

ISSUE 5 | 2021

DISCOVERY



CalPolyPomona
College of Science

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COVER PHOTO:

Associate Professor Nicholas Van Buer leads a tectonics class on a field trip to the El Paso Mountains.

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Alison Baski, Ph.D.
Dean

Lisa Alex, Ph.D.
Associate Dean – Operations and Students (2019-2020)

Michael Page, Ph.D.
Associate Dean – Students and Operations (2021-)

Craig LaMunyon, Ph.D.
Associate Dean – Academics and Research (2018-2021)

LAYOUT & DESIGN

Dan Griggs
Rafaela Dandolin Rech

PHOTOGRAPHY

Dan Griggs
Tom Zasadzinski

WRITERS

Dan Griggs
Nancy Yeang
Michael Walton

EDITOR

Dan Griggs

OUR VISION

Fostering curiosity and a culture of scientific discovery

OUR MISSION

Educate, mentor, and inspire students through scientific inquiry and hands-on learning

CORE VALUES

Curiosity
Integrity
Collaboration
Inclusivity
Innovation

DEAN'S MESSAGE

The 2020-2021 academic year is over but not forgotten. We haven't forgotten the disruption, the loss, and the challenges. We must not forget the way we met those challenges with unity, compassion, and resilience in the face of adversity brought on by the COVID-19 pandemic.

In May 2021, we celebrated the graduates for the Classes of 2020 and 2021 with drive-in ceremonies held at the Pomona Fairplex. Our students celebrated their accomplishments as Cal Poly Pomona students have done for the last 83 years, not in the same way, but with the same spirit. Honking car horns were certainly a new feature!

Moving forward, we remain dedicated to our mission to "Educate, mentor, and inspire students through scientific inquiry and hands-on learning."

As we prepare to repopulate the campus this fall, we are guided by safety measures as outlined by the county, and are guided by our core values of curiosity, integrity, collaboration, inclusivity, and innovation.

Our College of Science community is made up of students, alumni, faculty, staff, and donors who support our mission. We invite you to be an active member of our community by participating in an activity that is meaningful to you, attending an event, and supporting the college.

— Alison Baski, Dean

VIDEO SERIES WILL FEATURE ROCK STAR

Desert rock? The phrase may conjure up images of Coachella, but we're talking granite rock, mostly, and the star is Associate Professor Nicholas Van Buer from the Department of Geological Sciences.

Van Buer is proposing a YouTube series that will chronicle his 500-mile journey (on foot) through the Mojave Desert, from the Mexican border in Yuma Arizona to the Sierra Nevada mountains in Olancho, CA. The trip will take 32 days. He'll collect rock samples along the way for dating and analysis.

The series is part of Van Buer's 2022 sabbatical proposal, but he's already created student field trip videos that served as proof of concept.

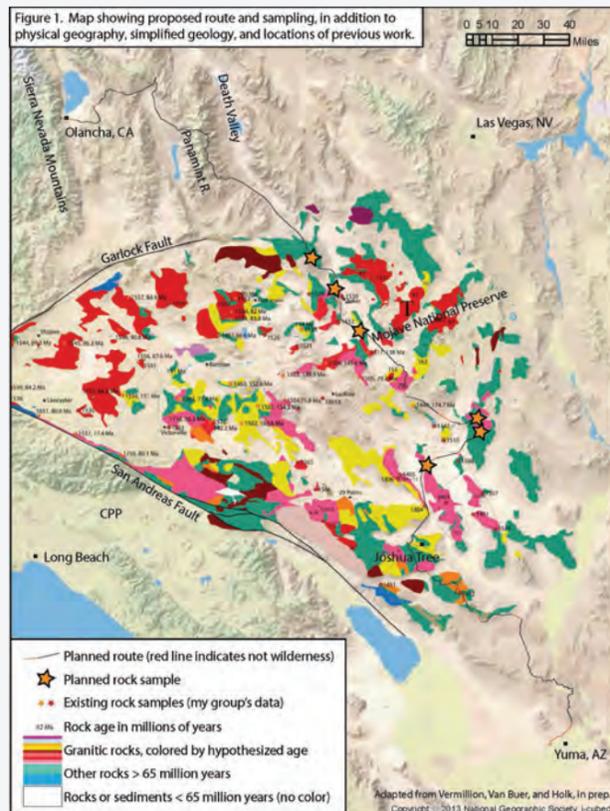
Much of his research focuses on the Mojave Desert. Van Buer's last student field trip explored the tectonics of Death Valley. He recorded 15 videos from that trip.

Students were able to observe and interpret a variety of geological features, including rocks formed during and after "snowball earth," the global freezing that occurred some 635 million years ago. Students visited faults related to the building of the Rocky Mountains some 100 million years ago.

"Students saw where marine limestones were pushed over fossil sand dunes, and a 'metamorphic core complex' near Death Valley where rocks from the middle crust, over 20 kilometers deep, were pulled up to the surface by a giant extensional fault," Van Buer said.

Also notable were rocks that came from a "supervolcano" in Arizona some 19 million years ago. The volcano spread hot ash as far as Barstow.

Undergraduate Ryan Tomson, who was on the trip, said, "This kind of in-person viewing brings together how complex the western tectonics systems are and makes you really want to learn more." Tomson plans to go to graduate school.



Students who participate in the field trips conduct research on the sites they visit and make presentations to the class. "It was the most memorable experience for me. I gave my speech on the Death Valley turtlebacks from Dante's View," Tomson said.

Van Buer's proposed YouTube series will be an educational resource for students unable to attend field trips in-person and will also allow him to continue his research. "Very few of the Cretaceous rocks found in the Mojave have been dated. I started doing that in 2014," he said.

Van Buer said, "My work is largely focused on the late Mesozoic (~150-70 million years). Most of the hypotheses about geologic happenings during this period, including the proposed collision of an oceanic plateau, are based on studies of the western margin of the Mojave." That's why Van Buer will travel across the central/eastern side. Because he'll be on foot, he will drop rock samples near vehicle accessible points to be picked up later. The samples will undergo dating at Stanford, where Van Buer completed his Ph.D., using radiometric dating.

Because he'll be alone and on foot, he'll have to travel light. He will sleep in a pup tent. He's designated 23 supply points along the way, at least two of which will be for food. Like explorers before him, who traveled by foot, he plans to carry flour and bake bread.

Safety measures include GPS communications

that will update his location every 10 minutes. Rattlesnakes are a concern but they should be dormant in the winter. His trip is planned to begin near the end of January when the desert will be cooler.

Van Buer concluded with, "Although hiking 510 miles across a desert may sound a bit extreme, I've actually completed about six desert field seasons since 2006. Each trip included about 500 miles of foot travel, albeit usually spread over about 8 weeks of geologic investigation per season rather than compressed into 5 weeks of dedicated hiking. I go through a lot of hiking boots."



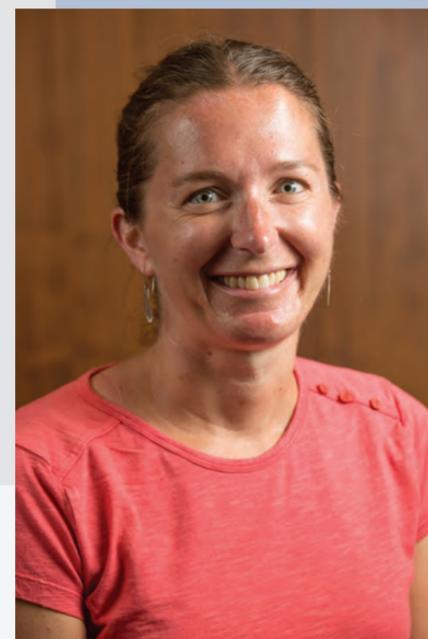
DISTINGUISHED TEACHING AWARD



LECTURER SVETLANA STOUKLOVA *Physics and Astronomy*

Svetlana Stouklova began lecturing at CPP in 2006, bringing valuable experience as a physicist and engineer in industry to share with students. She instills confidence in her students while teaching them a challenging subject like physics. Her teaching style is engaging, and though she teaches about 200 students per semester, manages to call them by name. Stouklova offers innovative classes that include problem-solving recitation, and a flipped general physics course.

OUTSTANDING FACULTY ADVISOR OF THE YEAR AWARD



ASSOCIATE PROFESSOR JAMIE SNYDER *Biological Sciences*

Jamie Snyder is Associate Chair for Advising in Biological Sciences where she oversees the advising of about 1,500 majors and non-majors. She successfully handled virtual orientation last summer, and her efforts in promoting the department ensured a high yield of accepted students. Snyder enjoys working with students and demonstrates her commitment with empathy and understanding.

RALPH W. AMES DISTINGUISHED RESEARCH AWARD

PROFESSOR ALAN KRINIK *Mathematics and Statistics*

Alan Krinik has an outstanding and extended record of scholarly work on Markovian models and matrix properties. During his 38-year career at CPP, he has helped edit five research monographs and published 33 articles, the majority of which had student co-authors. Krinik embodies the teacher-scholar ideal, directing 29 graduate students in their master's thesis and assisting over 30 students to present at conferences.



PROVOST'S AWARD FOR EXCELLENCE IN SCHOLARLY AND CREATIVE ACTIVITIES

ASSOCIATE PROFESSOR S. CHANTAL E. STIEBER *Chemistry and Biochemistry*

S. Chantal E. Stieber, associate professor in the Department of Chemistry and Biochemistry, joined Cal Poly Pomona in 2015. She pursues environmentally conscious research that investigates ways to reduce pollutants, examines methods for responsible pharmaceutical and agrochemical synthesis, and explores ways to eliminate nuclear waste. Stieber has received several prestigious grants since joining the CPP faculty, including a \$600,000 Department of Defense grant to purchase an X-ray diffractometer used in determining molecular structure, and a \$475,000 NSF CAREER grant, "in support of junior faculty who exemplify the role of teacher-scholars through research and education." She is currently mentoring 17 students in her laboratory. Students say that her mentorship has given them a sense of purpose and inspiration to pursue their goals. One of her graduate students, Justin Cortez, won first place at the CSU Student Research Competition in the category of physical and mathematical sciences.



The Provost's Awards Symposium is currently scheduled for October 7, 2021 from 3:00 – 5:00 p.m.

MONITORING AND RESTORING THE CALIFORNIA COAST

Seaweed is an important part of the intertidal ecosystem. It supplies food and shelter for a variety of sea life. Professor Jayson Smith has recently received two grants. One grant supports the restoration of rockweed (*Silvetia compressa*), a type of seaweed on the California coast. The other grant supports monitoring of sea life in the intertidal zone.

Monitoring the coast for changes in sea life enables scientists to see trends and potentially recognize problems before they become too big to address. With the help from a Multi-Agency Rocky Intertidal Network (MARINE) grant, Smith's Coastal Ecology Lab collaborates with UC Santa Cruz to explore trends and track biodiversity.

"The MARINE data goes back 20 years. It means we can observe shifts due to climate change or anthropogenic disturbances, such as oil spills. The data provides a solid foundation to base conservation and management decisions," said Sierra Sutton, who continued working with Smith after graduating ('18, biology).

While monitoring, the team can spot changes like the decline of rockweed in certain areas, a problem that the restoration project will address. Smith has been involved in monitoring the coastline since 1996 when he was a student.

"My college advisor was a Principal Investigator (PI) on the work. I continued with it through grad school and joined the collaborative as co-PI when my predecessor retired," Smith said. "The monitoring done by the MARINE team allowed for early detection of sea star wasting syndrome which is caused by densovirus. It affected the whole species range, and they're still recovering."

The rockweed species is important to California intertidal ecology. "It provides a canopy for species that live underneath. Without the rockweed they'd die from desiccation at low tide. It increases diversity by providing a safe refuge and is home to other sea weeds, limpets, snails, and can serve as a nursery for fish species," Smith said.

The restoration is a collaboration between PI's Smith, and marine scientist Robert Miller from UC Santa Barbara, and co-PI's from UCSB, Channel Islands National Park, UC Santa Cruz and UCLA.



Research Assistant Sierra Sutton ('18, biology).

Professor Jayson Smith from the Department of Biological Sciences prepares to transplant some surfgrass.



One technique Smith's lab will use in restoring the rockweed is transplantation. They are currently figuring out the donor and recipient sites. Smith said, "Robert Miller is figuring out the genetics so we don't try to transplant a population that won't succeed there. We also don't want to mess with the genetics of an area, but our sites are not long distances apart so that shouldn't be a problem."

Smith's Coastal Ecology Lab is providing many opportunities for students to learn by doing. CPP's part of the restoration project spans an area from San Diego to Palos Verdes. During restoration students will break off sections of rock where the rockweed is growing abundantly and transplant it to sites where the plant's population is dwindling.

Graduate student Larissa Fields will be exploring other restoration methods. "For my thesis research I'm investigating how abiotic factors affect gametogenesis in rockweed and if gamete transfer is a viable method of rockweed restoration," Fields said.

In layman's terms, she'll be taking rockweeds into the lab, harvesting their gametes which can then be transplanted to the sea, or fertilized on discs in the lab. The discs, intended to simulate rocks, would then be epoxied to coastal rocks during low tide.

An interesting fact about rockweed is that it can be monoecious, have both male and female reproductive parts, or dioecious, have male and female parts on different plants.

Sutton, who also works on the restoration project, sees community outreach and education as a vital part of restoration. "It's clear that the public has an important part in the success of restoration, particularly in areas that are heavily utilized," she said.

Fields says her work with Smith's lab taught her the importance of communication and collaboration among scientists. After she completes her MS degree in 2021 she would like to work at the Department of Fish and Wildlife or the National Park Service.



Larissa Fields holds a California sea hare.



SHECODES SUPPORTS SUCCESS OF WOMEN IN COMPUTER SCIENCE

by Dan Griggs

When I was a child my mother took me to visit her computer science professor. The professor was a woman. At the time I thought nothing of the professor being a woman, after all, my mother was taking her class.

Though my mother never pursued computer science as a career, many of her classmates did and by 1984 the national percentage of women in computer science reached a high of 37 percent.

The percentage of women in the field has steadily declined since then and is currently below 20 percent. At the College of Science Department of Computer Science it's 20 percent.

Some attribute the decline to the advent of personal computing and gaming, and the marketing of PC's to a male audience. Small numbers of women in computer classes can also be discouraging.

"I was taking an introduction to CS class in high school and there was only one other girl, then she dropped. I felt scared because there seemed to be a lack of support," said sheCodes President Patriz Daroy. "I was intending to major in industrial engineering but after I took that class and coded a website, I found the creative aspect fulfilling. I've always loved drawing and painting and this was another way to use my creativity."

SheCodes is a CPP club that provides support to women in computer science. The club is a chapter of the Association for Computing Machinery – Women in

Computing (ACM-W) The CPP club grew out of a "girl's night of coding" event sponsored by the larger CPP Computer Science Society. In 2017 sheCodes became an official club.

The club is built on three pillars: community, outreach, and growth. The club builds community through meetings, frequent communication, events, and mentorship.



Camryn Sumabat demonstrates the banana piano at the STEAM Fair.

One of the things they do for outreach is an event called Future Women Developers (FWD) which Daroy points out is also the abbreviation for "Forward". It's usually a day-long conference but in Spring 2021 the virtual version lasted a week. Students from middle schools and high schools were invited and guests included representatives from Northrop Grumman and Microsoft.

SheCodes has also participated in an annual outreach event called the STEAM Fair. Camryn Sumabat who is External VP for the club shared, "At the Fair a young girl and her mom approached my booth. After my demonstration of the banana piano, the young girl told her mom she thought it was so cool, and her mom said, 'you can be a scientist like her!' It was heart-warming to hear and made me realize I didn't really see women as scientists when I was younger. I hadn't even thought of myself as a scientist until that moment."

The club offers many opportunities for growth. The club holds panels on topics such as how to do LinkedIn profiles and how to write resumes that stand out. In a physical environment their events included field trips to companies. They have visited the Google campus in Venice, Jet Propulsion Lab, Qualcomm, and Behr. Virtual events have included inviting software engineers, program managers, and e-recruiters to speak to the club. Even though the club's purpose is to empower women, everyone is welcome to their events which they advertise on social media and on their website.

Daroy got hired by Microsoft through a recruiting event the club attended. She will work as a software engineer on a team that is working on the future of work. Daroy will be specializing in accessibility, something she's passionate about. She realized that passion through her experience in Assistant Professor Ben Steichen's lab.

Sumabat has combined her interest in computer science with her love of baking. "I currently run a small bakery from home and sell online. I donate some of my profits to Black Girls CODE, an organization that provides young black girls with the resources they need to be successful in CS. In terms of combining these two skillsets, I would love to work as a software engineer for companies that build things for small businesses, or at least make an impact in the small business/hospitality world," Sumabat said.



"At the fair... her mom said, 'you can be a scientist like her!' I didn't really see women as scientists when I was younger. I hadn't even thought of myself as a scientist until that moment."

RETIRED PROFESSOR

Opens Math Teachers Fund Through Planned Giving

by Nancy Yeang

Velma Merriline Smith's hands were shaking long before she was officially diagnosed with Parkinson's in 2016. Smith, a math professor at Cal Poly Pomona for more than three decades, made sure her students knew that her physical state would not affect her as an educator or as a person.

"On the first day of class I would tell students, 'I want you to know I have a tremor but I'm not afraid of you,'" Smith says.

The fearless spirit that helped her be upfront with students about her tremor was what made Smith a pioneer when she started teaching at Cal Poly Pomona in 1972. She implemented math placement exams, opened the first computer lab on campus, introduced graphing calculators in her math courses, and incorporated groupwork during a time when classes were only lecture-based. These are only a few of the innovations she brought to teaching and learning math.

"She was my role model and I learned a lot watching and working alongside her," says Mathematics Professor Lilian Metlitzky, who joined the university in 1980. "Whatever was going to be the leading edge of the way education needed to be, Merriline was there, and by working beside her I got to experience that."

MAKING MATH EASY

Smith served as chair of the math department in the 1980s with a focus on implementing the math placement exams. She had noticed that some of her calculus students were failing classes because they never took the necessary preparatory courses. With no math placement exams at the time, faculty could not determine what support students needed.

Smith teamed up with Metlitzky to implement the exams, writing grants and raising funds for a preparatory mathematics program, which was taught by graduate students. This inspired another round of funding for a program to help graduate students teach math.



"It's so important that you have a good teacher," Smith says. "Math is not just rules that somebody should memorize — you should understand it. It's easy as long as you were taught right."

When Metlitzky joined the campus as an adjunct professor, Smith mentored her and provided opportunities for her to enhance learning and teaching.

"She had a way of explaining difficult topics and the ability to make any level of math easy," Metlitzky says. "She was absolutely the right teacher for me and for many students."

After 10 years of serving as the mathematics department chair and two years as vice president of the faculty senate, Smith stepped down, saying, "All I wanted to do was teach."

Smith retired in 2003 when her tremors prevented her from grading papers, a task she valued because she viewed it as an opportunity to help students understand concepts.

CONQUERING MOUNTAINS

After retiring, Smith and her husband Jesse traveled throughout California and the Pacific Northwest until they ran out of coastline. When they were younger, the couple made a pact to financially support each other while they took turns earning their degrees. In retirement, they supported each other in their adventures.

"We climbed so many mountains, I couldn't say how many mountains we climbed," Smith says. "There wasn't any place else for us to go in California, so we crossed the river and went to Arizona."

They purchased a custom-built manufactured vacation home in Quartzite, Arizona, as they ventured out to more national parks, from Grand Canyon through Yellowstone.

"I always wanted to give back to Cal Poly Pomona for what it gave to me."

GIVING BACK

Smith's first gift to the university was when she purchased three bricks on the walkway entrance to the Rose Garden; one in her name, one in the name of her master's degree student at the time, Christel Sauter Embree, and one for Embree's husband, Roger, both of whom took their last two graduate classes with Smith.

"I always wanted to give back to Cal Poly Pomona for what it gave to me," Smith says. "It gave me a job, it gave me my life."

After her retirement, she donated an apophyllite crystal to the university in 2019, which is shown in foundation geology classes. Geological Sciences Associate Professor Nick Van Buer uses the crystal to show the symmetry, crystal form, and how the gemstone breaks along specific planes.

"A single rock may tell the story of seas and mountains that have come and gone, but this history of the earth is written in the language of minerals," Van Buer says. "Students need to learn to identify minerals and their properties before they can fully understand the rock record."

They grew their geology collection from gem and mineral shows during their travels.

After 54 years of marriage, Jesse died in 2015 and Smith began taking cruises alone throughout Southeast Asia, Europe, Alaska and Canada. Her Parkinson's diagnosis in 2016 didn't stop her from traveling. But a difficult fall in that year landed her in a rehabilitation center for seven months, so she sold her home in Arizona.

Smith felt that she didn't need her money from the sale and started to think about giving back to Cal Poly Pomona. One of her fondest memories at Cal Poly Pomona was seeing her name among the distinguished university professors on the wall of the University Library.

Throughout the years, she kept in touch with her former undergraduate and master's students who have followed in her footsteps in education. Her connections to Cal Poly Pomona were still very strong.

"I wanted to do what I thought was best with the money and how I would do the most good for the most people," Smith says.

Smith then decided to give \$130,000 to Cal Poly Pomona through a charitable gift annuity (CGA) to establish the Dr. Velma Merriline Smith Mathematics Teachers Fund. When the funds are available in the future, they will help purchase up-to-date educational resources, technology, and equipment for the teaching laboratory. The lab will be open to all mathematics faculty and those who are interested in using the resources in the lab, including students.

By investing in the laboratory, Smith will ensure that math teachers have access to innovative math teaching methods and technology to implement in classrooms.

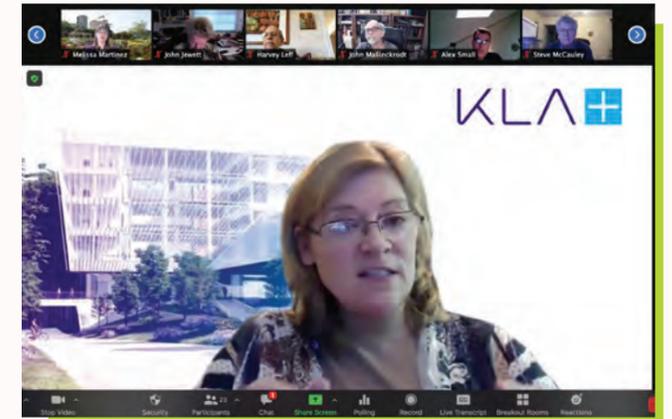
"I always felt her passion was in the teaching of future teachers and innovation," Metlitzky says. "To me, her gift is a way of keeping her work and her name alive with people who have met her, and who will never meet her. It was important for her to have that legacy, and I was thrilled to hear that will happen."



ALUMNI SHARE THEIR EXPERIENCE DURING PROFESSOR FOR A DAY

In 2021 our virtual week of alumni career panels featured 25 alumni providing great information to more than 100 students.

Professor for a day is actually a week of events that happens every spring. Alumni who are interested in participating in Professor for a Day in the College of Science participate in a 1 hour-long career panel. Students have the opportunity to ask alumni questions and get career advice.



2022 Professor for a Day is March 7-11
Luncheon is March 10

MORE INFORMATION:

bit.ly/Sci-PFAD

The CGA also provides Smith with a one-time tax write-off and an ongoing quarterly income. These features were added bonuses to her gift, but what was most important to her were how many teachers and students the fund would help.

“If anyone got anything out of Cal Poly Pomona, they have an obligation to give back and they can give to anything, there are so many areas to support,” Smith says. “If students graduated and got a good job, they don’t have to give a lot, they just have to acknowledge that this is a place you got something from and give back to it.”

WHAT ARE GIFT ANNUITIES?

A charitable gift annuity is a way to make a gift to support the causes that you care about. You make a gift of cash or property to us. In return, we will make payments for life to you, you and a loved one, or another person.

Depending upon your gift, you may receive the added benefit of mostly tax-free payments. You will also receive a charitable deduction in the year that you set up the gift annuity.

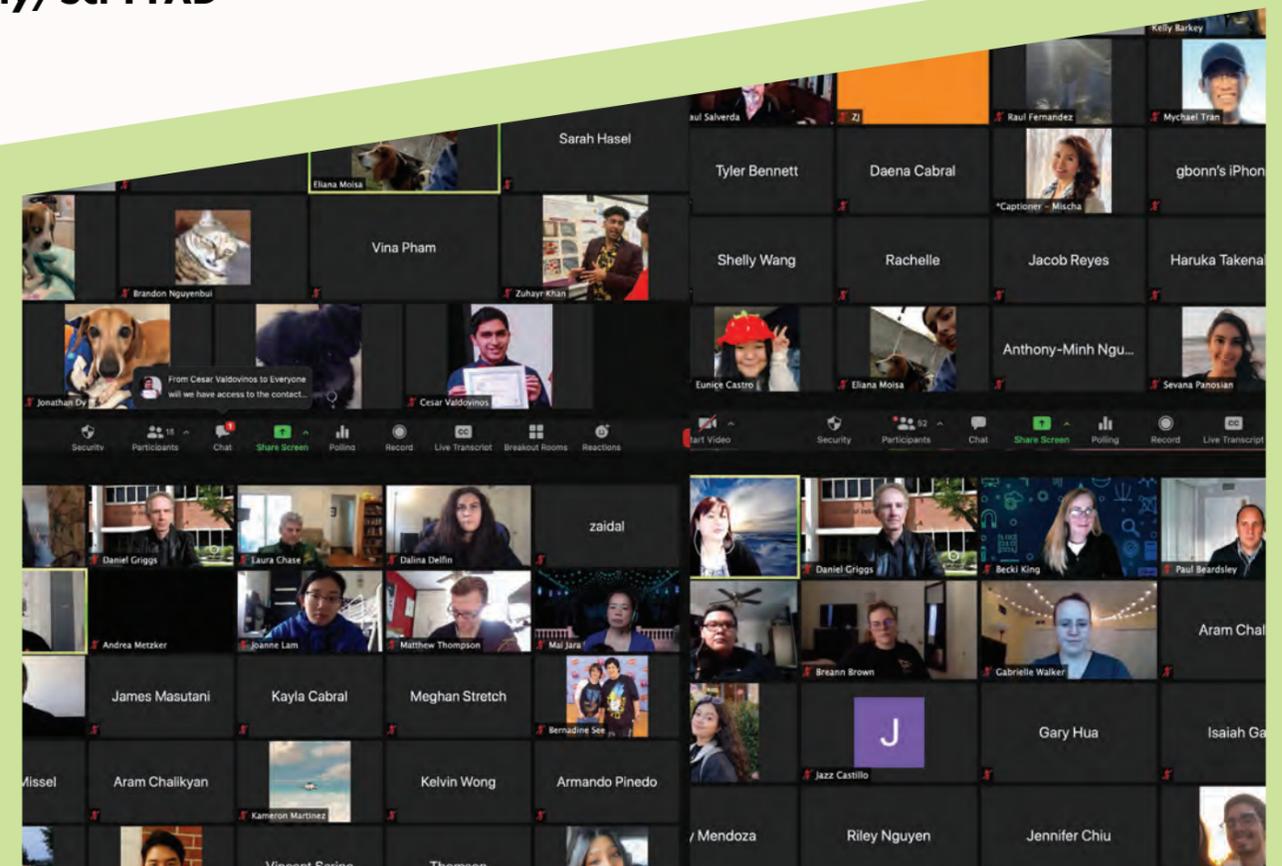
After all payments have been made, we will receive the remaining value of your gift to support the causes that matter to you.

FOR MORE INFORMATION ON PLANNED GIVING OPPORTUNITIES:

Contact the Director of Planned Giving, Vince Fraumeni at **(909) 869-4825** or email at vjfraumeni@cpp.edu.

You can also visit the Cal Poly Pomona Planned Giving webpage for free resources or to sign up for an e-newsletter.

<https://cpp.giftlegacy.com>





GET FIT, WEAR IT

About one in five Americans have a wearable fitness device or smartwatch with fitness tracking features. But do these devices really make us more fit?

That's one of the questions Assistant Professor Zakkoyya Lewis-Trammell, from the Department of Kinesiology and Health Promotion, is asking with her research.

Research prior to hers was conducted between 2013 to 2014 with 800 subjects and found that the devices didn't improve health outcomes. Lewis-Trammell points out that wearables in 2013 didn't have the same features they have now.

"It's true, the literature doesn't support that they improve weight or overall wellbeing but one problem is that there isn't enough long-term data," Lewis-Trammell said. That's because the studies that have been done only examine usage of four weeks to 1 ½ years.

Her research found they can have an impact. "It depends on the outcomes. Wearables can improve physical activity. That's been shown using pre and post measures," she said.

She cautions that the wearables are really aimed at making people aware of their total wellness and helping them adopt a more active lifestyle. They're good at doing that. She added that, "Wearables let you know how much you actually do, as opposed to what you think you did."

Lewis-Trammell shared that the current recommendation for staying fit is 30 minutes of daily exercise. "That doesn't necessarily equate to ten thousand steps. Increasing steps by as little as two thousand has been shown to improve long-term health," she said.

Wearables provide behavioral support through reminders, and rewards like badges. There are also challenges that you can take and invite others to take.

Lewis-Trammell is focusing on three areas in her research. The first is categorizing all the different models that are out there based on the features they have and how they align with people's needs. She said, "Some people need motivation, and other people need education. Also, everyone likes to exercise differently." Her goal is to make it easy for people to know which device is best for them.

She's looking at ways to personalize the wearable experience. That leads to the second focus area which is studying whether social media can be incorporated to get feedback and build community.

She conducted focus groups with CPP students, faculty, and staff, and found that there was some interest in using social media for exercise, but more for instruction. Respondents weren't comfortable sharing their exercise routines with others but were interested in having access to experts like personal trainers through social media.

The third area she's interested in is how wearables affect public health. She has teamed up with a colleague at Youngstown State University, Ohio, and has applied for a grant. They plan to look at national data from the "All of Us" database and

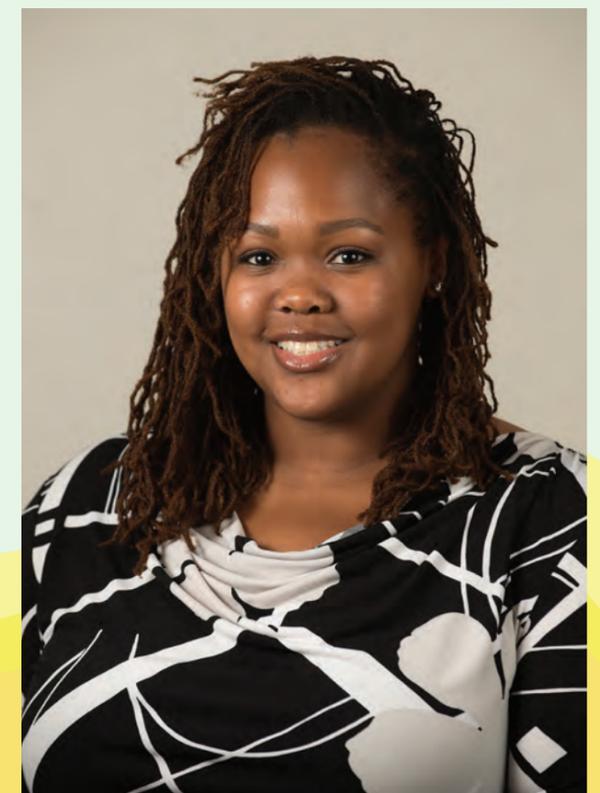
the National Health and Nutrition Examination Survey to see if there's been an improvement on populations.

"I want to look at how it can impact different groups. People in lower socio-economic status groups may not be able to afford a wearable, so they can't reap the benefits that come with it," Lewis-Trammell said.

Wearables vary in price from thirty to several hundred dollars. Most smartwatches and phones also have fitness features. The Pew Research Center reports that 31% of households with income of \$75,000 and above have fitness trackers and use them on a regular basis. That number drops to 12% in homes with income of \$30,000 or less.

The good news is that traditional behavioral interventions can be just as good, or better than fitness trackers at increasing physical activity. Those interventions are things like education, social support, and access to facilities and resources.

"Wearables let you know how much you actually do, as opposed to what you think you did."



Assistant Professor Zakkoyya Lewis-Trammell, from the Department of Kinesiology and Health Promotion.

Physics Alumnus Glenn Johnson Helps Improve Life in Space

“There’s no degree that prepares you to be a space toilet specialist but your degree shows that you know how to learn,” said alumnus Glenn Johnson (’91, physics).

“Potty training” is just one of many things he’s done for NASA astronauts. Things that we take for granted in our daily lives require training and practice when you’re living in zero gravity. He’s trained astronauts how to prepare food and eat, and how to avoid dangerous carbon dioxide bubbles while sleeping.

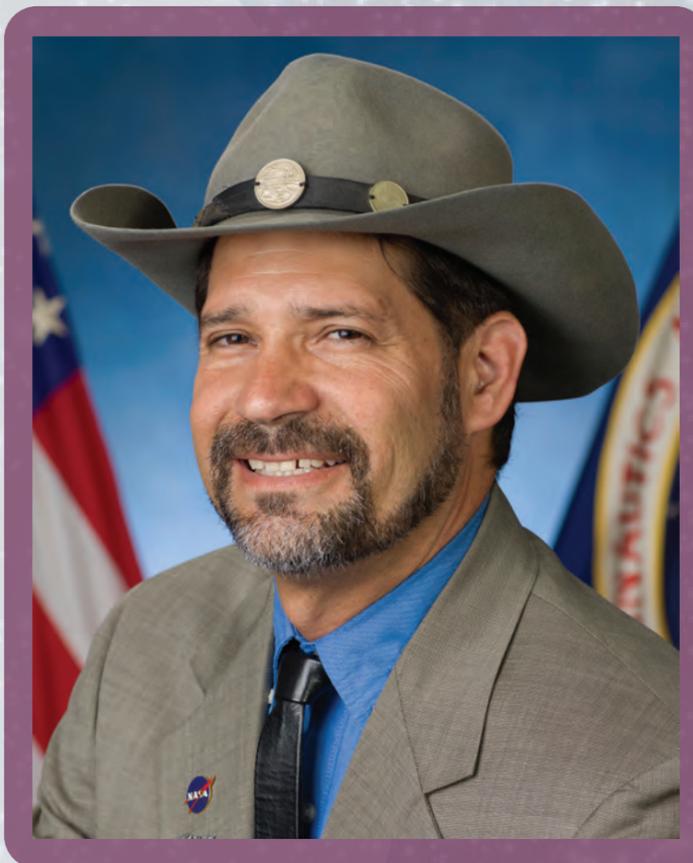
The taste of dried food can be boring so astronauts like to spice it up with tobasco or srirachi sauce. But a stray drop can easily float into their eyes so they need to learn how to prepare food without spilling it.

“A big part of CPP is hands-on learn-by-doing and at NASA there’s a lot of that,” Johnson said. He majored in physics because he liked the variety of things it allowed him to study.

After graduating, Johnson taught high school physics for five years. That experience prepared him for the work he’s now doing for NASA’s HUNCH program. HUNCH stands for **H**igh school students **U**nited with **N**ASA to **C**reate **H**ardware. Johnson is a design engineer who works with high school students in about 30 states to design and create new products that astronauts can use in space.

Johnson said, “We listen to the problems astronauts are having in orbit and design solutions to solve those problems.” Some of those solutions can be mission critical. For example, there are ACME bolts that hold batteries to the outside of the international space station (ISS) that kept jamming. Johnson and his students designed brushes to clean and lubricate the threads.

The galley table where astronauts on the ISS eat was built by students from three high schools in Texas. It features hand rails and places to hook bungee cords to hold things in place. It can also be reversed and used as a work table, complete with tracks to fasten down gear. Students did everything from designing to machining the parts.



“We listen to the problems astronauts are having in orbit and design solutions to solve those problems.”



Johnson reminisced about his time at Cal Poly Pomona. “I really liked the look of the campus with the jacaranda trees and the smell of jasmine. It’s a memory that sticks with me. The grounds keepers deserve a lot of credit.”

He remembers performing in physics magic shows that were open to the public. “I did the shows three or four years. I liked being on stage and it led me into wanting to do the same things in the classroom.”

“I had several professors who were interested in physics education,” Johnson said. “That led me to become a high school teacher and made me a better engineer.”

“Dr. John Jewitt was one of my favorite professors. He liked doing demonstrations. I still have one of his books. Dr. Harvey Leff was impressive because some things he taught in energy and environment class applies to what I’m doing now. Dr. John Mellinkrodt was involved in the physics magic shows, and would sometimes play guitar. Those shows were critical for me because I got experience with hands-on demonstrations. It allowed me to understand the principals better.”

Professors Emeriti Mellinkrodt and Leff are in a band called the Out-Laws of Physics. The band has a scholarship fund for promising physicists and physics teachers.

Johnson believes it’s important to support

students. “I had such great experiences at CPP. I like that the school gave us room to grow while providing a framework as we progressed through our studies,” he said. “I worked at Kellogg West as a waiter and then at the theater as a stage technician. There were so many opportunities and things that kept me involved on campus. I want other students to have that too.”

The advice Johnson would give current students? “Be involved in as many projects related to your degree and classes as you can because it gives you experiences and connections beyond the classroom. That way when you’re applying for jobs there’s more to talk about than taking classes and what you learned from books. You’ll also get to know people who might help you.”

“A big part of CPP is hands-on learn-by-doing and at NASA there’s a lot of that.”



The California Mathematics Project at Cal Poly Pomona

Cal Poly Pomona is committed to serving the community by promoting excellence in science and math teaching at all levels. One way the College of Science is doing that is through the California Mathematics Project (CMP). The program offers free workshops to develop and enhance K-12 teachers' math knowledge and teaching strategies.

CMP is a statewide grant-funded program with 19 regional sites. Cristina Runnalls is the principal investigator (PI) and director of the program at the CPP site.

"We're striving to develop teacher/leaders in school districts and build a learning community," Runnalls said. As the person who organizes the eight workshops per year and the week-long summer institute, Runnalls shared that virtual events have allowed her to bring in a broader range of guest speakers. She's able to host experts from around the country. Their speaker in April, 2021 was Julia Aguirre (UW Tacoma).

Aguirre presented "Math Strong in the Age of COVID." Prior to the event Aguirre wrote, "The interactive session will discuss mathematics learning and teaching through the lenses of empathy, resilience and justice. COVID has only amplified already existing injustices in our mathematics education system. We cannot return to normal because normal was not working for many children, especially children from communities of color and communities impacted by poverty. We must return to better. This talk will offer several ways you can take action inside and outside the classroom to broaden access and advancement in mathematics for K-12 children."

Workshops are grouped around themes such as rehumanizing math, rediscovering joy in mathematics, and forging digital connections. In addition to the workshops, the week-long session during the summer allows for expanding the content and presenting it in different ways. In 2020 attendees participated in interactive sessions, asynchronous reading and learning, and online discussions.

Attendees include teachers from districts as far away as Palm Springs. Ioana Robles is a Teacher on Special Assignment for a program called Math Support for Mission Graduate at Palm Springs Unified School District.

Robles said, "Our district is all about supporting teachers in professional development." She attended all eight workshops in 2020 and said the most memorable were, An Introduction to Rehumanizing Mathematics and Seeing You in Me and Me in You.

Robles said she learned that, "Students struggle with math because they don't see the connections between the topics and their real-life experiences and because they believe that they either have the math 'gene' or they don't.

This thinking may lead them to believe that they can't do math."

"Equity, diversity and inclusion are intertwined with the material presented at the workshops," Runnalls said. "The spring 2020 workshops series were specifically on rehumanizing mathematics. This is an important distinction we make in the work, which begins with acknowledging that mathematics has historically and societally become a dehumanizing experience for many students. Rehumanizing mathematics begins from this premise and strives towards making mathematics authentic, culturally relevant, and a place where students are active agents in their own learning."

The lack of access to meaningful mathematics education is a barrier to higher education and upward mobility.

"We've had workshops around social justice. It motivates students to know that statistics can be used to measure what's going on in society, and therefore it can be a tool for change," Runnalls said.

"We're striving to develop teacher/leaders in school districts, and build a learning community."



PAUL THEOBALD GIVES BACK — *and Pays it Forward*

by Michael Walton

Paul Theobald ('82, chemistry) is a living testament to the notion that it's not just what you know. What counts is what you do with what you know.

That philosophy—combined with a strong work ethic plus a desire to both pay it forward and give back—has done him well. Since graduating as a self-described average student, he has attained impressive positions in the chemistry field, and is now leading a major medical diagnostic concern in combatting serious diseases.

Along the way, Paul drew upon the experiences, people and programs he encountered at the College of Science to drive his success: a learn-by-doing ethos; a no-nonsense practicum; small class sizes; and close working relationships with professors.

“That motto, the learn-by-doing experience at Cal Poly Pomona, being a scientist and having labs...that's how we learn,” he asserts. “But while science drives the learning, you have to do it in a way that you understand, when developing products and work with multidisciplinary teams, and appreciate how all those things come together.”

It's easy to see why Paul Theobald has chosen to give back to his alma mater, not just financially, but by returning to share his success secrets with students as well.

Early on, Paul had ambitions of being a chemical engineer. Back then, CPP was one of the few places available to him that offered such a program. So, in 1977, he moved from his home in San Ramon, California, to begin classes here.



By his own admission, his first year in chemical engineering was less than stellar. “Really, I am the last person that would ever be a good engineer,” he says with characteristic candor. Fortunately, some sage advice from his department chair convinced him to change his major to chemistry, and he was soon on his way.

Like so many, Paul thrived amid the more direct professor-student environment at the College. To be sure, it was in great part because of his work with the late Dr. Ernie Simpson, his senior advisor Dr. Patrick Mobley, or professors Scott Pattison, Chuck Millner and Vasu Dev, that Paul quickly found gainful employment. It's also a big reason why he has stayed in touch with the school for 30-plus years, and why he chose to come back and inspire students by speaking to The Chemist in Industry class.

The Cooperative Education Program, founded by Dr. Simpson, was a springboard that helped Paul get his first job as an associate chemist at Beckman Instruments in Brea, California. There he initially worked with the Immunochemistry Development Group building assays and platforms that measured blood proteins and therapeutic drugs.

“For my senior project with Dr. Mobley I worked on the development of an immunoassay for insulin,” he says. “That project led to my placement in the internship program at Beckman.”

After working at Beckman for 18 years, Paul moved back to the Bay Area. A series of key positions in the medical diagnostics field then led him to become the general manager of Monogram Biosciences, part of Labcorp, an innovator of diagnostic products for treating major diseases such as HIV and COVID.

Paul sees a direct link between his practical scientific education and success in the working world. He believes it has enabled him to tie science to business, science to operations, and ultimately science to healthcare. “In the end it's about meeting the health needs of people,” he says, “and it's a great reason to come to work.”

“You don't need to be at the top of your class to be successful,” Paul insists. “What you're learning every day becomes a part of the fabric of your knowledge and your experience. That allows you to do things you would never have thought you were ever going to do.”

Living his truth and the principles of his CPP experience, Paul Theobald has become a regular contributor to the College of Science Dean's Excellence Fund. “I want to inspire future scientists,” he shared. “Because I see the value that science brings and the rewards it brings to people.”

“That motto, the learn-by-doing experience at Cal Poly Pomona, being a scientist and having labs... that's how we learn.”

During a 2018 campus visit Paul Theobald (right) posed for this picture with his former professor, the late Ernie Simpson.

2020 STAFF AWARDS

The College of Science acknowledges two exemplary staff members every semester with an award and luncheon. The nominating process is open to faculty, students, and staff who submit nominations based on several criteria. The categories are job performance, successful interaction and/or relationships, college/university-wide service, and noteworthy accomplishments that advance the goals of the College of Science.

To be considered, nominees must not have received the award in the last five years. The Staff Recognition and Award Committee, made up of past winners, reviews the nominations and chooses the winners. Awards are given in the semester following the committee's decision.

SPRING 2020

DESIREE TAX

*Instructional Support Technician II
Department of Chemistry and Biochemistry*

YEN PHUN

*Administrative Support Coordinator I
Department of Mathematics and Statistics*

FALL 2020

CIDNI GRIFFITH

*Administrative Support Coordinator II
Department of Mathematics and Statistics*



DIANA ASCENCIO

*Student Services Professional II (Advisor)
College of Science Advising Center*



OUTSTANDING STAFF ADVISOR OF THE YEAR AWARD

ASHLEY YSAIS

College of Science Advising Center

Ashley Ysais is coordinator of the College of Science Advising Center and has helped the center become a central hub for advising questions, concerns, and referrals. Her team successfully led the college through semester conversion. Ysais introduced a group advising model in 2017 and presented the results at a NACADA conference. The center has created several informational videos to help students, and in response to remote work, instituted drop-in advising.

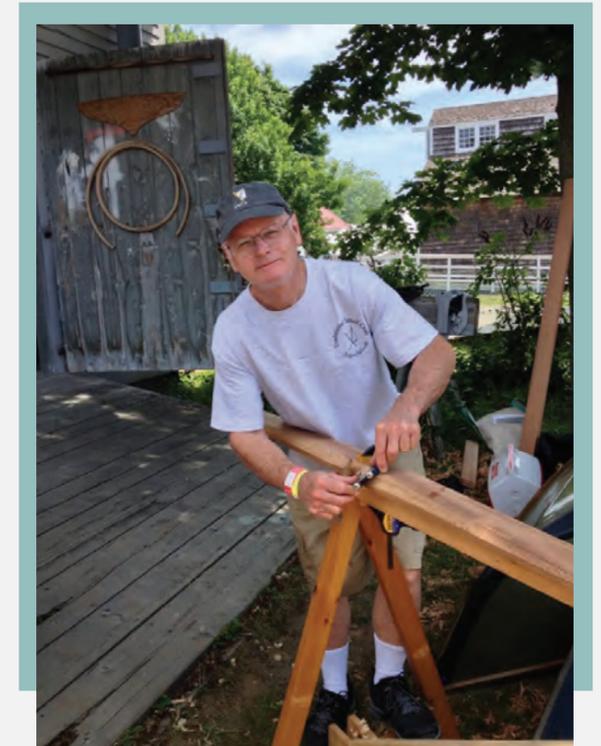


ALUMNI MAKE A DIFFERENCE ON GIVING DAY

In 2021 the College of Science raised nearly \$37,000 during Giving Day, Cal Poly Pomona's annual fundraising campaign.

Giving Day 2022 is April 20 and 21

For 2022 we need Giving Day Ambassadors who are willing to reach out to their networks via email, text messages, and social media to ask for support. We're also looking for matching gifts prior to the event to inspire others to give. Please contact Melissa J. Martinez for more information (contact information below).



"Although it has been many years since our days at Cal Poly and our lives in California, we still try to keep connected. In addition to family ties, we also wanted to maintain a meaningful connection to the University. This is why we support Cal Poly Pomona through the College of Science and the College of Engineering. It feels right knowing that we can help others advance toward their life goals."

Tara Jones Hauhe
('80, physical education, kinesiology)

Bill Hauhe
('80, chemical engineering)

"My 4 years at Cal Poly provided me with a great start in life. I was helped by many, including my professor, Dr Ernest Simpson. I made a donation to the Chemistry Au (gold) 50th Anniversary scholarship in memory of Dr Simpson."

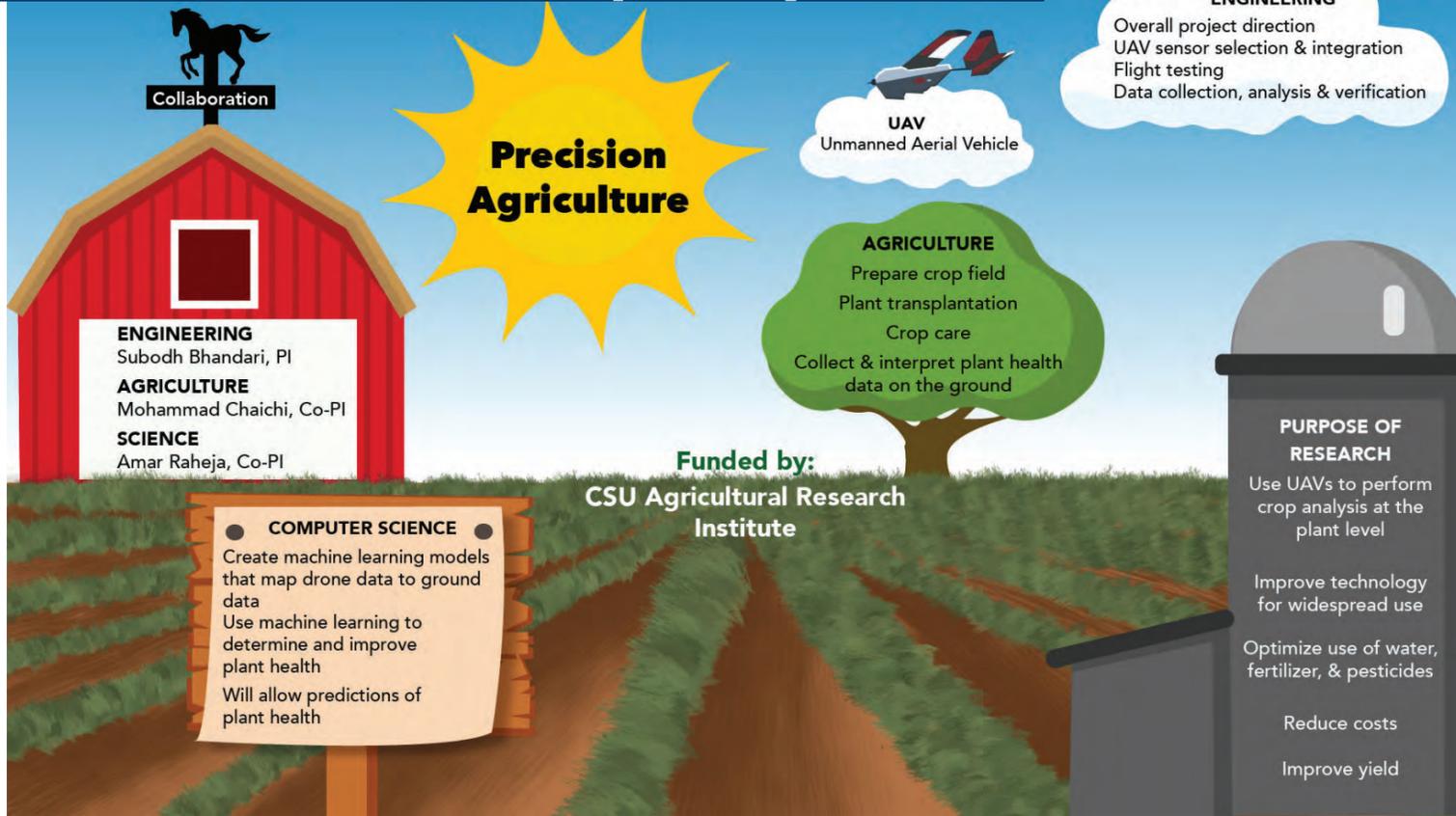
Brian Cooper,
('72, chemistry)

FOR MORE INFORMATION, PLEASE CONTACT:

Melissa J. Martinez, CFRE
Director of Development, College of Science
(909) 869-4160 | melissam@cpp.edu

OR VISIT:
give.cpp.edu/science

Interdisciplinary Grants



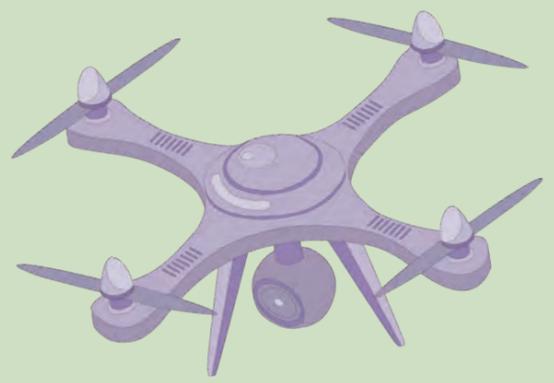
There are several Agricultural Research Institute (ARI) projects going on at CPP. Our infographic tells the story of one. It is **“Investigating the Methods to Increase the Accuracy of UAV-Based Remote Sensing and Machine Learning Techniques for Precision Agriculture.”** It’s a collaboration between the colleges of Engineering, Science, and Agriculture. The Principal Investigator is Subodh Bhandari from the College of Engineering.

CPP RECEIVES \$4.85M FROM AIR FORCE RESEARCH LAB (AFRL)

CPP received a \$4.85 million grant that will support research to improve the autonomy and security of unmanned vehicles while preparing students for the workforce of tomorrow.

The AFRL gave a total of \$10 million to Cal Poly SLO and Cal Poly Pomona as part of an Educational Partnership Agreement.

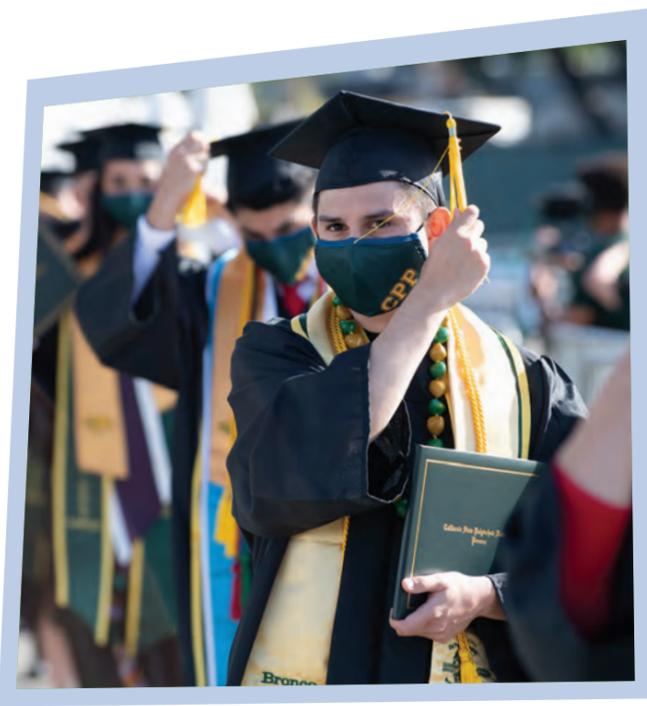
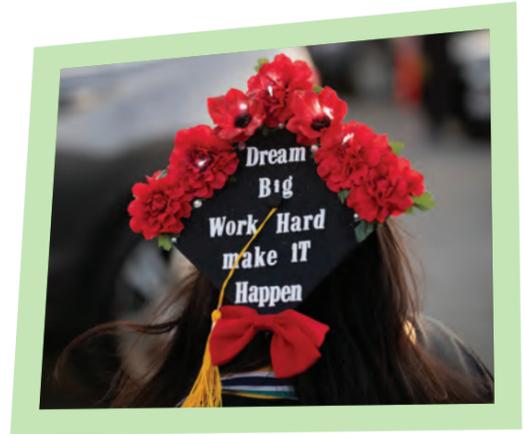
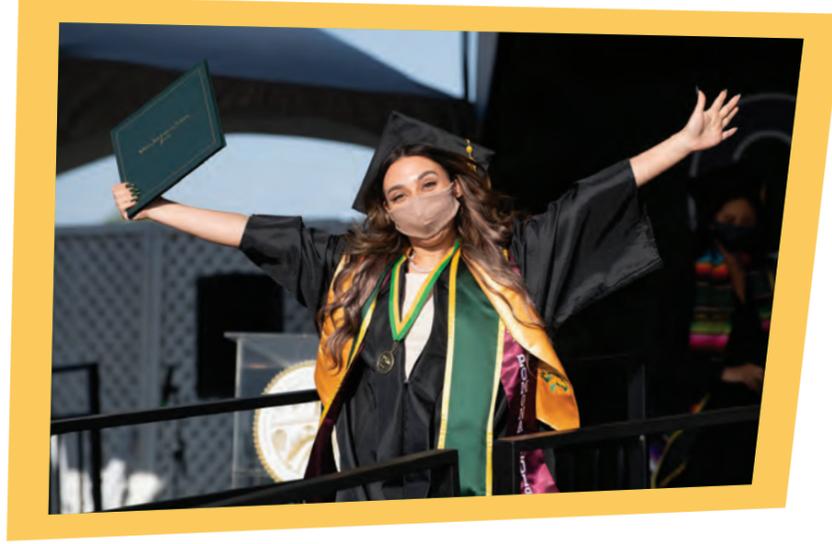
“This agreement between the Air Force and California Polytechnic Universities enables our students to explore the intersection of technology and defense, and play a crucial role in advancing our national security interests,” Rep. Norma J. Torres (CA-35) said.



COLLEGE OF SCIENCE CLASS OF 2021

Commencement Ceremonies were held in May 2021 for both the Class of 2020 and the Class of 2021. They were drive-in ceremonies held at the Pomona Fairplex. You can view recordings of the events at bit.ly/ CPP-Stream

1168 graduates
1066 bachelors
102 masters





IN MEMORIAM: JILL ADLER-MOORE

The Legacy of an Inspiring Professor, Mentor, and Friend Lives on Through her Students

Beloved Professor Emerita Jill Adler-Moore, who dedicated 47 years to teaching and mentoring students at Cal Poly Pomona, died on June 14 after a recurrence of pancreatic cancer.

She is survived by husband Larry J. Moore; son and daughter-in-law Matthew M. Moore and Tina L. Moore; daughter and son-in-law Laura J. Moore-McClelland and Sean G. McClelland; grandchildren Colin A. and James E. Moore; and nephews and nieces-in-law Pattabi and Viona Seshadri, and Raghu and Jaleen Seshadri.

Adler-Moore earned her doctorate in medical microbiology from Cornell University Graduate School of Medical Sciences in New York City. She joined the Biological Sciences faculty at Cal Poly Pomona in 1974. She chose to work at CPP because she found the students to be highly motivated, and the smaller class sizes would allow her to get to know her students.

Professor Nancy Buckley who was a colleague, collaborator, and friend recalls, “I remember when I was interviewing for my job, the committee wanted me to meet her. She was warm and welcoming, and generous with her time. She was a perfect example of a teacher-scholar, the idea that research and teaching could coexist.”

“She was a mentor to countless students and she was my mentor. She was there when I doubted myself, and offered moral support and encouragement. She pushed me to go further,” Buckley added.

Adler-Moore was a mycologist, and in 1983, during her sabbatical, she consulted with a biotech firm on an

antifungal drug. The work she began there, and finished in her lab at CPP, resulted in the development of the drug AmBisome®, a safe antifungal drug that has saved countless lives worldwide. Her innovative approach made the treatment less harmful to patients by using liposomes to deliver the drug amphotericin B.

Over the years she provided invaluable experience to students who conducted research in her laboratory. Adler-Moore’s contribution to the College of Science and those whose lives she touched will not be forgotten.



Since 2009, Adler-Moore led the NIH-funded Research Training Initiative for Student Enhancement (RISE) program at CPP. The RISE program provided research experiences and faculty and peer mentoring to prepare underrepresented minority (URM) science students to pursue Ph.D.’s in biomedical research.

That program and the opportunities it provided to students were important to Adler-Moore. “When we got together, a lot of our conversations centered on our RISE students and the progress they were making,” Buckley said.

RISE administrator Airan Jansen (’08, MS biology) said, “Adler-Moore loved the RISE program above all others. She did more than mentor students, she was their friend.”

“I know I wouldn’t be a Ph.D. student at USC right now if it weren’t for her and the RISE program. She helped a lot of people discover their passion for science,” said Jennifer Rubio (’17, MS biology).

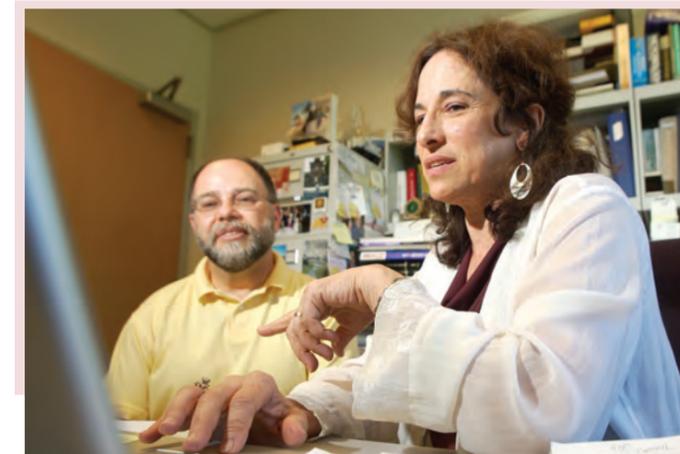
Unlocking people’s potential and helping them believe in themselves was her unique gift. Her husband Larry Moore (’76, microbiology), who was a first-generation college student, shared that it was his wife who convinced him he could pursue an advanced degree. He went on to become an oral and maxillofacial surgeon.

When she wasn’t working, she enjoyed dancing and also liked to camp, backpack, snowboard, and ski.

In 1990, Adler-Moore was instrumental in getting the biotechnology major added to Cal Poly Pomona. It was the first biotechnology major offered in the CSU system.

“There had been a microbiology major and a medical technology emphasis, but that didn’t reflect the kinds of jobs that students were finding after graduation,” Jon Olson recalls (’79, BS microbiology; ’83, MS biology). Olson managed Adler-Moore’s two labs and worked with her for 43 years.

“I took her immunology class and after taking the midterm she asked me to see her after class. I thought I’d failed. Instead, she asked me to join her lab,” Olson said. “Working with her was a challenge that uplifted me. Her dynamic personality drew people to her. Even



during the COVID-19 pandemic she had nine graduate students conducting research.”

One of her former grad students is Janam Dave (’18, BS biotechnology, ’20, MS biology) who first began working in Adler-Moore’s lab in 2016. The research he conducted with her focused on whether AmBisome® could be delivered through an aerosol formulation to treat Aspergillosis, a fungal infection that usually affects the lungs.

Dave plans to continue that research, and will start a Ph.D. program at Baylor College of Medicine in Houston, Texas in the fall.

Dave will pursue biomedical research and also teach. He’s especially interested in the commercialization of what’s developed in the lab. “I see it as a way to fund other research that might get overlooked,” he said.

“Dr. Adler-Moore helped me grow and mature. She had high standards. I got my work ethic from her,” Dave said. “She was an ethical and compassionate researcher. From her, I learned how exciting helping others could be. That’s the importance of biomedical research. Whatever good things I might be able to do, Dr. Adler-Moore had a hand in it.”

Rubio said she wants to become a professor and help others who are first-generation college students like herself or URM students. “I learned how to be a mentor from her. Being a good mentor to others is how we pay it forward. That’s how she lives on through her students.”

The family held a private memorial on June 21, but is planning a memorial event for the CPP community and her colleagues at Gilead Sciences, Inc. in LaVerne, tentatively scheduled for **Saturday, August 28, 2021**. Gilead is the firm that manufactures AmBisome®. (Please contact Matthew Moore at 3m.moore@gmail.com for further details.) The family has asked that in lieu of flowers, or gifts, a donation be made to the Biological Sciences Scholarship Fund at CPP - give.cpp.edu/science



BIOTREK HOSTS VIRTUAL FIELD TRIPS

BioTrek's outdoor learning spaces are a valuable resource for CPP students and also draw K-12 students and visitors from the community. In a typical year, thousands of K-12 students make field trips to BioTrek.

Currently, tours are being offered virtually. It is expected that in-person tours at BioTrek will resume in late fall 2021; virtual tours will continue to be offered to allow for greater participation.

Rain Bird BioTrek includes a tropical rainforest learning center and ethnobotany garden that were made possible through support from Rain Bird. Support from the Ernest Prete Jr. Foundation allowed the college to add a Mesozoic Garden and a riparian habitat featuring a natural spring called Project Blue.

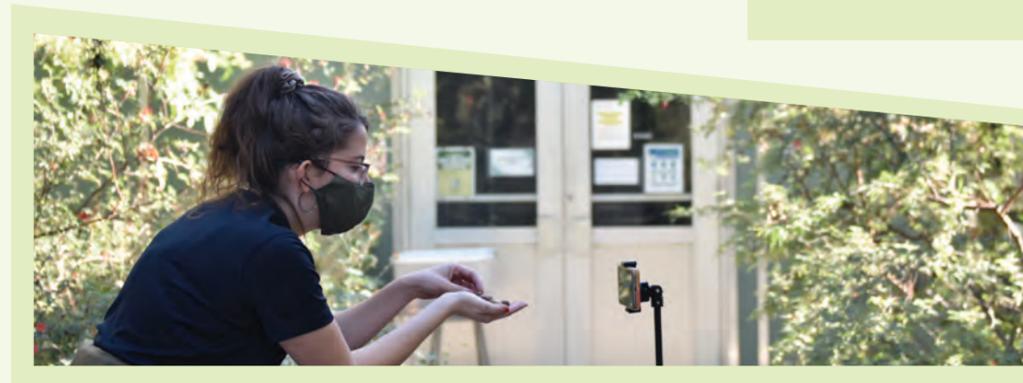
CPP students, who are enrolled in classes such as Interpretation of Science, learn by doing as they explain to K-12 classes how Native Americans use plants and show them the unique plants that grow in the rainforest.



"We're hoping to do 15-20 virtual tours per semester," Biological Sciences Professor Ed Bobich said. "It's a field-trip-like experience that helps break up the routine and teaches students about some interesting animals and plants, and how native Americans use plants for food and medicine."

There is a nominal fee for the K-12 field trips. Virtual tours allow more students to participate. On a recent tour five second grade classes participated, significantly lowering the cost per student.

If you'd like to find out more about virtual tours or know a K-12 teacher who would like to schedule a field trip, please visit: bit.ly/BioTrek

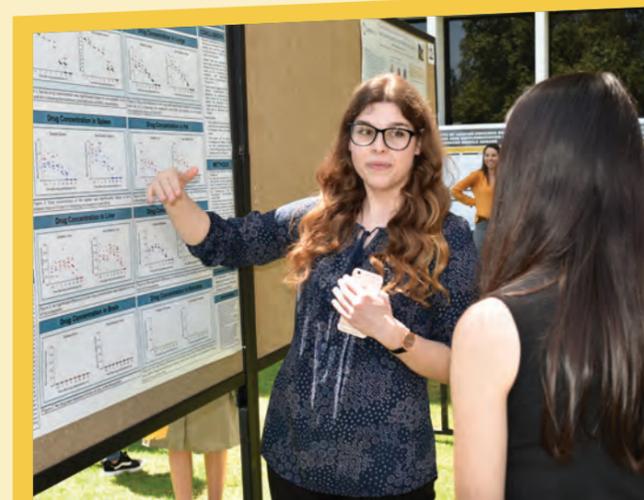


Staff members Michelle Terrazino (left) and Jennifer Alexander (above) conducting a virtual field trip.

2022 SCIENCE RESEARCH SYMPOSIUM

Join us to see our undergraduate and graduate student research projects.

April 29, 2022, 12-2 p.m. (tentative)



Bronco Mentoring Program

CPP Alumni:

With just a little bit of your time, you can give students the confidence to go after the career they want.

You're invited to join the CPP Bronco Mentoring Network, our career-mentoring and advice-sharing network that makes it easy for you to connect with others in the Cal Poly Pomona community. The goal of the program is to increase student success by connecting students with alumni who have expertise in their industry, major, or future career.

**Sign up to become
a mentor today!**



**Current students
can sign up here:**



cpp_science



cppcollegeofscience