

# SJSU Research Foundation 2020 Annual Report

SAN JOSÉ STATE UNIVERSITY  
DIVISION OF RESEARCH AND INNOVATION



COVER: From left, Ruben Flores, '20 Electrical Engineering; Vaishali Yasala, '20 MS Electrical Engineering; Electrical Engineering Assistant Professor Mohamed Badawy; and Mauricio Alvarado, '20 MS Electrical Engineering, outside the Charles W. Davidson College of Engineering building at San José State University. This faculty-student research team is developing methods for enhancing the efficiency and reducing the cost of generating solar power. More on page 7.

THIS PAGE: Moss Landing Marine Laboratories Assistant Professor Birgitte McDonald in Cape Crozier, Antarctica, is positioning herself to deploy tags on adult emperor penguins as they head to sea to forage. The engineered data-logging tags will allow Dr. McDonald to track the animals and collect information on their dive depth, acceleration, and GPS location. The tags also gather data relating to the environment in which the penguins travel, such as temperature and light level. More on page 12. PHOTO: Rob Dunbar



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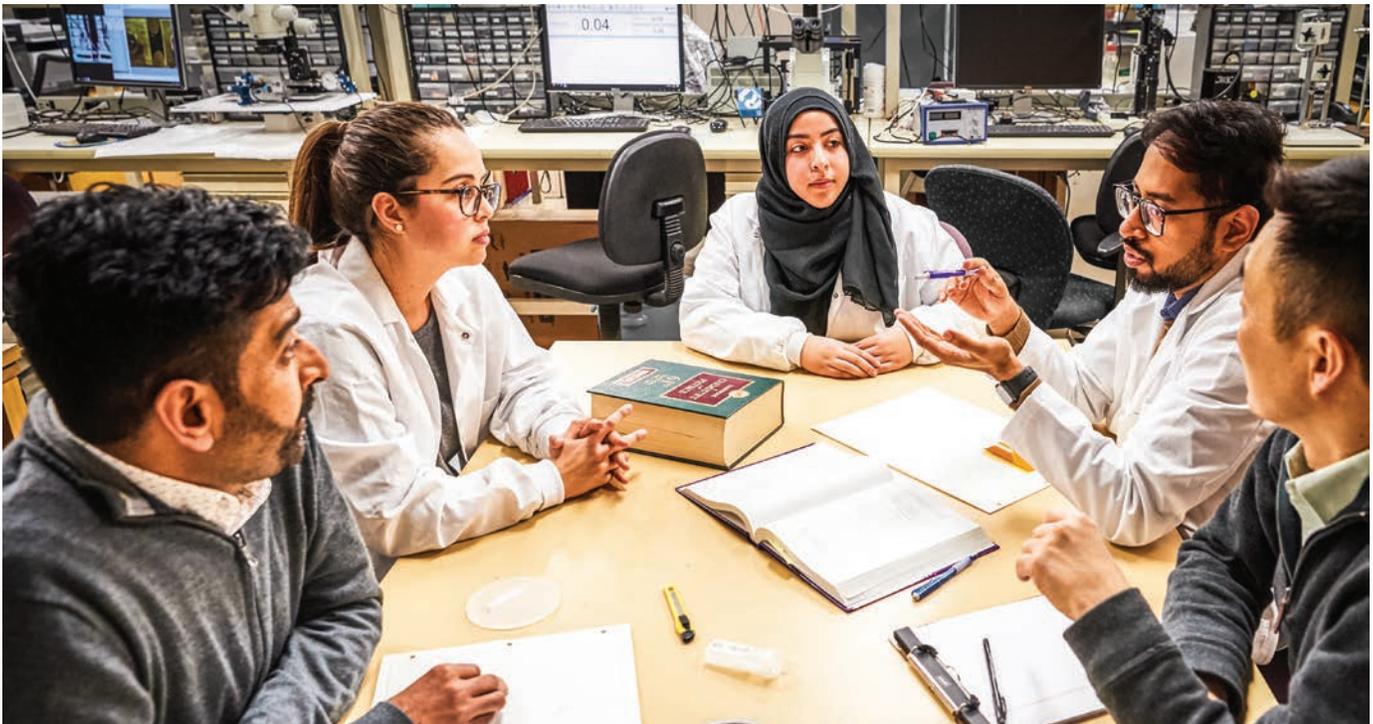


# ABOUT

The SJSU Research Foundation is a non-profit 501(c)3 California corporation that operates solely for the benefit of San José State University. It is an “auxiliary” of San José State University.

As explained on the California State University website: “Auxiliary organizations at the California State University (CSU) are non-profit organizations and separate legal entities. They operate pursuant to written operating agreement with the CSU Board of Trustees, have separate governing boards with close connections to a campus and follow all legal and policy rules established by the CSU system and the respective campus administration. Auxiliary organizations were created to perform essential functions associated with a postsecondary educational institution, which under California law were difficult, cumbersome or legally restricted for the university and were not supported by state funding.”

The entire team at the SJSU Research Foundation continues to be inspired by the endeavors and accomplishments of SJSU researchers. We are committed to supporting their efforts through our dedication to providing streamlined, robust, and efficient research administration systems and services.



FROM LEFT: Professor Anand Ramasubramanian; Luciana Aguirre Resinowski, '20 Chemical Engineering; Jinann Alzaghari, '22 Chemical Engineering; Suyog Jitendra Pathare, '21 MS Biomedical Engineering; and Professor John Lee meet to discuss their research into the role of spatial heterogeneity on blood clot micromechanics.

# LEADERSHIP



## Mohamed Abousalem

President  
SJSU Research Foundation  
Board of Directors  
  
Vice President for  
Research & Innovation  
San José State University



## Pamela C. Stacks

Vice President  
SJSU Research Foundation  
Board of Directors  
  
Associate Vice President for  
Research  
San José State University



## Rajnesh Prasad

Executive Director  
SJSU Research Foundation

These are exciting times for the SJSU Research Foundation and the entire San José State University research enterprise. With the establishment last year of its Division of Research and Innovation, SJSU is poised to continue its trajectory toward becoming a leader of research in the California State University system.

More than \$47 million in grants and contracts were awarded to the SJSU Research Foundation in Fiscal Year 2018-19. This represents tremendous success on the part of SJSU faculty, who continue to conduct substantive public impact research that delves into significant issues affecting humankind both locally and globally.

Student engagement in research also continues to grow. Guided by their professors, Spartans are tracking the travels of marine mammals using the Argos satellite, investigating the biomechanics of blood clots, and developing cybersecurity systems that will protect our society's networks and infrastructure.

Perhaps these experiences are best summed up by the students themselves:

*“All the courses at SJSU are industry-oriented and focused on the latest trends happening in the real world. If I look back over the past year, I see that I have experienced a huge exponential curve of growth in terms of knowledge, thinking ability and finding a way to solve the problem.”*

*Mohit Mohan Ingale  
'21 MS Computer Engineering*

We hope you enjoy reading these profiles introducing a select few of the research projects underway at SJSU.

# NUMBERS

SJSU Research Foundation numbers for Fiscal Year 2018-19, which ended on June 30, 2019

**226** Awards received valued at more than  
**\$47 Million**

**276** Proposals submitted valued at more than  
**\$108 Million**

**185** SJSU Faculty  
Engaged in sponsored research projects, grants or  
contracts managed by the Research Foundation

**305** SJSU Students  
Employed on sponsored research projects, grants or  
contracts managed by the Research Foundation

**\$1.4** Million Dollars  
Returned to San José State University in indirect  
revenue and strategic investment to the campus



Mauricio Alvarado, '20 MS Electrical Engineering; Ruben Flores, '20 Electrical Engineering; Assistant Professor Mohamed Badawy; and Vaishali Yasala, '20 MS Electrical Engineering; building the electronics related to the development of new hardware technology for solar power capture in SJSU's Power Electronics Lab.

## Mohamed Badawy Capturing solar power in partial shade

Renewable energy has always fascinated Mohamed Badawy and is what inspires his explorations of technology that could enhance the efficiency and reduce the cost of generating clean solar power.

Those explorations have led Badawy and his students to develop a new hardware technology that captures more energy from solar panels under “partial shading” conditions. Partial shading occurs when some of the solar panels are shaded while others are not, which traditionally has led to a significant drop in the amount of solar energy being captured.

However, their research has resulted in a system that increases energy capture in partial shade. It consists of a novel electronic power configuration based on the differential power processing topology (averaging topology), which increases

system efficiency by decreasing the processed current. The configuration also extends the system lifetime by eliminating the need for short lifetime electrolytic capacitors.

“The project results show that our system is able to increase the energy capture of photo-voltaic (PV) panels by over

30% under shading conditions while adding less than 10% of capital cost into the PV system,” explains Badawy.

Badawy and his students have constructed a working prototype of the technology, which has been successfully tested under partial shading conditions outside of the Charles W. Davidson College of Engineering building.

Their goal is to develop a commercial product, in partnership with their corporate sponsor Delta Products

Corporation, that will be more compact, lower-cost and more efficient than those currently on the market.

“SJSU has given me the opportunity to be involved in projects that advance technologies with real world implications.”

*Mauricio Alvarado  
'20 MS Electrical Engineering*

# Alessandro Bellofiore

## Instrumentation for an array of research applications

In one of SJSU's most significant instrumentation acquisitions to date, Alessandro Bellofiore led the College of Engineering's procurement of a High-Speed Particle Image Velocimetry (PIV) instrument, a laser-based tool for characterizing flow fields. Having this instrument on campus will advance faculty and student research relating to fluid mechanics in biomedical devices, microscopic blood cell interactions, ink technology droplet mobility, aerodynamic and combustion evaluations, and more.

"Particle image velocimetry is a powerful and reliable tool for characterizing flow in a wide array of applications," explains Bellofiore. "It is the de facto standard for the experimental investigation of liquid, gaseous, and multiphase flows, whether one is investigating fuel injection processes in aircraft engines or blood flow through implantable cardiovascular devices."

Using the PIV instrument, Bellofiore and his students are conducting research on the blood flow patterns associated with mechanical heart valves. Having created a mock circulation loop that mimics the vascular system, they apply

a thin sheet of laser light to illuminate a slice of a flow that is seeded with highly-reflective particles, and use a high-speed camera to take images of the particles. Sophisticated software analyzes the images to quantify how much each cluster of particles moves, which in turn gives a measure of the fluid flow velocity.

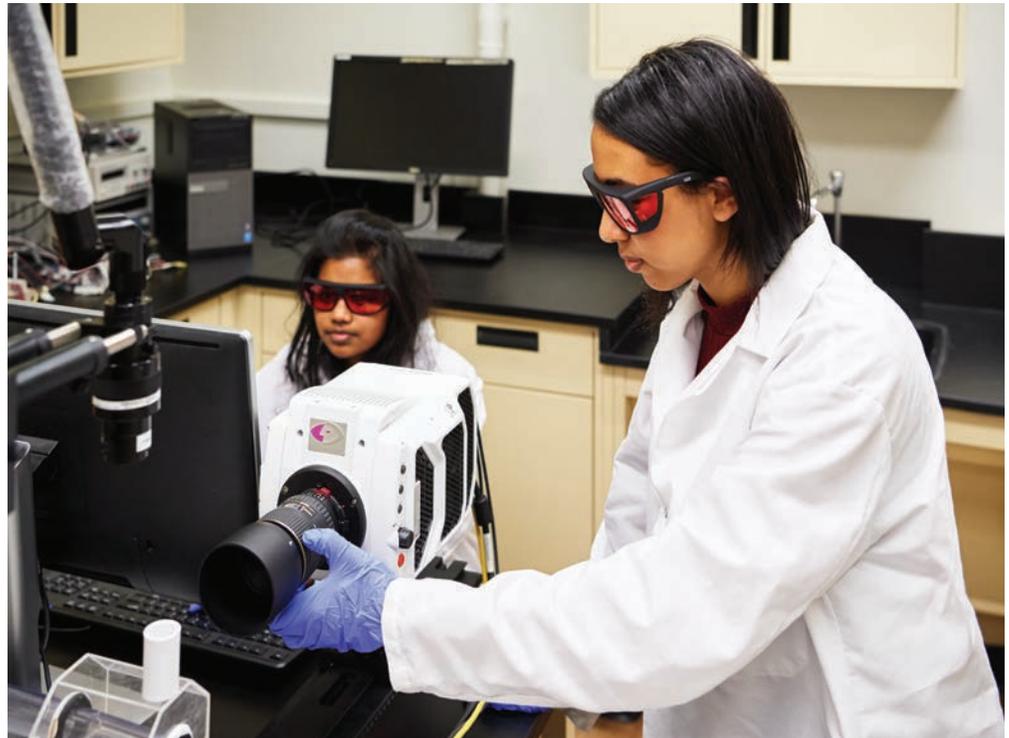
Bellofiore's passion for fluid dynamics was sparked when he was a student in Italy. "It was definitely the combustion course I took at University of Naples Federico II. It introduced me to the wonderful world of fluid dynamics, and motivated me to choose to focus on experimental fluid mechanics throughout my career."

"My experience at SJSU has been great. I love how the professors involve the students in research."

- Hania Osman, '21 MS Biomedical Engineering



Alessandro Bellofiore with replacement shoulder and hip joints. His research encompasses fluid mechanics of biomedical devices, hemodynamics and cardiovascular mechanics, wearable devices for cardiovascular applications, chronic kidney disease, and clinical imaging and data analysis.



Mary Colleen Grace Meshach Ponraj, '20 MS Biomedical Engineering, operates the particle image velocimetry instrument while Hania Osman, '21 MS Biomedical Engineering, adjusts the camera for examination of the hemodynamic performance of a mechanical heart valve in vitro.



“After gaining this interest in research, my ultimate goal is to work towards becoming a clinician scientist by applying to M.D.-Ph.D. programs.”

*Arshia Hamzehpour Savojbalaghi  
'22 Biology (Concentration in  
Systems Physiology)*

Dr. Brook demonstrates how to load and unload metallo-organic compounds from a physical property measurement system to Arshia Hamzehpour Savojbalaghi, '22 Biology (concentration in Systems Physiology). The system measures the magnetic properties of samples and how they change in different temperatures, from approximately 400K (344° Fahrenheit) to 50K (-369.4° Fahrenheit).

## David Brook Uncovering applications for unique molecular substances

David Brook and his students are investigating and developing new molecules and materials that can switch between electronic or magnetic states as a result of controllable external stimuli. In addition to increasing fundamental understanding of the science of such systems, their work may uncover sophisticated applications for the molecular substances created in Dr. Brook's lab.

“I've always been interested in molecules that are unusual — that don't behave the way most molecules do,” Brook says.

One of the materials he is examining is a metallo-organic compound with switchable magnetic properties. That is, the magnetic properties change dramatically depending on external influences such as temperature and light. “As we gain a greater understanding of these substances, we

hope to use them in more complicated systems where, for example, change in the magnetism of one molecule may trigger a change in its neighbor. They may eventually have applications as sensors, in information storage at the molecular level, and in molecular or quantum computing.”

Students participate in Brook's research at all levels — from completing measurements, to synthesizing new materials, to presenting at national and international conferences such as American Chemical Society national meetings and the International Chemical Congress of Pacific Basin Societies. His students have continued on to graduate studies at McGill University, UC Irvine, UCLA, UC Merced, UC Riverside, UC San Diego, and the University of Nebraska, as well as going into industry at companies including Apple and Gilead.



## Craig Clements, Minghui Diao



Doppler radar  
acquisition,  
deployment,  
and research

“Growing up in southern Louisiana I saw the aftermath of many hurricanes that made landfall on our coast. Specifically, Hurricane Katrina had a large impact on my family, piquing my interest in atmospheric science.”

*Taylor Aydell  
'20 MS Meteorology*

ABOVE: Meteorology and Climate Science Assistant Professor Minghui Diao and Professor Craig Clements with the recently acquired mobile Ka-band Doppler Radar.  
BELOW: Nick McCarthy, a visiting Ph.D. student from the University of Queensland, and Taylor Aydell, '20 MS Meteorology, examine data generated by the mobile radar during deployment at the Kincade Fire on October 23, 2019 near Healdsburg, California.

With its acquisition of a mobile Ka-band Doppler Radar in 2019, SJSU now owns and operates the first-of-its-kind deployable lab capable of conducting observational studies all the way from the Earth's surface to the tropopause, across both dry and wet atmospheric conditions.

“The tool allows our students to learn to operate an integrated array of state-of-the-science equipment, thereby providing them with rich context for developing high-level academic and professional skills,” explains Meteorology and Climate Science Professor Craig Clements, head of the Fire Weather Research Lab at SJSU.

In addition to sampling wildfires, the radar will enable SJSU faculty and students to conduct advanced research

relating to precipitation processes in coastal and mountain environments, explains Assistant Professor Minghui Diao.

“With this technology we can measure ice and mixed phase

clouds with unprecedented resolution, and monitor cloud structure development during atmospheric river events.”

The sophisticated system may also serve to attract undergraduate and graduate students to SJSU's noteworthy meteorology programs.

Clements adds, “The scope of the research now being conducted leverages the non-

overlapping fire and storm seasons in the western U.S. as well as a number of regionally specific ‘natural laboratories,’ thus maximizing the utility of a single instrument for multiple research objectives.”



## Bree Grillo-Hill

### Impacts of intracellular pH on cancer cell behaviors

Bree Grillo-Hill's research characterizes and identifies pH sensors that mediate cancer cell behaviors. She has designed tools that measure and alter acid levels inside cells – a first in the field development – which allow her to better understand diseases and how they progress.

“Cells generate acids as a normal consequence of metabolism and other biochemical activities,” she explains. “In diseases including cancer, cells cannot properly regulate their acid levels, and acid levels are subsequently reduced. This in turn causes proteins to function abnormally, which makes the cells behave differently, contributing to disease progression.”

Grillo-Hill's students are active in her lab and fully engaged in research. In fact, they have presented their research at the Society for Advancement of Chicanos/Hispanics and

Native Americans in Science Conference, the Annual Drosophila Research Conference, the California State University Annual Biotechnology Symposium, and the Annual Biomedical Research Conference for Minority Students.



Several of Grillo-Hill's students have gone on to pursue graduate and medical degrees, including at top-ranked programs like UC San Francisco. Others have taken positions at Takeda Pharmaceuticals, Beckman Coulter, and at the California Department of Justice Jan Bashinski DNA Laboratory, as well as in academic labs at UC San Francisco and the University of Pennsylvania.

Grillo-Hill considers her students' hands-on research experiences successful, “even if they don't continue to work as a bench scientist,” she says. “They learn collaboration and critical thinking skills in research that will benefit them in whatever path they choose after graduation.”

“Guidance and mentorship from my professor have opened career doors that I would never have known about.”

*Harnoor Virk, '21 Molecular Biology, Minor in Chemistry*

ABOVE: Assistant Professor Bree Grillo-Hill (left) and Barbara Sandoval, '20 MS Molecular Biology and Microbiology, examine bacterial growth plates. Barbara is generating new versions of fluorescent proteins with novel optical properties that can be used to detect changes in acid levels inside cells.

RIGHT: Bree Grillo-Hill and Harnoor Virk, '21 Molecular Biology and minor in Chemistry, examine slides of whole mount dissected fly tissues expressing fluorescent proteins that indicate whether cells are actively dividing using an inverted live-cell imaging microscope that they built from components at SJSU.



# Birgitte McDonald

## Marine mammals in extreme environments

To survive and reproduce in an ever-changing world, organisms must adapt, both behaviorally and physiologically. These adaptations are precisely what Birgitte McDonald investigates, with a focus on marine mammals that survive in extreme environments.

Marine mammals are an ideal study system because of their large size variation, geographic distribution and daily challenges, including hypoxia, extreme temperatures, and fasting. McDonald's research addresses fundamental questions in their life history and ecology with a special interest in divers. Already her research has improved our understanding in how divers manage their oxygen when balancing the conflicts of exercise and the need

to conserve oxygen during natural and disturbed dives.

"Understanding the mechanisms that allow an organism to interact and survive in its environment is crucial

for predicting, and potentially mitigating, their response to climate change," she explains.

All of McDonald's graduate students participate in her research, both locally and internationally, and interested undergraduate students volunteer in her lab. Last year one of her graduate students received the Best Student Presentation Award at the World Marine Mammal Science Conference in Barcelona for

her investigation of the energetic cost of disturbance in sea otters.



“Because of my experience at MLML I am considering pursuing a Ph.D. in marine biology and hope to work with marine mammals at a conservation focused non-profit.”

*Lauren Cooley  
'21 MS Marine Science*



TOP: Moss Landing Marine Labs Assistant Professor Birgitte McDonald (left) shares a satellite tag with Lauren Cooley, '21 MS Marine Science and Parker Forman, '21 MS Marine Science. Once attached to a marine mammal, the tag transmits to the Argos satellite network and allows researchers to determine the animal's location. ABOVE: Lauren Cooley operates a VHF receiving antenna to locate tagged northern elephant seals within a close range of Moss Landing Marine Laboratories.



“Doing diverse projects at SJSU enabled me to enhance my skills that in turn helped me bag a job as a software engineer at one of the top companies in the world.”

*Jasnoor Brar  
'20 MS Software Engineering*

Mohit Mohan Ingale, '21 MS Computer Engineering (center), places an electrode in the hand of Jasnoor Brar, '20 MS Software Engineering (left), to record her electrocardiogram (ECG) signal. In the authentication system being developed in the research lab of Professor Younghee Park (right) with Assistant Professor Nima Karimian, a user's ECG signal can be used to authenticate that user in order to grant access to a secured system such as a cell phone, tablet, or laptop.

## Younghee Park Developing cybersecurity curriculum

Near the start of her masters degree studies in 2000, Younghee Park came across a news article about the dangers of internet hacking and the importance of cybersecurity.

“At that moment, I knew that I wanted to become a sort of Ninja to fight against attackers in cyberspace,” she says. Since then, she has been committed not only to the field of cybersecurity, but also to enhancing academic curriculum relating to cybersecurity education.

“Network infrastructure is undergoing a major shift away from ossified hardware-based networks to programmable software-based networks,” Park explains. “Emerging network technologies introduce significant granularity, visibility, flexibility, and elasticity into networking, but at the same time bring new security challenges.”

To address these challenges, Park is building an open laboratory based on CloudLab, an NSF-sponsored

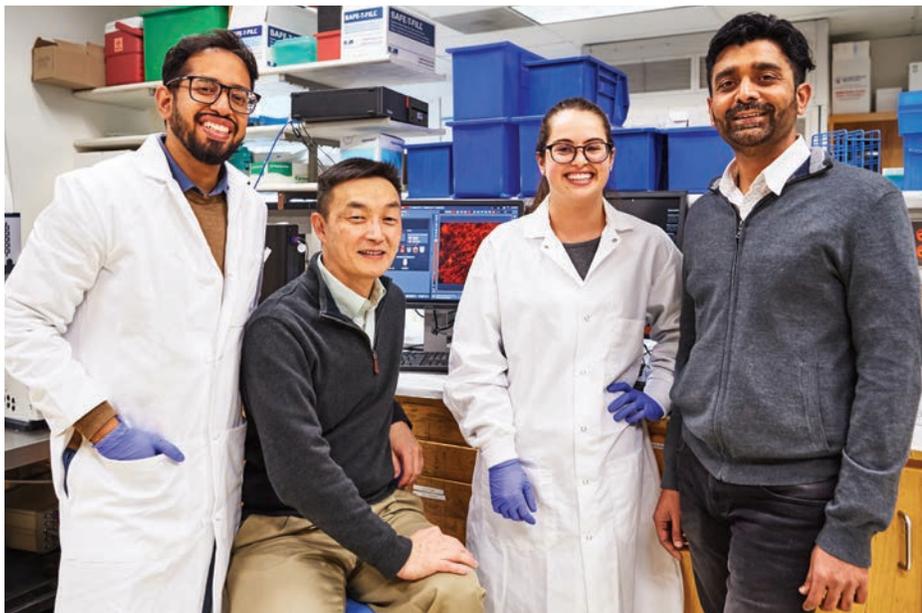
cloud platform for security education, in collaboration with colleagues from two other universities. The team is designing corresponding hands-on labs and undergraduate research projects, and developing related curricula for use in both academia and industry.

Park guides students in conducting practical research in her own lab, with a focus on building systems that protect usable devices and infrastructure from attacks. They gain critical thinking skills and hands-on experience while developing network security, and have gone on to both internships and full-time positions at companies such as Google, Hewlett Packard Enterprise, and Cisco.

“It is imperative that security research results be brought into cybersecurity education to prepare our students – members of the future workforce – with security awareness and readiness sufficient to protect the emerging infrastructure.”

# Anand Ramasubramanian and John Lee

## Deciphering blood clots at engineering intersections



Suyog Jitendra Pathare, '21 MS Biomedical Engineering; Professor John Lee; Luciana Aguirre Resinowski, '20 Chemical Engineering; and Professor Anand Ramasubramanian

Cardiovascular disease is one of the most common causes of death in the U.S., and understanding the formation and dissolution of blood clots has major implications for treatment. A grant partnership between Professors Anand Ramasubramanian (Chemical Engineering) and John Lee (Mechanical Engineering) has resulted in collaborative research among mechanical, chemical and biomedical engineering students and new discoveries in the field of clot biomechanics.

“We have made some interesting and, we believe, important measurements on how various components inside and outside the platelets embedded in the clot can provide the strength to oppose the forces due to blood flow,” explains Ramasubramanian.

Work on this project is being performed exclusively by undergraduate and graduate students. They first designed and

built a microextensometer, a device to apply micrometer scale displacements, and measured the resistive force from the clots. Then they performed advanced microscopy and quantified the distribution and nature of various clot components, which likely influence the



Jinann Alzaghari, '22 Chemical Engineering and Luciana Aguirre Resinowski, '20 Chemical Engineering, perform a tensile test on a blood clot and subject it to uniaxial strain in order to study the biomechanics of blood.

“No matter what future path I choose, I believe that my experiences at SJSU are preparing me to succeed and make an impact on the scientific community.”

- Jinann Alzaghari,  
'22 Chemical Engineering

mechanical properties of the clot. Their results may eventually have a direct impact on the procedures and success of stroke treatment.

Both professors are drawn to this area of research in part because answers lie at the intersection of different fields.

“The mechanics of blood clots and other biological tissues present intriguing challenges because things like strength, stiffness, and ductility are governed by nature’s dynamic role in microscale and at the molecular level. This is very different from more common structural engineering problems that have known properties and more predictable behavior,” says Lee.

“This project is providing our students with the interdisciplinary skills they need to succeed whether they pursue further studies or become engineering professionals,” adds Ramasubramanian.

# Jordan Schettler

## Preparing underrepresented undergrads for Ph.D. programs

The Preparing Undergraduates Through Mentoring Toward Ph.D.s (PUMP) program has been underway at southern CSU campuses for ten years, and with a grant from the National Science Foundation, Assistant Professor of Mathematics Jordan Schettler is spearheading the expansion of PUMP to northern CSU campuses, including SJSU.

“Our institutions have a large concentration of underrepresented minority and first-generation college students; most come from low-income families,” explains Schettler. “The PUMP program inspires and prepares these students to succeed in mathematical sciences careers through a series of high-quality, personalized activities.”

In fact, 47 PUMP participants have enrolled in Ph.D. programs since 2014, 25 of whom were Hispanic/Latino.

Schettler was inspired to become involved in PUMP by CSU Northridge Professor of Mathematics Helena Noronha, who founded the program and always hoped for its expansion, and by his co-researcher on the project, CSU Channel Islands Assistant Professor of Mathematics Cynthia Flores. Flores herself is a first-generation college graduate who took part in the PUMP program at CSU Northridge, which led her to obtain a Ph.D. in Mathematics at UC Santa Barbara.

PUMP activities include advanced coursework and seminars, plus year-long undergraduate research projects for junior and senior math majors.



Assistant Professor Jordan Schettler (left) and former student Mitchell Chavarria, who coauthored a research paper identifying mathematically optimal designs for curved frets on a guitar.

“Being a first-generation college student, the idea of entering grad school was quite daunting, as I had no one to really talk to about it. Working with a mentor gave me the opportunity to prove to myself that I could succeed in a graduate level math program.”

– Mitchell Chavarria, '21 MS Mathematics

Upon completion of those projects the undergraduates present talks on their research at a PUMP symposium. Strong mentoring is also key to the program, with faculty mentors attending an orientation that shares best practices for successfully supporting students from underrepresented groups.

Last year Schettler partnered with SJSU’s first PUMP participant, Mitchell Chavarria, on a research paper identifying mathematically optimal designs for curved frets on a

guitar. The paper was accepted by the Bridges Organization, which oversees the world’s premier conference on mathematical connections in art, music, architecture, education, and culture, and the pair presented their results at the 2019 Bridges conference in Austria last summer.

Chavarria is now pursuing an MS degree in Mathematics at SJSU. He intends to apply to Ph.D. programs as well as explore opportunities to teach mathematics at community colleges.



FAR LEFT: Angelina Huynh, '20 MS Chemistry, looks for colony growth of BL21 (DE3) competent cells, a strain of E. coli, on an agar plate containing Luria broth and Ampicillin antibiotic.

LEFT: Johnson Huynh, '21 Biochemistry, is pipetting protein samples into a 96 well plate for a BCA assay used to identify protein concentration.

BELOW: Assistant Professor Ningkun Wang with a model of the X-ray crystallography structure of the human SIRT1 enzyme.

“During the master’s program, I gained a deeper understanding of complex research and technical concepts, preparing me for work in the biotech industry.”

*Angelina Huynh, '20 MS Chemistry*

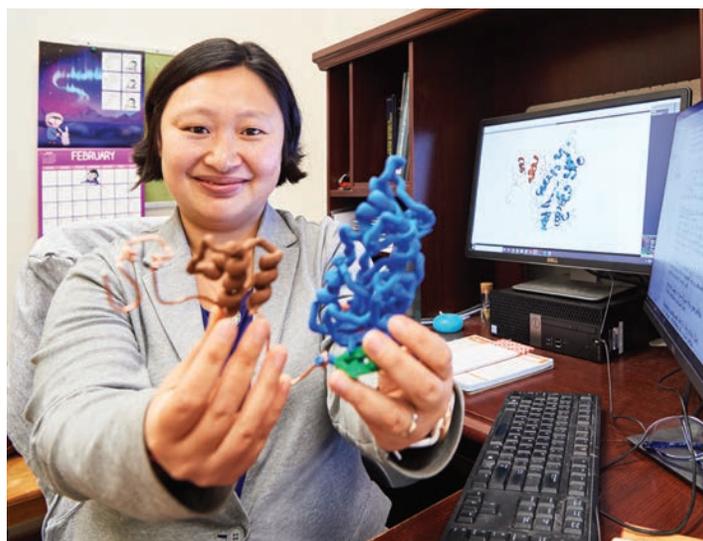
## Ningkun Wang

### Exploring the effects of enzyme movement in cells

“Ever since my Ph.D. advisor introduced me to the concept that proteins are not rigid — that they move, breathe and fluctuate — I’ve been fascinated by their ever-changing properties, and the importance of those properties in regulating protein function,” says Ningkun Wang.

Her interest led to the work she and her students presently do at SJSU: conducting research into enzymes, a subset of proteins, specifically SIRT1. Up-regulating SIRT1 in the cell can alleviate the effects of age-related diseases such as Alzheimer’s and diabetes.

“Our research is in the early stages. But the data that we are collecting is giving us tantalizing hints on how different domains of SIRT1 move in response to a drug-like molecule. If we can understand how to artificially activate SIRT1 using drugs, then we have a new way to treat these diseases,” she explains.



Wang’s undergraduate and graduate students apply what they are learning in her classroom to their lab activities, and she praises their work.

“Students not only perform tasks in the lab, they also contribute intellectually to experimental design and conduct background literature research that help us gain new ideas and approach questions from different angles.”

Lab experience is also helping her students make decisions regarding what career path to follow. Several have gone on to work in the biotech industry at companies such as Intuity Medical and Arcus Biosciences. Others are continuing their studies in order to pursue science-related careers, and one of her students has been accepted to pharmacy school at the University of Colorado Anschutz Medical Campus.

# Hiu Yung Wong

## Developing devices for deeper space survival

In his Multi-Physics and Circuit (M-PAC) lab, Hiu Yung Wong and his students are conducting research on topics ranging from Novel Ultra Wide Bandgap Power Devices to Reduce Carbon Footprint, to Cryogenic Electronics Modeling for Quantum Computing Interface, to Machine Learning in TCAD to Improve Fabrication Yield. This array of projects reflects Wong's interest in developing novel materials, devices, and circuits for a more sustainable world.

While Wong was interested in astronomy and space technology from a young age, he eventually followed an academic and professional path into electrical engineering. After several years of working in the technology industry, he joined the faculty at SJSU and is now fully and enthusiastically engaged in teaching and research.

"My students contribute very creative ideas, not only for research methodologies but also for device physics,

specialized programming, microfabrication flow, and integrated circuit chip design. My research wouldn't be possible without their dedication and involvement."

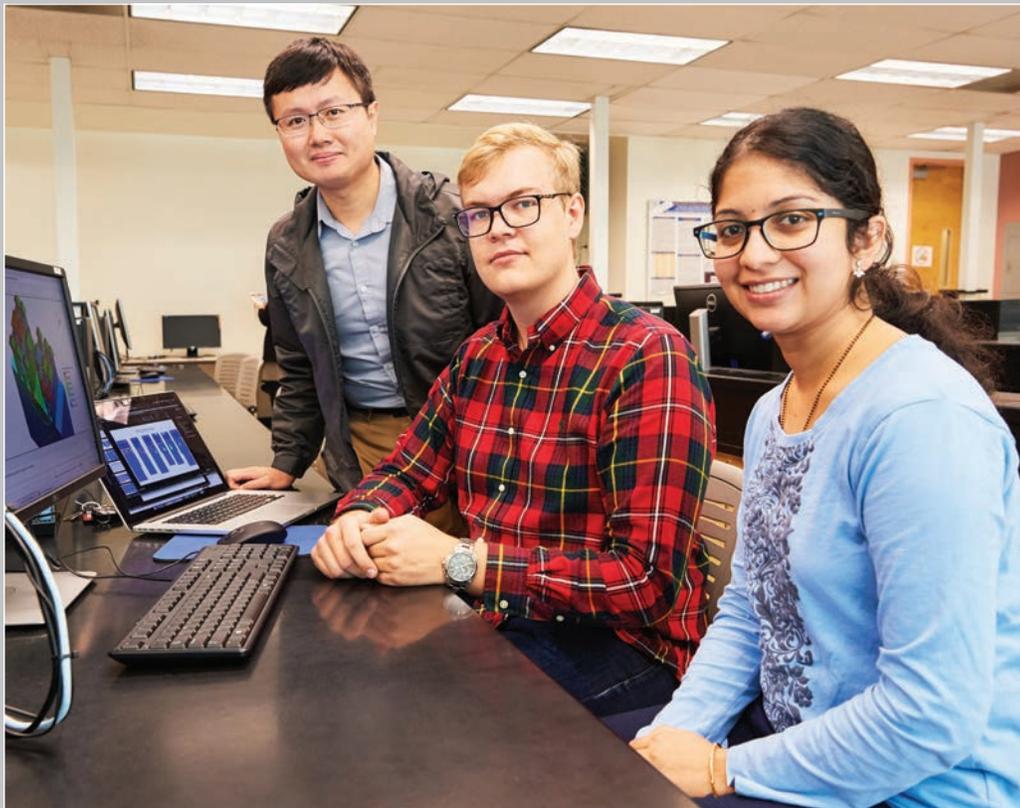
One of his lab's primary activities is the hands-on study of radiation hardness and the reliability of electronic devices and circuits. At present, Wong and his students are applying device physics to examine and model how electronics and circuits behave in outer space.

"All space mission electronics are vulnerable to radiation-induced damage over time," he explains. "We are modeling and evaluating those damaging effects, as well as designing circuits that can self-heal after radiation damage is inflicted."

The ultimate goal is to design electronic circuits that can survive the harsh radiative environment to enable the spaceship to explore the deeper space.

"All these experiences at SJSU are helping me to move in the path that I dreamt of – to become a good analog design engineer."

*Varada Kanchi, '20 Electrical Engineering*



FROM LEFT: Assistant Professor Hiu Yung Wong; Johan Saltin, '20 MS Electrical Engineering; and Varada Kanchi, '20 MS Electrical Engineering in the SJSU M-PAC lab.

# CSU STUDENT RESEARCH COMPETITION

The California State University Student Research Competition is an annual system-wide event where students from the 23 individual CSU campuses showcase their research and creative activities. Students make oral presentations before juries of professional experts from major corporations, foundations, public agencies, colleges, and universities.

Each year San José State University holds its own Student Research Competition, and the finalists go on to represent SJSU at the CSU-wide event. Three of SJSU's finalists received top awards at the 33rd annual CSU Student Research Competition at CSU Fullerton in 2019: Vanshika Gupta, Sarah Ortega, and Sambhav Gupta.

## **Vanshika Gupta**

'20 Biochemistry

First Prize

*“Investigating Macromolecular Structures for the Transformation of Greenhouse Gases Into Liquid Fuels”*

Mentor: Madalyn Radlauer  
Chemistry  
College of Science

## **Sarah Ortega**

'18 MS Aerospace Engineering

First Prize

*“Exploring a Hybrid Design for a Short to Medium Range Transport Aircraft”*

Mentor: Nikos Mourtos  
Aerospace Engineering  
College of Engineering

## **Sambhav Gupta**

'20 Business

Second Prize

*“Artificially Intelligent (AI) Tutors in the Classroom: A Need Assessment Study of Designing Chatbots to Support Student Success”*

Mentor: Yu Chen  
Information Systems & Technology  
College of Business

## SJSU STUDENT 2020 RESEARCH COMPETITION FINALISTS

These 12 students will represent SJSU at the 2020 CSU Student Research Competition:

### **Allison Bui**

Faculty Mentor: Areum Jensen  
Kinesiology, College of Health & Human Sciences  
*“Impaired Autonomic and Cardiovascular Function in Children with Autism Spectrum Disorder”*

### **Apoorva Karekal**

Faculty Mentor: Katherine Wilkinson  
Biological Sciences, College of Science  
*“Development of an Optogenetic Method to Stimulate Gamma Motor Neurons in vitro”*

### **Gurpreet Klar & Niko Rosales**

Faculty Mentor: Liat Rosenfeld  
Chemical & Material Engineering, College of Engineering  
*“Development of a Microfluidic Approach for Rapid and Continuous Detection of Pathogens in Food and Water Samples”*

### **Sovannie Len**

Faculty Mentor: C.J. Duh  
Psychology, College of Social Sciences  
*“In this Global, Multicultural World: Juggling Cultural Identities and Racial Microaggressions”*

### **Junlan Lu, Aldrich Mangune, & Nikhil Saunshi**

Faculty Mentor: Magadalini Elrinaki  
Computer Engineering, College of Engineering  
*“A SERP-Mining Approach for Classification of DNS Requests”*

### **Nivedha Murugesan**

Faculty Mentor: Cristina Tortora  
Mathematics, College of Science  
*“Evaluating Adaptive Ramp Metering through Partial Least Squares Path Modeling”*

### **Grace Shefcik**

Faculty Mentor: Pei-Tzu Tsai  
Communicative Disorders & Science, College of Education  
*“Assessment of Non-binary Individuals’ Self-perception of Voice”*

### **Austin Tse**

Faculty Mentor: Justin Rietz  
Economics, College of Social Science  
*“Finding Optimal Investment Strategies Using Monte Carlo Simulation”*

### **Rachel Windsor**

Faculty Mentor: Megumi Hosoda  
Psychology, College of Social Science  
*“The Moderating Effects of Gender and Occupation on Age Discrimination in Hiring”*

# EARLY CAREER INVESTIGATOR AWARD

## Kimberly Blisniuk and Wilson Yuan Receive ECIA Awards

Assistant Professor Kimberly Blisniuk from the Department of Geology in the College of Science and Assistant Professor Yue “Wilson” Yuan from the Department of Justice Studies in the College of Health and Human Sciences received the SJSU Research



Foundation Early Career Investigator Awards for calendar year 2019. The award recognizes tenure-track SJSU faculty members who have excelled in areas of research, scholarship and creative activity at an early or beginning point in their careers.

Dr. Blisniuk’s research investigates and quantifies how landscapes evolve over time due to earthquakes and climate change. She is particularly interested in earthquakes that are preserved in the landscape along active faults because the rate at which a fault moves is proportional to the fault’s seismic hazard potential. The societal impact of her research is high because data she collects will help refine

earthquake hazard models that forecast the potential of future earthquakes and their recurrence in California.

In 2019 Blisniuk received the National Science Foundation (NSF) CAREER Award, the organization’s most prestigious award in support of early-career faculty. This added to her remarkable track record of funded research grants and awards from organizations such as the U.S. Department of the Interior’s National Earthquake Hazard Reduction Program and the Southern California Earthquake Center. She has made presentations at the American Geophysical Union, the U.S. Geological Survey, Boston University, the California Institute of Technology, UCLA and Université Grenoble. Her publication record is equally impressive. In addition, she has been interviewed as a subject matter expert by Earth and Space Science News, National Geographic Magazine, the New York Times and major television networks.

Dr. Yuan’s research examines the origins of fear of crime and how individuals and communities react to criminal victimization, particularly in Asian and Latino immigrant communities. He explores whether an immigrant’s status is associated with victimization and how immigrants of different racial and ethnic groups mobilize formal and informal resources in response to crime.

Funded by a grant award from the National Institute of Justice, Yuan and six SJSU graduate students are launching an extensive mixed-methods city-level victimization study focused

on the city of San José, California. A survey of local residents’ victimization experiences will be conducted, as will in-depth interviews with residents, police department officials, victim services providers and members of community organizations.



Since arriving at SJSU in 2016, Yuan has published eight peer-reviewed articles on criminal justice and criminology in high-impact journals. With one of his graduate students as lead author, he co-authored “Surveillance-Oriented Security Measures, School Climate, Student Fear of Crime, and Avoidance Behavior,” which appeared in *Victims and Offenders*. He regularly presents at criminology conferences and has made invited research presentations at law schools (Nankai University and Southwestern University of Finance and Economics) and at Harvard University.

# STATEMENT OF ACTIVITIES: FISCAL YEAR ENDING 06/30/2019

## REVENUE AND SUPPORT

Federal Contracts and Grants	\$26,969,228
State Contracts and Grants	7,264,170
Other Contracts and Grants	6,486,829
Indirect Cost Recovery-C&G	8,290,378
Administrative and Program Fees	533,243
Campus Organization Other Revenue and Support	6,739,778
Gifts	1,269,151
Investment Income	1,149,966
Other Revenue and Support	457,752

**Total Revenue** **\$59,160,495**

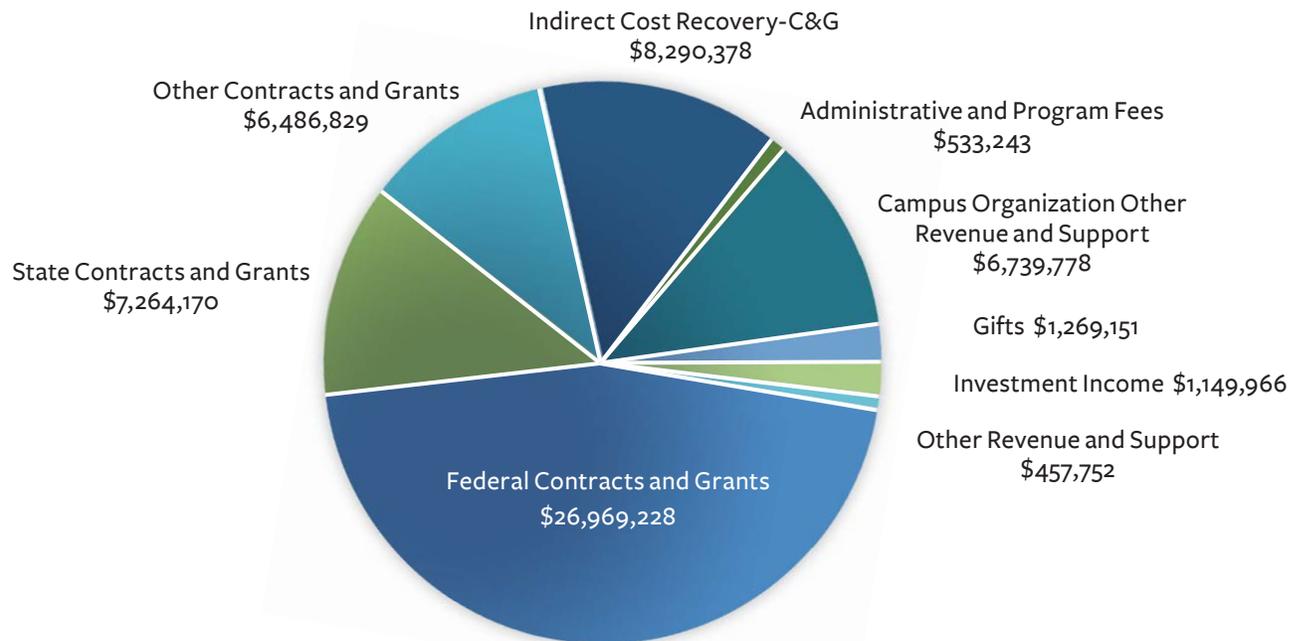
## EXPENSES

Program Activities	
Sponsored Programs	\$40,433,651
Board Designated Programs	1,623,247
Campus Organization Expenditures	8,016,523
Support Activities-Management and General	8,365,067
Other Expenses and Transfers	-0-

**Total Expenses** **\$58,438,488**

## CHANGE IN NET POSITION

	<b>\$722,007</b>
Net Position at beginning of year	\$16,232,271
Net Position at end of year	\$16,954,278



# GRANTS AND CONTRACTS FISCAL YEAR 2018-19

## College of Business

### Dean's Office

**Frances L. Edwards and Karen E. Philbrick**

#### Philbrick

*MTI's Emergency Management Training for VTA*  
Santa Clara Valley Transportation Authority  
\$96,000

*RFP S18024 Emergency Operation Plan Project*  
Santa Clara Valley Transportation Authority  
\$204,133

**Dan Moshavi and Karen E. Philbrick**

*California State University Transportation Consortium (CSUTC) YR 2*  
California State University System  
\$2,000,000

*Mineta Consortium for Transportation Mobility (MCTM)*  
U.S. Department of Transportation  
\$1,400,100

*MTC Leadership Academy Training*  
Metropolitan Transportation Commission  
\$100,000

*MTI Database on Terrorist and Serious Criminal Attacks against Public Surface Transportation*  
U.S. Department of Homeland Security  
\$138,669

*National Summer Transportation Institute Program FY2019*  
California State Department of Transportation  
\$76,679

### Information Systems and Technology

**Leslie Albert, Esperanza Huerta, Scott Jensen and Subhankar Dhar**

*Cyber Training: CIU: SJSU Data Science for All Seminar*  
National Science Foundation  
\$410,060

## College of Education

### Child & Adolescent Development

**Robin Love**

*Better Together - 2018 California Teachers Summit*  
CSU Fullerton  
\$19,954

**Emily Slusser, Maria Fusaro and Andrea N. Golloher**

*Early Childhood STEM Education: Training and Ambassador Program*  
Santa Clara County Office of Education  
\$6,978

## Communicative Disorders & Sciences

**Wendy Quach and June McCullough**

*Project EPICS - Educating Pacific Island Clinicians in Speech*  
U.S. Department of Education  
\$250,000

**Wendy Quach and Pei-Tzu Tsai**

*Project Tapestry: Preparing Culturally Competent Speech-Language Pathologists to Deliver High Quality Services to Children with Disabilities*  
U.S. Department of Education  
\$250,000

## Counselor Education

**Michele C. Burns**

*In-Custody Education Services*  
County of Santa Clara  
\$181,950

## Teacher Education

**Katya Aguilar**

*San Jose State University Single Subject Intern 2018-2019*  
Milpitas Unified School District  
\$75,135

## College of Engineering

### Dean's Office

**Kacey Beddoes**

*CAREER: Characterizing Gendered Socialization of Newcomer Engineers to Promote Inclusive Practices and Retention of a Diverse Workforce*  
National Science Foundation  
\$504,220

*Collaborative Research: Research: Advancing Engineering Education through Peer Review Analysis*  
National Science Foundation  
\$51,718

*Collaborative Research: Improving Interdisciplinary Design Teamwork and Communication Using Boundary Negotiating Artifacts*  
National Science Foundation  
\$129,920

**Sheryl Ehrman**

*Planning Grant: Engineering Research Center for Cognitive Neuro-Engineering*  
UC Davis  
\$35,835

**Farshid Marbouti**

*Researching How You Teach Holistic Modeling (RHYTHM)*  
National Science Foundation  
\$78,045

**Tina Panontin**

*Systems Engineering Subject Matter Expertise/ Research*  
Metis Flight Research Associates  
\$215,265

**Jinny Rhee and Blanca L. Sanchez-Cruz**

*2017-2018 MESA Engineering Program (MEP) @ SJSU*  
Regents of the University of California  
\$10,000

## Aerospace Engineering

**Nikos J. Mourtos**

*NASA MUREP Scholarship- Cameron Young National Aeronautics and Space Administration (NASA)*  
\$2,850

*Scan Drawings from Unitary Wing Tunnels*  
Jacobs, Inc.  
\$51,790

## Biomedical Engineering

**Melinda Simon**

*Isolation of DNA from Single Cells in Microdroplets*  
Lawrence Livermore National Laboratory  
\$26,000

## Chemical & Materials Engineering

**Claire F. Komives**

*Development of a Low-Cost Therapy for Biological Toxins for Rural India*  
U.S. Department of Health & Human Services  
\$108,375

**Dahyun Oh and Katy Kao**

*Microbe-Assisted, Nanostructured Solid-Electrolyte Interphase (SEI) for Long-Lasting Lithium-Ion Batteries with Water Electrolyte*  
LG Chem  
\$150,000

**Anand Ramasubramanian and John Lee**

*The Role of Spatial Heterogeneity in Clot Micromechanics*  
American Heart Association  
\$154,000

# GRANTS AND CONTRACTS

## Civil & Environmental Engineering

### Akthem Al-Manaseer

CSULB and SJSU Joint Training & Certification Program for Caltrans and Industry  
CSU Long Beach Foundation  
\$21,270

### Udeme J. Ndon

Investigation of Reproducibility and Capabilities of Standardized Scaling Test Protocol Using SJSU Water  
Virginia Tech  
\$2,701

## Computer Engineering

### David Anastasiu

CRIL: III: RUI: Effective Protein Characterization via Fast Exact Open Modification Searching  
National Science Foundation  
\$85,843

Intel HIVE Project  
Intel Corporation  
\$25,000

### Ronald Mak

NASA Ames ISRDS-2 Internships  
Stinger Ghaffarian Technologies  
\$114,846

### Simon Sang Shim

Current and Future Trends in Global AI Technology  
Association of Korean-Canadian Science & Engineering  
\$20,000

### Wencen Wu

Modeling, Identification, and Estimation of Distributed Parameter Systems Using Mobile Sensor Networks  
National Science Foundation  
\$298,157

## Electrical Engineering

### Mohamed Badawy

Developing Efficient Photo-voltaic Converters Using Differential Power Processing Concept  
Delta Electronics, Inc.  
\$57,578

### Ping Hsu

Introduction to Engineering Lab Development  
West Valley Community College District  
\$14,967

### Essam A. Marouf

Investigation of Saturn's Rings by Cassini Radio Occultation: Cassini Equinox Mission to Saturn  
Jet Propulsion Laboratory  
\$251,250

### Jonathan Ponniah

Small Unmanned Aerial Systems Spoofing  
Stevens Institute of Technology  
\$5,000

### Hui Yung Wong

CMOS Applications of MST Film Using TCAD  
Atomera  
\$25,219  
Radiation Hardness Projection and Optimization of sub-10nm Technology Node SRAM through Design-Technology-Co-Optimization (DTCO)  
U.S. Department of Defense  
\$26,143

### Juzi Zhao

NeTS: Small: Collaborative Research: Design and Provisioning for Inter-Datcenter Multigranular Flexible Optical Networks  
National Science Foundation  
\$196,217

## Industrial & Systems Engineering

### Hongrui Liu

Proposal to Test/Research Market Clearing Systems for ISO New England  
ISO New England  
\$55,264

### Dan Nathan-Roberts

Proposal for Human Factors Research and Development Guidance of Operating Room Graphical User Interface for STERIS  
Steris Corporation  
\$12,675

UserWise Training Decay Grant

UserWise  
\$100,330

## Mechanical Engineering

### Fred Barez, Louis Freund, and Winifred A. Schultz-Krohn

Autonomous Vehicle (AV) and Mobility-as-a-Service (Maas)  
Confidential Company  
\$197,300

## College of Health and Human Sciences

### Justice Studies

#### Margaret Stevenson

Record Clearance Project - Path to Expungement  
County of Santa Clara  
\$33,500

### Bryce Westlake

Edward Byrne Memorial Justice Assistance Grant Program  
San Benito County Sheriff's Office  
\$7,529

## School of Information

### Lili Luo

Institute for Research Design in Librarianship (IRDL)  
Loyola Marymount University  
\$21,441

### Kristen R. Rebmann

Native American Community Anchors: TV Whitespaces for Tribal Connectivity, Equity, and Inclusion  
Institute of Museum & Library Services  
\$249,882

## Nutrition, Food Science, and Packaging

### Ashwini Wagle

Cal-Pro-Net Center 2018-2019  
California Department of Education  
\$121,355

## School of Nursing

### Deepika Goyal

ADN to BSN RN Bridge Program - TVSON/EVC Collaborative - AY 2019-21  
San José Evergreen Communicative College District  
\$158,090

## School of Social Work

### Edward Cohen

Independent Evaluator for the Co-Occurring Substance Abuse and Mental Health Adult Drug Court Program  
Superior Court of California, County of Santa Clara  
\$30,000

### Laurie Drabble

Sexual Orientation Differences: Prevalence & Correlates of Substance Use and Abuse  
Public Health Institute  
\$38,145

### Peter Allen Lee

BHWET Integrated Behavioral Health MSW Stipend Program  
UC Berkeley  
\$110,000  
Title IV-E Child Welfare Training 2018-2019  
UC Berkeley  
\$1,734,815

## College of Humanities and the Arts

### Art & Art History

#### Anne Simonson

Bay Area California Arts Project (BayCAP)  
2018-19  
Regents of the University of California  
\$10,000

### English & Comparative Literature

#### Jonathan H. Lovell

San Jose Area Writing Project 2018-2019 - CSMP  
UC Berkeley  
\$32,185

San Jose Area Writing Project 2018-2019 - CSMP/  
ESSA Federal  
UC Berkeley  
\$39,082

San Jose Area Writing Project NWP 2019-2020  
C3WP Grant  
National Writing Project  
\$15,000.00

#### Richard McNabb and Kelly Harrison

Arguing the Humanities: A Course for STEM  
Students  
National Endowment for the Humanities  
\$100,000

#### Cathleen Miller

Center for Literary Arts Program Funding  
2018-2019  
City of San José  
\$15,000

## College of Science

### Dean's Office

#### Elaine D. Collins

SJSU MESA School Programs SJSU Agreement  
(Partner School Site: Lincoln High School &  
Gunderson)  
San José Unified School District  
\$4,410

SJSU MESA Schools Program (MSP) Academic  
Year 2018-2019  
Regents of The University of California  
\$210,000

SJSU MESA Schools Program - Downtown  
College Prep  
Downtown College Prep  
\$8,820

#### Michael J. Kaufman

An upGREAT Map in M20  
University Space Research Association  
\$37,200

### Biological Sciences

#### Bree Grillo-Hill

Roles for Intracellular pH Dynamics in Cancer  
Cell Behaviors  
U.S. Department of Health & Human Services  
\$83,669

#### Cleber C. Ouverney

MARC U\*STAR at San José State University  
U.S. Department of Health & Human Services  
\$273,203

#### Julio Soto, Miri K. VanHoven, and

#### Rachael L. French

REU Site: Research by Undergraduates using  
Molecular Biology Applications (RUMBA)  
National Science Foundation  
\$127,565

#### Miri K. VanHoven

Molecular Mechanisms that Regulate Neural  
Circuit Formation  
U.S. Department of Health & Human Services  
\$438,583

Olfactory Memory Acquisition Consolidation  
and Recall  
UC San Francisco  
\$122,825

#### Katherine Wilkinson

Control of Muscle Proprioceptor Sensitivity  
U.S. Department of Health & Human Services  
\$108,375

### Chemistry

#### Lionel E. Cheruzel

RU: Light-Driven Selective Chemoenzymatic C-H  
Functionalization  
National Science Foundation  
\$231,283

#### Laura C. Miller-Conrad

Blocking Cationic Antimicrobial Peptide-  
Resistance in Pseudomonas Aeruginosa  
U.S. Department of Health & Human Services  
\$108,375

#### Alberto A. Rascon, Jr.

Vector Control Strategy Through Inhibition of  
Aedes Aegypti Midgut Proteases  
U.S. Department of Health & Human Services  
\$108,375.00

#### Karen A. Singmaster

CSU SJSU LSAMP Program 2018-2019  
CSU Sacramento  
\$17,000

CSU SJSU LSAMP Program 2018-2019  
CSU Sacramento  
\$43,000

#### Karen A. Singmaster, Cleber C. Ouverney, and Alberto A. Rascon, Jr.

San Jose State University RISE Program  
U.S. Department of Health & Human Services  
\$563,811

#### Roger H. Terrill

Evaluation of Optical Properties of Some High  
Refractive Index Materials  
Sahajanand Technologies Pvt. Ltd  
\$13,440

#### Annalise L. Van Wyngarden

Undergraduate Summer School in Nuclear and  
Radiochemistry  
University of Missouri  
\$99,742

#### Ningkun Wang

Intramolecular Allosteric Regulation of SIRT1  
Deacetylase Activity by the N-terminal Domain  
U.S. Department of Health & Human Services  
\$131,546

#### Abraham Wolcott

Fluorescent Enhancement of the Nitrogen  
Vacancy Center in Nanoscale Diamond for  
Bioimaging Applications  
U.S. Department of Health & Human Services  
\$325,125

Fundamental Surface Science of Nanoscale  
Diamond and their Interaction with Biological  
Surfaces

U.S. Department of Defense  
\$600,000

### Geology

#### Kimberly Blisniuk

CAREER: Re-Evaluating the Evolution of the  
Southern San Andreas Fault along its Restraining  
Bend from Holocene to Mid-Quaternary  
Timescales via <sup>36</sup>Cl/<sup>10</sup>Be Burial and Cosmogenic  
Exposure Dating  
National Science Foundation  
\$313,691

Determining the Distribution of Slip Across the  
Northern San Andreas Fault System through  
Long-term Fault Slip Rates on the Rodgers Creek  
Fault, Northern California  
U.S. Department of Interior  
\$70,759

Identifying Faults and Earthquakes, and their  
Potential Association with Mass Wasting Along  
the Seal Cove Strand of the San Gregorio Fault in  
San Mateo County  
U.S. Department of Interior  
\$21,488

Quantifying the Geologic and Geodetic  
Distribution and Transfer of Slip Rate on the  
Southern San Andreas Fault  
U.S. Department of Interior  
\$23,948

# GRANTS AND CONTRACTS

## Meteorology & Climate Science

### **Alison F.C. Bridger**

*SJSU Unidata Equipment Proposal*  
University Corporation for Atmospheric  
Research  
\$10,000

*Understanding “B” Regional Dust Storms on  
Mars*

National Aeronautics and Space Administration  
(NASA)  
\$158,794

### **Sen Chiao**

*Detailed Quantitative Precipitation Forecasts  
for Santa Clara Valley Water District*  
Santa Clara Valley Water District  
\$24,992

*The NOAA Cooperative Science Center in  
Atmospheric Sciences and Meteorology*  
Howard University  
\$100,000

### **Craig B. Clements**

*Monitoring Plume Structures and Boundary  
Layer Characteristics during Wildfires in the  
Western US*  
U.S. Forest Service  
\$60,000

*PREEVENTS: Track 2: Understanding Extreme  
Fire Weather Hazards and Improving Resilience  
in Coastal Santa Barbara, CA*  
UC Santa Barbara  
\$86,498

### **Minghui Diao and Sen Chiao**

*ROSES-2015/Health and Air Quality Applied  
Sciences Team*  
National Aeronautics and Space Administration  
(NASA)  
\$183,675

## Mathematics & Statistics

### **Sogol Jahanbekam**

*Collaborative Research: Improving Design for  
Additive Manufacturing through Physically  
Integrated Design Concepts Generated from  
Computationally Efficient Graph Coloring  
Techniques*  
National Science Foundation  
\$135,866

### **Julie S. Spitzer, Jordan Schettler, and Cheryl D. Roddick**

*Santa Clara Valley Mathematics Project  
(CSMP - State)*  
Regents of The University of California  
\$20,000

### **Julie S. Spitzer, Cheryl D. Roddick, and Jordan Schettler**

*Santa Clara Valley Mathematics Project 18-19*  
Regents of The University of California  
\$24,223

### **Liam Stanton**

*Continuum Modeling of Cellular Membranes and  
Oncogenic Proteins*  
Lawrence Livermore National Laboratory  
\$98,461

### **Yan Zhang**

*Consensus Protocol Research for Ethereum 2.0  
Beacon Chain*  
Ethereum Foundation  
\$25,000

### **Yan Zhang and Cristina Tortora**

*CAMCOS Intuit: Intuit-CAMCOS MLT*  
Intuit Inc.  
\$33,177

## Moss Landing Marine Labs

### **Ivano W. Aiello**

*Participation of Scientists Based at U.S.  
Institutions in the IODP on Expedition 385*  
Columbia University  
\$58,461

### **Ivano W. Aiello and Ryan Portner**

*Acquisition of X-Ray Diffraction Instrumentation  
for Mineralogical Research*  
National Science Foundation  
\$144,158

*Elkhorn Slough Foundation Project - Advanced  
Geospatial and Geotechnical Services and  
Development of Materials to Inform On-Going  
Estuarine*  
Elkhorn Slough Foundation  
\$155,000

### **Joseph J. Bizzarro**

*Applications of Life History and Fisheries Data  
for Improved Management of Skates*  
UC San Diego  
\$55,261

### **Holly A. Bowers and G. Jason Smith**

*Advancing Portable Detection Capabilities  
of Harmful Algal Bloom Species in California  
Waters*  
University of Southern California  
\$77,571

### **Dustin Carroll**

*ECCO-Darwin Model Exploration of Physical and  
Biogeochemical Interactions in the Land-Sea  
Continuum*  
Jet Propulsion Laboratory  
\$153,924

### **Ross P. Clark**

*Agreement Number 15446 - Developing and  
Validating Assessment Tools for Ephemeral  
Streams*  
Southern California Coastal Water Research  
Project  
\$49,661

*Spatial Representativeness of Bioassessment  
Results for Channels with Engineered Features*  
Southern California Coastal Water Research  
Project  
\$20,000

### **Thomas Connolly, Kenneth H. Coale, and G. Jason Smith**

*CeNCOOS: Long-Term Monitoring of  
Environmental Conditions in Support of Marine  
Area Management in Central and Northern CA*  
Monterey Bay Aquarium Research Institute  
\$61,000

### **Rocio Illiana Cooley**

*A Novel Approach to Identify Sources, Transfer  
and Impact of Domoic Acid in Marine Food Webs*  
UC San Diego  
\$74,514

### **Colleen A. Durkin**

*Linking Sinking Particle Chemistry and Biology  
w/Changes in the Magnitude and Efficiency of  
Carbon Export into Deep Ocean*  
Skidmore College  
\$76,126

### **Luke Gardner, Michael Graham, and Scott L. Hamilton**

*Sea Feeds: Identification and Culture of  
Californian Marine Macroalgae Capable of  
Reducing Greenhouse Gas Production from  
Ruminant Livestock*  
UC San Diego  
\$205,759

### **Jonathan B. Geller**

*Metagenetic Analysis of Zooplankton of Port  
Valdez Alaska*  
Prince William Sound Regional Citizens Advisory  
Council  
\$8,022

### **Michael Graham**

*MLML15 Tank Setup & Seaweed Growth Testing*  
Google, Inc.  
\$35,519

### **H. Gary Greene and Joseph J. Bizzarro**

*Biological and Essential Fish Habitats  
Assessments of Marine Fauna in the Vicinity of  
the Monterey Bay Aquarium Seawater Intake  
Pipelines*  
Monterey Bay Aquarium Research Institute  
\$16,325

## FISCAL YEAR 2018-19

### **Scott L. Hamilton**

*Evaluating Performance of California's MPA Network through the Lens of Sandy Beach and Surf Zone Ecosystems*  
UC Santa Barbara  
\$64,077

### **Scott L. Hamilton and Richard M. Starr**

*California Collaborative Fisheries Research Program - Monitoring and Evaluation of California Marine Protected Areas*  
UC San Diego  
\$1,000,000

### **James Harvey**

*RV Use for Monthly Water Samples*  
Applied Marine Sciences Inc.  
\$80,000

*Waterfowl Ecology and Management Suisun Marsh*  
Suisun Resource Conservation District  
\$560,695

### **James Harvey and Brian Ackerman**

*Carl Moyer Program Grant Contract*  
Association of Monterey Bay Area Governments  
\$199,416

### **James Harvey and Jonathan Mike Prince**

*Auxiliary General Purpose Oceanographic Research (AGOR) Support Services*  
Office of Naval Research  
\$161,209

### **Wesley A. Heim**

*DWR-46-9668: Mercury and Methylmercury Sampling and Analysis*  
California State Department of Water Resources  
\$19,980

*DWR Yolo Bypass Mercury Studies*  
California State Department of Water Resources  
\$369,199

### **Wesley A. Heim and Autumn L. Bonnema**

*Contract No: 1287 - San Francisco Estuary Institute/Aquatic*  
San Francisco Estuary Institute  
\$73,333

*SWRCB Agreement Number: 17-023-270*  
California State Water Resources Central Board  
\$232,620

### **Birgitte McDonald**

*Enhanced Stranding Response and Training for the Future on the Central California Coast*  
UC Santa Cruz  
\$3,539

*Heart Rate Logging in Deep Diving Toothed Whales; a New Tool for Assessing Responses to Disturbance*  
Office of Naval Research  
\$28,954

*The Hidden Lives of Emperor Penguins: Cameras and Movement Loggers Provide Insight into Foraging of an Antarctic Icon*  
National Geographic Society  
\$26,004

*The Hidden Lives of Emperor Penguins: Cameras and Movement Loggers Provide Insight into Foraging of an Antarctic Icon*  
SeaWorld & Busch Gardens Conservation Fund  
\$10,000

*UC Davis Agreement #32751-Support for California Sea Lion Unusual Mortality Even*  
UC Davis  
\$62,750

### **Kimberly A. Null and Ross P. Clark**

*Characterizing Shallow Groundwater Nutrient Sources in Central Coast Sloughs*  
UC San Diego  
\$77,960

### **Marco A. Sigala**

*USACE Ogluuga Island Remedial Investigation, Ogluuga Island, AK*  
Ahtna Environmental Inc.  
\$20,000

*San Francisco Estuary Regional Monitoring Program For Water Quality In San Francisco Bay*  
San Francisco Estuary Institute  
\$183,136

### **G. Jason Smith**

*The Alliance for Coastal Technologies (ACT): National-Scale Efforts Toward Verification and Validation of Observing*  
University of Maryland Center for Environmental Science  
\$200,000

### **Richard M. Starr**

*Monitoring and Evaluation of Mid-Depth Rocky Reef Ecosystems in the MLPA Marine Protected Area Network*  
UC San Diego  
\$2,400,000

### **Diana L. Steller**

*Minimizing Disturbance Impacts by California Vessel Mooring Systems on Living Rhodolith Benthos in Catalina MPAs: an Experimental Assessment*  
UC San Diego  
\$40,580

### **Alison Stimpert**

*Data Analysis of Passive Acoustic Data (PAM) from Rockfish Behavioral Response Study*  
U.S. Department of Commerce  
\$35,000

*Soundscape Characterization in the National Marine Sanctuaries Using Passive Acoustic Monitoring*  
Naval Postgraduate School  
\$31,613

### **Nicholas A. Welschmeyer**

*DNV GL Kurita Ballast Project*  
California Maritime Academy  
\$423,290

*PIA - Evoqua Ballast Project*  
California Maritime Academy  
\$97,181

*PIA - Gensys/Oscar Ballast Project*  
California Maritime Academy  
\$423,290

### **Mark Yarbrough**

*Marine Optical Buoy (MOBY) Operations and Technology Refresh.*  
University of Miami  
\$2,310,000

### **Jenifer Zeligs**

*Investigating Sea Lion Locomotion*  
West Chester University  
\$15,000

## Physics & Astronomy

### **Ranko Heindl and David Brook**

*MRI: Acquisition of a Physical Properties Measurement System VersaLab for Research in the Areas of Spintronics and Advanced Nanostructured Magnetic Materials*  
National Science Foundation  
\$400,659

### **Michael J. Kaufman**

*Using the Astronomical Infrared Bands as Calibrated Probes of Astrophysical Conditions with the NASA Ames PAH IR*  
National Aeronautics and Space Administration (NASA)  
\$544,965

### **Ehsan Khatami**

*RUI: Exact Dynamical Properties of Strongly Correlated Materials at Finite Temperatures*  
National Science Foundation  
\$235,829

### **Aaron J. Romanowsky**

*Dark Matter and Stellar Populations in a Benchmark Ultra-diffuse Galaxy*  
Jet Propulsion Laboratory  
\$14,000

### **Aaron J. Romanowsky, James Michael Parrish and Michael J. Kaufman**

*Collaborative Research: A Bridge to Physics & Astronomy Doctorates for Students with Financial Need*  
National Science Foundation  
\$471,343

# GRANTS AND CONTRACTS

## College of Social Sciences

### Environmental Studies

#### Katherine Kao Cushing

*CommUniverCity: Community Leadership*

Program FY2018-19

City of San José

\$50,000

*CommUniverCity: Community Services Program*

FY 2018-19

City of San José

\$100,000

*Coyote Creek Education Project*

Keep Coyote Creek Beautiful

\$34,947

#### Bruce Olszewski

*Household Hazardous Waste Hotline*

County of Santa Clara

\$45,607

*Household Hazardous Waste (HHW) Hotline*

County of Santa Clara

\$42,273

*Recycling Hotline*

County of Santa Clara

\$72,270

*Recycling Hotline 19-20*

County of Santa Clara

\$79,980

### Political Science

#### Garrick Percival

*IPACE Internship Program FY 2018-2019*

Office of Jim Beall, California State Senator

\$6,640

*IPACE Internship Program FY 2019-2020*

Office of Jim Beall, California State Senator

\$6,659

### Psychology

#### Kevin Gregory

*2019 Fatigue Management Training for San*

*Francisco Bar Pilots*

California Maritime Academy

\$4,000

*Fatigue Management Project Proposal*

Puget Sound Pilots

\$119,354

#### Alan N. Hobbs

*San Francisco Bar Pilot Fatigue Study*

Board of Pilot Commissioners

\$56,814

#### Sean P. Laraway

*Human Systems Integration: Collaborative*

*Human Factors Research to Improve Safety,*

*Efficiency, and Reliability of NASA's Aeronautics*

*and Space Missions*

National Aeronautics and Space Administration

(NASA)

\$12,824,353

*Test Subject Recruitment Office*

ASRC Federal

\$301,785

#### Randall Mumaw

*Technologies for Indicating System Status and*

*Dependencies during Complex Non-Normal*

*Situations*

University of Iowa

\$40,000

#### David Schuster

*CAREER: Understanding the Cognitive Processes*

*of Computer Network Defense*

National Science Foundation

\$115,545

#### Susan M. Snycerski

*Advanced Rotorcraft Research: Adaptive*

*Autonomy, Future Lift Systems, and Human-*

*Centered Display Design*

National Aeronautics and Space Administration

(NASA)

\$3,649,916

*Implementing Macroergonomics for Increasing*

*the Safe, Effective, and Efficient Operation of the*

*Entry Systems and Technology Division's High*

*Enthalpy Facilities*

National Aeronautics and Space Administration

(NASA)

\$257,568

## University Programs

### Associated Students

#### Heather Vise

*CCAMPIS - Child Care Access Means Parents in*

*School*

U.S. Department of Education

\$256,154

### Provost's Office

#### Carl Kemnitz

*Transforming College Teaching: Statewide*

*Implementation of the Faculty Learning*

*Program to Improve STEM Undergraduate*

*Teaching and Learning*

UC Berkeley

\$32,379

### Student Academic Success Services

#### Patricia A. Backer

*Project Succeed: 2013 Title III Strengthening*

*Institutions Program*

U.S. Department of Education

\$449,752

#### Maria E. Cruz

*ASPIRE (Student Support Services) - San Jose*

*State University*

U.S. Department of Education

\$471,327

*The Ronald E. McNair Post-baccalaureate*

*Achievement Program*

U.S. Department of Education

\$267,450

### Student Affairs, Counseling Services

#### Wei-Chien Lee

*Outcome Study of the Garrett Lee Smith (GLS)*

*Campus Suicide Prevention Grant*

U.S. Department of Health & Human Services

\$95,099

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# ANNUAL REPORT

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