

# InSights

A PUBLICATION OF THE COLLEGE OF ENGINEERING,  
COMPUTER SCIENCE, AND TECHNOLOGY

CALIFORNIA STATE UNIVERSITY, LOS ANGELES



## PAVING THE WAY TO THE FUTURE

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# DEAN'S PERSPECTIVE

Welcome to our latest issue of InSights. I trust that a number of you have enjoyed spending time connecting with family and friends over the summer. Not long ago, we witnessed the graduation of the ECST class of 2017, the perfect time to celebrate how far our students have come. We recently welcomed ECST's newest students, and we're excited to support them in reaching their fullest potential in the years ahead. The success of our students is a testament in no small part to the dedication of our esteemed faculty and staff, as well as to our alumni and partners in industry. Many thanks to all of you!

It feels appropriate, then, that the focus of this issue of InSights reflects on where we've been, how far we've come, and where we're going next. Our passion for progress is evident:



Emily Allen, Ph.D.

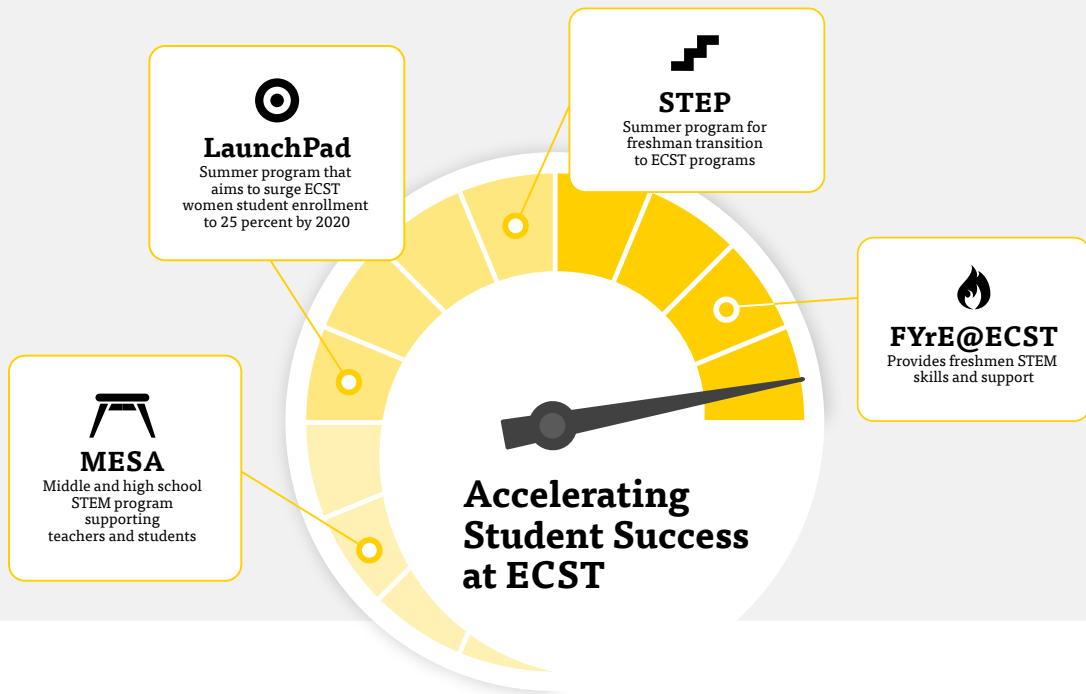
- We aim to increase female enrollment at ECST to 25% by 2020. As we look back at the journey of the first female student who joined our college in 1957 (pg. 10), it's quite a remarkable achievement to note we're at 15% now, but we're aiming even higher. Our LaunchPad program, part of our broader Accelerating Student Success initiative, is key to helping us reach this goal. The pilot launched successfully this summer.
- We've got big plans to create our own MakerSpace (pg. 18) here on campus where students can learn in new, tangible ways. We're in the early planning phase now, but are excited to see our ideas take shape and continue to make innovation a focal point for our students.
- I was struck by what alumni donor Jorge Ramirez recently told us. He is the CEO of Heateflex, where many of his employees are from Cal State LA. The reason? Our students are better equipped to solve real-life problems when they arrive at his company. Jorge was notably the first in his family to pursue higher education, and is grateful for the foundational role that ECST played in his current day success.
- I'm pleased to share that Cal State LA has the nation's highest upward mobility rate, defined as the fraction of its students who come from a family in the bottom fifth of the income distribution and end up in the top fifth. Our rating is the highest in the nation and I couldn't be prouder of the significant role Cal State LA plays as a promoter of upward economic mobility. The data comes from a report by Chetty et al., "Mobility Report Cards: The Role of Colleges in Intergenerational Mobility" and is available at [equality-of-opportunity.org](http://equality-of-opportunity.org).

When we dream big, both as individuals and as a collective, there's no telling how far we can go. I, for one, could never have guessed that someday I would become the dean of this college, so rich in human capital. But here I am, and there's nowhere else I'd rather be. I'm pleased that you, our accomplished alumni, continue to be part of our journey.

Emily Allen, Ph.D.  
Dean  
College of Engineering, Computer Science, and Technology

# ACCELERATING STUDENT SUCCESS AT ECST

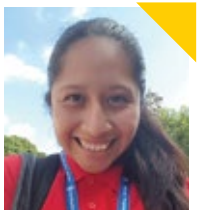
ECST proves it is committed to accelerating the success of incoming students through its diverse programs aimed at building community, developing skills, and reinforcing the core concepts of the ECST curriculum to help them get off to a strong start on their path toward graduation.



## MESA

The Mathematics, Engineering, Science Achievement (MESA) Schools program at Cal State LA works directly with MESA middle- and high-school teachers to provide professional development and support for activities and STEM competitions for students from educationally disadvantaged schools.

Thelma Federico, Director of the MESA Schools program at Cal State LA, works with 26 schools within the LA region and almost 50 teachers. “We have MESA kids who choose to come to Cal State LA. It’s a big circle of giving back,” Federico explains.



### MEET SANDRA HERNANDEZ

Senior, Industrial Technology

Hernandez was involved in MESA all four years of high school, and it was the main reason she enrolled at Cal State LA. “MESA taught me about engineering, but I chose Cal State LA because it felt like my second home.”

Looking for a way to give back, Hernandez started volunteering with MESA during her freshman year, which led to a position to coordinate the program’s events. “I love giving back to the community,” she says.

### Highlights:

- Exposes students to Cal State LA to encourage them to go to college and pursue a degree in math, science, or engineering
- Reinforces California math and science standards through hands-on projects, group learning, and constantly evolving curriculum

### Results:

- 94% of last year’s seniors completed math and science courses for admission to UC/CSU
- 94% of seniors went on to college or university
- 99% of students completed pre-algebra and two years of science by end of eighth grade





## LAUNCHPAD

LaunchPad is a two-week summer program designed to introduce rising female high school seniors to the fields of engineering and computing.

“Our goal is to bring ECST female enrollment up to 25 percent by 2020,” states Zilong Ye, Ph.D., Assistant Professor. “Our theme for the pilot is how engineering can make the world a better place.”



### MEET LEANNE DAVID

Senior, Computer Science

As a fourth-year student, David noticed a startling trend within her more advanced computer science classes. “At times, there were only one or two female students in my classes,” she recalls.

David first learned about LaunchPad from the Dean of ECST during their conversation about the lack of women in technical fields. “I offered to help,” David begins. “I want to share my passion for technology with other women.” David volunteers as a student advisor for LaunchPad, providing a female student voice to the program team.

### Highlights:

- Introduces students to engineering and computing concepts through project-based learning grounded in real-world challenges
- Creates meaningful connections with like-minded female students
- ECST faculty and students serve as teachers, role models, and mentors

### Results:

- The pilot program successfully launched summer 2017 with a cohort of almost 30 female high school students

## A SPECIAL THANKS TO OUR LAUNCHPAD FOUNDING SPONSORS!

ECST Alumnus Jorge Ramirez and wife Katie are proud sponsors of our LaunchPad program. Their gift of \$25,000 to LaunchPad, plus an additional \$25,000 for ECST scholarships, has been instrumental in supporting the program’s development. As CEO of Heateflex Corporation, Ramirez employs a number of Cal State LA graduates, whom he describes as being “ready to work when they get here,” thanks to the hands-on education they’ve received.

As parents of two daughters, one of whom is pursuing studies in engineering and is among only a few women in her program, Ramirez appreciates the efforts for providing equal access into the field. When asked why his family felt compelled to support LaunchPad, he replied, “We’re all about supporting open-access: encouraging minorities and underrepresented community members’ involvement and contributions. [LaunchPad] is exciting — and brings a whole new aspect to the effort and new ways to innovate.”

Ramirez serves as a member of the ECST Dean’s Advisory Board.



*Jorge Ramirez, class of 2004, supports ECST and believes in its ability to positively impact the STEM community.*

# ACCELERATING STUDENT SUCCESS AT ECST

Continued from page 3



## STEP

STEP is a seven-week summer math boot camp that prepares incoming freshmen to successfully complete ECST academic requirements and integrate them into campus life.

Frances Hidalgo, Director of Student Success for ECST, has overseen the program since its inception in 2007. "We are teaching our students more than just math skills." Hidalgo continues, "We're teaching them that it pays off to focus on excellence right from the start and make the right choices."



### MEET CHRISTOPHER GARCIA

Senior, Civil Engineering

Garcia participated in STEP as an incoming freshman. "I learned how to learn that summer," Garcia remembers.

"STEP inspired and motivated me to do my best." Garcia continues, "I became a peer mentor my sophomore year so I could give back to others." Garcia says his leadership skills have flourished ever since: "It gave me the confidence to join more clubs and be more involved."

### Highlights:

- Offers deep instruction and practice in math concepts required for ECST majors
- Introduces students to campus life and student organizations
- Provides peer mentorship and guidance
- Includes freshmen orientation and help with Fall registration

### Results:

- 90% exit exam passing rate for STEP students
- Approximately 85% of STEP students will advance to Calculus I



## FYRE@ECST

FYRE@ECST is a first-year cohort program that supports and integrates math, engineering, and physics learning during freshman year to help prepare and retain students for ongoing success at ECST.

"When I joined Cal State LA, I noticed some of the students were not quite prepared for the rigors of calculus and physics," says Gustavo Menezes, Director of FYRE@ECST and a civil engineering professor at Cal State LA. "Our program is designed to match the needs of our students."

One of the ways FYRE@ECST is meeting the needs of its students is by creating a strong sense of community to help students develop relationships that will add to their success.



### MEET RAYMOND DUMAUA

Junior, Mechanical Engineering

Dumaau participated in the FYRE@ECST pilot and then volunteered as a facilitator during his sophomore year. He says the relationships he built pushed him to go beyond what he thought he was capable of.

"I wanted to get involved as a facilitator to make a difference." Dumaau continues, "I was able to build relationships with my professors early which helped me build my community and made it easier for me to ask for help."

### Highlights:

- Builds on the summer STEP program by providing supplemental instruction in math and physics
- Registers students into block scheduling with their cohort group to facilitate relationship building and encourage ongoing support from their peer group
- Supports students through dedicated academic advising and the creation of a "Golden Eagle Flight Plan" to ensure completion of core courses

### Results:

- Pilot conducted 2014/2015 with support from the CSU STEM Collaboratives, funded by the Helmsley Foundation
- Approximately 90% of students successfully completed first year classes and continued with ECST majors after first year

# EXPLORING OUR WORLD



**Philip Tran (back row, third from left) joins Cal State University study abroad students for an engaging performance of traditional Okinawan dance and music in the village of Ryukyu Mura.**

## ECST Students Embrace Learning in New Places

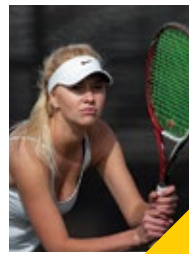
An education from Cal State LA's College of Engineering, Computer Science, and Technology (ECST) cultivates mindsets that enable students to tackle some of the world's most intractable problems. And in an increasingly connected world, a global perspective is critical to innovation. Two ECST undergraduate students, Philip Tran and Elizaveta Sokolova, reflect on their experiences of being immersed in different cultures, and how it has shaped them as both students and individuals.

Philip Tran, a senior in his fifth year, took a detour from his major in computer science to study for a year abroad at the prestigious Waseda University in Tokyo, Japan. Though this delayed his graduation, Tran knew it was worth it. "I have a strong interest in designing video games, so it was critical for me to better understand the culture of my future product consumers."

While at Waseda, Tran studied Japanese culture and language. He believes the humanities focus of the program is a strong complement to his formal area of study, computer science. "I feel like you might lose something if you don't have the other," reflects Tran.

While in Japan, Tran broadened his perspective on the nuance of cultural difference. "It was the little things that I noticed," he recalled. "In Japan, direct eye contact is considered impolite, unlike here in the United States, where people perceive it as having your full attention."

Tran also deepened his appreciation of his parents' immigrant experience as they likely faced similar challenges such as filling out forms in a foreign language. Given Cal State LA's diverse student population, Tran noted that you don't necessarily have to leave the country to be exposed to other perspectives.



**Elizaveta Sokolova**

Elizaveta Sokolova came to ECST from Moscow, Russia, her freshman year. Sokolova is a computer science major, with a love of both learning and tennis. She's following in her father and grandfather's footsteps, both computer scientists. "My grandfather was the first programmer in Moscow," she shared. As for tennis, she's been playing since she was four years old.

When graduating high school at the age of 16, Sokolova knew that she wanted to pursue both passions. Universities in Russia don't allow students to engage in sports in addition to academics, so she was open to making a change. "I would never have been able to choose between school and tennis."

Sokolova received an athletic scholarship for ECST's tennis team, impressively ranked 23rd in the nation, which helps pay for both tuition and housing. "When I walk out on the court, I feel that's where I should be."

Sokolova was also awarded an academic scholarship, and has made the Dean's list for two consecutive terms. Her record of academic excellence predates ECST: in Moscow, she was the recipient of the prestigious Gold Medal for maintaining straight A's since she was three years old.

Setting goals and achieving them are Sokolova's forte. She continues to excel in her two passions here at ECST, but what has been most surprising is how the experience of coming to Los Angeles has shaped her as a person.

"People are so different here — more open. When I first arrived, people often thought that I didn't like them, which wasn't true — it was just that I had a different way of being. But little by little, step by step, I was changing. Now when I go home to Moscow, my parents say they can't believe I'm their daughter," Sokolova laughed. "My teachers, our department, my classmates, my tennis teammates: they're like family to me." ●

# NEW FACULTY: FIRST IMPRESSIONS

In Fall 2016, we welcomed 10 new faculty members to ECST. (Faculty joining in Fall 2017 will be featured in our next issue of InSights.)



**DR. SHAURYA AGARWAL, PH.D.**

Electrical and Computer Engineering

**Area of expertise:** Control Systems, Intelligent Transportation Systems, Computer Vision, Sensor Fusion, Urban Data Analytics, Mean Field Games

**Came to ECST from  
New York University**



**DR. MEHRAN MAZARI, PH.D.**

Civil Engineering

**Area of expertise:** Transportation Engineering, Transportation Infrastructures, Sustainable Transportation, Pavement Materials

**Came to ECST from  
Savannah State University**



**DR. SHIHAO (TRAVIS) HU, PH.D.**

Mechanical Engineering

**Area of expertise:** Nanomechanics and Nanomaterials of Engineering and Biological Systems; Biomimetics/Biomimicry; Multiscale Modeling and Simulation

**Came to ECST from  
University of Denver**



**DR. MARINA MONDIN, PH.D.**

Electrical and Computer Engineering

**Area of expertise:** Signal Processing, Digital and Wireless Communications, Quantum Communications, Monte Carlo Simulation

**Came to ECST from Polytechnic  
University of Turin, Italy**



**DR. JIM KUO, PH.D.**

Mechanical Engineering

**Area of expertise:** Fluid Mechanics, Heat Transfer, Optimization, Renewable Energy, Sustainability

**Came to ECST from  
University of Toronto**



**DR. ARMAN PAZOUKI, PH.D.**

Mechanical Engineering

**Area of expertise:** Soil and Granular Media, Robotics, Computational Multibody Dynamics, Fluid-Solid Interaction, High Performance Computing

**Came to ECST from University  
of Wisconsin-Madison**



**DR. WING SHUN (WELSON)  
KWAN, PH.D.**

Civil Engineering

**Area of expertise:** Geotechnical Engineering and Geotechnical Earthquake Engineering

**Came to ECST from Norwegian  
Geotechnical Institute**



**DR. MOHAMMAD  
POURHOMAYOUN, PH.D.**

Computer Science

**Area of expertise:** Data Science, Big Data Analytics, Predictive Analytics, Machine Learning, Risk Prediction for Healthcare applications

**Came to ECST from UCLA**



**DR. NI LI, PH.D.**

Mechanical Engineering

**Area of expertise:** Optimization, Control, Vibration, and Instrumentation

**Came to ECST from  
University of Central Florida**



## Q: HOW WOULD YOU DESCRIBE THE ECST COMMUNITY?

**A:** As a new member of the ECST faculty, I felt right at home from the very first day. — *Dr. Marina Mondin*

A great place for teaching, researching, learning, and collaborating with amazing people with a lot of potential for prosperity and success. — *Dr. Mohammad Pourhomayoun*

The college feels like a big family to me. — *Dr. Shihao (Travis) Hu*

Even as a single individual, you can make a difference. — *Dr. Marina Mondin*

So friendly and helpful: be it the faculty members, staff, or students. — *Dr. Shaurya Agarwal*

A close-knit and active community that is committed to prepare the thinkers and doers of tomorrow. — *Dr. Jim Kuo*

A genuine, close group [that] consists of supportive colleagues who are willing to collaborate across different disciplines, and students with active participation in activities. — *Dr. Wing Shun (Welson) Kwan*

While the ECST budget is not large, many significant projects are being accomplished here. — *Dr. Arman Pazouki*

Filled with amazing and friendly people. — *Dr. Ni Li*

## Q: WHAT WAS YOUR FIRST IMPRESSION OF THE ECST STUDENTS?

**A:** Extremely motivated...and grateful for the education they are receiving. — *Dr. Marina Mondin*

Extremely hardworking and passionate. — *Dr. Shaurya Agarwal*

Very mature and respectful. — *Dr. Arman Pazouki*

Friendly and respectful. — *Dr. Shihao (Travis) Hu*

Very nice, grateful and respectful. — *Dr. Mohammad Pourhomayoun*

## Q: WHAT EXCITES YOU MOST ABOUT ECST?

**A:** Inspiring students to expand their passion for learning, thinking, and researching; developing their curiosity and creativity; and allowing them to enjoy the pleasure of learning. — *Dr. Mohammad Pourhomayoun*

Encouraging [students] with my life stories — both failures and success. — *Dr. Wing Shun (Welson) Kwan*

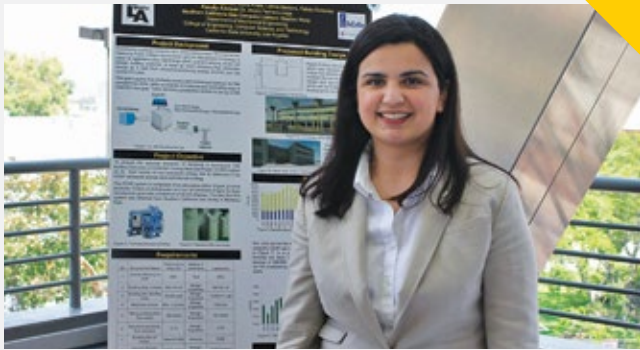
Establishing a strong and productive research program that attracts underrepresented students. — *Dr. Shihao (Travis) Hu*

Bringing my enthusiasm for teaching and research, and sharing and enriching my experience. — *Dr. Marina Mondin*

Being a part of such an active, supportive, friendly and enthusiastic community. — *Dr. Mehran Mazari*

# CREATING JOB OPPORTUNITIES THROUGH HANDS-ON LEARNING

Securing a job after graduation can be challenging. Four ECST alumni prove the secret to their success: Real-life engineering experience during college that leads to employment.



*Maria Prieto's senior design project was to design a zero-net energy building for SoCalGas.*

## **MARIA PRIETO, Associate Engineer, SoCalGas**

Degree: BS Mechanical Engineering & Manufacturing Engineering, June 2015

Prieto applied for an internship at SoCalGas after meeting an ECST alumnus who encouraged her to apply. It was during the internship where Prieto convinced her manager to sponsor one of ECST's senior design projects. "It was my first lesson in networking," she remembers.

The SoCalGas senior design project was to design a zero-net energy building — one that produces its own energy through solar panels and other renewable energies.

"I never thought of a gas company as a place for engineers," Prieto begins. "My advice is to do as many internships as you can because you figure out your likes and dislikes quickly."



*Brian Martinez (second from the left) with team members from a project sponsored by NASA.*

## **BRIAN MARTINEZ, Electrical Engineer, Raytheon**

Degree: BS Electrical Engineering, June 2016

Martinez had an opportunity to complete his senior design project as a junior. His team created a proof of concept for Raytheon's rescue operations robot — including a two-way radio to talk to victims and the ability to change sensors, like oxygen levels, to optimize the robot for different conditions.

It was during the end-of-year senior design expo where Martinez met Raytheon's Director of Talent Acquisition, and the rest is history.

"My advice is to choose a senior design project that you're willing to put your time into," Martinez explains. Martinez discovered he enjoyed robotics so much, he participated in Cal State LA's Swarmathon team, a robotics competition sponsored by NASA, his senior year.

*“I highly encourage other students to join programs like EcoCar. It proves you have what it takes to be successful.”*

**Guadalupe Banales**

**GUADALUPE BANALES,  
Hybrid Validation Engineer, General Motors**

Degree: BS Mechanical Engineering, December 2013

Banales learned about EcoCar during her first few weeks of college, “I felt like it was meant to be.” She was one of the first students to join the team, tasked with converting a Chevy Malibu into a hybrid vehicle — the three-year project included research, design, and optimization.

The EcoCar program imitates the work environment at automotive companies, one of the reasons General Motors approached Banales to join their rotational program, hiring her six months before graduation.

“I highly encourage other students to join programs like EcoCar,” says Banales. “It proves you have what it takes to be successful.”



*Guadalupe Banales with her team in front of the EcoCar during a winter workshop (second from right).*

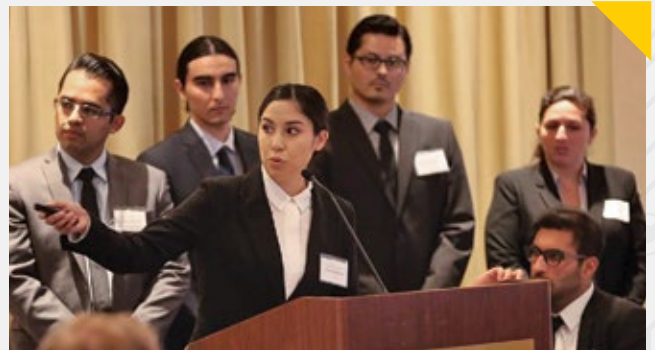
**SHIRLEY ZAMORA, Transportation Engineering Associate 1, Los Angeles Department of Transportation**

Degree: BS Civil Engineering, September 2015

Zamora completes traffic studies for the LA Department of Transportation (DOT) to recommend traffic controls. Her favorite part of the job? “I get to make our streets safer.”

Zamora interned at the DOT for two years during college. Her future at the DOT was secured by her work with the Southern California Regional Interconnector senior design project: “My work as the team project manager gave me real-life experience to talk about during my interview,” Zamora explains.

Zamora even honed in on her presentation skills, delivering the project at the Institute of Transportation Engineers competition where the team won first place — a first for Cal State LA. 🟡



*Shirley Zamora takes the podium to deliver her senior design project at the Institute of Transportation Engineers competition.*

*“My work as the team project manager gave me real-life experience to talk about during my interview.”*

**Shirley Zamora**



# THE WOMEN OF ECST

THREE WOMEN WHO BROKE NEW GROUND AT THE COLLEGE OF ENGINEERING, COMPUTER SCIENCE, AND TECHNOLOGY, PAVING THE WAY FOR FUTURE GENERATIONS.



*ECST's first female graduate, Nida Alex, defies convention and blazes trails in pursuit of an engineering calling.*

ECST welcomed its first woman student in 1957. At that time, women in engineering were practically unheard of in the U.S., viewed more as curiosities than as serious contributors to the field.

Today, women make up 15% of ECST's student body, and account for more than 24%\* of the STEM workforce. Here's a look at three incredible women who blazed trails for women at ECST and in the STEM field.



## A DIFFERENT WORLD

Nida Alex, ECST's first woman graduate, has spent her life challenging convention.

As a child, Alex and her parents fled Lithuania during World War II and were among the last refugees to be admitted to the United States as part of its refugee quota. "Our family was not welcome," Alex recalls. "The U.S. wanted able-bodied men and women to work."

Alex remembers first hearing about engineering from fellow displaced Lithuanians. "We didn't speak English, so we needed to get jobs that didn't require language. Skills in engineering were transferable." Alex's father eventually got a job with the State of California, and Alex excelled through high school, graduating at age 15 from Immaculate Heart in Los Angeles.

"I was interested in Metallurgy so I applied to Cal State LA (known then as Los Angeles State College)." Alex was accepted to the engineering program in 1957, and was the only woman among 450 men. Professor Leslie Cromwell, head of the department at the time, told the Los Angeles Examiner in 1958, "When she started, I thought it was just a kid stunt. She was simply too pretty to be much of a student. I figured she'd change to dramatics or something after the first semester — especially with that heavy study load."

"It was a different world then," says Alex. "You had to prove that you were smart enough to be in this major. They didn't believe that you could be a woman interested in pursuing an engineering career. I didn't just have to pass my classes, I had to outdo the men." Alex sped through her studies, taking summer classes, and graduated in just two years.

Armed with her degree, Alex headed straight to Fontana Steel Mills hoping to get a job in Metallurgy. "They laughed at me and said, 'We're not going to build special bathrooms just for you.'"

***"It was a different world then. You had to prove that you were smart enough to be in this major. They didn't believe that you could be a woman interested in pursuing an engineering career."***

Professor Cromwell recommended her for an entry-level position at the Jet Propulsion Laboratory (JPL) where she helped work on America's first space flight and went to night school. "They didn't take me seriously as an 18-year-old woman." When it was time for a promotion, JPL offered her such a low salary that she left. "Other companies offered me well-paid positions. They wanted to show me off as their token woman."



**Nida Alex advises women today to "take advantage of — and enjoy — all the opportunities available to them."**

Alex was hired as an engineer by Pacific Bell of Chicago (now AT&T of Illinois). "I had to go through a training program where we had to climb up utility poles to check equipment. They expected me to show up in a skirt and I had a full audience. I showed up in slacks!"

Alex went on to get a Masters in Operations Research at the University of Chicago.

After she obtained her Masters, Alex had her first child, and only two weeks after giving birth, started working for the City of Los Angeles. As a full-time working mother, she was once again an anomaly. She went on to obtain a Doctorate at Southwestern University, graduating Cum Laude in Jurisprudence. "I wanted to be a patent attorney, but I couldn't get any clients despite having all of the necessary qualifications."

Ultimately, she went into business for herself as a civil attorney. "In my soul I was an engineer, but I took a path to law for more opportunities."

***"It's just as exciting a frontier [engineering today] as it was 60 years ago — for women and men."***

"The College of Engineering opened the door for me to so many experiences," Alex says. "Today, women in science have a wonderful open field. Women don't have to be denied Metallurgy and Patent Law. There are so many new inventions. It's just as exciting a frontier as it was 60 years ago — for women and men." What is Alex's advice for women today? "Take advantage of — and enjoy — all the opportunities and experiences available to you. Don't worry about what people say. Focus on your accomplishments and they will stand on their own merit."

## WOMEN OF ECST

Continued from page 11

### INSPIRING THE NEXT GENERATION



**Neda Fabris, two years after she joined Cal State LA's faculty.**

More than 20 years after accepting the first female student, the College of Engineering hired its first woman faculty member: Neda Fabris.

It was 1979 and Fabris recalls, "It was lonely. They didn't know how to treat a woman faculty member. I had no one to talk to." But, at that point in her career, Fabris was accustomed to pushing boundaries.

Fabris grew up in Sarajevo, in the former Yugoslavia. When she announced as a young woman what she wanted to study, naysayers said, "I know why you want to study engineering: you want to marry an engineer."

An excellent student, Fabris was encouraged by her mother to study a profession that could be practiced all over the world. "I studied mechanical engineering because it was new and promising. The only machine I'd ever been exposed to was a meat grinder that we had in our kitchen."

Fabris, the only woman in a class of 300, ultimately graduated magna cum laude from the University of Sarajevo with a degree in Mechanical Engineering. She became an Assistant Professor there and spent one year as an associate lab researcher in manufacturing at a technical school. "I was the first female researcher and was told by the director of the Institute at that time, that 'in the Engineering profession, all women are men.'"

Fabris married, and her husband was offered a full fellowship for graduate study at the Illinois Institute of Technology (IIT), so the couple immigrated to Chicago. Fabris didn't speak a word of English when she arrived in the U.S. in 1970, but went on to obtain an M.S. in 1972 and Ph.D. in 1976 from the IIT while working as a teaching and lab assistant there, and as a lecturer at the University of Illinois in Chicago. She wrote her Ph.D. thesis on Experimental and Analytical Investigation of Self-Excited Chatter in Metal Cutting.

Fabris was hired as a member of the technical staff at Bell Telephone Labs in 1976, where she worked for three years. "I liked my job at Bell. The projects were rewarding professionally and financially, and I was able to apply for my patent. However, there was no work-life balance in those days at Bell. I wanted to teach in a University where I could have the flexibility to spend more time with my husband and two growing children." Her husband wanted to come to California, and Fabris was game.

At that point, Cal State LA was building up its manufacturing curriculum. It was still a new frontier for a woman engineering faculty member, but Fabris was given the opportunity to propose courses. She developed eight classes and later taught over 24 courses in mechanics, design, materials and manufacturing, including the sponsorship of numerous research and design projects. She won the College's first National Science Foundation (NSF) Grant and served as Chair of Mechanical Engineering from 1988 to 1992. Fabris was one of only two women in the country in a Mechanical Engineering Chair position.

***"It's okay to be the first woman. You just don't want to be the last woman hired. Then you know you didn't do a good job."***

One of Fabris' most innovative efforts was a six-week "Mother-Daughter Engineering Academy". "I knew that to increase the number of women engineers, I needed to promote the field's many opportunities not only to girls, but to their mothers, who were very influential in the career decision-making process."

The Academy covered design, energy, materials and manufacturing, and hands-on activities. Panels of young women professionals came to share their engineering experiences. The highlight of the program was a visit to a local satellite manufacturer where participants observed the making and testing of satellites.

The Academy received partial sponsorship from the NSF, and gained national recognition. It was presented before the U.S. Congress as a best practice in recruiting women into engineering. Fabris received numerous awards for her efforts, including the Distinguished Engineering Educator Award in 2001. She also received the Society of Manufacturing's Desert Pacific Region, Educator of the Year in 1998 and the department students honored her as Outstanding Mechanical Engineering Professor.

Fabris retired in 2008, but continues to make a difference by teaching teachers how to teach physical science. She started a Mechanical Engineering scholarship for graduate students and recently published a Manufacturing and Materials Science Handbook.



**Neda Fabris, Professor Emerita, Department of Mechanical Engineering.**

## FORGING NEW FRONTIERS

When Gina Orozco-Mejia started at ECST in 1987, there were more women than in Nida Alex's day, but still only ten percent of engineering students were women.

***"If a woman failed or dropped out, it was expected. The expectation level was low."***

"Most of us [students] came from immigrant homes. I was working 30 hours a week and carrying a heavy load at school. I wanted to graduate and start earning an income as soon as possible. ECST had a wonderful support group, the Minority Engineering Program, which gave us a place to go to study together, network, and interact. Cal State LA really catered to people who worked and went to school. They were very aware that a lot of students were trying to work and they made it a lot easier to manage our loads."

Growing up in Mexico, Orozco-Mejia recalls how she was introduced to engineering, "I got interested in the sixth grade after picking up a book on nuclear power. It was the engineering power of the future. My generation thought of electrical engineering the way today's generation thinks of computer engineering. Everything was electrical engineering. But it was a man's job."

She later moved to California and was still interested in engineering in high school, but doubtful about it being for a woman. "The summer between my junior and senior year, I went to an engineering fair at USC and met someone who told me about her experience attending college in the 60's. I thought if she could do it — I could do it."

When she started at ECST, Orozco-Mejia said it was a psychological challenge being one of the few women in the program. "If a woman failed or dropped out, it was expected. The expectation level was low."

***"The rewards once you finish school are tremendous and the flexibility of what you can do is significant. Don't lose sight of your goals."***

Orozco-Mejia persevered, however, and when she was a junior, secured an internship with Southern California Gas Company. "I was worried about my ability to be hired as a woman when I graduated. I was thrilled to get the internship; I knew it would help me be more successful later."

Now, after 27 years with SoCal Gas, Orozco-Mejia is thriving as the company's first Latina Vice President, and notably made Fortune Magazine's list of "The 50 Most Powerful Latinas of 2017." "There's been such a tremendous change in the number of women graduating with engineering degrees and entering the workforce. We have diversity in every level and a very high percentage of women. My advice to women today is to take advantage of the tools that school offers and participate in its many face-to-face networking opportunities. The rewards once you finish school are tremendous and the flexibility of what you can do is significant. Don't lose sight of your goals." ■



**Gina Orozco-Mejia, today: leading the way as SoCal Gas' first Latina Vice President.**

# ECST'S RESEARCH SOARS TO NEW HEIGHTS AND BREAKS NEW GROUND

ECST has been awarded several prestigious research grants thanks to the efforts of five passionate professors. Find out how they're pioneering new frontiers in space and on Earth.

## STUDYING SOLIDIFICATION IN SPACE TO IMPROVE MANUFACTURING

Mohsen Eshraghi, Ph.D., assistant professor of mechanical engineering, obtained two competitive grants from NASA totaling \$840K to conduct materials science experiments on the International Space Station. Both grants were awarded in collaboration with Cleveland State University and the University of Akron. Eshraghi serves as Principal Investigator of "Pore-Mushy Zone Interaction during Directional Solidification of Alloys: 3-D Simulation



**Mohsen Eshraghi, Ph.D.**

and Comparison with Experiments", and a Co-Principal Investigator of "Influence of Thermosolutal Convection on the Cellular/Dendritic Pattern Formation during Directional Solidification of Single Crystal Metallic Alloys."

"This research studies solidification microstructures in space where gravity is absent, and compares it with solidification on earth in the presence of gravity," says Eshraghi. "Solidification is a critical step in all manufacturing processes. Understanding solidification phenomena will help manufacturers produce parts with superior properties for space and for products on earth."

## VIRTUAL REALITY SPACE EXPLORATION

Building on ECST's long relationship with NASA's Jet Propulsion Laboratory (JPL), Professor Eun-Young (Elaine) Kang obtained a \$20K grant from the Lunar Quest Mission.



**Eun-Young Elaine Kang, Ph.D.**

Under the grant, Computer Science graduate student Michael Fong will spend one year evolving software that generates scientifically accurate planetary scenes and enables virtual reality space exploration from users' home computers.

"Part of our efforts will enable people to use their mobile phones as handheld

navigation devices to visit accurate virtual landscapes of Mars and the moon," shares Kang.

Four years ago, undergraduate students supported a project for JPL's Lunar Mapping and Modeling portal, which enables the public to explore the moon's surface. Since then, ECST has increased the speed of the software using GPU programming to enhance the user experience and leveraging JPL's technology to profile data for incorporating craters on the moon and Mars' surface.

"This is state-of-the-art work that helps students feel a real sense of accomplishment and confidence," Kang adds.

## PREDICTING AVIATION'S IMPACT ON CLIMATE CHANGE

Over the last decade, the FAA has worked in partnership with MIT to develop and refine a tool that helps scientists evaluate the impact of aviation on climate change. As features are added, independent scientists help evaluate the tool's efficacy. The FAA awarded its second grant to the University of Illinois (with a subcontract to Cal State LA), "Evaluation of Metrics and FAA Tools for Climate Impacts from Aviation," totaling \$100K, to test recent upgrades. The University of Illinois



**Arezoo Khodayari, Ph.D.**

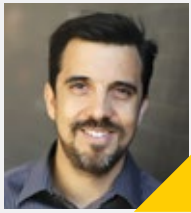
(U of I) has again called upon Arezoo Khodayari, Ph.D., assistant professor of civil engineering, for ECST's support.

Khodayari and her team of ECST and U of I students will run an independent evaluation of the tool, using science to ensure each process in the atmosphere is properly presented.

The tool, using computer modeling, allows scientists to test a variety of scenarios that offer a predictive analysis of aviation impact, both in the near and long term. "It's great to help people make science-based decisions for our future while also helping students grow," reflects Khodayari.



## USING TUNNEL VISION TO LOOK AHEAD



**Tonatiuh Rodriguez-Nikl, Ph.D.**

The US Department of Transportation (DOT) awarded ECST's University Transportation Center, in partnership with The Colorado School of Mines and Lehigh University, a five-year, \$1.5M grant to study underground transportation infrastructure. Tonatiuh Rodriguez-Nikl, associate professor of civil engineering, says the grant serves two main purposes: improving

durability and extending the life of underground transportation infrastructure or tunnels, and developing skills in this area through new degree or professional development programs. Four projects will be funded across multiple departments.

"This is a great opportunity for Cal State LA to establish ourselves as experts in the field of underground transportation infrastructure," says Rodriguez-Nikl. Alumni currently working in this area are encouraged to contact Rodriguez-Nikl at trodrig7@calstatela.edu.

PROJECT	LEAD BY	OBJECTIVE
<b>Application of Big Data Analytics in Underground Transportation Infrastructure</b>	Mohammad Pourhomayoun, assistant professor of computer science, and Mehran Mazari, assistant professor of civil engineering	Collect data and develop algorithms to predict future conditions, and help identify and respond quickly to anomalies during and after construction
<b>Effect of Recycled Steel Fiber on Properties of Self-Compacting Geopolymer Concrete</b>	Mehran Mazari, assistant professor of civil engineering	Examine the use of steel fibers recycled from waste tires to develop advanced concrete materials that improve infrastructure performance and constructability
<b>Resilience and Sustainability of Underground Transportation Infrastructure</b>	Tonatiuh Rodriguez-Nikl, associate professor of civil engineering	Determine a holistic sustainability and resistance standard, like the LEED green building standard, that can be applied to underground infrastructure
<b>Application of Soil Moisture Active Passive (SMAP) Data in Underground Transportation Infrastructure Hazard Management</b>	Sonya Lopez, assistant professor of civil engineering	Use satellite data to predict water conditions to help monitor and predict flood hazards

## SECURING DATA FROM CYBER-ATTACKS

Marina Mondin, Ph.D., associate professor of electrical and computer engineering, received a grant from the North Atlantic Treaty Organization (NATO) under its Science for Peace and Security program, which supports civil science cooperation and innovation. The three-year \$380K grant will fund an international research and development project lead by the United States in collaboration with Italy, Israel, and Pakistan that focuses on cyber security.



**Marina Mondin, Ph.D.**

Specifically, the project centers on the design and implementation of a practical Quantum Key Distribution (QKD) system between two major cities in northern Italy. QKD uses quantum mechanics to guarantee secure communications and is the only known technique that is unconditionally secure against cyber-attacks.

"What's exciting about this project is that it supports the development and advancement of all related technologies for both fiber optics and free space systems, while also enhancing dialogue with all partners based on research, innovation and knowledge exchange," said Mondin. ●

# WINNING GOLD WITH SOLAR



**Roman Vazquez celebrating the historic win back home at Cal State LA.**

“It was an incredible high — and one of the most joyous things I’ve ever done,” Vazquez recalls. Roman Vazquez III graduated from Cal State LA with a degree in civil engineering in 1999. He was the project leader and lead driver for the Solar Eagle III, a solar-electric powered car, designed, built, and tested by ECST students and staff to compete in the Sunrayce in 1997.

## **Joining the Team**

“Other people have said it better: Success is never a straight line. It’s multiple steps that take you forward, sideways, backwards, and eventually forward,” Vazquez begins.

ECST’s Solar Eagle II team was already full when Vazquez first learned about it as a college freshman. But this didn’t stop him. With a love for race cars, Vazquez asked to join the team and was told: “You can lead our public outreach, but you probably won’t drive the car.”

Knowing nothing about public relations or community outreach, Vazquez was thrilled. He remembers thinking he would have swept floors if it meant being on the team.

During the next four years, Vazquez visited almost every high school in Southern California to show off the Solar Eagle race cars, speaking to groups of 30 to 300 about engineering, teamwork, and following your dreams. Through his hard work and perseverance, he also became the lead driver and team leader for the Solar Eagle III.

## **Pushing Through the Breakthrough**

While developing Solar Eagle III, there were times when Vazquez and his team weren’t sure if their strategy would work, but they worked tirelessly and kept going. Deep down they knew in the end — somewhere between Indianapolis and Colorado Springs — every decision they made would affect them on the road.

***“It’s the personal satisfaction you get out of the work that keeps you thinking about the end goal. It’s what gets you through all of the twists and turns, and hard decisions.”***

Covering more than 1200 miles, Vazquez and his team drove for nine days in the solar-powered electric car they built from scratch — stopping only to sleep and recharge their battery with solar panels.

Cal State LA came in first place at the Sunrayce 1997 — beating MIT, Stanford, and the University of Michigan

— the first major win for the college. The win helped put ECST on the map, and the team gained a lot of notoriety, complete with their own Hot Wheels car and action pack, commissioned by Mattel.



*The Solar Eagle III crossing the finish line with the checkered flag.*

### Career-Shaping Experience

“The project gave me a vehicle to do what I love — problem-solving, innovating, public speaking, creating something from start-to-finish.” Vazquez credits the skills he developed as part of the Solar Eagle III team to much of his success today.

Nearing graduation, Vazquez remembers being nervous about his future and thinking, “How can it get better than this?”



**Today, Roman Vazquez works at Southern California Edison as a Principal Project Engineer.**

Southern California Edison (SCE) recognized his potential and offered him an internship and a full-time job after graduation. Thriving at one challenge after the next, Vazquez is still at SCE nearly 20 years later, and the Principal Project Engineer on the Tehachapi Renewables Transmission Project, approximately 170 miles of new 500kV transmission lines that will deliver electricity from renewable wind energy generators in Kern County to LA County and eastward to the existing Mira Loma Substation in San Bernardino County.

As a leader at SCE, Vazquez is still using the public speaking skills he developed at ECST. “A big part of my work is public outreach — telling the community about the projects, the need, and the greater societal good that can come from them,” Vazquez explains.

Today, Vazquez lives in Whittier, California and has a 9-year-old son. He is still passionate about electric cars — and recently traded in his SUV for a BMW i3 — a battery-powered, carbon fiber car that inspires him every day. “I feel like I’ve come full circle with this car: I’m driving what we helped innovate back in the 90s.” ●

## HOW IT ALL BEGAN: A BRIEF HISTORY

Over 10 years, Cal State LA built three solar-powered cars and raced in several national and international competitions, ultimately leading to the Solar Eagle III win in 1997. June 28, 2017, marked the 20th anniversary of the legendary win for ECST.

It all started in 1988 when Ray Landis, Dean of ECST from 1985 to 2001, received a thick packet in the mail from General Motors, in search of universities to design and fabricate a solar-powered car to compete in the first-ever Sunrayce from Florida to Michigan, to be held in 1990.

Landis could have thrown the request in the trash — but he didn’t. He called a meeting to gather interest. “No one was interested,” Landis remembers.



*“When someone tells you that you can’t do something, you start looking for ways to prove them wrong.”*

**Ray Landis**

Eventually, Landis pulled together a team, which included Dick Roberto, an ECST faculty member for 38 years. “During those years, I was on campus for 12 to 16 hours per day, sometimes seven days a week,” Roberto recalls. “It was a difficult project, but it was worth it — we beat them all.”

Roberto, who is now the Chief Mechanical Inspector for the American Solar Challenge, says, “Of the hundreds of cars I’ve inspected over the years, I can say, without reservation, that only a handful of cars have come close to the caliber of the Solar Eagle III — in terms of design, engineering, and construction.”

There have been fourteen cross-country races since the first race in 1990, and only five schools have their names engraved on the rotating trophy. Cal State LA is one of them. Roberto reflects, “One could say that good engineering is never obsolete — and our school still stands with the best of them.”

For those who were involved in the program, winning in 1997 was one of the greatest achievements in their careers — and in the history of ECST. ●



# CREATING SPACE FOR INNOVATION

Earlier this year, the College of Engineering, Computer Science, & Technology (ECST) kicked off its newest, multi-year initiative: The ECST MakerSpace.

ECST is reimagining its underutilized real estate to create a shared space to fuel problem-solving and spark innovation through hands-on iterative design, fabrication, and testing.

“The MakerSpace is intended to give our college a much needed and exciting facility for providing outstanding hands-on learning opportunities,” explains Ted Nye, Director, Professional Practice Program and the instructor for the Electrical and Mechanical Engineering Senior Design course.



*Senior Design students assembling their project.*

*In this photo (from left to right): Arsine Baghdasarian, Sara Salam, and Omar Ramos.*

*“Our students deserve the kind of cutting-edge working space this will provide, where collaboration and inspiration is the name of the game.”*

**Dean Emily Allen**

He continues, “It will provide our college with a collaborative learning environment for all students and faculty, more efficient use of our lab space with an ever-increasing enrollment, and allow us to modernize our equipment with 3D printing and cutting-edge electronics. Line of site safety zones will create a safe, secure environment for students to work in.”

Adds Dean Emily Allen, Ph.D., “Our students deserve the kind of cutting-edge working space this will provide, where collaboration and inspiration is the name of the game. It will be part machine shop, part wood shop, with lots of team brainstorming space as well as 3D printers and hand tools — everything our students need to design, build, and test their ideas.”

The ECST MakerSpace will be the first lab of its kind on the Cal State LA campus — and will provide a dynamic environment to enable learning and development of new skills through the process of thinking, making, and creating. The ECST MakerSpace will help seed and support the innovations needed for our future by:

- Empowering students to shift their roles from passive observer to active creator;
- Equipping and enabling diverse students to become the next generation of engineers through hands-on, innovative learning;
- Engaging the community by offering this space to other colleges and the public;
- Offering something for everyone — including a space for design/engineering, fabrication, and testing.

Phase 1 of the project has been completed by a brainstorming MakerSpace Task Force composed of ECST faculty, staff, and students. Phase 2 will be the completion of conceptual design documents for the space, creating momentum for the project, and gathering necessary funding commitments.

If you're interested in learning more about investing in the ECST MakerSpace, please contact Dolores Ybarra at [dybarra6@calstatela.edu](mailto:dybarra6@calstatela.edu). ■



# ADJUNCT PROFESSOR: EDUARDO ANGELES



**Eduardo Angeles, at home on the tarmac.**

This fall, Cal State LA will welcome adjunct professor Eduardo Angeles to the Technology Department's Aviation Administration Program, where Angeles will teach aviation law. "I always wanted to be a pilot, but didn't make the cut due to not having perfect vision. Thankfully, I had great mentors who steered me toward law."

Born in the Philippines, Angeles immigrated at the age of seven to the United States. "I was on the last plane out of Manila before then-president Ferdinand Marcos declared martial law, which suspended immigration patterns to and from the Philippines. That first ride on an airplane — I drew a passion for aviation."

Angeles' career began as a trial lawyer in San Francisco, litigating cases for the city when an opportunity arose to serve as the Principal Deputy City Attorney, providing in-house counsel to the San Francisco International Airport (SFO). The move towards aviation law allowed him to merge two of his great passions.

Angeles was later appointed by President Barack Obama to serve as the Federal Aviation Administration's Associate Administrator for Airports, where he oversaw all U.S. airports.

But his career highlight came when he represented U.S. aviation on an international stage as the principal delegate for the U.S. at an aviation conference in Manila, Philippines. He called it "an American dream come true."

Given Angeles' career success, many assume he came from a privileged background. Angeles looks forward to sharing his personal story as an adjunct faculty member and showing students "that anything is possible."

***"My story isn't far different from many students at Cal State LA. As immigrants who come from backgrounds below the poverty line, my family had a lot of obstacles to overcome."***

Today, Angeles serves as a Senior Assistant City Attorney for the Los Angeles City Attorney's Office assigned to the Los Angeles World Airports (LAWA) Legal Division.

Angeles is excited to teach at Cal State LA, noting that the university is the only public institution in California to have an Aviation Administration Program, which is surprising, given it's a \$3 trillion-dollar industry with a solid future ahead of it. "Cal State LA is at the forefront and will lead to job opportunities that aren't going away — they'll only expand." ●

## RETIRING STAFF: COLLEEN YOSHIDA



**Colleen Yoshida**

We thank Colleen Yoshida for her 32 years of service to Cal State LA. Yoshida held a variety of administrative positions over the years, having spent the last nine years as a staff member at ECST. She served most recently as an Administrative Support Assistant in the

ECST Dean's Office. "I am grateful to have met so many people: the staff, faculty, and all the great students," Yoshida shared.

"We'll remember her for her welcoming smile and willingness to offer a helping hand," says Dean Emily Allen. "We wish her well on her next chapter." ●

# EVENTS

Cal State LA and the College of Engineering, Computer Science, and Technology are proud to host a number of events for our students and alumni throughout the year. These events are a great way to connect with current students, network with your fellow alumni, and stay in touch with both ECST and Cal State LA. We hope to see you at an event soon!

## Event highlight

### ECST HEADS TO RAYTHEON

On May 2, 2017, ECST advisory board member Noel Ellis hosted 15 Cal State LA alumni who work at Raytheon and ECST faculty. "Events like these are a fun way to celebrate and strengthen our partnership by offering our employees opportunities to get involved with their alma mater," says Ellis.

To learn more about how your employer can partner with ECST, contact Dolores Ybarra, Director of Development: (323) 343-3071.



*In this photo (left to right): ECST alumni Desmond Yenaung, class of 2014, and Ted Lumanlan, class of 2004, at the event.*

## UPCOMING EVENTS

**August 23, 2017**

### ECST ALUMNI HAPPY HOUR @ LUMINARIAS

We hope you'll join us at our first-ever ECST Alumni Happy Hour! This is a great opportunity to connect with former classmates, catch up with faculty and staff, and learn more about what's new and exciting at ECST. For more information and to RSVP, visit [ECSTalumnihappyhour.eventbrite.com](http://ECSTalumnihappyhour.eventbrite.com).

**September 22, 2017** ●

### CAL STATE LA NIGHT @ DODGER STADIUM

Join us for a spectacular evening, and cheer on our University President as he throws the honorary first pitch. For tickets, visit [dodgers.com/calstatela](http://dodgers.com/calstatela).

**October 21, 2017** ●

### BILLIE JEAN KING & FRIENDS GALA @ THE LANGHAM HUNTINGTON HOTEL, PASADENA

Join us for the annual Billie Jean King & Friends Gala at the Langham Huntington Hotel in Pasadena. Proceeds from this event benefit the student-athlete scholarship fund at Cal State LA. Visit <http://www.calstatela.edu/bjk20> for more information.

**October 26, 2017**

### ECST AND B&E ALUMNI NETWORKING EVENT AT THE GAS TOWER, DTLA

SoCalGas will be hosting a networking event at the Gas Tower in DTLA for Cal State LA alumni who currently work at SoCalGas. If your company is interested in hosting a similar event, please contact Dolores Ybarra at [dybarra6@calstatela.edu](mailto:dybarra6@calstatela.edu).

**October 28, 2017** ●

### 50TH AND ALL-ALUMNI REUNION

The Cal State LA Half Century Club will be inducting its newest members (alumni who graduated in 1967) during its third annual gathering. The event will start with a small reception followed by a lunch ceremony, and is open only to members. That afternoon, we'll also host our first ever all-alumni reunion, which is open to all alumni. While here, be sure to check out one of three athletic events occurring that day! For more information, contact the Alumni Relations Office: (323) 343-2586.

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