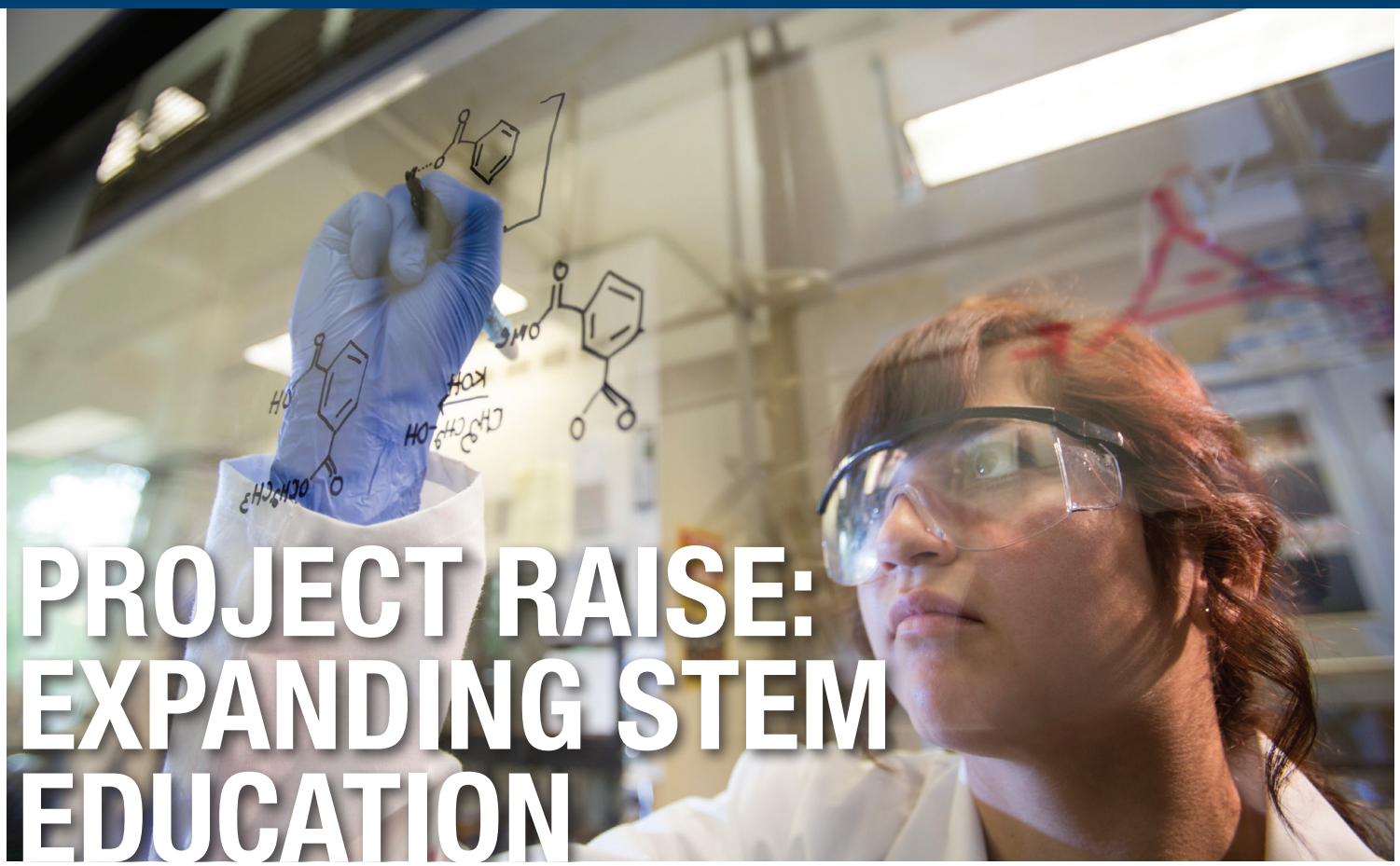
SUMMER 2017

CALIFORNIA STATE UNIVERSITY FULLERTON™

TraNSMission

News from the College of Natural Sciences & Mathematics



PROJECT RAISE: EXPANDING STEM EDUCATION

Cal State Fullerton was recently awarded a five-year $5.8 million grant from the U.S. Department of Education for its latest effort to boost science, technology, engineering, and math (STEM) transfers and increase STEM retention and graduation rates among low-income and Hispanic transfer students.

Building on a decade of success in improving STEM transfer and graduation rates through projects such as (STEM)2, CSUF has partnered with eight local community colleges in what is being called the Regional Alliance In STEM Education, or Project RAISE.

The partnership includes Citrus, Cypress, Fullerton, Golden West, Mt. San Antonio, Orange Coast, Santa Ana, and Santiago Canyon community colleges. Growing out of a comprehensive needs assessment that included CSUF and community college deans, counselors, and other stakeholders, the project expands on proven methods and adds several new components designed to provide current and potential STEM transfer students with even greater support.

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PROJECT RAISE

Mark S. Filowitz, associate dean of NSM and interim associate vice president for academic operations, serves as principal investigator and author of the Project RAISE grant proposal.

PEER ADVISERS

Project RAISE peer advisers will connect with STEM students or potential STEM students at each of the community colleges, where they will serve as role models, ambassadors, guides, and resources before and after the students transfer to CSUF. Initially recruited from among students who have completed the $(STEM)^2$ transition program and later from among students who have completed the RAISE Transfer Program, these advisers will prepare STEM transfer students for the faster pace of coursework at CSUF and provide strategies to help them succeed in STEM majors.

SUMMER INTERNSHIP PROGRAM

Working with the Orange County Business Council and a variety of businesses in need of STEM graduates, the Project RAISE Summer Internship Program connects students in the RAISE Transfer Program to paid summer internships. Candidates will receive support from career specialists, who will help them write their resumes and cover letters and prepare for interviews.

"There's nothing like hands-on work experience in STEM industries to prepare students for success in a STEM career," says CSUF Career Specialist Michelle Levy. "Not only does it show them what to expect and teach them critical skills, it also helps them establish their network and provides a valuable workforce development pipeline for employers."

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MESSAGE FROM THE DEAN

In the College of Natural Sciences & Mathematics, our faculty members believe the best way to learn science and math is to do science and math. Faculty members introduce students to experiences and opportunities beyond the classroom, in the lab, or in the field that will shape their future careers and worldviews.

Our students have contributed to the discovery of gravitational waves, modeled policing strategies to mitigate the most crime using limited resources, documented the negative soil legacy effects of invasive fennel on California native plant growth; and mapped and evaluated past earthquake faults in the eastern Sierra Nevada to untangle earthquake history, among other achievements. Each of these opportunities was made possible by the mentorship of our brilliant and dedicated faculty.

Through these experiences, our students gain confidence in their ability to problem-solve effectively. They can discuss abstract concepts in simple, understandable terms. They have extensive knowledge and awareness of the world around them, and they have their own ideas to contribute.

These attributes make our graduates some of the most capable and prepared citizens to take on societal, scientific, and global challenges. I'm so grateful to be part of a college that give these leaders and heroes of tomorrow their start and to work with faculty members who make it their mission to help students reach their highest potential.

Marie Johnson, Ph.D.
Dean, College of Natural Sciences & Mathematics

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TRANSFEROLOGY.COM

One of the biggest problems that transfer students face is credits that don't transfer to CSUF or other universities. This slows progress toward a degree, lowers graduation rates, and is a particular problem for STEM majors due to the large number of prerequisites for higher level courses. The Transferology website addresses this by enabling community college students to quickly determine which courses will transfer to CSUF STEM degrees. "Students planning to transfer will be able to make more informed decisions about the courses they choose to take," explains Mark S. Filowitz, associate dean of the College of Natural Sciences & Mathematics (NSM) and interim associate vice president for academic operations, as well as principal investigator and author of the Project RAISE grant proposal. "The website will also help ease the burden on community college counselors and eliminate the reliance on outdated databases."

STEM ARTICULATION CONFERENCE

Based on feedback from counselors at our partner community colleges, CSUF will host an annual conference to share information, discuss admissions standards and enrollment issues, and engage in dialogue with the purpose of drafting updated articulation agreements that are consistent across all community colleges. The conference will include panel discussions featuring NSM and Engineering and Computer Science (ECS) faculty, administrators, and staff; panels with community college science and engineering deans and counselors; information sessions; and a presentation of the Transferology website.

"Making sure the community college counselors and faculty are equipped with the latest tools and information will be a great benefit to their students," says Dr. Filowitz. "And working together to update our agreements will set us up for long-term success."

RAISE TRANSFER PROGRAM

The RAISE Transfer Program offers a number of resources to community college STEM transfers intended to ease their transition from community college, help them establish a support network, and contribute toward academic success.

Students who participate in the RAISE Transfer Program attend an orientation before their first semester on campus, helping them prepare for the rigors of a four-year university. The program also includes an expansion of the CSUF Transfer Resource Center (TRC) to provide more success workshops, counseling from graduation and career specialists, academic enrichment sessions, and other resources and activities. Along with many of the other project components, the Transfer Program is supported by four full-time Project RAISE staff members, led by Project Director Megan Drangstveit, and aided by Transition Coordinator César Montenegro, Academic Success Coordinator Angela Sardan-Long, and Administrative Assistant Kulsoom Sizar.

RAISING THE BAR FOR LOW-INCOME AND HISPANIC STEM TRANSFERS

Over the last three years, CSUF has reduced the achievement gap for transfer students by 10.4 percent, improved the six-year graduation rate for STEM transfers by 8 percent, and reduced the average time to degree completion by almost a full year. And with the new and expanded programs being developed as a result of the Project RAISE grant, the university is looking to continue that trend.

"Our target is to increase the number of STEM major transfer students graduating within three years from their transfer date by 20 percent," says Dr. Filowitz. "We hope our success in empowering Hispanic and low-income students interested in STEM will serve as a model for the CSU system and colleges across the country."

THE UNDERGRADUATE RESEARCH EXPERIENCE

Developed as a result of the success of $(STEM)^2$, the Undergraduate Research Experience introduces prospective transfer students to research in STEM fields, builds confidence in their abilities, and helps them develop their course of study and career plans. This program is available to 32 researchers per summer, four from each community college. It also provides the students with much-needed financial support, relieving the pressure to find part-time jobs and enabling them instead to focus on learning valuable skills and exploring their chosen fields. •

THE NSM GIFT CHALLENGE GROWS

2015-2016 GIFT CHALLENGE

Raised $100,000
for research endeavors
benefiting 45 undergraduates

2017-2018 GIFT CHALLENGE

Alum Dan Black is giving
$50K toward a 2nd challenge

Alum Jeffrey Van Harte
made the first donation
for the new challenge
by giving $5,000

To make your pledge or to learn more about the 2017-18 NSM Gift Challenge, please contact **Mike Karg** at **mkarg@fullerton.edu** or **657.278.3348**.

SUCCESS OF GIFT CHALLENGE SPARKS REPEAT EFFORT

During a May event celebrating undergraduate research, a longtime donor made a surprise pledge to reignite the successful College of Natural Sciences & Mathematics Undergraduate Research Gift Challenge, which supported dozens of student researchers during the last academic year.

As students, faculty, and administrators celebrated the successful 2015-2016 Gift Challenge, which raised $100,000 to directly fund research endeavors for 45 undergraduates during the 2016-2017 academic year, physics alumnus and Gift Challenge founder Dan Black ('67) announced he'd give another $50,000 toward a second challenge for the 2017-2018 academic year.

The first challenge, initiated by a $50,000 pledge from Black, raised additional funds through university donors. Science and mathematics students received research stipends from these funds, which gave them opportunities to focus on faculty-mentored research as well as to publish and present their work on the regional or national stage.

"Let's do it again," said Black, drawing cheers from faculty members and students. He says investing in student and faculty research "is probably the most rewarding thing I can do."

After Black's announcement, university donor and business alumnus Jeffrey Van Harte ('80), chair of the Cal State Fullerton Philanthropic Foundation Board of Governors, pledged $5,000 toward the second gift challenge.

Two student beneficiaries of last year's Gift Challenge thanked Black and his fellow donors for their generosity, noting that the stipends made their research possible.

Following her passion for marine ecology, Kelsey Nannini, a biological science major, has been able to study brilliantly colored marine polyclad flatworms along the Southern California coast.

And Alyssa Garcia, a physics major, analyzed and compared model gravitational waveforms for colliding black holes, presenting her research at conferences, including one in Scotland, and co-authored a journal article in *Classical and Quantum Gravity*. Garcia was part of the CSUF faculty-student research team that played a significant role in the 2015 discovery of gravitational waves.

"Getting this funding to do research has prepared me for the next level in my academic journey," says Garcia, who graduated in May 2017 and was accepted to 10 graduate schools. She begins the doctoral program in physics at Brandeis University in Massachusetts this fall. •

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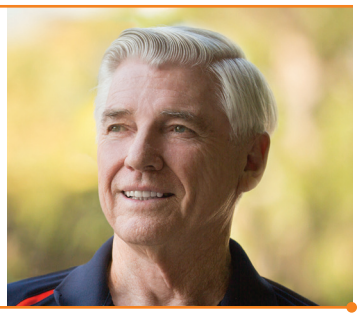


FOLLOWING HER PASSION TO A HIGH-TECH CAREER

People often ask Patricia Beauchamp how a girl from a small town in Wales, UK, ended up at the NASA Jet Propulsion Laboratory (JPL), where she serves as chief technologist of the Engineering and Science Directorate.

"I came to this country in the late 1960s. My first stop was Berkeley, California, when my former husband was a graduate student," says Beauchamp. "When he became a professor at California State University, Fullerton, I enrolled in Fullerton Community College for a year and then transferred to CSUF, where I majored in chemistry and math. At CSUF, my passion for chemistry grew, and I had great experiences working in the labs of Pat Wegner and Barbara Finlayson-Pitts. After graduation, I went on to complete my Ph.D. in chemistry at Caltech, followed by a postdoctoral fellowship in chemical engineering."

During her graduate studies, Beauchamp visited JPL frequently to use equipment and interact with researchers, but upon completing her postdoc, she thought it would be good experience to work in industry.

"I had been consulting with Aerojet ElectroSystems, and when they offered me the opportunity to set up my own laboratory doing research on semiconductor surfaces, I jumped at it," she says. "It was not until a decade later, when my research had moved in the direction of low-temperature optical surfaces and high-temperature coating, that I felt it was the right time to move 'back home' to JPL."

NAVIGATING AN EXCITING AND CHALLENGING FIELD

Beauchamp's favorite part of working at JPL is "developing novel concepts for missions that could not be done without new technologies."

As chief technologist, she sets the Directorate's technology goals and offers advice on matters related to the scope and conduct of technology research and its implementation, assesses research and development needs and priorities, and creates paths to infuse technologies into flight projects. Beauchamp advocates for and promotes new technology and relationships beneficial to JPL's goals, mentors the next generation of JPL technology leaders, helps attract talent, and promotes technical capabilities to the community.

Beauchamp also plays an active role in supporting NASA headquarters and serves on the Planetary Science Division Technology Planning committee, as well as on external panels and review committees.

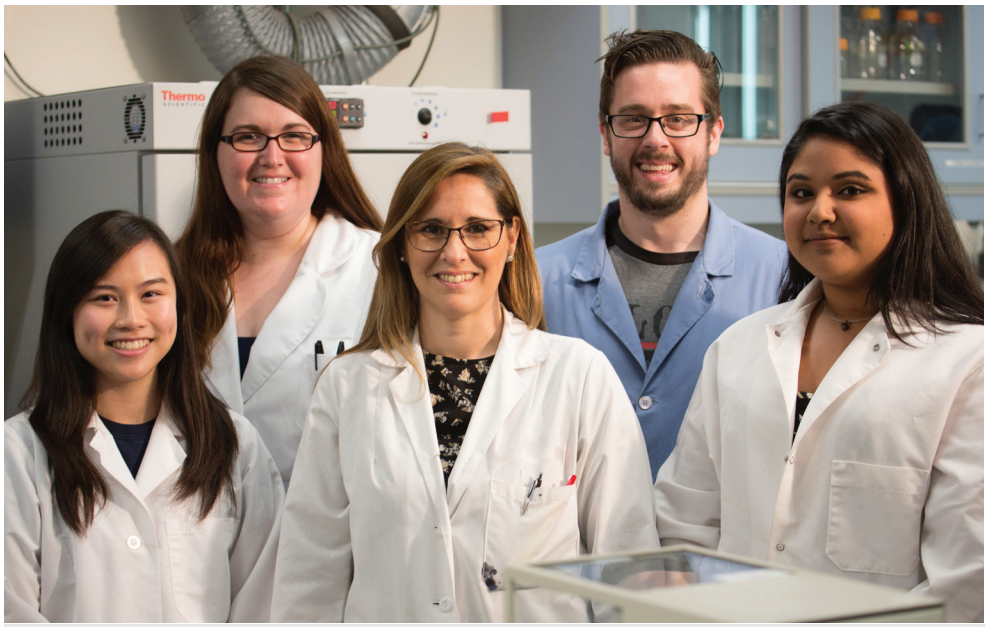
While she loves her job, challenging days are common.

"JPL is an operating division of Caltech, but we are also the NASA Center that develops and builds planetary robotic missions, so we have to live by multiple rules, including Federal Aviation regulations," explains Beauchamp. "This means a lot of ideas and technologies often have a long and tortuous path, and many never make it to missions. We have to navigate this complex world, and it can be quite challenging."

Beauchamp says the research skills and strong background in math, physics, and chemistry she had from CSUF were very helpful for her time at Caltech and throughout her career. For current students aspiring to highly technical work, she offers some advice.

"Follow your passion, be committed, work hard, communicate often, and write well," she says. "Some people may make technical work look easy, but we are all peddling as fast as we can under the surface! If you are passionate and love your chosen field, it is easy to work hard, but you also have to be able to communicate effectively, whether it is by writing or speaking. And, no matter what field you choose, you need to network and have fun in your chosen field!" •

FACULTY FOCUS



Veronica Jimenez (center), assistant professor of biological science, was recently awarded grants from the National Institutes of Health and American Heart Association to advance her research on Chagas disease.

Sam Behseta, professor of mathematics, has been selected as a Fellow of the American Statistical Association for his outstanding contributions to the advancement of statistical science.

Sean Walker, professor of biological science and department chair, received the Faculty Leadership in Collegial Governance Award for his collaborative, inclusive approach to university-wide problem-solving.

Merri Lynn Casem, professor of biological science, was awarded the Carol Barnes Excellence in Teaching Award, the highest campus honor given to a CSUF faculty member for teaching.

Jocelyn Read, assistant professor of physics, was honored as California Senate District 29's 2017 Woman of the Year in Science and Technology for her leadership and contributions to the community.

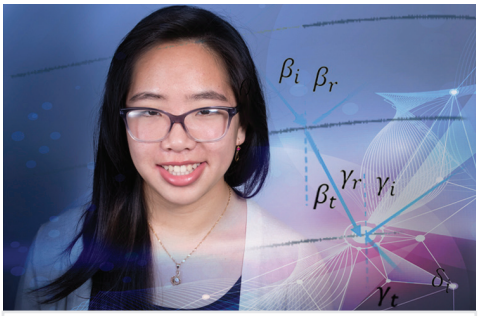
Sinan Akçiz, assistant professor of geological sciences, is conducting groundbreaking research on past earthquakes in Southern California to better understand what future earthquakes might look like.

Geoffrey Lovelace, assistant professor of physics, became just the fourth faculty member to receive the National Science Foundation Early Career Development (CAREER) Program award for his contribution to breakthrough discoveries in detecting and modeling gravitational waves. The grant will be used to fund his project: Computational Gravitational-Wave Science and Education in the Era of First Observations.

Armando M. Martínez-Cruz, professor of mathematics, was recognized with the Outstanding Latino/a Faculty in Higher Education Award from the American Association of Hispanics in Higher Education.

NSM NEWS

Carina Sandoval, **Noopur Dave** (pictured above), and **David Hsu** won top awards at the CSU Annual Biotechnology Symposium in Santa Clara earlier this year for research on how plants fight viruses and how parasites affect humans, and for outstanding student teaching, respectively.



Applied mathematics student **Trini Nguyen** won a national award from the Mathematical Association of America and American Mathematical Society for her Mathematical Model to Noninvasively Detect Dry-Eye Disease.

CSUF HOSTS NOBEL LAUREATE

Building on our longstanding tradition of hosting STEM thought leaders, CalTech Professor of Chemistry and 2005 Nobel Laureate Robert H. Grubbs recently delivered a lecture on the design and application of selective olefin metathesis catalysts.

FACULTY AWARDS

Outstanding Lecturer: **Kelly Ruppert,** Geology
Outstanding Teaching: **Cherie Ichinose,** Mathematics
Outstanding Untenured Faculty Member: **Geoffrey Lovelace,** Physics
Distinguished Faculty Member: **Michael Loverude,** Physics

IN MEMORIAM

Jewel Plummer Cobb, president of CSUF from 1981 to 1990 and the first African-American woman to lead a major university west of the Mississippi, passed away on January 1 at the age of 92. She was known for her emphasis on research and scholarship and oversaw major expansions in the school's campus and programs.

H. Eric Streitberger, professor emeritus of chemistry and biochemistry, joined CSUF in 1968 and taught for 30 years, including 12 years as director of the University's Science Education Program. He passed away February 3 at the age of 81.

Mario U. Martelli, professor emeritus of mathematics, taught at CSUF from 1987 to 2001 and received CSUF's Outstanding Professor Award in 1996. He passed away December 30, 2016, at the age of 79.

Robert E. Spenger, professor emeritus of chemistry, joined Cal State Fullerton in 1964 and taught organic chemistry for nearly 25 years. He passed away January 20 at the age of 92.

ALUMNA SHARES PUBLIC HEALTH CAREER HIGHLIGHTS

When Rear Admiral Pamela M. Schweitzer, a 1982 Cal State Fullerton biological science alumna and first female chief professional officer of pharmacy and assistant surgeon general in the U.S. Public Health Service, visited campus in March, she encouraged students to explore careers beyond their comfort zones. In her role, Schweitzer helps to improve and advance the health of the U.S. population and leads America's public health responders deployed to such places as West Africa during the Ebola virus outbreak, Puerto Rico to tackle the spread of Zika, New Orleans following Hurricane Katrina, and other public health emergency sites.

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HATS OFF TO OUR GRADS!

The Natural Sciences & Mathematics celebrated our newest class of graduates during commencement ceremonies May 20-21, 2017. We look forward to watching with pride as you embark on your future studies and careers. Congratulations on your achievements!

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