

UNIVERSITY OF CALIFORNIA

Fact Sheet: UC Research and the National Science Foundation

The University of California (UC) is an economic engine for California and the nation – due in large part to National Science Foundation (NSF) funding. NSF has a broad mission: “to promote the progress of science; to advance the national health, prosperity, and welfare; [and] to secure the national defense.”

- UC researchers consistently earn two-to-three times more NSF support than any other university system.
- In Fiscal Year 2015, UC successfully competed for \$509 million in NSF funding on more than 2,100 grant awards – which represents over half the total for all California institutions.
- UC’s NSF-funded research addresses key areas – biology; computing; geology and earth sciences; social sciences; engineering; and science education.
- With NSF funding, UC advances knowledge, builds technical expertise, drives innovation, helps to create new businesses and trains tomorrow’s scientific workforce.

Strong funding for the National Science Foundation across all research disciplines is critical for UC scientists and graduate students to tackle our nation’s great challenges and expand knowledge of our world and the universe.

UC supports \$8 billion for NSF in Fiscal Year 2017.

The following are UC research projects on water, environment, energy, sustainability and STEM education that were funded by NSF.



UC Berkeley – NSF I-Corps supports commercialization of mercury sensors

UC Berkeley leads the Bay Area NSF Innovation Corps (I-Corps) Node, in partnership with UCSF and Stanford. Through the Haas School of Business, UC Berkeley trains researchers in the skills needed to become entrepreneurs. Spun out of UC Berkeley and the Lawrence Berkeley National Lab in 2013, Picoyune was founded by I-Corps team members and NSF grant recipients Jay James and Jeff Crosby to commercialize plasmonic sensors to replace expensive equipment with devices anyone can use. The technology is used to monitor for mercury, which can damage equipment and lead to catastrophic failures at natural gas plants. Picoyune technology is also used to analyze contaminated sites and monitor emissions from coal power and cement plants. *NSF Innovation Corps Program.*



UC Davis – Hands-on watershed science education tool

UC Davis researchers Geoff Schladow and Louise Kellogg have created the Augmented Reality Sandbox -- a hands-on exhibit that combines sand with virtual topographic contour lines and water simulations. Users can create customized models of mountains, valleys and water flows to demonstrate how quickly lakes and rivers fill up after storms and how water moves through the system. It is available to science museums and schools to teach students geographic, geologic and hydrologic concepts, such as how to read topographic maps and understand watersheds. *NSF Advancing Informal STEM Learning Program.*



UC Irvine – Computer models for improved precipitation estimates

A UC Irvine team, led by Soroosh Sorooshian, is developing computational science methods and Machine Learning techniques to improve global precipitation estimates. Climate variability and change cause uncertainty in freshwater resource planning and management. Because extreme events -- flooding and drought -- are becoming more frequent and severe, better information will help communities prepare for and respond to such crises. *NSF Cyber-Innovation for Sustainability Science and Engineering Program.*



UCLA – Understanding LA County’s water infrastructure

UCLA Professor Stephanie Pincetl researches the hidden hydrologic cycle of Los Angeles to understand the water delivery infrastructure of the nation’s most populous county, which involves more than 100 public, private and nonprofit water providers. This work is a first of its kind and is being used to advance the sustainability of water resources in the region and support future water infrastructure needs. *NSF Water, Sustainability and Climate Program*



UC Merced – Understanding water, soil and forest health in the Sierras

The Southern Sierra Critical Zone Observatory (SSCZO) is an NSF-supported research platform on “critical zone” processes in the Sierras. Led by Professor Roger Bales, the SSCZO is a strategic partnership between UC Merced and the US Forest Service Pacific Southwest Research Station. The SSCZO science model is based upon linkages between water, nutrients and material fluxes, and landscape and climate variability across the rain-snow transition in the Sierras. *NSF Low Temperature Geochemistry Program*



UC Riverside – Exploring Earth’s persistent habitability

UC Riverside Professor Tim Lyons is exploring four billion years of Earth’s history as a guide in the search for life on distant worlds. Using a variety of sophisticated chemical tools, Lyons’ research examines how Earth has remained persistently inhabited for 4.5 billion years – illuminating our origins and informing the search for life on other planets. *NSF Sedimentary Geosciences and Paleobiology Program*



UC San Diego – How plants lose water in photosynthesis

UC San Diego researcher Julian Schroeder helps scientists develop crops that use less water at a time of rising CO₂ in the atmosphere. Schroeder’s research reveals the molecular and cellular mechanisms at work in processing CO₂ through photosynthesis, which cause plants to lose water via evaporation. Over eighty percent of fresh water is used for agriculture in arid and semi-arid regions globally, including California. Schroeder’s research is attracting commercial attention. *NSF Cellular Dynamics and Function Program*



UC San Francisco – Biological research and STEM education

In addition to ground-breaking biological, human health and medical technology research, UC San Francisco is a leader in science education. Since 1989, UCSF has directed a science internship program to mentor San Francisco high school students who work in laboratories, conduct experiments independently and present scientific research findings. With NSF support, UCSF helps Bay Area students succeed in school and gain hands on experience for future careers in science. *NSF Presidential Awards for Excellence in Science, Mathematics and Engineering Mentoring Program*



UC Santa Barbara – Assessing the resiliency of the nation’s energy-water system

UC Santa Barbara researcher Sangwon Suh is working on the “Energy-Water Nexus” national grand challenge. The electric power sector is the nation’s leading user of fresh water, and grid reliability and climate change adaptation can present difficult problems for water and electricity systems. This research explores how these systems can be maintained given rising demand and anticipated climate changes. *NSF Water Sustainability and Climate Program*



UC Santa Cruz – Renewable energy and microgrid reliability

Professor Michael Isaacson at the UC Santa Cruz Center for Sustainable Energy and Power Systems directs a collaborative project to address technical, social, and economic aspects of community-scale renewable energy microgrids. Intermittent resources, global exchange and market volatility require new strategies. The project also involves Danish researchers in a virtual research, development and education center. *NSF Partnership for International Research and Education (NSF-PIRE)*

If you have questions about the ongoing NSF-sponsored research at the University of California, please contact the UC Office of Federal Governmental Relations at 202-974-6300.