role in the future, especially in computing and automation.

That was before the PC, Microsoft or Apple had become household names.

Today, Rhoads, who earned her bachelor's

and master's degrees in electrical engineering from Cal Poly Pomona, is vice president and chief information officer for the Raytheon Company, an industry leader in global defense and technology.

She credits her years at Cal Poly Pomona with giving her the tools she needed to succeed in a highly competitive and challenging environment.

"While technologies have changed several times over since I graduated, I often call upon my educational foundation, even today," says Rhoads. "The basics of science, technology, engineering and math were reinforced by the College of Engineering as fundamentals that would position me for future opportunities."

As a woman entering a highly technical engineering field, Rhoads quickly had to become comfortable working and competing with a majority of men at all levels. She built a network of mentors, peers and role models that helped her take the steps necessary for career advancement.

Rhoads, who thrives on challenges, is now leading Global Business Services, a new organization created by Raytheon, which is designed to integrate shared services such as human resources, finances, supply chain,

advanced media and information technology throughout the organization.

During her career, Rhoads has earned several distinctions including recognition for the Corporate America Top 100 Influential Leaders and Top 50 Women in Technology. In 2008, she was selected as a Distinguished Alumna by the College of Engineering. She was also elected to the Computerworld CIO Hall of Fame, ranked No. 6 on ExecRank's list of Top 50 Female CIOs in 2012, and named Boston's No. 1 most powerful woman in technology by Boston.com in 2012.

Reflecting on her own education and career path, Rhoads suggests that students tackle numerous projects that take them out of their comfort zones and that give them the opportunity to learn new technologies, approaches and techniques.

"Remember that the job you'll be doing in five or 10 years probably doesn't exist yet—but you'll help define and develop it on the way," says Rhoads. "Take the hardest jobs that no one wants, do them well, and then move on. Yet, always balance work and life – it will help keep you energized and focused on business results."



Rebecca Rhoads (EE BS '80, MS '86) is the vice president and chief information officer for the Raytheon Company.





# INSPIRING THE NEXT GENERATION

PROMOTING NATIONAL SUCCESS IN A COMPETITIVE WORLD

Dr. Cordelia Ontiveros works with students to help them on their path to a career in engineering. (Pictured left to right) Industrial engineering student Minerva Munoz, civil engineering student Charisse Garrido and electronics and computer engineering technology student Victor Zamora.

**E**ngineering is a critical field for positioning our nation in an ever more competitive global market. If we, as an advanced industrial nation, want to be successful, we must entice as many talented people as possible to pursue careers in engineering and science. In order to attract a wide variety of students and to inspire the next generation of young men and women, the College of Engineering is committed to recruiting and retaining highly qualified and

diverse faculty and administrators to enrich students' experiences and to challenge them to become leaders in engineering.

With only 19 percent of engineering bachelor's degrees awarded to women nationwide, just nine percent to Hispanics and a mere four percent to African Americans, stronger initiatives are needed to support these and other underrepresented groups who have traditionally not entered the field of engineering.

Cal Poly Pomona is positioned as a leader in promoting national success by supporting talented students and highly qualified faculty. A Hispanic Serving Institution, the College of Engineering is ranked number one in California for its large number of Hispanic engineering graduates. At Cal Poly Pomona, more than 26 percent of engineering bachelor's degrees were awarded to Hispanics last year, which is more than three times



**“Dr. Ontiveros’ success in the field of engineering is very inspiring to current Cal Poly Pomona engineering students like me.”**

the national average. Moreover, the college graduates more African Americans than any other engineering school in California.

“Our efforts to engage talented and diverse students are enhanced by recruiting and retaining highly qualified and diverse faculty and administrators to serve as role models,” says Dr. Mahyar Amouzegar, dean of the College of Engineering. To that end, the college has made tremendous strides in hiring talented and diverse faculty, significantly exceeding the national average, with 22 percent female and nine percent Hispanic faculty members.

Dr. Cordelia Ontiveros, associate dean for academic programs & student services and professor of chemical & materials engineering, is a leading example. Ontiveros (CME ’78) earned a Ph.D. from

Princeton University and has had a highly successful career in academia, in addition to her experience in industry and with the NASA Kennedy Space Center. She is also a registered Professional Engineer in California, a certified Corrosion Specialist and serves as a prime role model to female and Hispanic students.

Though Ontiveros serves many important roles, her commitment to diversity in engineering is most evident through her partnerships with organizations such as the Society of Hispanic Professional Engineers (SHPE), Society of Women Engineers (SWE) and Project Lead The Way (PLTW), which addresses the national STEM workforce shortage by providing engaging engineering curricula for middle school and high school students.

Ontiveros was honored

as a Distinguished Speaker at the 2012 SHPE National Conference, where she discussed the college’s efforts to inspire the next generation. “Universities from around the country were extremely impressed with Cal Poly Pomona’s programs to motivate young people to improve the world around them by pursuing a career in engineering,” says Ontiveros.

Minerva Muñoz, an industrial engineering student who attended the 2012 SHPE National Conference, says, “Dr. Ontiveros’ success in the field of engineering is very inspiring to current Cal Poly Pomona engineering students like me.”

“We plan to move forward with our great partnerships and programs to encourage our students to become the leaders of tomorrow,” says Ontiveros. “Cal Poly Pomona’s proactive efforts have generated many positive results, and we are committed to furthering these crucial initiatives to maintain our nation’s place in the global economy.”

## WOMEN IN ENGINEERING RECEIVE SOUTHERN CALIFORNIA EDISON GRANT



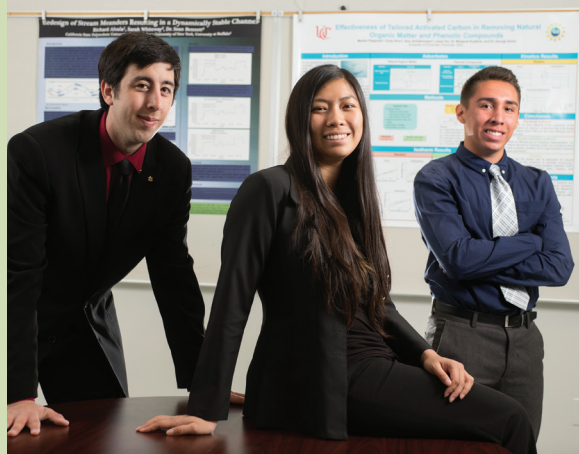
SOUTHERN CALIFORNIA  
**EDISON**®

An EDISON INTERNATIONAL® Company

Cal Poly Pomona’s Women in Engineering (CPP WE), a program that works to attract, retain, and graduate a higher percentage of female engineering students, has received a \$100,000 grant from Southern California Edison (SCE).

“The college appreciates its long-standing partnership with SCE, and looks forward to working with them and a variety of other organizations to encourage more young women to pursue a career in engineering,” says Dean Mahyar Amouzegar.

“The opportunities provided by this grant will have lasting positive effects for our young female engineers.”



## STUDENTS SHINE AT NATIONAL CONFERENCE

At the 2012 Society of Hispanic Professional Engineers (SHPE) National Conference, mechanical engineering student Michael Alio and civil engineering students Cindy Khov and Richard Alcala (pictured left to right) were chosen through a highly selective process to compete against students from across the nation with their poster and paper presentations.




“Attending the SHPE National Conference was an amazing experience,” says Khov. “We had the opportunity to interact with so many amazing people from top positions in the engineering field.”

# OUTSTANDING FACULTY

The College of Engineering recognizes faculty for their dedication to teaching and scholarly pursuits through three annual awards: Outstanding

Teaching, Innovation in Teaching and Excellence in Research. Dr. Ben Bahr, associate dean for research & graduate studies, is proud that the college

honors such excellence. “Because of our faculty, Cal Poly Pomona continues to be one of the best engineering schools in the country,” says Bahr.

<p><b>OUTSTANDING TEACHING</b> <b>Dr. Kamran Abedini</b> <i>Industrial &amp; Manufacturing Engineering</i></p>  <p>An outstanding faculty member for 18 years, Abedini continues to push students with a new, project-based course, Operations Planning &amp; Control, that simulates real-world challenges</p> <p>– tight deadlines, oral and written presentations, and competition from other teams.</p>	<p><b>INNOVATION IN TEACHING</b> <b>Dr. Subodh Bhandari</b> <i>Aerospace Engineering</i></p>  <p>Bhandari has revitalized the area of Flight Dynamics and Control, engaging students in cutting-edge, senior design projects. Bhandari also renovated the Flight Controls and Simulations and Unmanned Aerial Vehicle Labs, which support interdisciplinary student projects.</p>	<p><b>EXCELLENCE IN RESEARCH</b> <b>Dr. Vilupanur Ravi</b> <i>Chemical &amp; Materials Engineering</i></p>  <p>Ravi has spearheaded and developed unique experimental research facilities dedicated to developing high-temperature, protective coatings on metallic materials and studying their corrosion behavior. Ravi’s research efforts to fight corrosion can potentially save billions of dollars for public and private industry.</p>
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# PRESENTING CAL POLY POMONA’S CIVIL ENGINEERING DEPARTMENT

Civil engineering students have consistently placed in the top 10 in competitions held by the American Society of Civil Engineers and against the best schools in the U.S. These are among the accolades of Cal Poly Pomona’s Civil Engineering Department, a model of

success and academic recognition. With a storied history of distinctions and awards, the department continues to be a sterling example of the best the college has to offer. “The secret of our success stems from the exciting creativity of our faculty, students’ teamwork and the rousing stimulation from

our industry partners,” says Dr. Francelina Neto, department chair. “We are in the vanguard of civil engineering education, and our students’ thirst to demonstrate that is so visible in the countless top awards in professional, regional and national competitions.”

<b>1st Place</b>	GeoWall Team, ASCE National Geo-Institute Conference	<b>2nd Place</b>	ASCE Pacific Southwest Conference
<b>2nd Place</b>	Seismic Team, Seismic Design Competition	<b>4th Place</b>	Steel Bridge Team, ASCE Pacific Southwest Conference
<b>Prominent Chapter Award</b>	CE Honor Society Chi Epsilon, Pacific District Conference	<b>7th Place</b>	Concrete Canoe Team, ASCE National Concrete Canoe Competition



# A WINNING FORMULA

## STUDENTS RECEIVE TOP NATIONAL AND INTERNATIONAL RECOGNITION FOR GOING THE EXTRA MILE IN THE RACE CAR BUILDING COMPETITION

**C**al Poly Pomona's Society of Automotive Engineers Formula Car team placed sixth in the world and first in California among the 90 teams that entered custom-built race cars in the FSAE 2013 International Competition in Lincoln, Neb. Each year, Cal Poly Pomona's team designs a formula vehicle using highly specialized software, and then builds it from scratch in the lab by machining and fabricating steel, aluminum and carbon fiber.

Notably, this year's team placed higher in the competition than a number of well-funded European teams that opted to place all of their efforts into the computer design of their cars and then hired professional contractors to manufacture and assemble them.

"The experience of building a competitive prototype vehicle from the ground up takes the design process out of the abstract for students and enables them to experience hands-on systems engineering design and problem-solving," says Mr. Clifford Stover, engineering laboratory/facilities director for the College of Engineering and advisor for the FSAE team at Cal Poly Pomona.

Team members must also learn effective management of funds, materials and time, in order to transform a limited amount of



The Formula SAE car during testing at Auto Club Speedway in Fontana, Calif.

resources into a high-performance formula car. Corporate sponsors, some of whom have supported the team for years, provide monetary and in-kind donations to the team.

"Some of our sponsors have found their support of the team to be an investment in

their own organizations," says Stover. "Formula SAE is an engineering design competition, not a race, and our sponsors get to connect with prospective employees, who are demonstrating the effective use of high-level skills in a competitive environment."

## RECOGNIZING ACADEMIC EXCELLENCE

The College of Engineering concluded another exciting year, culminating with Commencement, where we graduated close to 1,000 engineers. As with every year, our valedictorians represent some of the best and brightest from our college. This year's valedictorians include Dika Handayani from manufacturing engineering, Katherine Slevkov from electrical engineering, Hoa Lieu from chemical engineering and Amanda Smith from industrial engineering. All four valedictorians plan to pursue advanced degrees in engineering.



Dika Handayani, Katherine Slevkov, Hoa Lieu, Amanda Smith (Pictured left to right)



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## Department Chairs

### **Aerospace Engineering**

*Dr. Ali R. Ahmadi*

### **Chemical & Materials Engineering**

*Dr. Vilupanur A. Ravi*

### **Civil Engineering**

*Dr. Francelina A. Neto*

### **Electrical & Computer Engineering**

*Dr. Phyllis R. Nelson*

### **Engineering Technology**

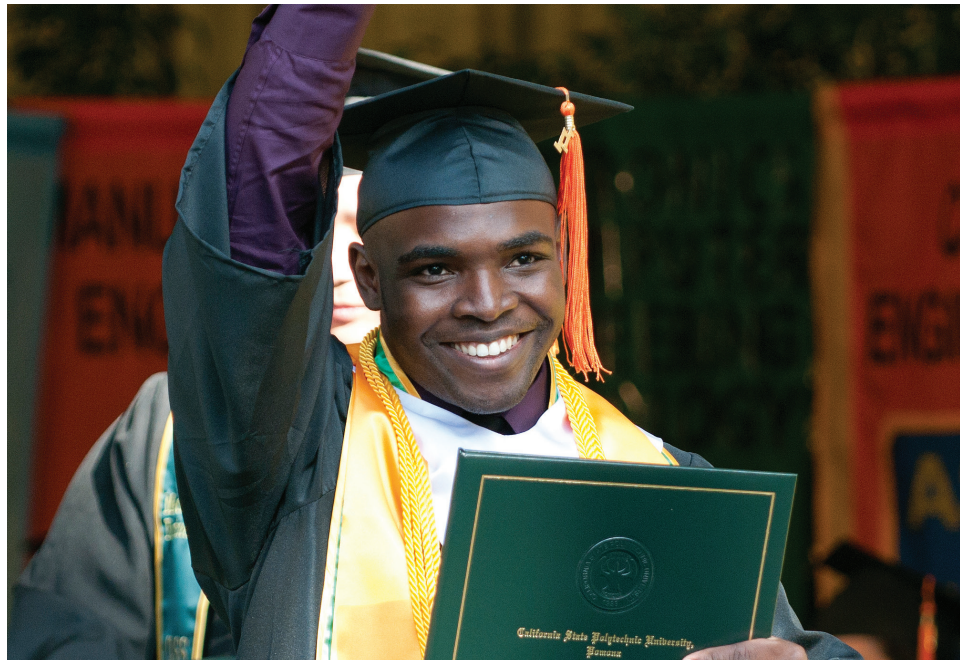
*Dr. Massoud Moussavi*

### **Industrial & Manufacturing Engineering**

*Dr. Abdul B. Sadat*

### **Mechanical Engineering**

*Dr. Angela C. Shih*



## YOUR GIFT CAN MAKE A DIFFERENCE. DONATE TODAY.

Gifts in all forms are important to the College of Engineering. With your support, we can help students achieve their dreams. Your gift can be directed to any area of the college that is of interest to you.

For more information, contact Patrick Stewart, senior director of development, College of Engineering, 909.869.5128 or [pestewart@csupomona.edu](mailto:pestewart@csupomona.edu).

Pictured above: Michael Omiyale (EE '10) is currently a substation engineer at Southern California Edison.