

# Transmission

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## OUT-OF-THIS-WORLD OPPORTUNITIES FOR UNDERGRAD RESEARCH



**Alyssa Garcia never dreamed her career in astrophysics and cosmology would begin as an undergraduate. But at the College of Natural Sciences & Mathematics (NSM), she's had the chance to contribute directly to the mission of the Laser Interferometer Gravitational-Wave Observatory (LIGO). This large-scale, National Science Foundation-sponsored physics experiment aims to detect gravitational waves first predicted by Albert Einstein in 1916.**

“Working at the Gravitational-Wave Physics and Astronomy Center (GWPAC) has offered strong connections to LIGO and an amazing glimpse into the field,” says Garcia, a senior majoring in physics. “My research involves modeling and hybridizing gravitational waves through numerical simulations of binary black holes – some of the waves’ most promising sources.”

GWPAC was established to support faculty-mentored research and provide education and outreach in gravitational-wave astronomy, physics, and astrophysics.

Four faculty members collaborate within the center: associate professor of physics

Joshua Smith is the center director and works on the experimental detection of gravitational waves; assistant professors of physics Jocelyn Read and Geoffrey Lovelace study gravitational-wave astrophysics involving neutron stars and computational relativity, respectively; and mathematical physics professor Alfonso Agnew studies theoretical relativity.

“Most of our 36 students have been physics, astronomy, and math majors, but we’ve also worked with engineering, biology, and chemistry students,” says Smith. “So far, 18 of our students have graduated as members of GWPAC and seven entered doctoral programs. Others are applying what they learned in industry positions.”

GWPAC recruits talented students from CSUF and nearby community colleges. Other interested students can get involved by contacting Smith and attending one of the center’s weekly group meetings.

GWPAC faculty and students conduct research focused on:

- **Improving** laser light scatter and thermal noise in optics.
- **Finding and reducing** sources of noise in LIGO detectors.
- **Simulating and visualizing** the orbits of binary systems with black holes and neutron stars, using CSU’s ORCA supercomputer.



## MESSAGE FROM THE DEAN

The College of Natural Sciences and Mathematics is a leader in producing workforce-ready graduates who are confident in their abilities and prepared to collaborate and communicate effectively in any career they pursue.

This readiness stems from our college's culture of strong faculty-mentored undergraduate research. From aspiring astrophysicists studying binary black holes at the Gravitational-Wave Physics and Astronomy Center (GWPAC) to eager ecologists analyzing environmental effects on marine life through the Biology Undergraduate Research Scholars Training (BURST) program – our students are mentored and motivated by forward-thinking faculty who value their students' development as much as their own discoveries.

At NSM, we're making significant strides in drug discovery, stem cell studies, and therapeutics that could extend the lives of Alzheimer's patients. Our faculty have been honored with top teaching awards and elected to prestigious leadership positions in their fields, and they have presented revolutionary research at regional and national conferences. Our alumni also continue to amaze us with their scientific, humanitarian, and business achievements on the national and international stage.

We are a student research university, and our faculty understands the impact of collaboratively engaging undergraduates in their scholarship. Our alumni recognize the role this broader, deeper method of learning has played in their success, and we call on them – and our whole college community – to help us ensure these outstanding opportunities continue to be available to the students we serve.

### David Bowman, Ph.D.

Interim Dean, College of Natural Sciences and Mathematics



*Physics faculty members Jocelyn Read, Joshua Smith, center, and Geoffrey Lovelace have been awarded funding for their gravitational-wave research.*

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- Studying the behavior of neutron stars in binary systems using astrophysics calculations.
- Developing teaching methods for gravitational-wave astronomy.
- Studying theoretical relativity related to gravitational-wave emission.

“We are working on something that hasn't even been detected yet,” explains Smith, “In the coming years we expect these Advanced LIGO detectors to directly measure gravitational waves for the first time.”

Through this faculty-mentored research program, GWPAC has connected students with the wider gravitational-wave community, sending them to Korea, Italy, and a number of regional and national conferences, including meetings at LIGO sites in Washington and Louisiana. The center also provides peer mentoring on research, careers, and graduate school exams and applications.

“Our emphasis on community, and the high quality and quantity of faculty support the students receive, sets the GWPAC experience far above other undergraduate research opportunities,” notes Agnew. “GWPAC emphasizes a wider variety of vital technical, social, and communication skills.”

## SUPPORTING TOMORROW'S SCIENTISTS THROUGH TIERED TRAINING

Vy Nguyen graduated from NSM in May with a biological science degree. She says faculty-mentored research was critical to her character development and academic success.

In 2013, she began a Southern California Ecosystems Research Program (SCERP) project with Jennifer Burnaford, associate professor of biological science, exploring the effects of low tide conditions on the photosynthetic health of feather boa kelp. Funded through the National Science Foundation, SCERP offered research opportunities, travel funding, and career planning for undergraduates interested in ecology and environmental biology.

As funding for SCERP ends, the new BURST (Biology Undergraduate Research Scholars Training) initiative, funded by the University Office of the Provost, has stepped in to increase student participation in biological science research experiences. In spring 2015, Nguyen was named a BURST scholar.

“Faculty-mentored research taught me to communicate with various audiences, network with professionals, manage my time, troubleshoot, and collaborate with others,” says Nguyen. She says her peer-mentoring experience prepared

her for her current role as a California State University Science, Technology, Engineering and Mathematics (STEM) AmeriCorps Volunteer in Service to America (VISTA). In this role, she recruits and nurtures students as they transition into California State University, Long Beach and the new National Institutes of Health-funded research program known as BUILD (Building Infrastructure Leading to Diversity).

Director Bill Hoese, professor of biological science, explains that BURST is open to all undergraduate biological science majors and is divided into three tiers – “expose, engage, and immerse.”

The first tier introduces students to undergraduate research. The second focuses on students strongly considering, or just beginning, research with a faculty mentor and emphasizes the value of communicating science with others. The third tier is designed for students actively engaged in independent undergraduate research projects with faculty mentors.

“During the first tier, we invite alumni to share how their undergraduate experiences impacted their working life,” says Hoese. “In the second tier, we emphasize communication and provide funding for mentored attendance at local, regional, and national scientific conferences.”

BURST also provides an hourly wage for third tier students to conduct research, funds their travel to present research at conferences, and trains them to serve as peer mentors for students in the middle tier as well as facilitate first-tier events.

In addition, BURST runs an introductory research experience for incoming freshmen. During orientation BURST faculty and third-tier students, as well as other students involved in independent research with faculty, lead new students through an embryonic research project involving California grunion – an unusual fish that spawns and lays eggs on land.

“There’s plenty of literature showing that engaging students in long-term intensive activities, like undergraduate research, develops critical thinking and builds marketable skills for future employment,” says Hoese.

Thomas Parker, a 2015 graduate and monitor for the California Department of Fish and Wildlife, agrees.

“I got involved in BURST during my last year at CSUF, which happened to be my third year of research on Olympia and Japanese oysters with my mentor, Dr. Danielle Zacherl,” says Parker. “I came in as a veteran researcher and mentored students who had little, if any, experience. BURST also helped me present my oyster restoration research at a few conferences and win Best Student Poster at the Western Society of Naturalists.”

Parker says his experience at NSM prepared him to apply for wildlife permits, design his own experimental protocol, obtain and analyze datasets, and present research at national conferences.

“I honestly think that faculty-mentored research gave me the best look at the scientific world and provided me with skills to set myself apart in the job market,” he says.

## FUNDING THE FUTURE OF FACULTY-MENTORSHIP

Funding for programs like GWPAC and BURST provides essential training and support for developing young scientists, say Hoese and Smith.

“In particular, we have a pressing need for computing administration to help more of our students effectively use the resources available to compute gravitational waves, analyze data, and perform optics calculations,” says Smith. “These computations would help us learn the most from the first gravitational-wave detections and lead to further research on improving state-of-the-art optics, which would benefit the whole industry.”

Hoese says alumni and donor support can magnify the effects of BURST.

“We’ve done so much in just two years,” says Hoese. “If we knew we could count on funding, we have a whole list of dreams to expand the program, impact more students, and provide deeper research opportunities. And we could help replicate this model in other departments.” •



*Using a microscope, incoming freshman Zainab Syed gets an up-close look at California grunion embryos – seeing the grunions’ heartbeats.*

*The Biology Undergraduate Research Scholars Training (BURST) program presented the summer session as part of new student orientation.*

# LEADING THE FIGHT AGAINST DISEASE

NSM faculty are working on research that could help end some of the world's deadliest diseases. Here are just a few of the many disease-fighting research projects taking place on campus.



Nilay Patel  
Associate Professor of Cell Biology

## RACING TO SLOW ALZHEIMER'S DISEASE

While there's no cure for Alzheimer's disease, Nilay Patel's research could slow onset of the disease.

Patel, associate professor of cell biology, and a team of students are examining regulation of apolipoprotein E (APOE) – the gene most commonly associated with late-onset Alzheimer's. Their work is aimed at stopping production of one of the gene's allelic forms linked to the disease.

"A drug that could do that, would push the start of the disease back 5 to 10 years," says Patel.

"Five more years of good life means you've reduced healthcare costs and increased family productivity."

And Patel says there is something people can do right now to help prevent Alzheimer's. In his research, he's seen a link between high cholesterol and Alzheimer's disease. The connection may even be higher than statistics show. "People with really high cholesterol levels may die before the age they would get Alzheimer's," he says.

So Patel recommends a low cholesterol diet – particularly from age 30 to 50. And he offers a target weight to aim for. "To weigh no more than what you did when you were 16," he says. •



Peter de Lijser  
Professor of Organic Chemistry

## DISCOVERING A POTENTIAL ANTI-CANCER DRUG

Organic chemistry professor Peter de Lijser points out one thing many important innovations have in common.

"Many discoveries are accidental," he says.

De Lijser and his students in a collaborative project with Nilay Patel's research lab made their own accidental discovery when some molecules they were designing to act as drugs to promote stem cell pluripotency did something unexpected.

"Some of our results were consistent with these compounds decreasing cell growth" he says. "We realized we could possibly kill cancer cells."

The research team even did a test comparing some well-known cancer drugs to the drugs they were creating. The drugs they made outperformed the existing cancer drugs.

De Lijser's student researchers have made almost 600 compounds and are accelerating the process to create molecules most likely to be effective drugs.

"The potential is very exciting," he says. "Especially because these are simple, straightforward molecules." •

# TraNSMission



Alexandra Orchard  
Assistant Professor of Chemistry

## RESEARCHING HOW TO HELP SOLVE A GLOBAL HEALTH ISSUE

Alexandra Orchard, assistant professor of chemistry, is researching a safer way to treat high-risk strains of HPV (human papillomavirus), which leads to more than 11,000 cases of cervical cancer per year in the United States alone.

“In theory, we could end up with a drug for HPV,” she says. “There are currently no antiviral drugs clinically available for the treatment of high-risk, cancer-causing HPVs. There is a vaccine, but this doesn’t help the numerous people who already are infected.”

Her research team uses computer programs to design medication she hopes will kill the infected cells – a much preferable alternative to what is often done.

“I personally know many women who have a high-risk HPV infection that has progressed to the early stages of cervical cancer,” she says. “The only treatment then is to cut out large portions of infected tissues, which besides being expensive and painful can cause problems, such as an inability to conceive or carry a pregnancy to term.”

If she is successful in creating molecules that kill HPV-infected cells, she believes these molecules could be modified to have other applications.

“In the future, we intend to expand our projects to include other diseases, such as other cancers and other viral infections,” she says. •



Math Cuajungco  
Associate Professor of Biology

## UNDERSTANDING THE ROLE OF ZINC IN DISEASES

Math Cuajungco, associate professor of biology, is studying how regulating zinc could help fight conditions affecting the brain such as Alzheimer’s disease, Parkinson’s disease, stroke, and Mucopolysaccharidosis type IV.

Zinc is an essential nutrient necessary for the body to grow, and for the immune, digestive, and nervous systems to work properly. However, if too much zinc accumulates in the brain cells, it becomes dangerous.

“Zinc binds the amyloid-beta protein contained in senile plaques associated with Alzheimer’s, and zinc itself is toxic to cells at high concentrations,” he says.

Cuajungco is looking at the role of an ion channel protein called mucolipin-1 (TRPML1) located in cell compartments known as lysosomes. That’s the part of the cell once thought to be just a dumping ground for unwanted materials for recycling.

But he thinks it may be connected to degenerative diseases like Alzheimer’s and Parkinson’s.

Understanding the role of TRPML1 in lysosomes could also help to figure out how to clear out bad proteins like amyloid-beta to prevent its accumulation in the brain of Alzheimer’s patients. Cuajungco is looking at how TRPML1 interacts with another protein called TMEM163 that may function to regulate zinc ions inside the cells.

“The knowledge that will be gained from my research could be used to minimize or prevent zinc flux that is detrimental to cells,” he says. “Drugs that mop up zinc are called chelators and could be used to prevent zinc accumulation in cells and prevent metal toxicity.” •

# ENHANCE YOUR RELATIONSHIP WITH YOUR ALMA MATER

Last month, I overheard a conversation between two graduates of a local private university. As they discussed their connection and commitment to that institution, I wished I could be a fly on the wall during a similar conversation among our own alumni. What makes you feel connected to, or inspired to invest in, your alma mater? And, if money's tight, what other opportunities might you seek to show your support and alumni pride?

We want to help each of you find that perfect opportunity to reconnect with the college. Here are three options that we hope pique your interest!

## INTERESTED IN SUPPORTING NSM PHILANTHROPICALLY?

The College of NSM has philanthropic opportunities that expand student undergraduate research, graduate fellowships, scholarships, faculty support and community programs. From now through June 2016, NSM is conducting a Matching Gift Challenge to raise \$100,000 for undergraduate student research. Double your impact and give today!

Visit [fullerton.edu/nsmgiftchallenge](http://fullerton.edu/nsmgiftchallenge) or call 657.278.3348

## WANT TO RECEIVE SPECIAL SAVINGS AND PERKS?

Join the CSUF Alumni Association. Members receive discounts and other benefits as part of their membership package. Take advantage of career assistance services, discounts, on-campus privileges, and access to alumni news and events.

Visit [fullerton.edu/alumni/membership](http://fullerton.edu/alumni/membership) for more information and to join the Alumni Association from the comfort of your living room.

## SEEKING SOMETHING MORE SOCIAL OR PROFESSIONAL?

Consider attending a student research day, the NSM Symposium, or department alumni day. If you want to mentor or recruit talented students, consider speaking at the NSM Professor for a Day or student club, hire an intern, attend a career fair, or sign up for a job shadowing opportunity.

And if you happen to be sitting in a coffee shop talking to a fellow alumnus about Titan pride and engagement, I hope I get a chance to listen in!

**Cher Carrera**

Alumni Association Vice President, Membership and Marketing  
NSM Alumnae

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Margaret M. McMillan  
Marilyn E. Millet '73

## A LIFETIME OF GIVING: A PROFESSOR'S LEGACY – PROTECTING THE ENVIRONMENT

**CSUF Professor of Biology Mike Horn started a scholarship with a mission: to encourage biology majors to pursue a career in conservation biology.**

Horn wanted to inspire and prepare students to help preserve the earth's biological diversity and restore damaged habitats and communities.

He named the scholarship after Rachel Carson, the enormously influential biologist who exposed the dangers of pesticides such as DDT in her groundbreaking 1962 book "Silent Spring."

"Carson is a hero," Dr. Horn says. "She stood her ground and she's been proven correct about the effects of DDT on organisms. She also started her career when it was rare to encounter a female biologist."

This is not the first time Dr. Horn's concern for the environment has led him to invest in CSUF. His first donation was in 1990. Today, he has given for 26 consecutive years.

Now he's providing a major gift of \$65,000 with \$25,000 to endow the Rachel Carson scholarship. He's giving an additional \$20,000 towards student undergraduate research for CSUF's Southern California Ecosystems project. \$10,000 of this will be matched through NSM's Dan Black scholarship challenge. And he is giving a third \$20,000 gift. This will establish the Violet Horn Graduate Research Fellowship, named in honor of his aunt, a life-long teacher and avid supporter of education in all its forms.

Philanthropy isn't the only way Horn has given to CSUF. He served in the biology department in multiple capacities and remains a professor emeritus. He built his career around the department's vital research and sees his gifts as a continuation of that work.

"We can't do the things we want using just state funds," he says. "We'd like to raise the profile and show others there are lots of ways to provide more opportunities for students."

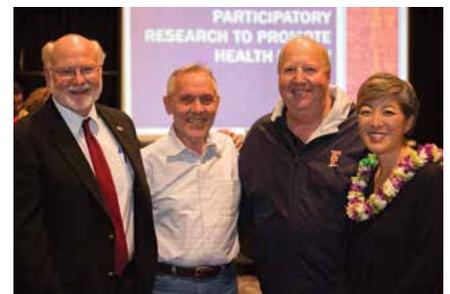
Horn has mentored students in his research areas: fish and sea birds. Although he's very involved in research in the lab, he loves to see species in their natural surroundings.

In recent years, he's looked closely at seabirds as indicators of the effects of climate change. He's recorded how changes in their behavior, habitats, and reproduction habits indicate a shift in the ecosystem.

More than 50 years since the publication of the seminal "Silent Spring," he feels there's much more work to be done in the tradition of a biologist who changed how people viewed the environment, and he hopes that his gift will help people not only remember Rachel Carson, but follow in her footsteps. •

***"We can't do the things we want using just state funds. We'd like to raise the profile and show others there are lots of ways to provide more opportunities for students."***

Mike Horn, Professor of Biology



Mike Horn (second from left) with outstanding professors Marty Bonsangue, Steven Murray, and Sora Park Tanjasiri.

Tharwat Morcos '02  
Laurie K. Morgan '88  
Dr. Michael J. Mulligan '82  
Takeshi Nakaya '85  
Janice E. Nelson '76  
Allene K. Symons '02 & Alan J. Nestlinger '76  
Dr. Maria Linder & Gordon Nielson  
Amy K. & Timothy O'Brien  
Karyn L. Ofa '87  
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Dr. David L. Pagni  
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Joan Partridge '06  
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James O. Paumier '73  
Ann & Donald E. Pease  
Rene A. Perez '02  
Jill & Dr. George R. '77 Perri  
Janet C. Petty  
Angel Pineda  
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# INTRODUCING NEW FACULTY

## BIOLOGICAL SCIENCE



**Joshua Der**, assistant professor of population genetics, with an emphasis on evolutionary genomics / *Research focus:* evolutionary origins

of flowering development, the dynamic co-evolutionary relationship between parasitic plants and their hosts, and fern genomics / *Education:* doctorate in biology, Utah State University



**Ryan Walter**, assistant professor of biology, specializing in population genetics-spatial, conservation genetics, and connectivity / *Research focus:* molecular,

genetic, and genomic approaches to studying spatial and temporal population structure, speciation, and hybridization. / *Education:* doctorate in evolutionary and conservation genetics, University of Windsor



**Parvin Shahrestani**, assistant professor of biology specializing in population genetics. / *Research focus:* evolutionary genetics of life history

traits, emphasizing aging, physiological function, and immunity / *Education:* doctorate in biological science, University of California, Irvine

## CHEMISTRY & BIOCHEMISTRY



**Allyson Fry**, assistant professor of analytical chemistry / *Research focus:* probing the dynamic nature of local crystal environments through

the development of dynamic pair distribution function (DPDF) using inelastic neutron scattering to collect data. / *Education:* doctorate in inorganic chemistry, Ohio State University

## GEOLOGICAL SCIENCES



**Natalie Bursztyn**, assistant professor of geoscience education. / *Research focus:* examining resisting forces to erosion along the Colorado River. She seeks

to contribute bedrock strength data to the age-old debate over the mechanism and timing of both uplift and erosion in the Interior West. / *Education:* doctorate in geology, Utah State University

## PHYSICS



**Gina Passante**, assistant professor of physics and astronomy education research / *Research focus:* student understanding of quantum mechanics at

all levels of instruction and developing Tutorials in Physics / *Education:* doctorate in physics, University of Waterloo, Canada

## MATHEMATICS



**Bridget Druken**, assistant professor of mathematics education / *Research focus:* teacher content knowledge and an examination of factors that

support and constrain practicing mathematics teacher engagement in Lesson Study / *Education:* doctorate in mathematics and science education, University of California, San Diego and San Diego State University



**Jessica Jaynes**, assistant professor of statistics. / *Research focus:* conceptualizing the Sustainability of Lesson Study in mathematics

professional development as well as broadly applied statistics with a specialization in experimental design. / *Education:* doctorate in statistics, University of California, Los Angeles

## MATHEMATICS (continued)



**Alison Marzocchi**, assistant professor of mathematics education. / *Research focus:* recruitment and retention of underrepresented students in mathematics

and the success of these students through teaching mathematics for understanding / *Education:* doctorate in education with a concentration in mathematics education, University of Delaware



**Valerie Poynor**, assistant professor of statistics. / *Research focus:* Bayesian nonparametric statistics, survival analysis, and neuronal data analysis.

/ *Education:* doctorate in statistics and applied mathematics, University of California, Santa Cruz



**Roberto Soto**, assistant professor of mathematics education / *Research focus:* representation theory of groups and algebras and their applications, as well

as K-12 teachers' professional development.

/ *Education:* doctorate in mathematics, University of Iowa •

### TOP 25

A new report, "Finding Your Workforce: Latinos in Health," by Excelencia in Education, ranks Cal State Fullerton among the top 25 institutions in the nation in awarding bachelor's degrees to Latinos entering health professions and programs.



## FACULTY NEWS

**CSU Model:** Cal State Fullerton has been recognized as the California State University Center of Excellence for Supplemental Instruction and will serve as a model for other CSU campuses. CSUF will work with the University of Missouri-Kansas City (UMKC) to certify supplemental instruction (SI) trainers in the UMKC method, as well as promote, initiate, and enhance the use of SI throughout the CSU system.

**Hope Johnson**, assistant professor of biology, and **Sean Loyd**, assistant professor in the Department of Geological Sciences, taught an intensive five-week field- and laboratory-based summer course, exploring the evolution of the Earth and its biosphere, to an interdisciplinary group of doctoral students from around the world.

**Misty Paig-Tran**, assistant professor in the Department of Biological Science, spent her summer alongside other science faculty and student researchers, studying the remains of a rare oarfish that washed ashore on Catalina Island.

**Leigh Hargreaves**, assistant professor of physics, received NSF funding that will help him and his students establish a new electron spectrometer based on a magnetic beam principle to help mitigate traditional technological limitations of electron scattering experiments.

**Christopher R. Meyer**, chair and professor of chemistry and biochemistry, will serve as a program director in the National Science Foundation's Division of Biological Infrastructure through August 2016.

**Angel Pineda**, associate professor of mathematics, lectured on "Task-Based Optimization in CT and MRI" at the Johns Hopkins Biomedical Engineering Department in January.

**Doug Eernisse**, professor of biological science, presented a poster titled, "When is a Keyhole a Giant?: A Rapid Assay to Verify *Megathura Crenulata* Hemocyanin," at the February Aquaculture American meeting in Seattle. •

**Philip Janowicz**, assistant professor of chemistry and biochemistry, has been named interim director of the California State University Center of Excellence for Supplemental Instruction at Cal State Fullerton, a model for other CSU campuses. Janowicz also received a \$350,000 National Science Foundation grant to study the effects of SI, a peer-to-peer program that helps to improve student success.





## TOP PROFESSOR AWARDS

**Scott Annin** (center), professor of mathematics, was honored in May with Cal State Fullerton's 2015 Outstanding Professor Award for his scholarship, excellence in teaching, student mentorship, and service. In his 13 years on campus, Annin has taught more than 20 mathematics courses, prepared students to present and compete at math conferences, served as Math Club adviser, coached students in mathematical competitions and, in fall 2014, co-chaired the largest undergraduate research conference ever on campus. In 2015, he was also chosen as the Distinguished Faculty Member for the College of Natural Sciences and Mathematics. •



**Bill Hoese** (center), professor of biological science, received Cal State Fullerton's Carol Barnes Excellence in Teaching Award this May in recognition of his academic rigor in teaching consistent with the mission and goals of California State University. During his 15-year tenure on campus, Hoese has impacted the lives of nearly 3,000 students, garnered about \$3 million in external research funding, and continuously worked for the betterment of students, faculty, and the University. One of the highlights of his teaching career was serving as co-director of the Southern California Ecosystems Research Program, which provided training for undergraduates interested in pursuing careers or graduate school in ecology or environmental biology. He is now director of BURST – a faculty-mentored research program funded by the Office of the Provost. •

# STUDENT SPOTLIGHT

## STUDENTS BRING HOME HONORS FROM RESEARCH COMPETITION

In May, three CSUF students received awards at the 29th annual California State University Research Competition, which featured 200 research projects from 260 students at 22 CSU campuses. **Kyle Hess** won first place in the undergraduate biological and agricultural sciences category; **Brenna Briggs** took second place in the undergraduate physical and mathematical sciences category; and **April Nakagawa** took second place in the graduate behavior and social sciences category.

## GEOLOGY STUDENT UNCOVERS FOSSILS AT THE PANAMA CANAL

Senior geology student **Isaac Magallanes** spent 10 weeks uncovering fossilized turtle shells, shark teeth, horse teeth and crocodile vertebrae and teeth, among other items, during his summer internship through the Panama Canal Project – Partnerships for International Research and Education.

## GRADUATE STUDENT WINS AWARD AT CREATIVE ACTIVITIES AND RESEARCH DAY

**Gabriel-Philip Santos**, a graduate student in geological sciences, won Outstanding Poster at the Student Creative Activities and Research Day for “The Talega Bonebed – Fossils from an ancient rainforest,” which highlights his master’s thesis research on a 45-million-year-old fossil bone bed from San Clemente preserved at the John D. Cooper Archaeological and Paleontological Center.

## STUDENT LEADS ASSISTANCE FOR EARTHQUAKE VICTIMS

Physics Club President **Jackie Cross** led a donation drive to collect funds to supply necessities to aid earthquake victims in Nepal. The club raised more than \$2,000.

## STUDENTS CONDUCT FIRSTHAND MARINE LIFE RESEARCH

Biological science majors **Joshua McKinley**, **Prarthana Shankar**, **Melanie Espino-Canche**, and **Blake Miyamoto** spent their summer exploring ecological and environmental issues affecting ocean animal and plant life. McKinley focused his research on how air exposure during low tide affects sea anemone feeding behavior; Shankar studied the reproduction of the California mussel; and Espino-Canche and Miyamoto spent their time looking at how environmental factors affect intertidal kelps on San Juan Island.

## MATH CLUB PROVIDES RESOURCES FOR FEMALE MATH MAJORS

Cal State Fullerton’s Sisters in Mathematics, Academics, Relationships and Teaching club (SMART Girls) is providing female CSUF students who specialize in mathematics with resources to succeed, including career advice, math-related events and fundraisers. The leaders of the club include **Nicole Borg**, **Shiline Nguyen**, **Asha Cyrs**, **Lisa Mueller**, **Christina Tran** and **Tanya Delgadillo**.

## BIOCHEMISTRY STUDENT WINS TOP AWARD FOR DISEASE RESEARCH

During her senior year, biochemistry major **Ashley Chui** was the winner of the California State University Biotechnology Symposium’s top undergraduate research award for her work in investigating a type of protein responsible for degenerative neurological diseases. Chui received the 2015 Glenn Nagel Undergraduate Research Award. Chui studied a protein linked to cancer, which has implications in the medical treatment of diseases such as Alzheimer’s and Parkinson’s. •

## SUPPORT TOMORROW’S SCIENTISTS TODAY

The College of Natural Sciences and Mathematics takes great pride in offering students faculty-mentored research opportunities that prepare them for the rigor of advanced study and help them develop workforce-ready skills.

“What I enjoy most about research is the critical thinking that it involves and the problem solving it requires,” says **Ashley Chui**, a 2015 biochemistry graduate and winner of one of California State University’s top biotech research awards. “My research is interdisciplinary, exposing me to different techniques in both biology and physical chemistry.”

We need your help to increase the number of faculty-mentored undergraduate research opportunities we can offer students. Our generous, longtime supporters **Kathy and Dan ('67) Black**, have issued a challenge to the NSM community of alumni, business leaders, donors, and friends – to raise \$50,000!

The Blacks will match any individual gift up to \$10,000, and provide up to \$50,000 total in matching gifts, through June, 30, 2016.

With \$100,000, NSM can create new and enhanced funded research opportunities for students and help additional undergraduate students publish and present their work on a regional or national stage.

Support our students' scientific endeavors today. Just call **657.278.3348** or visit [fullerton.edu/nsmgiftchallenge](http://fullerton.edu/nsmgiftchallenge) to make your donation. Individual gifts greater than \$1,000 can be designated for specific research needs.



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#### **LOCAL FAMILIES HAD A BLAST AT THIS YEAR'S PREHISTORIC OC**

Attendees of the Prehistoric OC event on October 10 found themselves surrounded by Native American culture, archeological and paleontological history, and even some volcanic activity.