



College of Engineering
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Spring 2023



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Aerospace engineering student Mohab Wahdan works on the SLO Propulsion Technologies Club's rocket test assembly MK-1.

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Cover Photo

Electrical engineering student Raheel Rehmatullah works on testing electronics during a SLO Propulsion Technologies Club meeting in the Bonderson Projects Center. The club recently completed a successful hot fire test of a liquid, bipropellant rocket engine.



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Cal Poly Concrete Canoe Team Wins 7th National Championship in 13 years

“This year, we’ve had our fair share of obstacles, but we’ve all come together and put in a tremendous amount of work and effort into this.”

—Heather Migdal



The Cal Poly concrete canoe team, the defending national champion, was the team to beat at the 2023 American Society of Civil Engineers Concrete Canoe Competition at the University of Wisconsin-Platteville on June 10-12.

It became official at the awards presentation at the end of Day Three.

“We just won our seventh national title!” said a beaming civil engineering senior Heather Migdal, the team’s project manager and one of four paddlers of Cal Poly’s canoe, Oceana.

Twenty university teams from the United States and Canada advanced to the finals from a series of ASCE regional qualifiers.

It was a dramatic defense of last year’s national victory at Louisiana Tech University. Cal Poly’s 2022 victory snapped what had been a four-way tie of five titles with UC Berkeley, the University of Alabama in Huntsville and the University of Wisconsin. The seventh win (in 13 years) of the 36th annual competition adds an exclamation mark to the title.

“This year, we’ve had our fair share of obstacles, but we’ve all come together and put in a tremendous amount of work and effort into this,” Migdal said. “The five senior captains were all on the team last year. We all know what is expected and I’m just beyond excited and happy that we’re able to say ‘We’re a two-time, national-winning team.’”

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Founding Director of The Noyce School of Applied Computing Shares First-Year Goals, Five-Year Dreams

Professor Chris Lupo knew establishing a school of applied computing at Cal Poly would be a game changer for the College of Engineering as it supports students and faculty in a field seeing explosive growth.

He also knew he wanted to lead The Noyce School of Applied Computing – the first interdisciplinary school of its kind at Cal Poly, made possible by a transformational gift from the Robert N. Noyce Trust.

A hiring committee agreed Lupo was the best choice, naming him founding director in March after a nationwide candidate search. He will officially begin his assignment this summer.

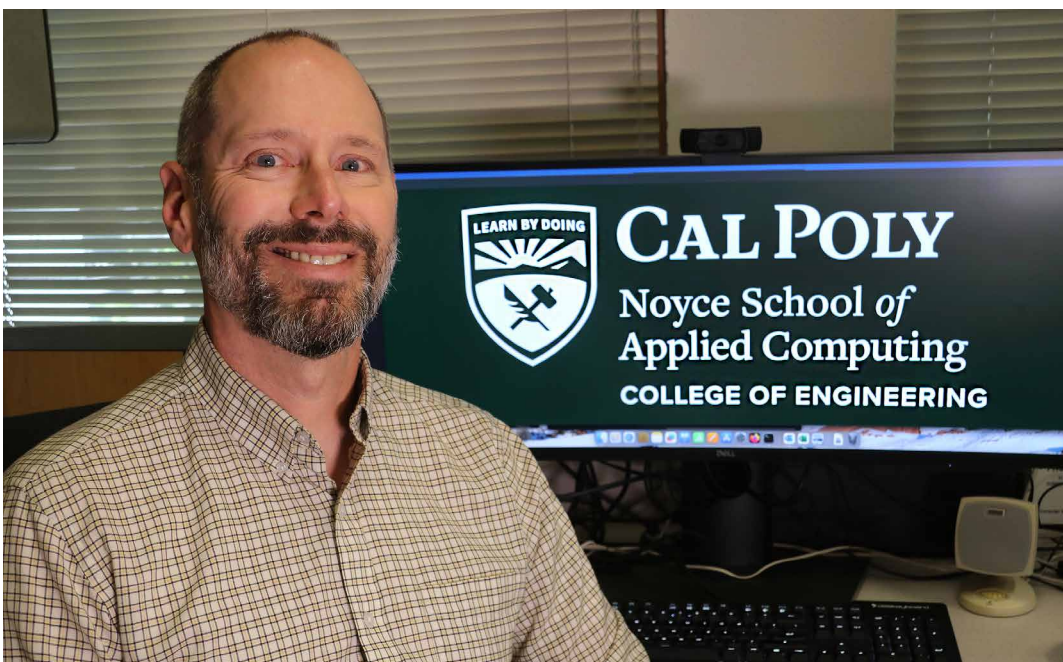
“I was excited from the beginning,” said Lupo, who took part in early discussions about the endowment as chair of the Computer Science and Software Engineering Department. “This is a once-in-a-lifetime opportunity that perfectly aligned with my own experience and education.”

The Noyce School combines three departments – Electrical Engineering, Computer Science and Software Engineering, and Computer Engineering – to create opportunities for students and faculty using computer principles, concepts and technologies to address real-world problems.

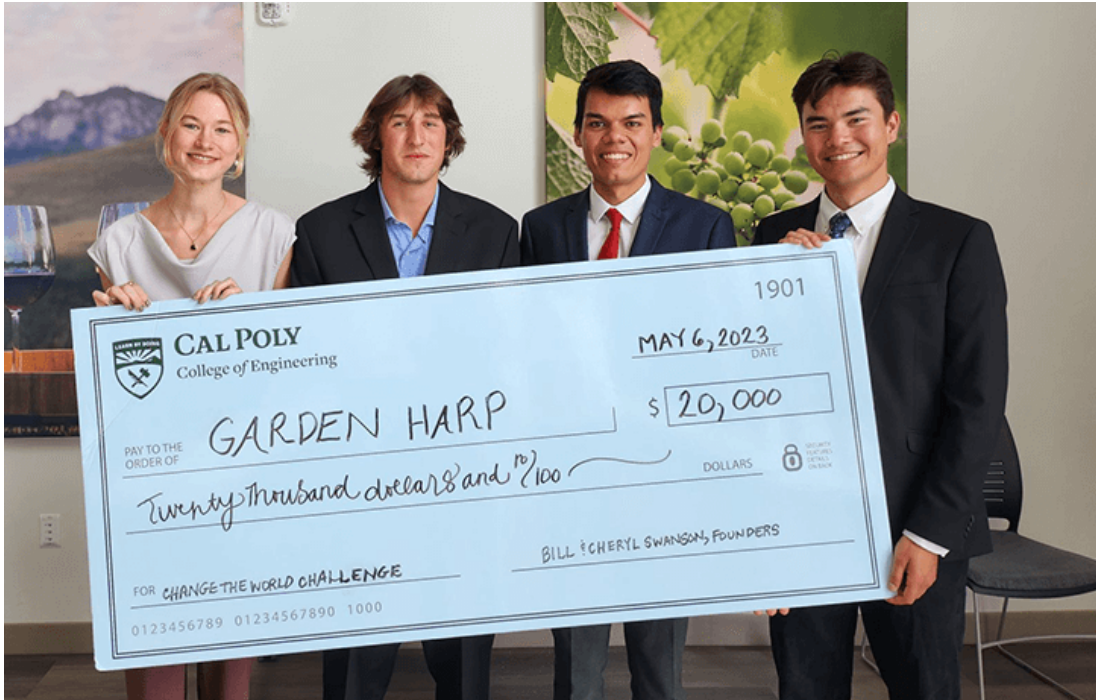
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“Faculty members across campus recognize the tremendous potential of The Noyce School to Cal Poly as a whole; there is a tangible sense of excitement and enthusiasm around the launch.”

—Chris Lupo



Change the World Challenge Winners Announced



“That is what truly makes this the type of challenge that will change the world. It was very encouraging to see the advanced level of thinking this year by all teams.”

—Bill Swanson

Four Cal Poly students received \$20,000 to implement their research idea through the Change the World Challenge, an interdisciplinary competition sponsored by Bill Swanson, a College of Engineering 1973 industrial engineering alumnus and retired Raytheon chairman and CEO.

Luke Bowen (environmental management and protection), Liam Drew (mechanical engineering), Sam Hudson (mechanical engineering) and Amelia Stonkus (biological sciences, environmental earth and soil sciences) impressed judges with their project, Garden Harp, an environmentally friendly planter that captures moisture from fog to water gardens.

“The Garden Harp is a home garden structure that combines an olla irrigation system and a fog harp,” Stonkus described.

The prototype connects three arrays of vertical steel wires with bamboo rods that are planted into the soil. When fog passes through, the water droplets from the fog connect to the steel rods and distribute into the soil.

The Change the World Challenge encourages students to focus on real-world problems and create solutions while working within interdisciplinary teams.

“The challenge’s intent uses system engineering principles in solving problems the team thinks can and should make a difference in today’s world,” Swanson said. “That is what truly makes this the type of challenge that will change the world. It was very encouraging to see the advanced level of thinking this year by all teams.”

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Aerospace Engineering Track Stars Vault their Way into the Record Books

Track stars and engineering students Mathis Bresko and Lexi Evans are setting pole vault records on the track and earning accolades in the classroom, as they prove the sky is not the limit.

Bresko, a fourth-year student, is Cal Poly's defending conference champion in the men's pole vault, currently ranking No. 13 in the West Region, while Evans, a freshman, is having a stellar first season in the women's pole vault, moving to No. 5 on Cal Poly's all-time list.

Both are aerospace engineering majors, with a fascination for flying.

"There are many ties between aerospace engineering and pole vaulting," Bresko said

between practice vaults on Cal Poly's track. "Learning the physics aspect helped me think about pole vaulting and energy conservation, because the goal is to add as much energy as possible into the vault without losing any by perfecting the technique."

Evans noted the complexity and problem-solving aspect of vaulting appeals to her engineering mind: "There are all these little aspects you can change in jumping."

Bresko and Evans are aiming high as they post personal bests and work toward careers in the aerospace industry, with one setting his sights on the 2024 Olympics.

"At first, it was a lot of trial and error and trying to feel comfortable knowing it's a dangerous sport, but then I started having fun."

—Lexi Evans

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Making a Hand for Maggie

Most of life's defining moments happen unexpectedly as was the case for Maggie Collier in her biomedical engineering class one spring day.

A materials specialist was visiting David Laiho's introductory class to discuss how molding and casting play a critical role in engineering, including the field of prosthetics, and Collier was captivated.

She wanted to learn how to craft prosthetic devices that would help others but didn't know she was on the verge of discovering they could also help her.

Brooke Wheeler – the specialist from Reynolds Advanced Materials whose son received a liberal arts degree from Cal Poly in 2013 – concluded his demonstration by offering each student the chance to make a mold of their thumb.

Collier, however, had a different idea.

She asked Wheeler on a whim if she could make a mold of her left hand to capture the likeness of her abnormally short fingers that were stunted by a syndrome that restricts blood flow in the womb.

Wheeler's response stunned Collier.

"You could use this to make something to help with your hand," he said, explaining that the mold could be a first step toward creating a device that would give Collier a level of mobility and freedom she's never had.

"Really?" she asked in disbelief. "No way!"

"When Maggie walked in and told me her story, I immediately said, 'Yes! Let's do this.'"

—Yael Livneh

[READ MORE](#)



The crew of NASA's Artemis II mission (left to right): Christina Hammock Koch, Reid Wiseman (seated), Victor Glover and Jeremy Hansen. Photo courtesy of NASA

NASA Names Cal Poly Alumnus Victor Glover as Pilot of Next Lunar Mission, First Crew Under Artemis Moon Project

Cal Poly alumnus Victor Glover has been named the pilot of the crew that will travel around the moon on Artemis II, the first crewed mission on NASA's path to establishing a long-term lunar presence for science and exploration.

NASA and the Canadian Space Agency (CSA) announced Glover and three other astronauts at a televised news conference Monday morning. Glover will pilot the Orion spacecraft. The other crew members are Commander Reid Wiseman, Mission Specialist 1 Christina Hammock Koch, and Mission Specialist 2 Jeremy Hansen of Canada.

They will work as a team to execute an ambitious set of demonstrations during the flight test.

The approximately 10-day Artemis II flight test will launch on the agency's powerful Space Launch System rocket, possibly late next year, to prove the Orion spacecraft's life-support systems and validate the capabilities and techniques needed for humans to live and work in deep space.

"For the first time in more than 50 years, these individuals — the Artemis II crew — will be the first humans to fly to the vicinity of the Moon," said Vanessa Wyche, director of NASA's Johnson Space Center. "Among the crew are the first woman, first person of color, and first Canadian on a lunar mission — and all four astronauts will represent the best of humanity as they explore for the benefit of all."

"This mission paves the way for the expansion of human deep space exploration and presents new opportunities for scientific discoveries, commercial, industry and academic partnerships."

—Vanessa Wyche

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Deaf Student, Interpreter Enhancing Culture of Engineering College

Mechanical engineering student Yosef Towfique was born to the sounds of the outside world that suddenly went quiet after his second birthday.

The unexplained, rapid loss couldn't be tied to an injury or illness, and hearing aids proved ineffective, according to Towfique.

While Towfique and his family created basic gestures they used at their home in Tracy, California, he didn't have a complete language until kindergarten, when he was enrolled in a Deaf and Hard-of-Hearing program.

Towfique learned the movements of the hands and face that constitute American Sign

Language, allowing him to understand the world through visual descriptions and make meaningful connections to those around him. Few of Towfique's peers at Cal Poly use ASL, but he is determined to relate to them through an ASL interpreter who has a background in engineering and a dedication to the Deaf community.

"Yosef has opened other students' minds to what deaf people can do," said Jennifer Beevers, who is accompanying Towfique through college. "When a student-interpreter team goes into a classroom, they improve the worldview and accessibility awareness for everyone in that class."

"Yosef has opened other students' minds to what deaf people can do."

— Jennifer Beevers

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Making History: Cal Poly Engineering Alumna Sends off the Last 747, ‘Queen of the Skies’



Susan Chandy did not dream as a Cal Poly freshman in the fall of 2000 that her engineering education would lead to a pivotal role retiring the most famous jumbo jet in the world – the “Queen of the Skies.”

She was living on her own for the first time in a new city, adjusting to the fast-paced quarter system and keeping up with a slate of industrial engineering classes in preparation for the desk job she imagined.

Four years later, an offer to work in the Boeing Co.’s fabrication division changed everything.

“I thought I would end up in an office, wearing business suits and high heels, but here I was on the manufacturing floor with boots

and safety glasses,” said Chandy (Industrial Engineering, 04), recounting her journey from the classroom to the shop floor, then into leadership at one of the world’s largest aerospace companies.

Her latest assignment will put her in the history books as the manager overseeing production of the last – or 1,547th – Boeing 747, which was rolled out for delivery in January.

During a final farewell ceremony, thousands paid tribute to the jumbo jet that revolutionized air travel and won a permanent place in American pop culture.

“The 747 shepherded in the jet era for the masses. Travel became more affordable, and the world became more connected,”

—Susan Chandy

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COLLEGE OF ENGINEERING CELEBRATES 2023 SPRING COMMENCEMENT



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More from Spring of 2023



June 15, 2023

Professor Peter Schuster named Man Enough to be a Girl Scout

Mechanical Engineering Professor Peter Schuster is officially man enough to be a Girl Scout.

The senior project organizer was honored by Girl Scouts of California's Central Coast for his contributions to the community, earning him the title of Man Enough to be a Girl Scout recipient.

Only four volunteers out of more than 4,000 received the award this year, according to CEO Tammie Helmuth, who oversees the Central Coast council and its growing membership of over 5,700 girls.

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June 7, 2023

Cal Poly Engineering Club Rockets to Success

In the middle of a three-second hot fire test of a liquid, bipropellant rocket engine, Adam Boegel saw what he was looking for — little diamond structures in the blue exhaust.

“The diamonds indicated we had the ethanol and gaseous oxygen combusting at optimal performance and we had reached supersonic flow out the back,” the Cal Poly aerospace engineering undergrad said. “We actually calculated it afterwards at about three times the speed of sound. Really, really cool.”

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June 6, 2023

Cal Poly Amateur Radio Club achieves 2,000 license milestone with iFixit CEO

In May, in a computer science classroom on the Cal Poly campus, iFixit CEO Kyle Wiens ('05, CSSE) became the 2,000 licensee of the Cal Poly Amateur Radio Club – (CPARC). The club (callsign W6BHZ) provides a simple way for students and community members to take their #fcc amateur radio license exam, thereby giving access to the amateur radio frequencies. The milestone reflects the club's commitment to introducing people to the hobby of amateur radio since the licensing team's formation in 2009.

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May 24, 2023

Students Implement Water Distribution System in Rural Nicaragua through Engineers Without Borders

Five years ago, the Engineers Without Borders USA matched a group of Cal Poly students to partner with a Nicaraguan community to design and construct a water distribution system. The project came to fruition this year when the Engineers Without Borders (EWB) Cal Poly Nicaragua team took a trip to La Rinconada. With guidance from Cal Poly faculty and staff, the Responsible Engineer in Charge of the project, the EWB-USA Nicaragua In-Country Office and the community, EWB Cal Poly designed a water distribution system that provides clean water to a 60-household area.

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May 23, 2023

College of Engineering Graduates Win Big at CSU Startup Competition

Two engineering entrepreneurs from Cal Poly won a combined \$35,000 for their emerging businesses – Ryde and X-Adapt – during the inaugural California State University startup launch competition on May 5 at San Jose State University.

The Sunstone CSU Startup Launch Competition is a groundbreaking partnership between the CSU system and Sunstone Management – an international investment firm based in Long Beach – designed to support and fund innovative startups created by CSU students.

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April 25, 2023

Debunking False Rumors on Twitter during Disasters

As Hurricane Harvey made its devastating landfall in August 2017, a rumor that ran rampant on Twitter posed extreme danger to Houston's undocumented immigrant community of around 600,000.

The rumor claimed undocumented immigrants could not enter Texas shelters and would be reported to federal immigration agents. Fearing deportation, many hesitated to access a critical resource that was, in fact, open to all.

During a crisis, millions of people turn to social media to find information and ask questions, but over the last decade a growing number of users have used platforms like Twitter to mistakenly or maliciously spread misinformation.

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More from Spring of 2023



April 12, 2023

Second Annual Art of Engineering Competition Depicts Collaboration through Artwork

A panel of judges from the College of Engineering honored five participants in the second annual Art of Engineering challenge.

The competition was born from the need to beautify the engineering buildings while simultaneously expressing the collaboration between art and engineering.

This year, judges presented awards in four categories: Platinum, Gold, Silver and the Dean's Appreciation awards.

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March 2, 2023

Engineering Student Excels in Mountain Biking, Honored at Capitol

Isabella Heinemann came to Cal Poly for mechanical engineering but found a community that shares her passion for an outdoor sport that has put her in the national spotlight.

Heinemann, a second-year student from Mill Valley, California, who is also a competitive mountain biker, was one of 19 Cal Poly students recently recognized by state lawmakers at the state Capitol in Sacramento for success both inside and outside the classroom.

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February 20, 2023

Student Shop Techs are at the Heart of Learn by Doing

Melina Ruano was scared the first time she set foot in the Hangar machine shop.

The aerospace engineering freshman had to complete her red tag certification but had never seen a drill press, table saw or any such machinery while growing up in east Los Angeles.

"I don't think I ever would have gone into the shop if I didn't have to get my red tag," she said. "I didn't even know there were different types of screwdrivers!"

Ruano conquered her fear and completed her certification with the help of patient and friendly student shop techs who left a lasting impression.

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February 14, 2023

Cal Poly Student Awarded U.S. Department of Transportation Student of the Year

Cal Poly graduate student Peyton Ratto was honored with the Student of the Year award by the U.S. Department of Transportation. The Santa Clarita, California, resident was among 34 students nationwide to receive the title.

The award was presented in January by U.S. DOT's University Transportation Centers Program, which awards grants to universities as it advances transportation research and technology.

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February 7, 2023

Engineering Team Takes on NASA's Lunar Challenge

General engineering senior Callan Hill traces his captivation with the moon to an astronaut's visit to his third-grade class.

The astronaut shared his adventures, signed autographs, and Hill was hooked.

"Space colonies will be a thing in my lifetime. We aren't an interplanetary species yet, but we will be and the implications of that are fascinating," said Hill, who brims with enthusiasm about the topic. "Space is my generation's new frontier."

He's now channeling his passion into an interdisciplinary senior project he hopes catches the attention – and funding – of NASA officials and paves the way for mineral prospecting on the moon.

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January 2, 2023

Road to Reclamation is Extraordinaire for Cal Poly Rose Float

Cal Poly universities' 'Road to Reclamation' received the Extraordinaire Award at the 2023 Rose Parade for the most extraordinary entry among the parade's 39 floats. It was the school's 62nd award in 74 parade appearances since 1949.

The float was controlled by a crew of four operators, below the float's decorative foam shell. From left, Logan Hauptman of Cal Poly, Pomona, animation operator Jeremiah Lee, driver Benjamino Cruz and Collin Marfia, engine operator, all from Cal Poly, SLO.

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Student Spotlights



April 7, 2023

CENG Student Spotlight: Joselyne Martinez

Civil Engineering

What made you choose engineering?

I'm a first-generation student whose mother, like many others, decided to move to the U.S. from Guadalajara, Mexico, seeking a better future for herself and her children. Growing up in a foreign place, I had to adapt to my new home and learn a new language, all while attempting not to fall behind in my studies. This is a lot to bear for any 9-year-old, and as a result, I fell behind in all my subjects in school, especially science and math. It took me a long time to catch up academically to my counterparts, but I achieved this in early high school.

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March 14, 2023

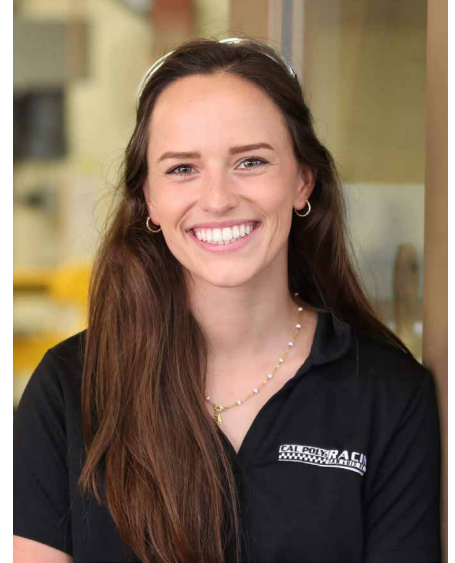
CENG Student Spotlight: Max Lewter

Biomedical Engineering

What made you choose engineering?

I love the process of taking on difficult challenges and figuring out practical and realistic solutions to them. I feel like engineering has the ability to make direct impacts on people's lives, and I get to see that often, especially through clubs like EMPOWER, where we build prosthetics and other devices for members of the community. The combination of making a tangible impact on people and the enjoyable process of problem-solving makes engineering a perfect field of study for me.

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March 7, 2023

CENG Student Spotlight: Jackie Fritsche

Mechanical Engineering

What made you choose engineering?

I chose engineering because I have always wanted to understand how the world works. My parents would get annoyed with me as a child because I always asked why or how. I also love math and art. I found that those two things connect with engineering. It's creative but structured. There is a reason why everything is how it is, which is very appealing to me.

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March 1, 2023

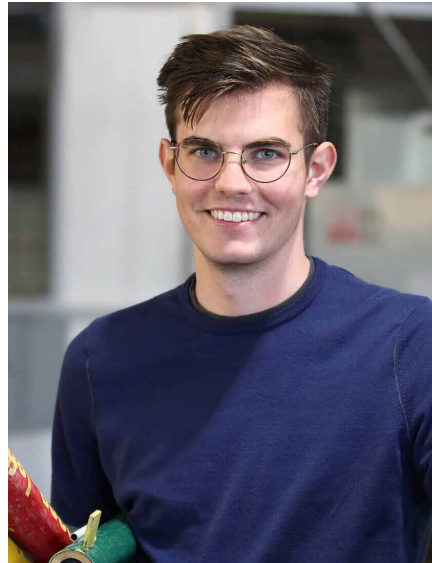
CENG Student Spotlight: Juan Carlos Palominos Jr.

Materials Engineering

What made you choose engineering?

I chose engineering because it would allow me to pursue my passion for math and science and equip me with the tools necessary to change the world one day. As the oldest son of two Mexican immigrants, I was raised with the morals and values that have encouraged me to become a leader and pave a strong academic path for my younger brothers. I was taught to be aware of the effects of my actions and how they can shape me into a better person. This role has heavily influenced my life and given me the courage to overcome the adversity I have faced as a first generation Mexican-American student in the field of engineering.

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March 1, 2023

CENG Student Spotlight: Matthew Bornhorst

Aerospace Engineering

What made you choose engineering?

I have always been a problem-solver ever since I was little, and engineering was the path where I would be able to solve some of the biggest problems that we're facing today, some of which haven't even been thought of yet. Engineering is a constant process of learning, failing and trying new things until you figure out something that works, and that is going to keep me interested in it for a lifetime.

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January 31, 2023

CENG Student Spotlight: Emily Gavrilenko

Computer Science

What made you choose engineering?

I've always liked math and science classes growing up, and engineering allows me to put everything I've learned into practical use to solve the world's problems. It's a perfect combination of problem solving and creative thinking, and there are always new things to learn and new challenges to tackle, so the work never gets old. Now that I am an engineer, it's really rewarding to use everything I've learned to create something new!

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