



Annual Report FY22

Greetings,

In the fourth year of the UC Santa Cruz's Office of Research Annual Report, I am excited to highlight the variety of research and creative work happening on our exciting campus. UCSC continues to address critical societal, research and creative opportunities through innovative and collaborative approaches. The accomplishments in this report represent our commitment to the innovators and changemakers at UC Santa Cruz as we support them in moving their research forward and out into our community, state, and the world.

Through this report we acknowledge the work and efforts of the many staff, divisional partners and others who all make UCSC research possible.

To learn more about how the Office of Research supports research and technology commercialization, I encourage you to visit our website at officeofresearch.ucsc.edu.

Sincerely,



John MacMillan

Interim Vice Chancellor for Research
Professor of Chemistry and Biochemistry





Contents

- 5 Extramural Funding
- 10 Office of Research Highlights
- 19 Highlighted Research Units
- 24 Divisional Highlights

FY22 AT A GLANCE



\$210M
in extramural
funding*



12.1%
increase in
extramural
funding*



17.6%
higher value
of award

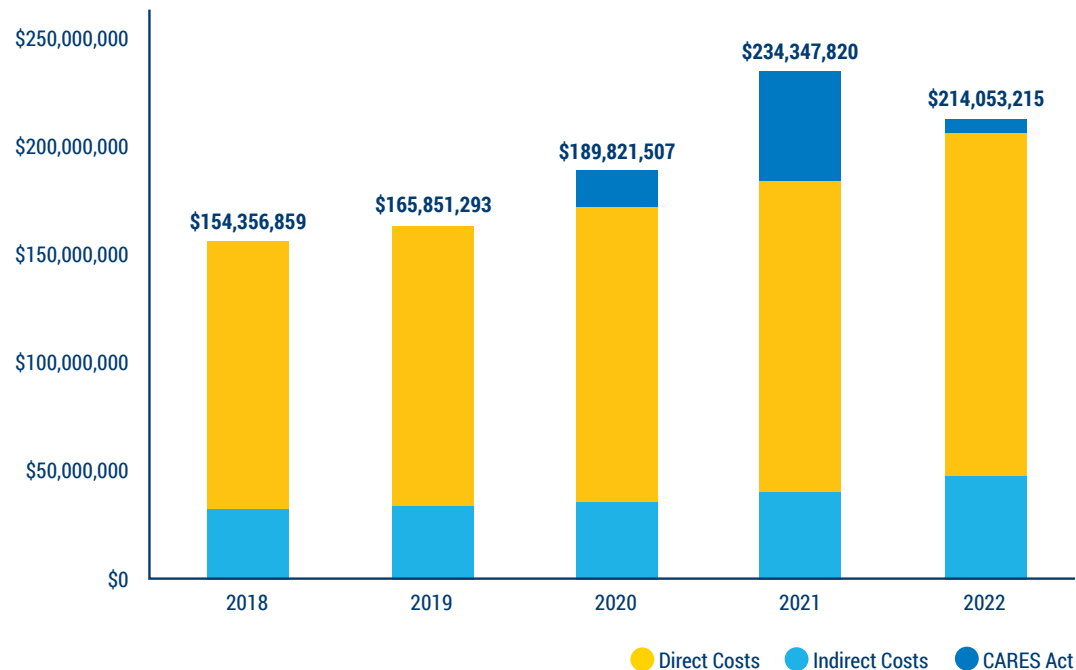
Extramural Funding





Extramural Funding

Total Award Funding





Extramural Funding

FY22 Award Funding Source

● Federal*

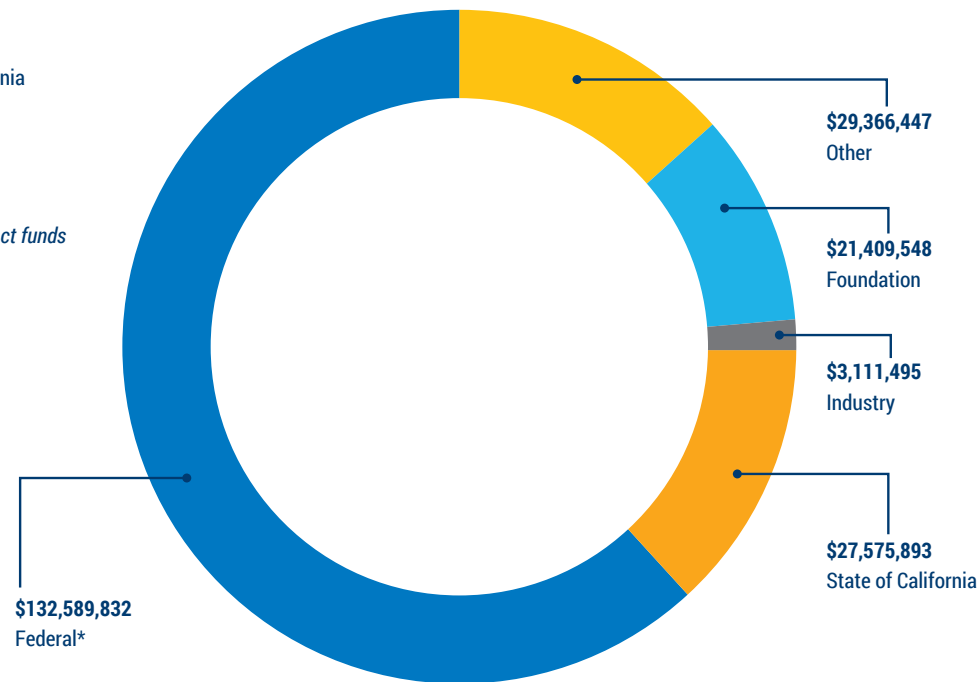
● State of California

● Industry

● Foundation

● Other

**Includes CARES Act funds*

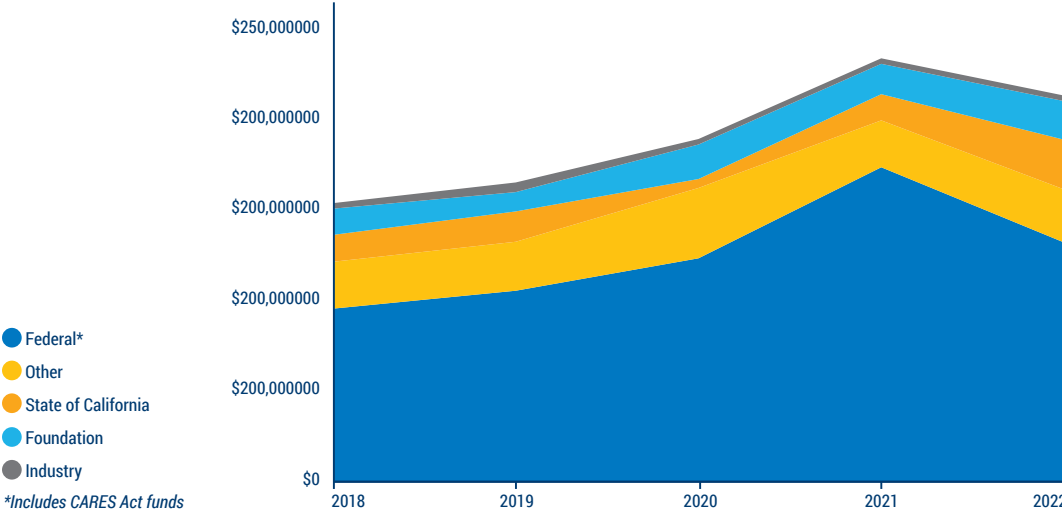




Extramural Funding

Funding Source Trends

	FY18	FY19	FY20	FY21	FY22
FEDERAL	\$96,127,857	\$105,715,493	\$123,653,255*	\$174,053,323*	\$132,589,832*
OTHER	\$25,781,212	\$27,254,304	\$38,944,788	\$26,114,651	\$29,366,447
STATE OF CAL	\$14,888,333	\$16,704,825	\$5,292,834	\$14,608,813	\$27,575,893
FOUNDATION	\$14,633,043	\$10,786,685	\$18,764,130	\$16,749,150	\$21,409,548
INDUSTRY	\$2,926,414	\$5,389,986	\$3,166,500	\$2,821,883	\$3,111,495





Extramural Funding

Awards by Funding Source

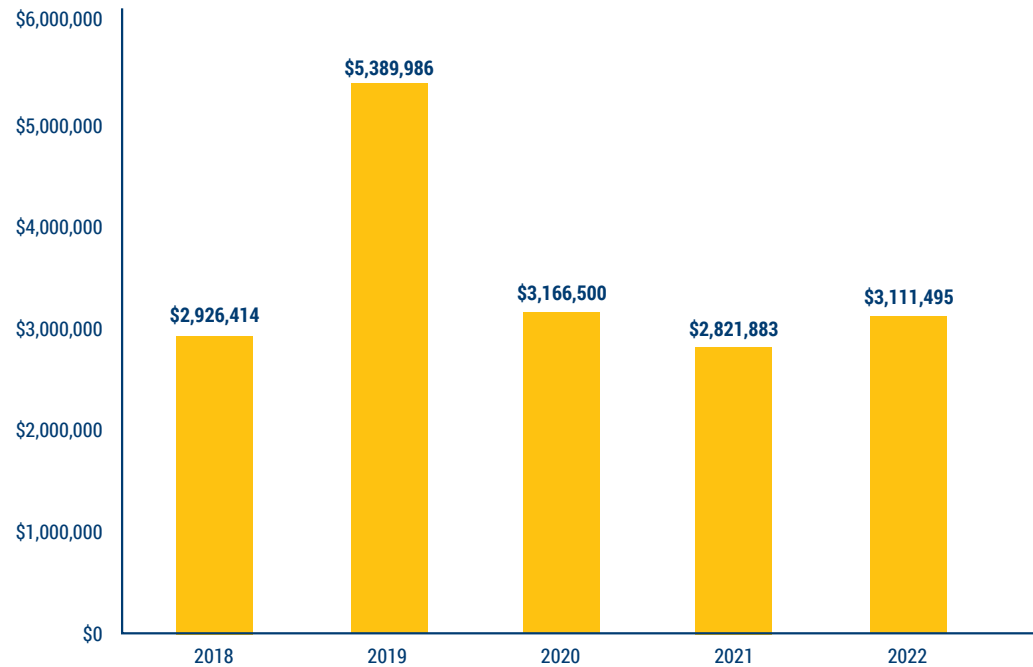
	DIRECT	INDIRECT	2022 TOTAL		2021 TOTAL
Bureau of Ocean Energy Management, Regulation & Enforcement	\$410,729	\$37,271	\$448,000	↓	\$492,885
Dept of Ed*	\$9,308,994	\$364,199	\$9,673,193	↓	\$52,810,545
DoD	\$8,201,073	\$2,257,059	\$10,458,132	↓	\$11,634,208
DOE	\$5,728,422	\$1,601,792	\$7,330,214	↓	\$9,013,235
Geological Survey - USGS	\$335,151	\$58,652	\$393,803	↓	\$461,578
NASA	\$4,503,211	\$1,599,558	\$6,102,769	↑	\$5,541,935
National Institute of Standard and Technology - NIST	\$162,337	\$87,662	\$249,999	↑	\$107,745
NEH	\$221,968	\$10,032	\$232,000	↑	\$60,000
NIH	\$42,687,698	\$14,540,187	\$57,227,885	↑	\$54,422,837
NOAA	\$6,210,623	\$1,540,288	\$7,750,911	↓	\$10,299,014
NSF	\$17,173,481	\$5,389,161	\$22,562,642	↑	\$22,413,642
U.S. Agency for International Development (USAID)	\$247,851	\$49,773	\$297,624	↑	\$229,588
USDA	\$882,558	\$323,217	\$1,205,775	↓	\$2,377,388
USDI	\$2,058,703	\$316,803	\$2,375,506	↑	\$1,325,883
Other Federal	\$5,005,303	\$1,276,076	\$6,281,379	↑	\$2,862,840
State of California	\$23,368,914	\$4,206,979	\$27,575,893	↑	\$14,608,813
Industry	\$2,577,338	\$534,157	\$3,111,495	↑	\$2,821,883
Andrew W. Mellon Foundation	\$2,247,000	\$0	\$2,247,000	↑	\$0
David and Lucile Packard Foundation	\$1,557,542	\$223,544	\$1,781,086	↑	\$274,642
Gordon and Betty Moore Foundation	\$4,154,566	\$337,636	\$4,492,202	↑	\$1,141,111
Heising-Simons Foundation	\$1,023,166	\$135,214	\$1,158,380	↓	\$1,710,672
James Irvine Foundation	\$1,461,054	\$191,946	\$1,653,000	↑	\$10,000
John Templeton Foundation	\$1,028,087	\$154,214	\$1,182,301	↑	\$0
Silicon Valley Community Foundation	\$290,558	\$43,584	\$334,142	↓	\$5,088,559
Simons Foundation	\$861,873	\$172,374	\$1,034,247	↑	\$1,020,957
Other Foundation	\$7,037,745	\$489,445	\$7,527,190	↑	\$7,503,209
Other	\$24,032,280	\$5,334,167	\$29,366,447	↑	\$26,114,651

*Includes CARES Act funds



Extramural Funding

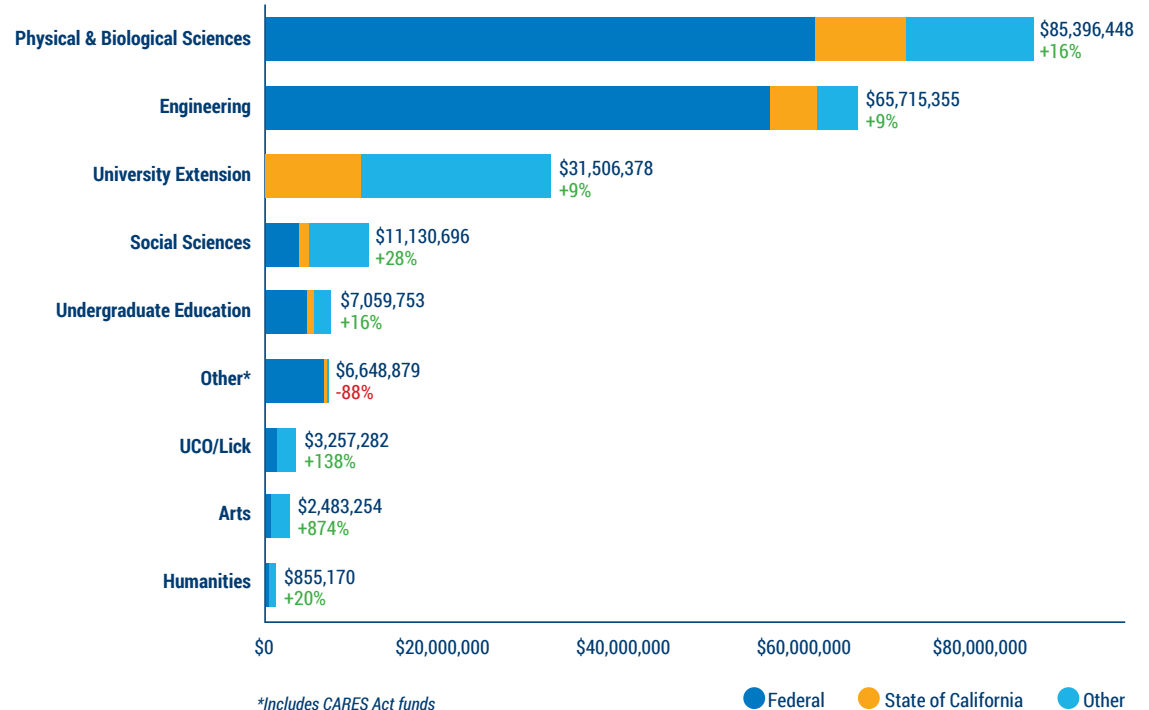
Industry Funding Trend





Extramural Funding

FY22 Funding by Unit





Extramural Funding

Top 5 Research Awards in FY22

\$14,967,096

**Maximilian Haeussler (PI)
William James Kent (Co-PI)**
Genomics Institute

NIH/NHGRI;
07/01/22-04/30/27
"The UCSC Genome Browser"

\$11,883,064

**David Haussler (PI)
Holger Schmidt (Co-PI)**
Genomics Institute

NIH/NHGRI;
09/15/21-06/30/26
"Center for Live Cell Genomics"

\$5,833,334

Benedict Paten (PI)
Genomics Institute

NIH/NHLBI;
07/22/20-03/30/22
"THE DEVELOPMENT AND INTEGRATION
OF ADVANCED CYBERINFRASTRUCTURE,
LEADING-EDGE TOOLS, AND FAIR DATA TO
ACCELERATE DISCOVERY BY THE NHLBI
RESEARCH COMMUNITY"

\$5,059,637

Eric Palkovacs (PI)
Institute of Marine Sciences

NATIONAL OCEANIC AND ATMOSPHERIC
ADMINISTRATION - NOAA;
07/01/21-06/30/22
"CIMEAS Investigations in Fisheries
Ecology"

\$5,014,161

Natalie Batalha (PI)
Astronomy & Astrophysics

NASA SHARED SERVICES CENTER;
05/01/21-04/30/26
"Follow the Volatiles: Tracing chemical
species relevant to habitability from proto-
planetary disks to exoplanet atmospheres"

A scenic photograph of the UC Santa Cruz campus, showing a white building on a hillside with green grass and trees, under a blue sky with wispy clouds. The image is positioned on the left side of the slide.

Extramural Funding

Top 5 Non-Research Awards in FY22

\$8,804,800

Maria Rocha-Ruiz (PI)
Educational Partnership Center

DEPARTMENT OF EDUCATION OFFICE
OF POSTSECONDARY EDUCATION;
10/01/21-09/30/28
"GEAR UP 2021 Proposal"

\$4,913,271

Camilla Forsberg (PI)
Biomolecular Engineering

CALIFORNIA INSTITUTE
FOR REGENERATIVE MEDICINE - CIRM;
11/02/21-11/30/26
"UCSC Training Program in
Biology of Stem Cells"

\$3,724,810

Lisa Hunter (PI)
*Institute for Scientist
& Engineer Educators*

GORDON AND BETTY MOORE FOUNDATION;
02/11/22-08/31/27
"Building a STEM Workforce in
Hawai'i to Support U.S. Astronomy
Through Akamai"

\$2,985,757

Maria Rocha-Ruiz (PI)
Educational Partnership Center

PAJARO VALLEY UNIFIED SCHOOL DISTRICT;
07/01/21-06/30/23
"Partnership Service Agreement between
EAOP and Pajaro Valley Unified
School District"

\$2,731,012

Eduardo Mosqueda (PI)
Education

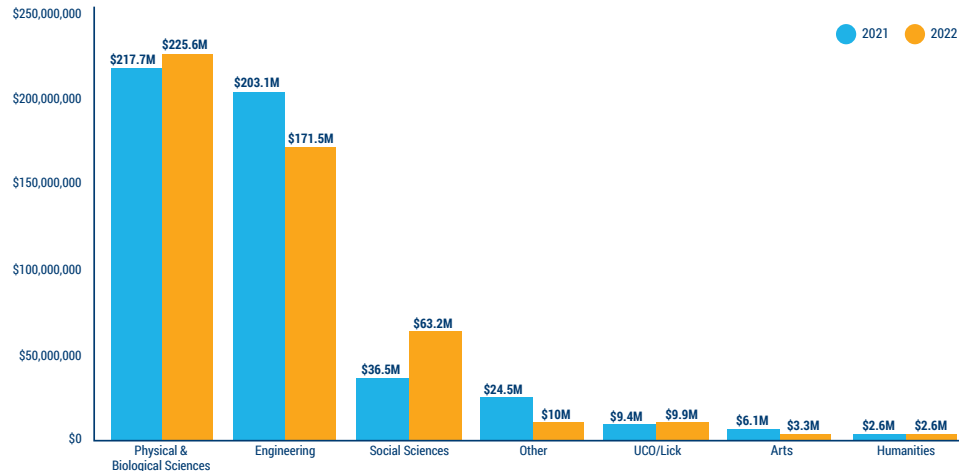
US DEPARTMENT OF EDUCATION
MISCELLANEOUS AGENCIES;
09/01/21-08/31/26
"Leveraging Bilingualism and Literacy
for Secondary English Learner STEM
Content Access"



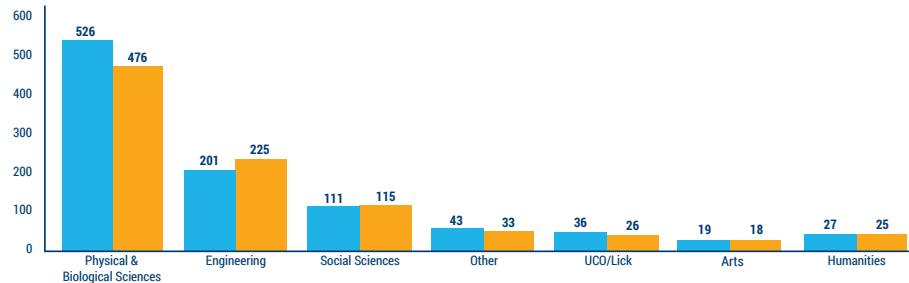
Extramural Funding

Proposals Submitted

Dollar Value of Proposals Submitted



Number of Proposals Submitted



Office of Research Highlights

Office of Research Highlights

Office of Research

FY22 HIGHLIGHTS

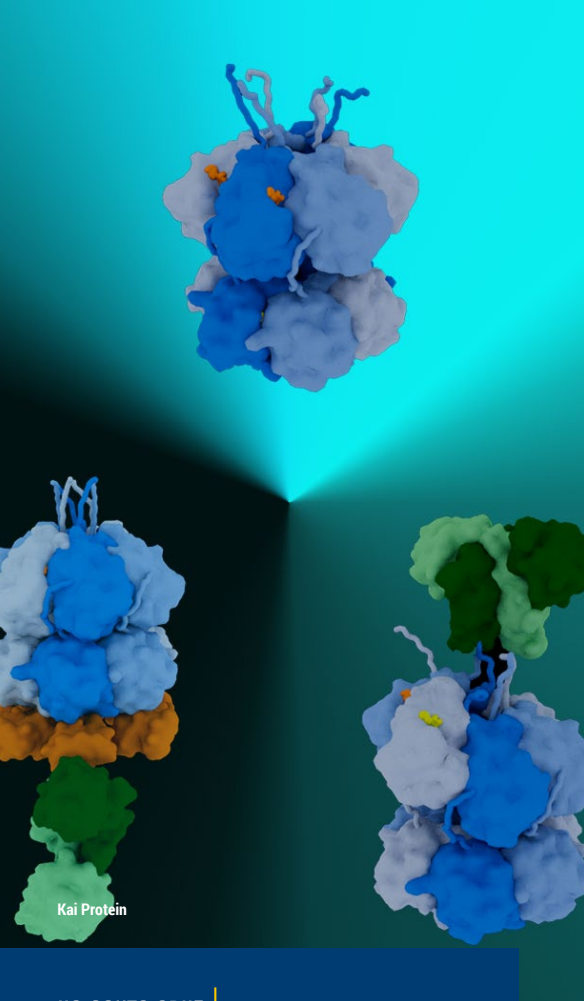
The campus launched the Innovation & Business Engagement Hub to facilitate and strengthen connections between students, faculty, staff, alumni, industry leaders and investors, and the community.

The UCSC Office of Research launched the Commit to Submit Initiative to provide comprehensive, structured support to those applying for the NSF CAREER award. Seven early career faculty completed all elements of the program and submitted proposals in FY22; of these, four received funding.

The UCSC Office of Research awarded funds in FY22 to 19 projects through its inaugural Seed Funding for Early Stage Initiatives program.

SEED FUNDING PROJECTS:

- **Advancing Stem Cell Biology with CRISPR**, led by Camilla Forsberg
- **Combining aDNA and stable isotope analysis to reconstruct 6,000 years of salmon life history diversity**, led by Eric Palkovacs
- **Cultivating the Transfer Landscape: Assessing Racial Equity for Community College Transfers**, led by Saskias Casanova
- **Dehydrated Landscapes**, led by Jorge Menna Barreto.
- **Developing protective biofilms that inhibit microbial-induced corrosion**, led by Chad Saltikov
- **Development of Heterogeneous Catalysts to Upcycle PVC Waste**, led by Rebecca Braslau.
- **Enhancing Security of Data Networks via Cross-Layer Device Fingerprinting Techniques**, led by Zouheir Rezki.
- **Ethnic Studies Research Collaboration with Santa Cruz County Office of Education**, led by Reikia Jibrin
- **Eureka!** led by John Jota Leanos.
- **FIRES NEXT TIME**, led by Joshua Harrison
- **Immigration and Social Policy in Latin America: Barriers for Inclusion**, led by Sara Niedzwiecki.
- **The Lasting Impact of Structural Racism and Racial Violence on Cognitive Health in Later Life**, led by Alicia Riley.
- **Lost Stories of Asian American Labor: Research & Planning for an Integrated Exhibit of Arts and Oral History from the Pajaro Valley**, led by Kathleen Gutierrez
- **Novel coral reef restoration without generating harmful chlorine**, led by Donald Potts
- **Reconstructing the past collapse of the West Antarctic Ice Sheet**, led by Terrence Blackburn
- **RICHLAND**, led by Irene Lusztag.
- **Robustifying Machine Learning for Safe and Secure Autonomous Vehicles**, led by Leilani Gilpin
- **Thin Films for Next Generation Tracking Detectors**, led by Michael Hance
- **Transnational China Research Hub**, led by Shelly Chan.





Office of Research Highlights

Patents

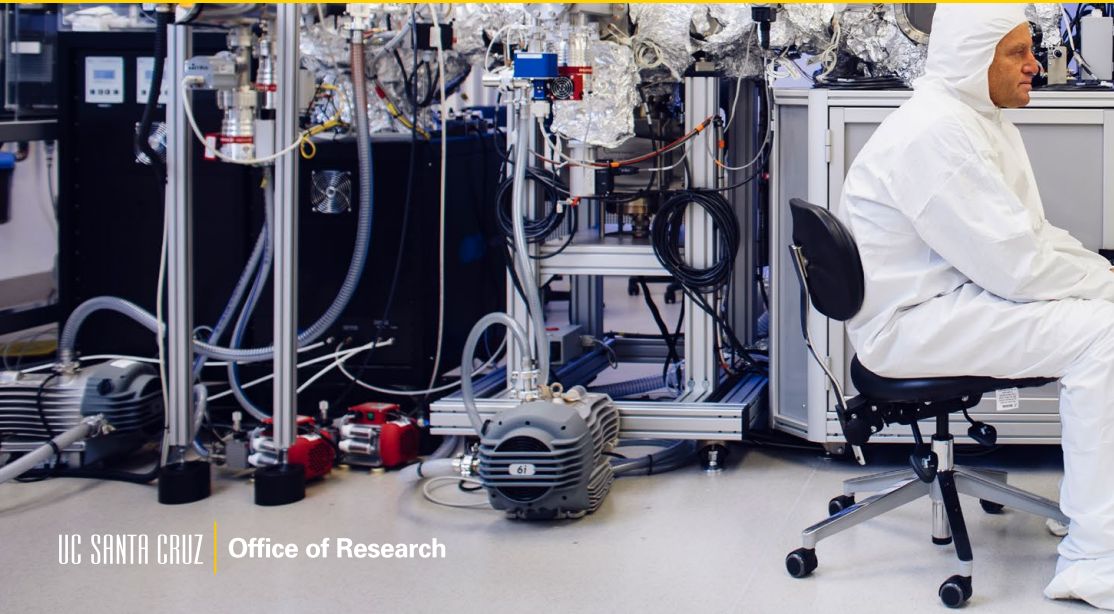
UC Santa Cruz set an all time record with 33 issued US patents in FY22. The previous record was 26 in FY19.

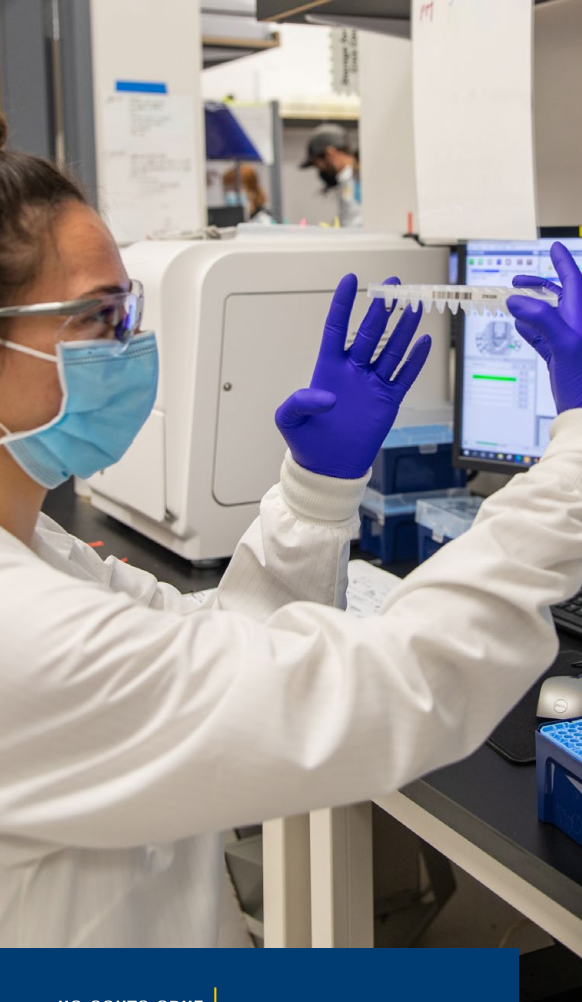
The patents below were issued in FY22 and are the first patent to issue from a patent family.

The remaining 14 issued patents were from continuing applications:

Ed Green	Methods for Labeling DNA Fragments to Reconstruct Physical Linkage and Phase
Alex Ayzner	Complementary Conjugated Polyelectrolyte Complexes as Electronic Energy Relays
Ted Holman	12(S)-Hydroxyeicosatrienoic Acid Compounds and Their Use as Therapeutic Agents
Brad Smith	Boolean Constrained Multipath Routing (BCMR) with Forwarding
Jin Zhang	Co-doped Core/Shell Nanocrystals for Visible Light
Keith Corzine	A Novel Modular Multilevel Converter
JJ Garcia-Luna-Aceves	Collision Avoidance in Multi-hop Ad-hoc Networks Using Half Duplex Transceivers
Katia Obraczka	Method and Apparatus for Efficient Communication Packet Generation in Internet of Things (IOT)
Ed Green	Methods of Producing Nucleic Acid Libraries
Holger Schmidt	Physically Operable and Mechanically Reconfigurable Light Sources
Ed Green	Method for Determining Relatedness of Genomic Samples Using Partial Sequence Information
Hamid Sadjadpour	Compact Key Encoding of Data for Public Exposure such as Cloud Storage
Leila Parsa	Dual Capacitor Resonant Circuit
Manel Camps	Fluorescence Based Reporters for Mutagenesis Detection in E. Coli
Shaowei Chen	Catalysis of Hydrogen Evolution Reaction Using Ruthenium Ion Complexed Carbon Nitride Materials
Mark Akeson	Nanopore Sensor for Enzyme-Mediated Protein Translocation
Ali Yanik	Plasmodic Microlenses for Label-Free Optical Sorting of Bioparticles
Roberto Manduchi	Semantic Interior Mapology
Katia Obraczka	Dynamic Tuning of Contention Windows in Computer Networks

Highlighted Research Units





Highlighted Research Units

Genomics Institute

VISION STATEMENT

Focusing the power of genomics – collaboratively, openly and ethically – for the benefit of both the individual and the planet.

FY22 HIGHLIGHTS

- The Telomere to Telomere Consortium co-led by UC Santa Cruz's Karen Miga published the first fully complete human genome, for which Karen was named one of TIME Magazine's 100 most influential people.
- We created a new Center for Live Cell Genomics to study complex three-dimensional cell cultures as they grow, which will allow us to better understand where and how mutations impact human tissue function and cause disease.
- Our Pathogen Genomics team is leading a new, state-sponsored public health program. This year, their USHER tool has become the primary method to identify lineages of COVID-19 worldwide.
- Our new ASPIRE program is using student researchers to collect baseline genomic data on California's biodiversity.

David Haussler
Scientific Director

Russ Corbett-Detig
Max Haussler
Karen Miga
Benedict Paten
Lars Fehren-Schmitz
Beth Shapiro

Associate Directors

Sofia Salama
Faculty Director, Diversity

FY22 TOP RESEARCH AWARDS

\$14,967,096

William James Kent (PI)
NIH/NHGRI;
"The UCSC Genome Browser"

\$11,883,064

David Haussler (PI)
Holger Schmidt (Co-PI)
NIH/NHGRI;
"Center for Live Cell Genomics"



Highlighted Research Units

Institute of Marine Sciences (IMS)

VISION STATEMENT

IMS aims to be a leader of innovative resources that cross research boundaries in marine science and coastal sustainability. Our vision is focused on centralized research themes aimed at understanding the processes that drive climate, ocean circulation, and biogeochemical processes in marine ecosystems. We function as a catalyst that not only keeps UCSC at the forefront of marine research and education, but propels us into unprecedented relevance in the area of marine sustainability.

FY22 HIGHLIGHTS

- Jessica Kendall-Bar, recent Ph.D. from the Costa-Williams labs, received the Eric and Wendy Schmidt Award for Excellence in Science Communications, from the National Academies for the visualizations associated with her field studies of elephant seal sleep.
- Roxanne Beltran, Assistant Professor, received a \$1.2M grant from NSF to investigate how the increasing size differences in developing elephant seals relate to differences in their behavior and in the perils they face at sea. The research will be shared with K-12 classrooms in real-time.
- Adina Paytan, research scientist, received the 2022 Vladimir Ivanovich Vernadsky Medal from the European Geosciences Union. Paytan studies chemical and biological processes in the oceans, how they have changed over time, and how they are affected by human activities.
- Our new ASPIRE program is using student researchers to collect baseline genomic data on California's biodiversity.
- Professor Michael Beck and Associate researcher Borja Reguero are key participants in \$7.5M grant DARPA award to the University of Miami called X-REEFS (neXt generation Reef Engineering to Enhance Future Structures). They will be designing a reef restoration solution that aims to protect coastlines with an engineered structure, which will also grow corals to be resilient in the face of climate change and other stressors.
- A consortium of IMS researchers and faculty have received a sub-award from MBARI as part of the "CeNCOOS MBON: Marine biodiversity information in support of a healthy Blue Economy in the central California Current."
- Megan Cimino, assistant researcher, was highlighted in episode Frozen Planet II (#6, Our Frozen Planet): "The frozen planet is changing. Meet the scientists and people dedicating their lives to understanding what these changes mean, not just for the animals and people who live there, but for the world as a whole"

Daniel Costa

*Director, Distinguished Professor
Dept of Ecology & Evolutionary Biology*

Raphael Kudela, Associate Director
Ashley Vizurraga, Assistant Director

FY22 TOP RESEARCH AWARDS

\$5,059,637

Eric Palkovacs (PI)

NATIONAL OCEANIC AND ATMOSPHERIC
ADMINISTRATION - NOAA;

"CIMEAS Investigations in Fisheries Ecology"

\$3,782,659

Cyril Michel (PI)

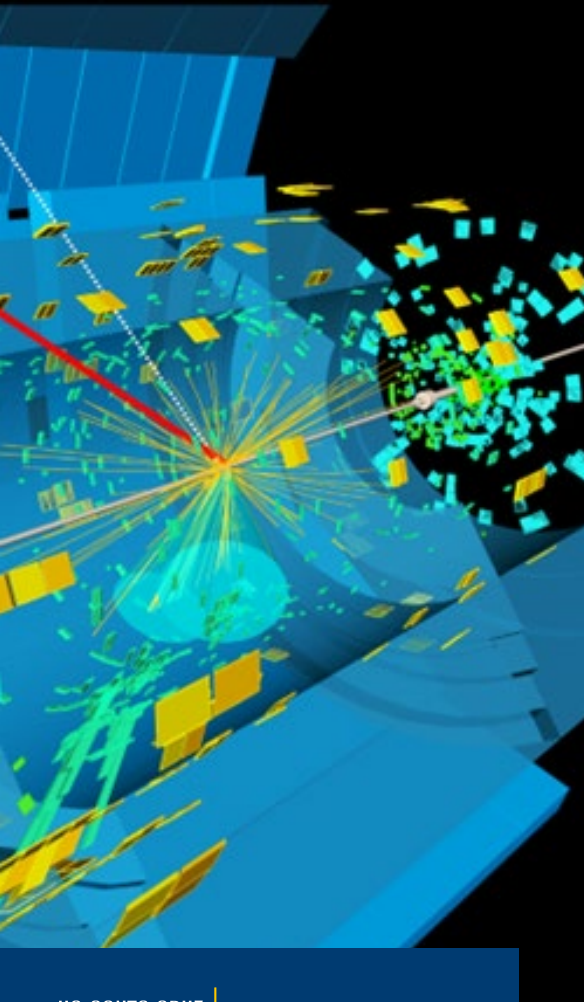
USDI/BUREAU OF RECLAMATION;
"Enhanced Acoustic Tagging, Analysis, and Real-Time
Monitoring of Wild and Hatchery Salmonids in the
Sacramento River Valley"

FIRST TIME GRANT AWARDEES

Heather Welch

Maite Willmes

Timothy Frawley



Highlighted Research Units

Santa Cruz Institute for Particle Physics (SCIPP)

VISION STATEMENT

SCIPP plays a world-leading role in experimental and theoretical particle physics and astrophysics, including the development of cutting-edge technologies—from sensors and electronics, through analysis and computational methods—with additional applications to other fields, such as neuroscience and biomedicine. With prominence in the most important international activities in these fields, and the cross-cutting nature of our work, opportunities are created for students at all levels to learn and make connections. In all our work, we are committed to fostering a welcoming and supportive climate for all members of our diverse community.

FY22 HIGHLIGHTS

- SCIPP physicists welcomed the restart of the Large Hadron Collider at CERN for Run 3 of its physics program at world-record collision energies. SCIPP personnel installed new equipment and detector algorithms to improve performance of the ATLAS experiment at the LHC. Run 3 will almost triple the data set for Higgs boson measurements and searches for new physics.
- SCIPP particle theorists joined experimental colleagues in proposing new experiments that could extend accelerator-based dark matter searches. Understanding the nature of dark matter and its interactions will require contributions from theoretical models, advanced instrumentation, and cosmological measurements.
- Three main structures comprising the Vera C. Rubin Observatory Camera for the Legacy Survey of Space and Time (LSST) were brought together for the first time. SCIPP astrophysicists continue to integrate and test the camera systems in preparation for installation at the observatory in Chile. At 3.2 gigapixels, the LSST Camera is the largest digital camera ever constructed.
- The Dark Energy Spectroscopic Instrument (DESI) completed its first year of survey operations, having already acquired spectra from more astrophysical objects than all of the previous redshift surveys combined. These spectra are used to measure the accelerating expansion of the universe.

Jason Nielsen, *Director*

Tesla Jeltema, *Associate Director*

Stefano Profumo, *Deputy Director for Theory*

Margaret Wuerth, *Assistant Director for Administration and Finance*

FY22 TOP RESEARCH AWARDS

\$742,000

Abraham Seiden (PI),

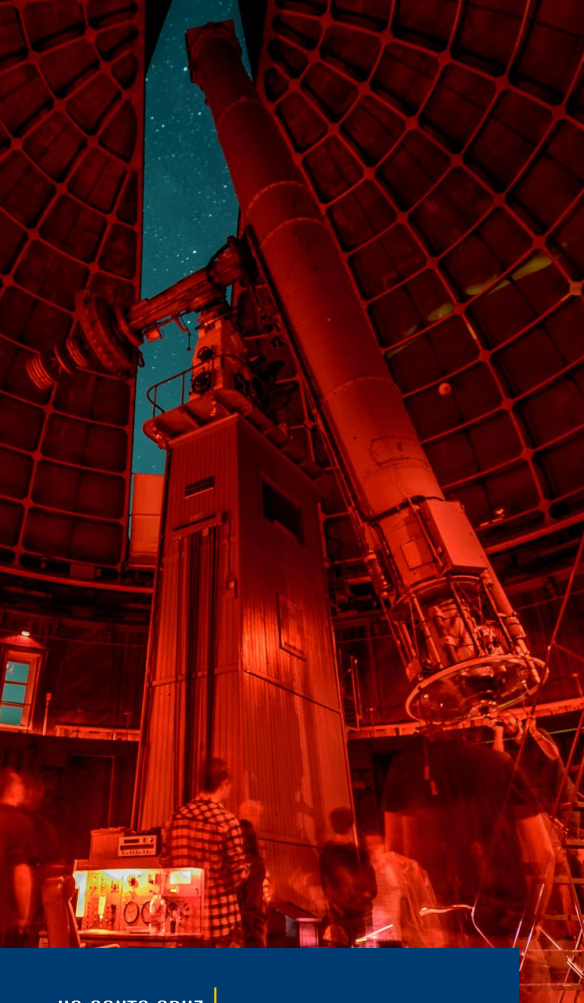
Anthony Affolder, Vitaliy Fadeyev (Co-PIs)

DEPARTMENT OF ENERGY/MISCELLANEOUS OFFICES AND PROGRAMS; "ATLAS Upgrade Construction Project for Strip Modules"

\$320,000

Shiva Abbaszadeh (PI)

DOE/WASHINGTON DC OFFICE; "Development and Characterization of a large area selenium avalanche photodetector for photon detection from ultraviolet to infrared wavelengths"



Highlighted Research Units

UC Observatories (UCO/Lick)

VISION STATEMENT

The University of California Observatories (UCO) is a multi-campus astronomy research unit, with headquarters on the UC Santa Cruz campus. The mission of UCO is to provide UC astronomers with continuing access to outstanding optical and infrared telescope facilities. These facilities support graduate and undergraduate teaching, the training of astronomy Ph.D.s, and faculty at nine UC campuses who are doing astronomy research. UCO operates the Lick Observatory on Mount Hamilton, technical labs at UCSC and UCLA, and is a managing partner of the W. M. Keck Observatory in Hawaii and the center for the UC participation in the Thirty-Meter Telescope (TMT) project.

FY22 HIGHLIGHTS

- A team of UC Riverside astronomers and eagle-eyed citizen scientists have discovered a hidden giant gas planet around a nearby star. The citizen scientists found the candidate planet with the TESS satellite data and informed the UCR astronomers who have confirmed its existence using Lick Observatory's Automated Planet Finder Telescope.
- There is a new dome at Lick Observatory! It contains a telescope with an innovative telescope and detector to use as part of the PANOSSETI experiment. Lead by UCSD scientists, this experiment will search for high speed celestial events possibly opening up new fields of astrophysics and also searching for extra-solar technology signals.
- A new detector for the Keck Cosmic Reionization Mapper was delivered to Keck Observatory by the UCSC Technical Labs. This new camera will double the wavelength coverage of one of the most popular new instruments, the Keck Cosmic Web Imager.
- Public outreach events returned to Lick Observatory this year. This includes the highly popular Lick Summer Series: Music of the Spheres, Evening with the Stars and Photography Nights.

Constance Rockosi

Interim Director, UC Observatories, Professor of Astronomy and Astrophysics, UC Santa Cruz

FY22 TOP RESEARCH AWARDS

\$1,999,998

Andrew Skemer (PI)

CALIFORNIA ASSOCIATION FOR RESEARCH IN ASTRONOMY (W.M. KECK OBSERVATORY); "SCALES Construction Phase Scope of Work, PRI"

\$734,588

Jason Prochaska (PI)

NASA SHARED SERVICES CENTER; "Reaching for Reionization: A Multi-Wavelength Study of High Redshift Quasars in the KOA"

Divisional Highlights





Divisional Highlights

Division of the Arts

FY22 ACHIEVEMENTS

Focus on Diversity, Equity, and Inclusion:

- The Arts Division was awarded \$350,000 from the UC-HSI-DDI program to support *Pathways to the Professoriate in the Arts and Humanities*, a cross-divisional initiative designed to prepare graduate students from historically underrepresented groups to go on to the professoriate.
- A.M. Darke, Assistant Professor in Performance, Play and Design, was awarded a \$120,000 grant from the National Science Foundation to support the Open Source Afro Hair Library.

Mellon Foundation award to support UC Santa Cruz's *Visualizing Abolition* initiative:

- The Andrew W. Mellon Foundation has awarded a \$1,977,000 grant to support *Visualizing Abolition*, the nation's most ambitious and sustained art and prison abolition initiative, led by UC Santa Cruz Feminist Studies Associate Professor Gina Dent, and Rachel Nelson, Director of the Institute of the Arts and Sciences.

Community-Engaged Arts Research at UCSC:

- Art professors Laurie Palmer and Jorge Menna Barreto received a \$37,000 grant from the City of Santa Cruz to create *LANDING*, an experimental space in downtown Santa Cruz that will feature events, workshops, and exhibitions focusing on relationships with land.

UCSC Arts Faculty awarded residencies and fellowships:

- Jennifer Parker (Art) was appointed Artist-in-Residence at Nord University.
- Laurie Palmer (Art) was awarded a residency at the summer program, *Abandoned Practices*, run by the Chicago performance group *Every House Has a Door*.
- Sarah Sanford (Art) was awarded a summer printmaking residency at In Cahoots in Petaluma, CA.
- Anna Friz (Film and Digital Media) was awarded the Rydell Fellowship.
- Soraya Murray (Film and Digital Media) was awarded the Higher Education Video Game Alliance Fellowship.
- Jimin Lee (Art) was awarded a residency at the Icelandic Printmaker's Association in Reykjavik, and the Hall of Awa Japanese Handmade Paper Museum in Tokushima, Japan.
- Kailani Polzak (History of Art and Visual Culture) was awarded a Getty/ACLS postdoctoral fellowship.

Graduate Student Achievements:

- Zoe Weldon-Yochim (History of Art and Visual Culture) was awarded Smithsonian and Luce/ ACLS Predoctoral Fellowships.
- Raed Rafei (Film and Digital Media) was awarded a Mellon/ ACLS Fellowship.
- Ph.D. candidate Wesley Somers (Music) received the Anne Dhu McLucas fellowship from the Society for American Music.
- Seth Glickman, Ben Dorfan, Nina Barzegar, and Rodrigo Barriga (Music) received a Tenri Cultural Institute residency to work with the renowned Yarn/Wire Quartet.

FY22 TOP RESEARCH AWARDS

\$1,977,000

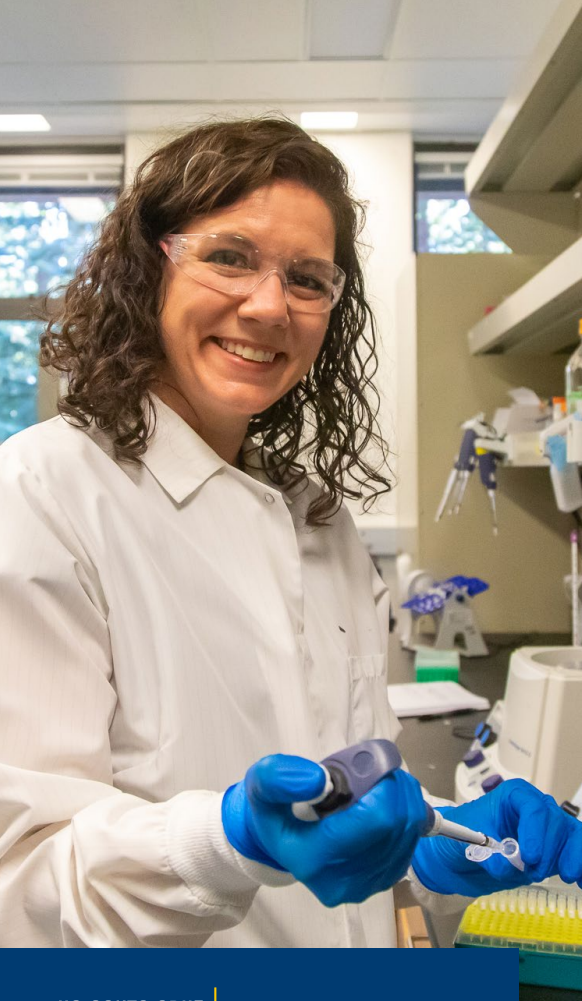
Gina Dent (PI), Arts

ANDREW W. MELLON FOUNDATION; The; "Visualizing Abolition: An Art and Public Scholarship Project for Reimagining Society"

\$165,000

Newton Harrison (PI), Arts

ANNENBERG FOUNDATION; "Center for the Study of the Force Majeure - Staff and Operations"



Divisional Highlights

Baskin School of Engineering (BSOE)

FY22 ACHIEVEMENTS

- The first truly complete sequence of a human genome, covering each chromosome from end to end with no gaps and unprecedented accuracy, is now accessible through the UCSC Genome Browser and is described in six papers published March 31 in Science.
- CIDER Pilot Training Program helps students reach new heights in drone research and industry. This field research was part of the first-ever drone Pilot Training Program put on by the UCSC CITRIS Initiative for Drone Education and Research (CIDER), which aims to support drone research and industry to develop a diverse drone workforce.
- New Google-funded research project applies computer science to aid bird conservation; Luca de Alfaro, professor of Computer Science and Engineering and Assistant Professor of Environmental Studies Natalia Ocampo-Peñuela have begun a new collaboration to use machine learning models to create continent-wide maps of bird habitat connectivity for conservation purposes, and they have recently received a \$60,000 Google Research Scholar award to fund this work.
- UC Santa Cruz receives National Endowment for the Humanities grant to connect studies of humanities, engineering; this endowment will create a new Certificate in the Humanities introducing students enrolled in the Baskin School of Engineering to humanities disciplines aimed to help them better understand the social and cultural impacts of technological change.
- UCSC signs \$3M state contract to deliver a public health data platform for pathogen genomics; This approach will let public health officials use genomic data to identify how a virus evolves, and then where and when its variants spread in an outbreak. This undertaking promises to help the state contain the spread of viruses like SARS-CoV-2, the virus that causes COVID-19, by rapidly and accurately changing public health policies and practices to control the spread of infection.
- Ricardo Sanfelice, professor of electrical and computer engineering, and Ike Nassi, adjunct professor of computer science and engineering, have been elected Fellows of the Institute of Electrical and Electronics Engineers (IEEE), "the world's largest technical professional organization for the advancement of technology."

NSF CAREER AWARDS

- Scott Beamer, assistant professor of computer science and engineering to support his work on verifiable computation.
- Lindsey Kuper, assistant professor of computer science and engineering to fund her lab's study of distributed systems.
- Yang Liu, assistant professor of computer science and engineering to fund his study of human-centered machine learning.

FY22 TOP RESEARCH AWARDS

\$3,785,110

**Rebecca DuBois (PI),
Biomolecular Engineering**

NIH/NIAID; "Structure-guided engineering to increase respiratory syncytial virus G protein immunogenicity"

\$1,907,991

**Shiva Abbaszadeh (PI), Weixin Cheng (Co-PI),
Electrical & Comp. Engineering**

DEPARTMENT OF ENERGY/MISCELLANEOUS OFFICES AND PROGRAMS; "Non-destructive, three-dimensional imaging of processes in the rhizosphere utilizing high energy photons"

FIRST TIME GRANT AWARDEES

Elin Carstensdottir, Computational Media

Leilani Gilpin, Computer Science & Engineering

Lindsey Kuper, Computer Science & Engineering

Norman Su, Computational Media

Paul Parker, Statistics

Tyler Sorensen, Computer Science & Engineering

Vanessa Jonsson, Applied Mathematics

Xin Wang, Computer Science & Engineering

Yu Zhang, Electrical & Comp. Engineering

Zehang Li, Statistics



Karen Tei Yamashita,
Professor Emerita
of Literature

Divisional Highlights

Division of the Humanities

FY22 ACHIEVEMENTS

- Humanizing Technology grant from the National Endowment for Humanities (NEH) in the amount of \$149,500. PIs: Jasmine Alinder (Dean of Humanities), Pranav Anand (Linguistics), Laura Martin (Porter/THI). The project will create a certificate in the Humanities introducing students enrolled in the Baskin School of Engineering to humanities disciplines aimed to help them better understand the social and cultural impacts of technological change.
- Race, Empire, and the Environments of Biomedicine (Sawyer Seminar). PIs Jennifer Derr (History) and Jennifer Reardon (Sociology). Mellon Foundation grant in the amount of \$225,000 supporting a postdoctoral scholar, graduate student fellows, a visiting scholar, and a series of public programs throughout the academic year.
- The Latinx Past: Archive, Memory, Speculation (PI: Kirsten Gruesz, Literature). Crossing Latinidades project grant in the amount of \$100,000 focusing on national research and mentoring collaboration. Funded by the Mellon Foundation.
- Three Humanities scholars received prestigious awards from the American Council of Learned Societies (ACLS) for their research. Faculty Caitlin Kelliaa (Feminist Studies) and Philip Longo, faculty in Feminist Studies and Writing respectively, as well as Christian Alvarado, a PhD student in the History of Consciousness.
- Two Humanities scholars faculty received grants from the NEH: Benjamin Breen (History) and Renee Fox (Dickens Project).
- Four Humanities scholars received grants for their public humanities/community engaged research in local and international communities: Alan Christy (History), Jon Ellis (Center for Public Philosophy), Renee Fox (Dickens Project), Amanda Smith (Literature) and Alice Yang (History). Funders include Luce Foundation, Monterey Peninsula Foundation, UCLA and the California State Library.
- Karen Tei Yamashita, Professor Emerita of Literature, received the 2021 National Book Foundation's Medal for Distinguished Contribution to American Letters
- Sandra Chung, Distinguished Professor Emerita of Linguistics, has been elected a fellow of the American Academy of Arts and Sciences, one of the nation's oldest and most prestigious honorary societies.
- The Humanities Institute (THI) continued to serve as a research hub in the Humanities Division. THI supported 7 research centers and over a dozen grant-funded research projects. The institute provided direct funding to faculty, graduate students, and undergraduate students engaged in research, teaching, and public humanities projects. THI's annual theme was Imagination and the Institute hosted more than 150 events with scholars and public intellectuals, reaching over thousands of households around the globe. Notable speakers included Michelle Obama, Yaa Gyasi, Angela Davis, and Agnes Callard.

FY22 TOP RESEARCH AWARDS

\$225,000

Jennifer Derr (PI), History

ANDREW W. MELLON FOUNDATION, THE;

"Race, Empire, and the Environments of Biomedicine"

\$149,500

Jasmine Alinder (PI), Humanities

NATIONAL ENDOWMENT FOR THE HUMANITIES (NEH);

"Humanizing Technology"

FIRST TIME GRANT AWARDEES

Amanda Smith, Literature

Caitlin Kelliaa, Feminist Studies

Jasmine Alinder, Humanities

Juned Shaikh, History

Philip Longo, Writing Project

Renee Fox, Literature



Divisional Highlights

Division of Physical & Biological Sciences

FY22 ACHIEVEMENTS

- Professor Carrie Partch and UC colleagues put time in a bottle: The reconstituted biological clock maintains daily cycles for days on end, allowing researchers to study the interactions of its component parts. "The active collaboration extended well beyond the principal investigators, with the students and postdocs who were trained in different disciplines conferring among themselves to share genetics, structural biology, and biophysical data, explaining to one another the significance of their findings." This work was supported by the NIH and the NSF.
- New global forecasts of marine heatwaves foretell ecological and economic impacts. The forecasts could help fishing fleets, ocean managers, and coastal communities anticipate the effects of marine heatwaves. Michael Jacox (IMS, NOAA) and NOAA/IMS colleagues contributed.
- Institute for the Biology of Stem Cells received three major awards including a \$1M training grant for postdoctoral researchers, a \$4.9 million grant from the California Institute for Regenerative Medicine to support a pre- and postdoctoral training program in systems biology of stem cells and funding from the UC-Hispanic Serving Institutions Doctoral Diversity Initiative to support underrepresented doctoral students.
- Reefense project aims to meld biology and engineering in novel structures for coastal protection- UCSC scientists are part of a DARPA-funded team to develop innovative solutions for coral reef restoration in Florida and the Caribbean to protect coastal infrastructure.

Major Awards:

- Roxanne Beltran, assistant professor of ecology & evolutionary biology, wins Packard fellowship to support her research using migrating elephant seals as "smart sensors" for monitoring ocean ecosystems.
- Jacqueline Kimmey, assistant professor of microbiology and environmental toxicology, named Pew Scholar in the Biomedical Sciences to support her research on the role of circadian rhythms in susceptibility to infectious diseases.
- Claudie Beaulieu, assistant professor of ocean sciences, has received a NSF CAREER Award to support her work using data science to study climate variability and climate change.
- Yuan Ping, assistant professor of chemistry and biochemistry was awarded The Alfred P. Sloan Foundation Research Fellowship as well as a NSF CAREER award to support her work developing computational platforms to investigate the physics of new materials for quantum computers and other applications of quantum information science.
- Carrie Partch, professor of chemistry and biochemistry, will be honored by the National Academy of Sciences with the 2022 Award in Molecular Biology for her contributions to the molecular understanding of circadian rhythms.
- Enrico Ramirez-Ruiz, professor of astronomy and astrophysics, has been selected to hold the Julio Cortázar Latin American Chair at the University of Guadalajara, Mexico, for 2022.

FY22 TOP RESEARCH AWARDS

\$5,014,161

**Natalie Batalha (PI),
Astronomy & Astrophysics**

NASA SHARED SERVICES CENTER; "Follow the Volatiles: Tracing chemical species relevant to habitability from proto-planetary disks to exoplanet atmospheres"

\$3,109,336

Bin Chen (PI), MCD Biology

NIH/NINDS; "Lineage progression of cortical neural stem cells"

FIRST TIME GRANT AWARDEES

Alegria Eroy-Reveles, Chemistry & Biochemistry

Carlos Diaz-Castillo, Microbiology & Environ. Tox.

Daniel Turner-Evans, MCD Biology

David Jones, Astronomy & Astrophysics

Euseok Kim, MCD Biology

Katarzyna (Kasia) Jankiewicz, Mathematics

Melodie Kao, Astronomy & Astrophysics

Pedro Morales, Mathematics

Pratigya Polissar, Ocean Sciences

Valerie Cortez, MCD Biology



Divisional Highlights

Division of Social Sciences

FY22 ACHIEVEMENTS

Faculty applied research expertise to inform responses to critical health challenges:

- Alicia Riley showed how racial/ethnic COVID-19 outcomes were contextual and not inevitable
- Rob Fairlie detailed the disproportionate impact of COVID-19 on women in the workforce
- Justin Perez considered the moral and imaginative aspects of the “End of AIDS” in Peru
- Matt Sparke considered how competing economic and political priorities shape global COVID-19 vaccine distribution

Soc Sci research tackled issues of climate, food and environment:

- Julie Guthman considered the rise of “alternative proteins” and its relation to traditional livestock
- Joji Muramoto considered the dynamics of linking plant and soil health measures to the health of animals, humans and ecosystems
- Maywa Montenegro explored the direction of CRISPR research by considering who and what research gets funded
- Madeleine Fairbairn explored the “financialization” of food and agriculture and the complex corporate ownership of land and water access.

Faculty supported and student-led community research:

- Through the Institute for Social Transformation, the Blum Center, the Research Center for the Americas, the Everett Program, Science and Justice

Research Center and the Center for Labor Studies, our community-engaged research included:

- Health and well-being, basic income and single mothers, food insecurity in Santa Cruz County, investigations of human rights violations, and experiences of first generation students.

FY22 TOP RESEARCH AWARDS

\$732,127

**Kai Zhu (PI),
Environmental Studies**

NATIONAL SCIENCE FOUNDATION (NSF); “CAREER:
Advancing a macrosystems framework for climate-phenology
coupling through integrated research and education”

\$653,000

**Chris Benner (PI),
Institute for Social Transformation**

JAMES IRVINE FOUNDATION; “Salinas Inclusive Economic
Development: Capacity Building and Economic Analysis”

FIRST TIME GRANT AWARDEES

Galina Hale, Economics

Linnea Beckett, Social Sciences

Viktoria Oelze, Anthropology

More Information

Contact:

vcr@ucsc.edu
831-459-2425

Resources:

[Inquiry Magazine](#)

Online:

[Office of Research](#)
[Innovation & Business Engagement Hub \(IBE Hub\)](#)
[Research Compliance](#)
[Research Development](#)
[Proposal Administration](#)

