

ENGINEERING

AT SAN JOSÉ STATE

CHARLES W. DAVIDSON
COLLEGE OF ENGINEERING

Spring 2019 Issue

powering Silicon Valley

High Hopes and Deep Lessons in the Desert

A Story by an SJSU Student and his Father

AEROSPACE
Alumni Awards

AROUND THE WORLD
With the College of Engineering

PARKSTASH
“The Airbnb of Parking”

SJSU SAN JOSÉ STATE
UNIVERSITY

RANKED
3RD
IN THE NATION
U.S. NEWS AND WORLD REPORT
2019
See back cover

THREE... TWO... ONE... LIFT OFF!



WELCOME TO THE SPRING 2019 ISSUE, WHICH HAS BECOME A CATALOGUE OF recent Davidson College of Engineering launches. You'll find stories about literal rocket launches, such as our High Altitude Rocketry Program's first launch from the desert. Another group of Aerospace students and alumni, TechEdSat-8, launched a tiny cube satellite, loaded with experiments, from the International Space Station earlier this year. Their story is here as well.

You'll also read about the launch of our new GO program, which rewards our students every time they attend a career-prep event, take action to build their community, or strengthen their skills. This incentive program is a way for students to expand, prepare and GO into the future armed with the knowledge, skills and abilities to launch their careers.

You will also learn about ParkStash, a new app launched by one of our alumni. In the SJSU tradition of creativity and resilience, Sameer Saran (MS Computer Engineering '18) figured out a way to connect downtown San José homeowners with students who wish to rent their driveways during school hours. Everybody wins.

We are putting the final touches on a new five-year strategic plan, scheduled for lift-off this Fall. Be on the lookout for the exciting things we are planning in the Fall 2019 issue. In the meantime, enjoy this issue. And if you ever feel like coming back and touching base with the Davidson College of Engineering mothership, we would love to engage with you. We have been honored with alumni who mentor students, share their career stories, and speak at our events, and we welcome your participation as well.

Sincerely,

Dean Sheryl Ehrman

*Don Beall Dean of Engineering, Charles W. Davidson
College of Engineering at San José State University*

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Photos (top to bottom, left to right): Panels in the new Materials Library; Engineers Without Borders in Ghana; Students prep for the High Altitude Rocketry Program launch; the TechEdSat cube satellite is propelled from the International Space Station.

Front Cover: Students move the rocket into place for the premier launch.



Erratum

In the fall 2018 issue, we credited Chris Brown and FARO Technologies for the photos on page 11: Taking “Reality Capture” Laser Scans of History, but we missed crediting Brian Miller, owner of PointZ Taken and creator of the reality capture technology program. We regret this omission.

IN THE NEWS

Four engineering research student teams were selected among the 10 SJSU finalists and will **represent SJSU at the annual CSU Student Research Competition** in April at CSU Fullerton. Congratulations to Eric Anderson (“Can 3D Printing Compete with Mass Production: A Mechanical Reliability Approach”), Sky Eurich & Shivangi Agarwal (“Takeover Response Times Following Disengagements in Semi-Autonomous Vehicles”), Avni Gulati (“Social Recommendation Systems”), and Sarah Ortega (“Exploring a Hybrid Design for a Short to Medium Range Transport Aircraft”), and their advisors!

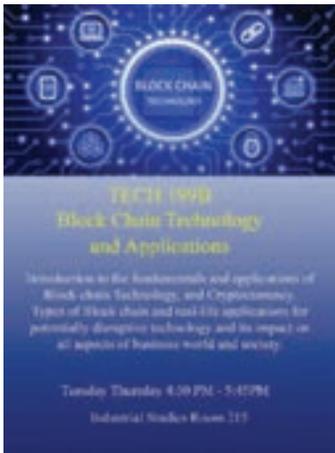
our local organizations.” SJSU projects included pop-up smart lockers with plug-in capabilities for the valley’s homeless population, and an aquatic rover, or underwater drone that could soon monitor chinook salmon and steelhead trout in the Guadalupe River.

The lower level of the Dr. Martin Luther King Jr. Library now houses the **first public materials library** and is home to an interdisciplinary innovation space for students and faculty to collaborate, test ideas and host events such as the USPS



Hackathon and Paseo Rapid Prototyping milestones. San José State University’s **Innovation Design Collaborative (IDC)** started four years ago when representatives from the Davidson College of Engineering connected with a handful of industry partners to discuss how the university could prepare students to meet evolving workforce needs. The IDC grew to include more than 40 industry and educational partners from off campus as well as campus representatives from each college. Through the generous support of Applied Materials and Xilinx, the dedicated Innovation Design Collaborative space was secured in the library, providing opportunities for students and faculty to work together, incubate ideas and gain valuable experiences needed to succeed in Silicon Valley beyond graduation.

The San José Mercury News says: “We knew it all along: San José State is a true gem. Recognized as an academic nexus in the engineering-and-tech-centric Silicon Valley, **San José State has been cranking out STEM graduates like crazy**, providing human fodder for the Apples and Googles and LinkedIns headquartered just up Highway 101. According to a new survey from *CollegeVine*, a Cambridge, Mass.-based consultant group that helps college-bound high-school students, **San José State is ranked the most underrated school in America.**” And while that may sound like a back-handed compliment, students like Hibo Osman say the ranking is right-on: “There is a “there” there at SJSU that the world is just starting to recognize.” 🍷



SJSU’s **first Blockchain class and club** both revved up this Spring. In Tech 199B, which is open to all SJSU students regardless of major, students learn Blockchain fundamentals and create their own cryptocurrency. The Blockchain club is planning hackathons, free seminars about Blockchain applications, industry-leader guest lectures, and they invite startups to share their ideas with SJSU.



The first Engineering Projects in Community Services (**EPICS**) Expo was held in the Student Union Ballroom. SJSU EPICS students, as well as EPICS students from Santa Clara University, unveiled

projects designed to address social inequalities throughout the local Silicon Valley community. KGO Reporter Amanda del Castillo called the expo “high tech with a heart.” Director of SJSU EPICS Program, Professor Julia Thompson shared, “The Silicon Valley is known for its technology, but we also have really high income inequality and a lot of social issues. All of these problems that the students are addressing come from the issues that have been identified by

AROUND THE WORLD WITH THE COLLEGE OF ENGINEERING

SJSU PRESIDENT MARY PAPAZIAN USED

a recent blog post to explore how important global perspective and cultural fluency is for our students. “When our students study abroad,” she wrote, “they not only are learning about cultures and people who could represent a possible customer base, but they also have opportunities to learn multiple ways of thinking, cultural values and traditions and different approaches to solving problems that may be new to them. They can then take that learning and apply it to their studies, giving them a more well-rounded education that will serve them—and the organizations they eventually work for—well.”



STUDYING ENGINEERING IN PARIS

Industrial Systems Engineering Assistant Professor **Dan Nathan-Roberts** leads a condensed and intensive area studies course in the fabled City of Lights. During the 2-week program, called “Culture Through Science & Innovation,” students study engineering by baking macarons (French meringue cookies) and learning humidity management, picnicking with entrepreneurial engineers by the Seine, and restoring part of an ancient castle. Nathan-Roberts created a study program that combined the enjoyment of touring with serious learning. “Our tour of the Louvre focused on how they’ve integrated VR and cutting edge technology to display, preserve, and learn about art,” he said. “They can see through paintings and even see how an artist covered up a mistake, and have created new ways to remove varnish and preserve paintings.”

ENGINEERING STUDENTS BUILD WATER FILTRATION IN GHANA



Engineers Without Borders is the perfect place for our students to discover the joy of philanthropic work while developing their engineering skills. In Fall 2018 the team traveled to Ghana.

FACULTY REPORT FROM HANOI

Biomedical Engineering Assistant Professor **Matthew Leineweber** blogged about his travels, students, and a LOT of tasty food while he taught a 10-day course at the Hanoi University of Science and Technology. After his teaching stint was up, he visited with SJSU BME’s **Hoang Nguyen** and **Shawn Bhinder** in Nha Trang (southeast coast of Vietnam).



Get involved

If you are an alum with an opportunity for our engineering students to travel, or if you have engineering lessons learned from living abroad, please consider sharing this with our students. As President Papazian said in her blog, “We are living in a global economy—a global society—and that our curricula must consistently take into account the global aspects of every academic discipline. . . For the students who we are educating, that means they almost certainly will need to understand cultures different from their own if they are going to be successful, even if they never leave the Bay Area.” 

HIGH HOPES AND DEEP LESSONS IN THE DESERT

A Story by an SJSU Student and his Father

Alexis Thoeny (Aerospace Engineering '19 and chair of the SJSU High Altitude Rocketry Program, a subdivision of the Rocket Club):

I want to preface this by saying: HARP UNO had a non-nominal flight. The upper stage did not ignite and was destroyed on impact. The lower stage has yet to be found and is lying somewhere in the Mojave Desert.

Peter Thoeny (Alexis' father):

Over the weekend we went to a remote place in California's Mojave desert to launch a big rocket called HARP - High Altitude Rocketry Program. My son was leading a student team at San José State University for the past 9 months.

It is a two-stage rocket about 15 feet (4.5 m) tall, and 4 inch (10 cm) diameter. The booster (lower stage) has a big N-motor, the sustainer has an even bigger O-motor. Both are solid state - the fuel is a rubber compound, the oxidizer is ammonium perchlorate. The rocket has a lot of electronics and several cameras. It simulated to reach 150,000 feet (46 km) - half way into space, with a top speed of Mach 3.8 - almost twice as fast as a rifle bullet.

Alexis:

From 8 AM to 3 PM when we launched, the team continuously and diligently worked on prep for the vehicle. We started the morning with a team briefing where we went over the checklist, safety notes, and the plan for the day.

All images courtesy of Peter Thoeny.



“If things are not failing, you are not innovating enough.”

During the morning briefing, I wanted to temper the team’s expectations. I want to thank our Advisor, Dr. Vergine, for continually advising me that it is not the launch result but the physical result, teamwork, and dedication that matters. Of course, if we were successful that would be a plus.

Following the morning meeting, the team split up into their subsystems and worked on final prep. At 2:57 PM, the countdown was called. The lower stage came up to pressure 2 seconds after the countdown, and the rocket roared off the launch pad.

It was relieving, exhilarating, and terrifying, all at the same time. Everyone was behind bunkers at launch, and we all ran out to see where the rocket was. At this point, I counted past the second stage ignition time without seeing the smoke cloud of the second stage burning. Then, about 80 seconds later, we all heard and saw the impact of the upper stage 1.5 miles away. The team hopped into two pickups and drove out to the impact site.



Peter:

The initial launch went well. With a rocket this size you usually need to be 2500 feet (700 m) away from the launch. We were close, very close - safe in a bunker. The launch was very loud, leaving a smoke trail that disappeared into the sky.

We did not see the sustainer light up, e.g. no secondary smoke trail. That meant trouble. We had to hide again in the bunker. A minute and 25 seconds after launch we heard a loud explosion. 2 miles (3.3 km) out we saw plumes of smoke rising up in the desert. The sustainer came in ballistic and exploded on impact.

Alexis:

The result: an 8-foot diameter, 3-foot deep crater. A bittersweet recovery.

Every team member felt bittersweet about the results, but there is only room for improvement from here. We do know that the upper stage did not ignite from the safety measures set in place by the upper stage flight computers.

Peter:

The team was in good spirits, despite the obliterated rocket. They will analyze the data and remains to find out what went wrong. Elon Musk once said, “If things are not failing, you are not innovating enough.” 🍷



AEROSPACE ALUMNI EARN PRESTIGIOUS NASA AWARDS

“Do the things that make you feel the most intimidated.”



AEROSPACE ENGINEERING ALUMNI ZION YOUNG (BS '08, MS '14) and Arash Alex Mazhari (BS '14, MS '15) were recently awarded the prestigious Exceptional Engineering Achievement and the Exceptional Achievement Awards, respectively, for their substantial contributions at NASA Ames Research Center.

Young has worked as the Manufacturing & Integration Lead on the agency's Heatshield for Extreme Entry Environment Technologies project since 2014. The team's main goal is to develop a novel, three-dimensional woven material able to withstand the scorching temperatures characteristic of space exploration. As a Lead, Young has been responsible for overseeing the manufacturing processes that make the team's goal possible and ensuring its effective integration at Johnson Space Center in Houston. The Thermal Protection System technology they develop will replace what NASA has previously used in missions and will make up new and improved Venus and Saturn space probes and landers.

Meanwhile, Mazhari has played an integral role in developing and has been managing the SpaceShop Rapid Prototyping Lab since 2014. The laboratory is essentially NASA's makerspace, as it provides both the Ames community and other federal agencies with a wide range of tools and equipment that help create hundreds of prototypes every year. As a manager, he has consulted on many of these projects, including the development of several small satellites, spacecraft, and other technologies used in the International Space Station.

The two have very different titles at Ames Research Center, and their visions for their futures while they matriculated at San José State were also unlike. Mazhari grew up dreaming of civil service since he was a young child, and even recalls “sleeping with a huge NASA sticker over [his] bed”. Conversely, Young had his eyes set on aircraft, not spacecraft. An internship as one of Ames' structural analysts changed his mind.

“What's kept me at NASA is the huge variety of projects you can work on,” says Young. “And that variety is a phenomenal opportunity to learn and grow. There's no other place like it.”

Both alumni credit San José State for providing them with the interpersonal skills and hands-on learning opportunities that help engineers like them land jobs. And, now in advanced roles, they see these same qualities in Spartans applying for internship positions on their own teams.

“It also started with an internship for me,” explains Mazhari. “I was chosen by Professor Marcus Murbach when I took his Propulsion class. I didn't know a thing about manufacturing but I hit the ground running. Now, I help run one of the government's makerspaces. The experience serves as a good reminder to do the things that make you feel the most intimidated. It's incredibly rewarding.” ☺

PARKSTASH, “THE AIRBNB OF PARKING”

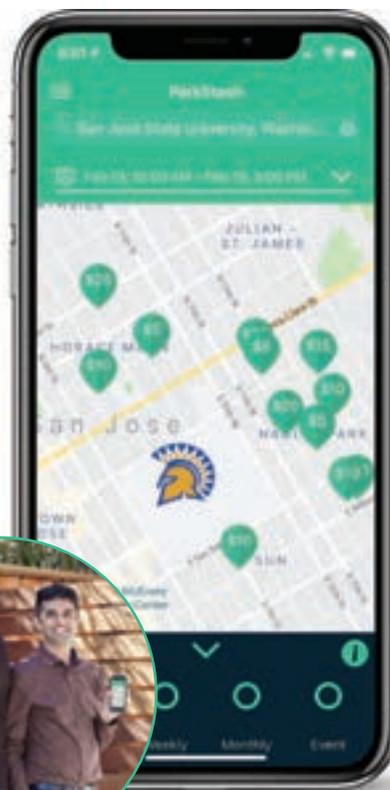
DAVIDSON COLLEGE OF ENGINEERING

alumnus **Sameer Saran** (MS Computer Engineering '18) is tackling San José State's worsening parking issue with an innovative new app called "ParkStash." Nicknamed "The Airbnb of Parking" by Saran, the app brings the sharing economy to downtown San José by connecting drivers with unused private parking spaces.

"I was paying for an expensive parking permit and spending thirty minutes a day driving around and looking for a space. I worried I would miss class and, when I finally got to class, I had to sit down and focus. I didn't want to stress about this any more," Saran explained.

This stress is not uncommon amongst SJSU students; around 41% of students identify as commuters and an ever-growing student body has created a three-to-one ratio between drivers and available parking spaces on campus. Additionally, ongoing construction has resulted in the closures of some of the school's main parking lots, affecting not only students but faculty and staff as well.

Saran and three other computer engineering students recognized this issue and launched the app late in 2017. Since then, the app attracted almost 2,000 users—54% of whom are students—who log in and pick from an array of parking spaces offered up by homeowners with an empty driveway or unused car port. The team has even collaborated with the SJSU Parking Department and Charlie Faas, Vice President of Administration & Finance, to mitigate the traffic congestion that results as parking becomes more difficult. The app now features the live status of the campus garages' occupancy and the ability to reserve a private space in advance, further alleviating users from the headache of parking space hunting and freeing up the streets of downtown.



The app has attracted almost 2,000 users—54% of whom are students—since 2017

While developing a business model, the students found support in Hooman Bolandi, another Davidson College of Engineering alumnus whom they met as a judge in the University's annual Silicon Valley Business Plan competition.

"The big question was: How do you bootstrap this app? It requires not only work but a lot of investment," says Bolandi. "At last year's competition, Sameer took my comments to heart and improved on his project. I saw passion and willpower and eventually joined ParkStash as co-founder."

Investment was slim, recalls Saran, but through a mighty grassroots effort, he and his team have grown their venture into one poised for powerhouse status. ParkStash's reach now extends to the suburbs near Levi's Stadium and SAP Center, giving event-goers a cheaper, faster choice for parking. In a few years, they hope to make ParkStash the main solution for other urban communities in California facing the same traffic and parking issues.

Interested in learning more about ParkStash? The app is available for download on the Apple App Store and the Google Play Store. 📱

Engineering Students Expand, Prepare, and



New incentive program aims to gamify career prep

SOMETIMES THE SHEER AMOUNT AND VARIETY

of opportunities to learn at SJSU can become overwhelming. Engineering students, in particular, are already laden with demanding coursework as well as a possible commute, a part or full-time job, caring for their families, and more. They may not feel they have time to join a club, head to a Career Conversations event, or attend a Silicon Valley Leaders Symposium lecture.

At the same time, the working world can be harsh to a newly graduated student who can only show technical skills, who might not have developed the savvy to work with teams, network with new people, or understand the market. Evidence shows that even a little career preparation gives our graduates an edge.

Thanks to a generous grant from Don Beall, an award-winning Distinguished Alumnus, Dean Sheryl Ehrman designed the College of Engineering's GO program as a way to connect more engineering students with the scores of professional development and career-readiness opportunities that already exist inside and outside SJSU. Think of it as a way to gamify extra credit. Through the GO program, students can accrue points when they attend events, complete senior projects, tour local companies, mentor others, join a club or organization, build their LinkedIn profile, and more. Points accumulate up to graduation, and twice a year students can cash in the points for prizes.

During the first semester of the GO program, participating students earned T-shirts, a special graduation cord, a pizza party, and a prestigious LinkedIn endorsement by Dean Ehrman. Future prize options include coffee with an alum (see below to get involved), social media recognition, and exclusive SJSU Engineering swag.



Get ready, set and **start here!**

- Step 1** You are attending this event — first step already completed.
- Step 2** You are currently standing next to the GO banner, so take a selfie with it!
- Step 3** Now GO log your points. Head to the following link to find out how: engineering.sjsu.edu/go. Complete the form and you are done!
- Step 4** For every event/activity you participate in (on your campus community, your network, you can do the following:
 - Take a selfie at the event/activity
 - GO to the link and log your points
 - Cash out your points for prizes!

Got questions? Visit our FAQ page: engineering.sjsu.edu/go/faq



By February, 65 students had logged in a total of 240 activities. The most popular activities have been building a LinkedIn Profile, attending a professional engineering event, joining a student club/society and attending an on-campus event such as an information session by a local company representative.

Most events are awarded 5 or 10 points, but students who enrolled in global experience programs or a semester-long career preparedness course, earned the maximum allowable 60 points. Some students earned more than 200 points in the first two semesters.

Students have been generous with their feedback as we improve the program and set a good foundation for future scalability. In addition to suggesting improvements, students have called the program “Inspirational” and “Awesome.” We have enlisted the help of two senior design project teams to build a database that will allow us to scale if all 7,000 engineering students are actively using it. 🍷

Hey, Engineering Professionals! Would you like to have coffee with an engineering student as one of the GO prizes? If so, please contact lisa.francesca@sjsu.edu with your field of expertise and possible availability during May and December. We will try to pair you with a student in your fields, and cover the cost of coffee!

We literally co-authored the safety and system requirements for such missions with NASA.”

On the recommendation of the San José City Councilmember Raul Perez, San José Mayor Sam Liccardo presented a commendation to the Technology Educational Satellite team for their achievements and the most recent launch of TechEdSat-8. Dr. Papadopoulos, and Adjunct Professor Murbach received the award in February. Present at the award ceremony in the City Hall Council Chambers were all members of the TechEdSat-8 team: Ali Guarneros Luna, Elias T. Reyes, Austin Tanner, Alejandro Salas, Cedric Priscal, Nicolas S. Williams, Reine Dominique Ntone, Bernardo Soriano-Gama, Khoa Ngo, Jesus Ramiro Rosila Mares, Roberto Rosila, Nanci Solomon, Robert Bruce and Zachary M. Hughes.

Five of those team members: Elias T. Reyes, Alejandro Salas, Bernardo Soriano-Gama, Jesus Ramiro Rosila Mares, and Roberto Rosila, were first generation Mexican-American students who also received an award from the Mexican Embassy in San José. 🌟



Photo (top): TechEdSat-8 Deployment from the International Space Station on January 31st 2019. Photo courtesy of NASA. Photos (bottom): TechEdSat-8 Team at work, and at the City Council of San José. Photo courtesy of Josie Lepe.

UPCOMING EVENTS

Engineering Awards Banquet

Thursday May 2, 2019 | Diaz Compean Student Union Ballroom
<https://engineering.sjsu.edu/banquet>

Coming this Fall:

Silicon Valley Leaders Symposium

Thursdays at noon | ENG 189

The symposium hosts a wide variety of industry and technology leaders to talk about business and technology trends, and their broader societal and political implications. Recent speakers have come from LinkedIn, SLAC, PopVox, and Aruba Networks.

Dean's Career Conversations

Days and times vary | ENG 494

Dean Sheryl Ehrman and select students enjoy conversation and refreshments with alumni and other mentors from all engineering fields.

Spring Commencement Ceremony

Thursday May 24, 2019 | Avaya Stadium
www.sjsu.edu/commencement

GreenTalk Speaker Series

Wednesdays at noon | ENG 189

Practicing engineers, scientists and technical experts deliver timely briefings on how engineers deal with environmental issues.

“I just want to say Thank You to you and your team at SJSU for making the SVLS series available, and also making it available on YouTube.”

– Sharath, SJSU Alum.

ALUMNI NOTES

ALBERT GARCIA III

MS Civil Engineering

Garcia was recently appointed as Vice President, Projects of Capstone Mining in Vancouver. He is a Professional Engineer with leadership experience in engineering, construction, mining and executive project management in large capital-intensive projects in challenging locations. Previously he was Senior Vice President and COO of Latin American Operations at AECOM and was the consultant Engineering Director on Capstone's Santo Domingo project in 2014. He has a PhD in Engineering from the University of Missouri-Columbia.

ALLISON SCHULKINS

MS Chemical Engineering '18

Schulkins is COO of Single Cell Technology, with experience in molecular biology, experimental design, fluid dynamics, and project management. She has spent years leading efforts to improve and validate SCT's processes for cell isolation, antibody screening, and amplification techniques for Next Generation Sequencing. She has used her expertise across SCT's converging fields to manage laboratory operations and client projects. Schulkins has a B.S. in Biochemistry from the University of California, Santa Barbara.



RON DEAL

BS Chemical Engineering '02

Deal joined Freese and Nichols, Inc., a corrosion protection services company, as a senior designer developing cathodic protection programs for clients in the water/wastewater, transportation and energy industries. Deal has worked with municipalities, public entities, water districts and military bases spanning the United States, including North Fort Bend Water District, Colorado River Municipal Water District and the Cities of San Angelo, San Diego and Los Angeles, along with numerous others in Texas and California.



The 2018-2019 academic year has been a great one for alumni gatherings! You've given us great feedback that you prefer attending department gatherings (vs. an all-college tailgate or Happy Hour) — and we heard you! Now you can connect directly with colleagues and professors.

BRAD EGGLESTON

MS Civil & Environmental Engineering '98

Eggleston, who started his career with the city of Palo Alto 20 years ago as an industrial waste investigator, is the new Public Works director. Eggleston is also at the center of implementing the council's 2014 Infrastructure Plan. He holds a bachelor's degree in conservation and resource studies from the University of California at Berkeley.

LARRY BOYCE HELMANDOLLAR

BS Mechanical Engineering '64

Was employed with Aerojet General, then Lockheed Missiles and Space Corp. until 1993. Larry worked on many high-level security projects primarily in the structural analysis group. He is enjoying retirement in the Portland, Oregon area.

ALI GUARNEROS LUNA

BS, MS Aerospace Engineering '10, and '13

Luna was recently the plenary speaker at The Women in Science and Engineering (WiSE) Conference, an annual event hosted by Texas State University's College of Science and Engineering. A senior aerospace engineer at the NASA Ames Research Center, Luna immigrated to the U.S. from Mexico City when she was 14 years old. She specializes in satellite design and works with the Office of Safety & Mission Assurance (OSMA) where she has performed in many engineering roles including design, building and testing for a series of suborbital experiments. Luna's work has earned her national and international recognition. In 2018 she was a recipient of the Reconocimiento Ohtli, awarded by the Mexican government to individuals who assist Mexican citizens or promote their culture.

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RANKED **3RD** IN THE NATION BY U.S. NEWS AND WORLD REPORT **2019**
Among public engineering programs offering bachelor's and master's degrees, excluding service academies.

SPOTLIGHT ON A SCHOLAR

Uyen Sou transferred to SJSU from a community college to pursue a degree in aerospace engineering. “When I first transferred,” Sou recalls, “I tried to go to every event—engineering-specific, career-focused, meet-ups for student organizations and clubs. I knew how important it is to have a community.”

Sou became a McNair Scholar, and joined the ASPIRE (Academic Support Program for Increased Retention in Education) program, which provided academic guidance and assistance. Sou also serves as a student coordinator with the Engineering Ambassador Program (EAP). For three years this position allowed her to awaken a love of science in dozens of local elementary, middle and high school students.

College can be stressful, and Sou sometimes struggles with insecurity and imposter syndrome. However, she’s able to overcome these feelings with help from her EAP cohorts and support from Jeanine Hunter, her Aerospace Engineering



professor; Angelina Ochoa Tran, her ASPIRE advisor; and Dr. Maria Cruz, McNair’s program director. “When I first met Dr. Cruz at the McNair tabling event, she saw something in me that I wasn’t aware of myself. My mentors encourage me to take chances and I feel stronger because of it,” Sou says. ☺

Support the Next Generation: bit.ly/givetoengr