



Annual Report
FY23

Greetings,

I am pleased to share UC Santa Cruz's latest Office of Research Annual Report. We are at a pivotal moment, having recently launched a new [Center for Coastal Climate Resilience](#) to help fight climate change in our coastal communities, received Ag Experiment Station designation, and have contributed to the [Leading the Change: The UC Santa Cruz Strategic Plan](#), which will address research infrastructure and identify new areas of scholarship, among other exciting initiatives. This year's report showcases the diverse range of research and creative endeavors we invest in across all divisions, including arts, humanities, physical sciences, social sciences, and engineering. As with all of our work, we remain steadfastly committed to social justice and diversity, interwoven into our research and across an array of disciplines. This report also serves as an opportunity to express our gratitude to the dedicated staff, collaborative divisional partners, and other contributors to our campus research community. To learn more, explore our website at officeofresearch.ucsc.edu.

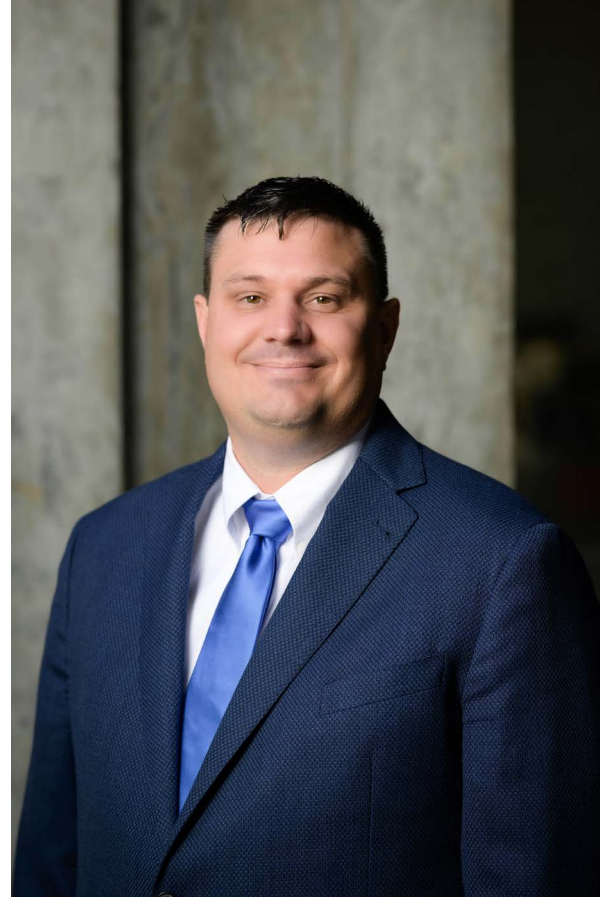
Sincerely,



John MacMillan

Vice Chancellor for Research

Professor of Chemistry and Biochemistry





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FY23 AT A GLANCE



\$235M
in extramural
funding



11.6%
increase in
extramural
funding



\$99.6M*
Awarded to
PBSci division

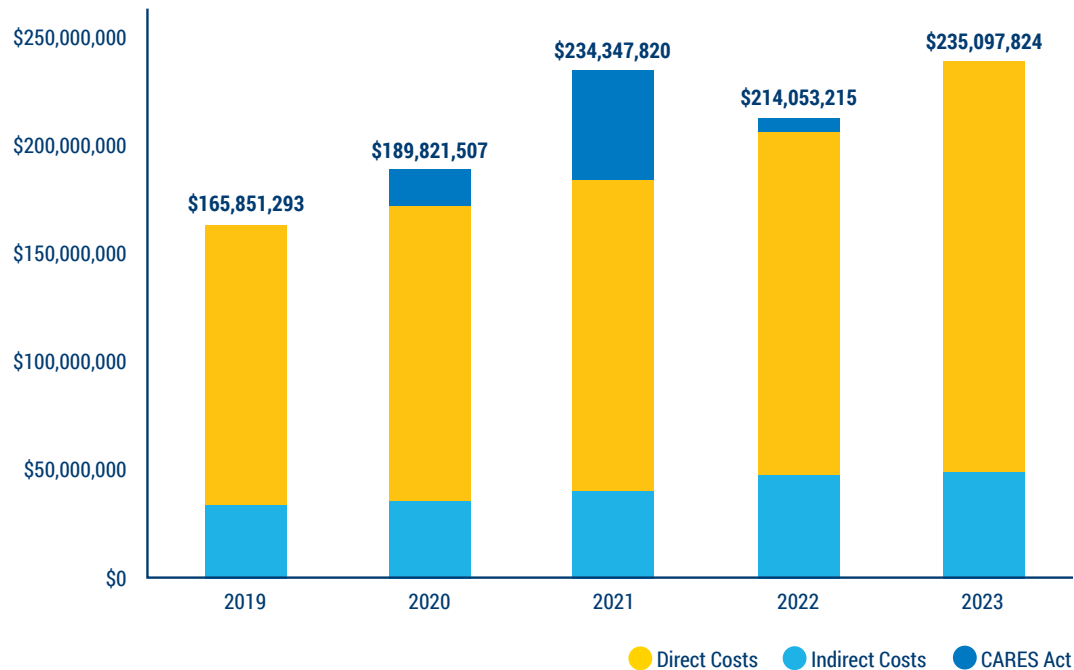
Extramural Funding





Extramural Funding

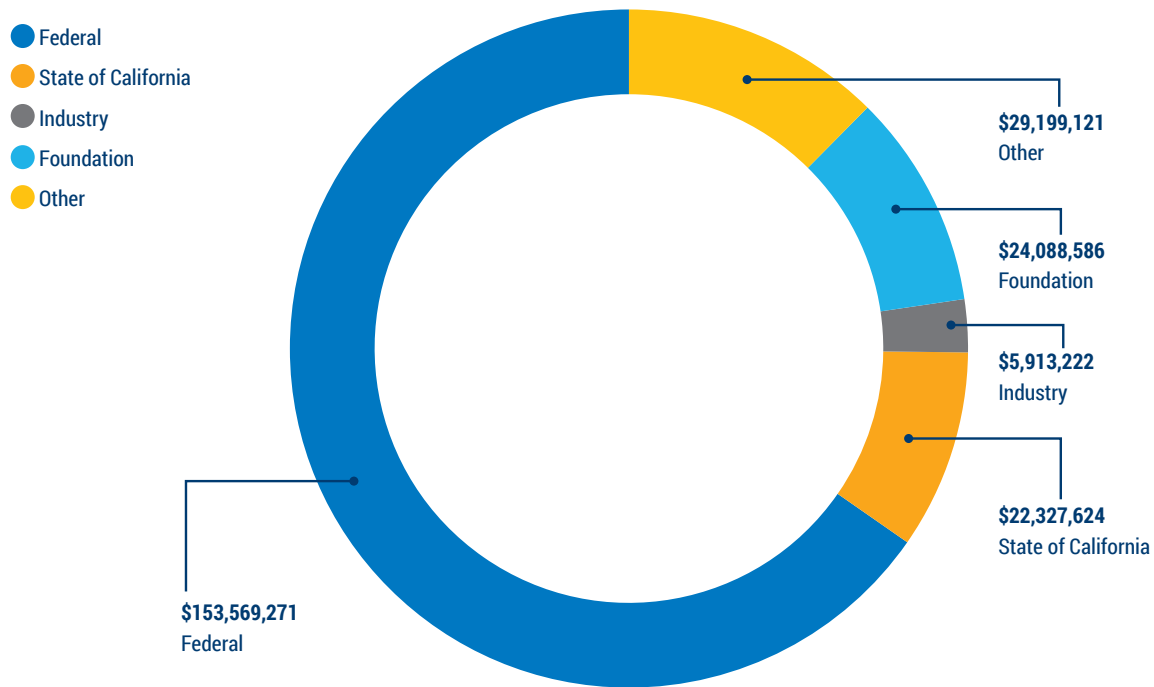
Total Award Funding





Extramural Funding

FY23 Award Funding Source

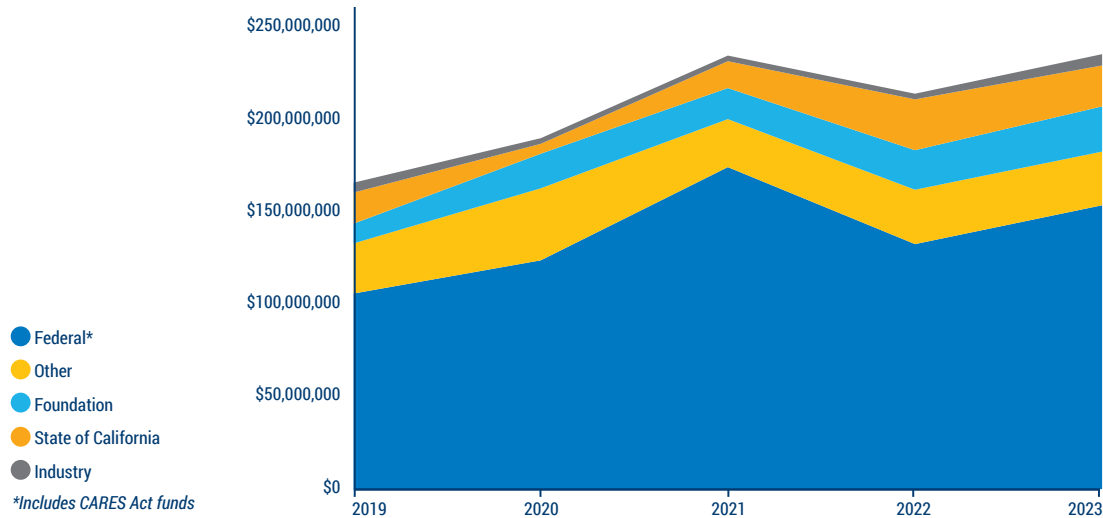




Extramural Funding

Funding Source Trends

	FY19	FY20	FY21	FY22	FY23
FEDERAL	\$105,715,493	\$123,653,255*	\$174,053,323*	\$132,589,832*	\$153,569,271
OTHER	\$27,254,304	\$38,944,788	\$26,114,651	\$29,366,447	\$29,199,121
FOUNDATION	\$10,786,685	\$18,764,130	\$16,749,150	\$21,409,548	\$24,088,586
STATE OF CAL	\$16,704,825	\$5,292,834	\$14,608,813	\$27,575,893	\$22,327,624
INDUSTRY	\$5,389,986	\$3,166,500	\$2,821,883	\$3,111,495	\$5,913,222





Extramural Funding

Awards by Funding Source

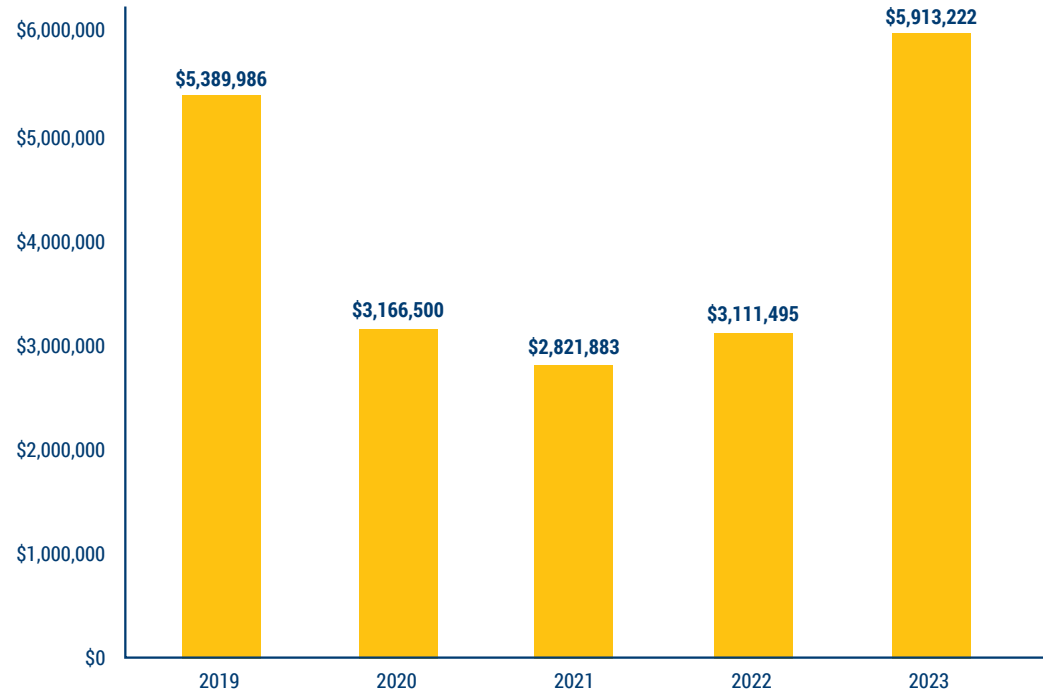
	DIRECT	INDIRECT	2023 TOTAL		2022 TOTAL
Bureau of Ocean Energy Management, Regulation & Enforcement	\$613,488	\$72,843	\$686,331	↑	\$448,000
Dept of Ed	\$6,447,157	\$352,455	\$6,799,612	↓	\$9,673,193*
DoD	\$9,766,112	\$2,801,430	\$12,567,542	↑	\$10,458,132
DOE	\$3,927,606	\$1,271,673	\$5,199,279	↓	\$7,330,214
Geological Survey - USGS	\$276,312	\$56,452	\$332,764	↓	\$393,803
NASA	\$4,789,330	\$1,728,200	\$6,517,530	↑	\$6,102,769
NEH	\$229,323	\$39,741	\$269,064	↑	\$232,000
NIH	\$45,395,344	\$17,036,224	\$62,431,568	↑	\$57,227,885
NOAA	\$6,249,911	\$1,688,117	\$7,938,028	↑	\$7,750,911
NSF	\$27,759,930	\$8,514,451	\$36,274,381	↑	\$22,562,642
U.S. Agency for International Development (USAID)	\$34,725	\$0	\$34,725	↓	\$297,624
USDA	\$9,803,448	\$2,223,165	\$12,026,613	↑	\$1,205,775
USDI	\$1,471,979	\$221,757	\$1,693,736	↓	\$2,375,506
Other Federal	\$616,185	\$181,913	\$798,098	↓	\$6,531,378
State of California	\$18,761,008	\$3,566,616	\$22,327,624	↓	\$27,575,893
Industry	\$4,858,373	\$1,054,849	\$5,913,222	↑	\$3,111,495
Gordon and Betty Moore Foundation	\$6,406,094	\$537,045	\$6,943,139	↑	\$4,492,202
Heising-Simons Foundation	\$1,767,549	\$265,133	\$2,032,682	↑	\$1,158,380
Simons Foundation	\$1,396,350	\$231,111	\$1,627,461	↑	\$1,034,247
Other Foundation	\$12,514,567	\$970,737	\$13,485,304	↓	\$14,724,719
Other	\$24,400,126	\$4,798,995	\$29,199,121	↓	\$29,366,447

*Includes CARES Act funds



Extramural Funding

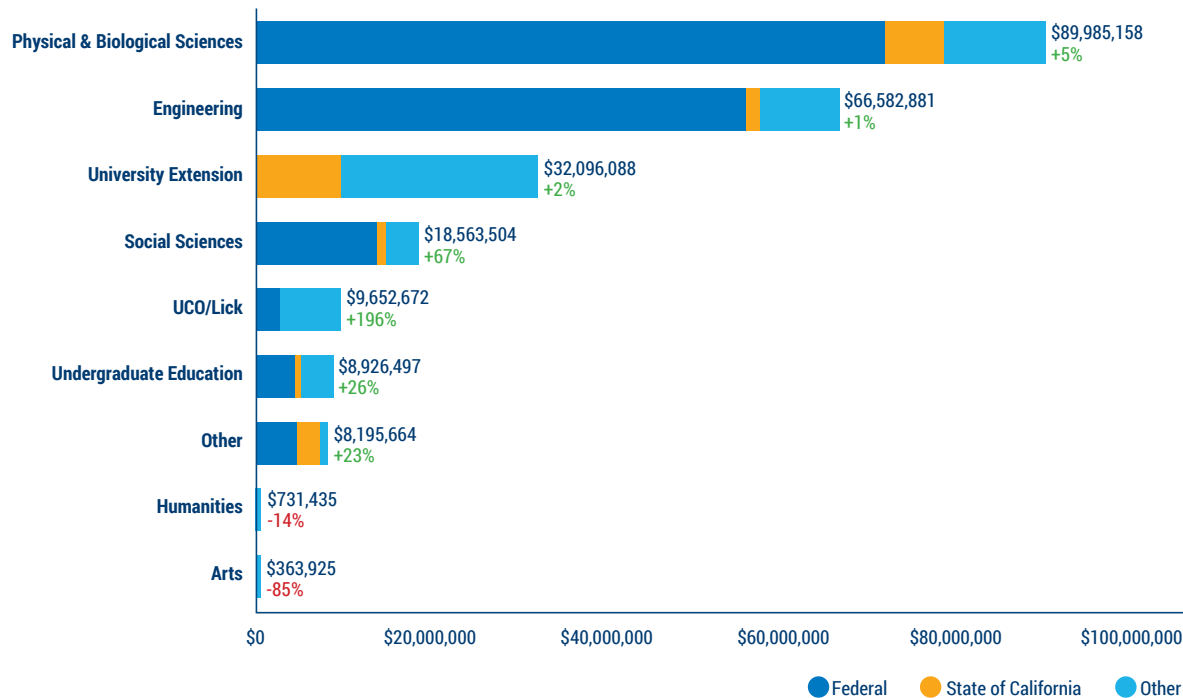
Industry Funding Trend





Extramural Funding

FY23 Funding by Unit





Extramural Funding

Top 5 Research Awards in FY23

\$7,491,188

David Haussler (PI)
Genomics Institute

NIH/NIMH

05/09/2023 - 04/30/2028
"Data Resource and Administrative
Coordination Center for the Scalable
and Systematic Neurobiology of
Psychiatric and Neurodevelopmental
Disorder Risk Genes Consortium"

\$5,758,472

Ricardo Sanfelice (PI)
Abhishek Halder, Heiner Litz (Co-PIs)
Electrical & Computer Engineering

NATIONAL SCIENCE FOUNDATION (NSF)
07/01/2022 - 06/30/2027

"Collaborative Research: CPS: Frontier:
Computation-Aware Algorithmic Design
for Cyber-Physical Systems"

\$5,466,932

Bruce Macintosh (PI)
UCO/Lick

GORDON AND BETTY MOORE FOUNDATION
11/30/2022 - 12/31/2026
"UCOLick outreach and education"

\$4,877,312

Eric Palkovacs (PI)
Institute of Marine Sciences

NOAA MARINE FISHERIES SERVICE
07/01/2022 - 06/30/2023
"CIMEAS Investigations in Fisheries Ecology"

\$3,525,000

Benedict Paten (PI)
William James Kent (Co-PI)
Genomics Institute

CHAN ZUCKERBERG INITIATIVE
07/18/2022 - 06/30/2025
"Human Cell Atlas Data Ecosystem"



Extramural Funding

Top 5 Non-Research Awards in FY23

\$10,000,000

Stacy Philpott (PI)
Flora Lu, Maywa Montenegro,
Damian Parr, Jeffrey Bury,
Rebecca Fenwick (Co-PIs)
Environmental Studies

NATIONAL INSTITUTE FOR FOOD
AND AGRICULTURE (NIFA)
06/15/2023 - 06/14/2028
"Cultivando Lideres: A regional
partnership for training and serving
diverse students in agroecology,
justice, and equity"

\$4,800,000

Maria Rocha-Ruiz (PI)
Educational Partnership Center

PAJARO VALLEY UNIFIED SCHOOL DISTRICT
07/01/2023 - 06/30/2026
"Partnership Service Agreement
between EAOP and Pajaro Valley
Unified School District"

\$3,215,000

Jason Nielsen (PI)
Michael Hance, Tesla Jeltema,
Carl Maltzahn (Co-PIs)
SCIPP

DEPARTMENT OF ENERGY/MISCELLANEOUS
OFFICES AND PROGRAMS
10/01/2022 - 06/30/2027
"Traineeships for Computational
High Energy Physics"

\$2,999,943

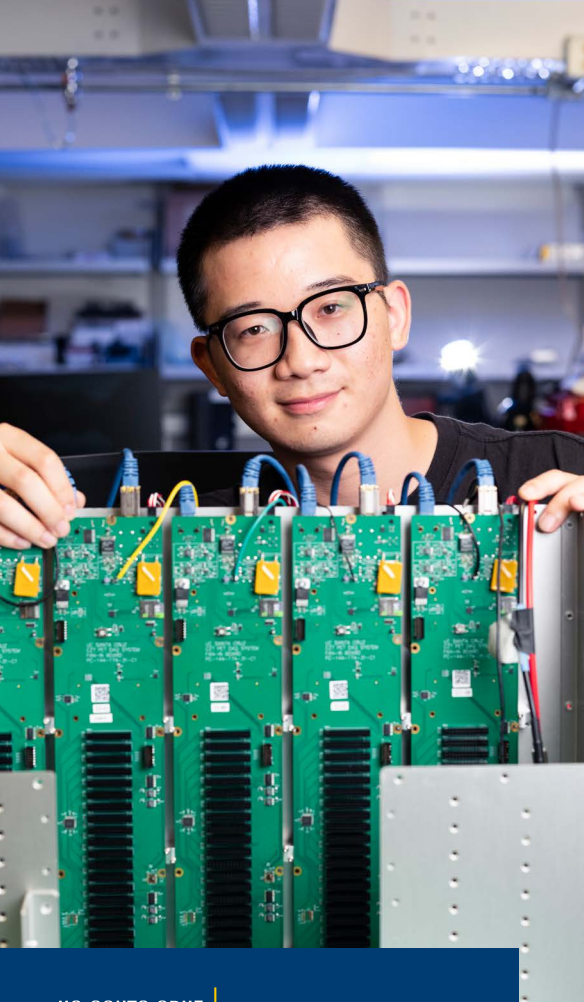
Charis Herzon (PI)
*Student Achievement
& Equity Innovation*

US DEPARTMENT OF EDUCATION
MISCELLANEOUS AGENCIES
10/01/2022 - 09/30/2027
"Cultivating Transfer Receptivity
at UC Santa Cruz"

\$1,549,985

Russell Corbett-Detig (PI)
Angela Brooks (Co-PI)
Genomics Institute

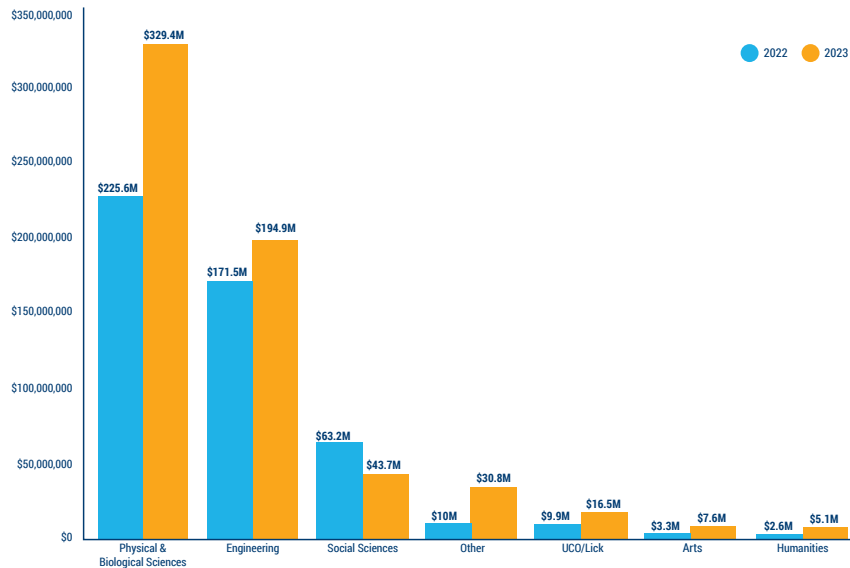
NIH/NHGRI
07/01/2022 - 06/30/2027
"UCSC Graduate Program
in Genome Sciences"



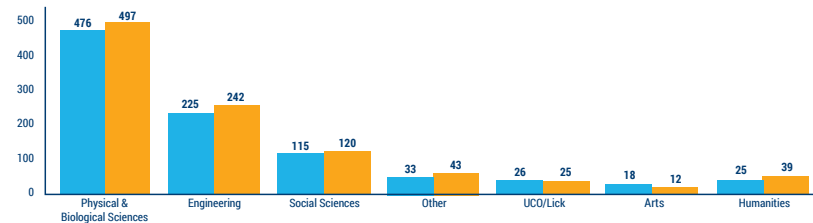
Extramural Funding

Proposals Submitted

Dollar Value of Proposals Submitted



Number of Proposals Submitted



Office of Research Highlights





Office of Research Highlights

Office of Research

FY23 HIGHLIGHTS

- UC Santa Cruz was awarded \$20 million in funding to launch the Center for Coastal Climate Resilience. This cross divisional center is housed in OR.
- Research Development (RD) expanded support across all divisions, with year over year increases in the number of submitted proposals supported (37%); the number of strategic consultations (65%); and the number of distinct lead PIs supported (21%).
- RD supported 400% more submitted proposals in Humanities and 100% more in Social Sciences in FY23 than in FY22.
- In the second year of the CSI:CAREER program, four of the seven NSF CAREER proposals for which RD provided substantial support were awarded.
- The first "Research Forum" was co-supported with the Division of Humanities to introduce faculty to the spectrum of support available throughout the research and funding life cycle.

SEED FUNDING PROJECTS:

- In March 2022, 19 awards totalling \$662,942 were made as part of the Seed Funding for Early-stage Initiatives program through FY23.
- A total of \$5,582,497 in follow-on funding was requested from federal, state, and foundation sponsors.
- Seed funding supported seven conference presentations, five publications, an international conference, a public museum display, a first-of-its kind digital archive, and a film premiered at the Tribeca Film Festival.
- OR launched a center-scale seed funding initiative in late FY23 for work to be conducted over the next year.



Office of Research Highlights

Center for Coastal Climate Resilience (CCCR)

VISION STATEMENT

The Center for Coastal Climate Resilience at UC Santa Cruz will leverage its deep expertise in research and policy and practice to help communities adapt to climate change. We will expand the development of solutions that benefit people and nature and build resilience that is just and equitable.

FY23 HIGHLIGHTS

- UC Santa Cruz received \$20 million in funding from the California State Budget Act of 2022-23 to create the Center for Coastal Climate Resilience. In October 2022, the center named research professor Mike Beck as its executive director.
- Beck, who holds the AXA Chair in Coastal Resilience, became co-director of the new Climate Risks and Equitable Nature-based Solutions Hub.
- In March 2023, the center hosted a Coastal Climate Resilience Symposium at the Seymour Center with scientists, policy leaders, and insurance experts focused on integrating nature-based solutions into risk management and insurance.
- CCCR is partnering with the UCSC Coastal Science and Policy Program to fund additional student opportunities and support workforce development programs.

In June 2023, the center awarded over \$4.6 million in funding to 23 UC Santa Cruz research groups for pilot projects and implementation projects supporting efforts to fight climate change in coastal communities across California and beyond. See [full list](#) of projects.

- The pilot funding initiative intends to foster previously unfunded research projects, collaborations, and creative works that address coastal climate-related impacts and solutions. Fifteen pilot projects were selected and received up to \$100,000 each.
- The implementation funding program supports projects that speak to the impacts to coastal communities from climate change, deliver clear outcomes and solutions, and engage partners to address the challenges from coastal climate change. Seven projects were selected for this program and received up to \$500,000 each.



Office of Research Highlights

Innovation & Business Engagement Highlights

Innovation & Business Engagement Hub

The Innovation & Business Engagement Hub has made significant progress on several programs and initiatives to advance innovation and entrepreneurship. The Hub is working hard to encourage a campus culture that emphasizes societal and economic impact, recognizes the value of innovation, and fosters an opportunities-centered mindset around translational research, commercialization, entrepreneurship, and partnering. The following two examples, created and managed by the Hub, were designed with this objective in mind.

The UC Santa Cruz Chancellor's Innovation Impact Awards Program recognizes and celebrates university faculty, researchers, staff, students, and community partners for their valuable contributions to innovations that have catalyzed transformative change and societal impact. Innovator of the Year, Community Changemaker, and Lifetime Achievement in Innovation awards were presented at an inaugural event that brought together the region's extended innovation community.

Awardees:

Innovator of the Year

Russell Corbett-Detig, Biomolecular Engineering
Ultrafast Sample Placement on Existing tRees (USHER) tool

Gina Dent, Feminist Studies, and
Rachel Nelson, Institute of the Arts & Sciences
Visualizing Abolition

Community Changemaker

Doug Erickson and Santa Cruz Works

Lifetime Achievement in Innovation

Dave Deamer and Mark Akesson, Biomolecular Engineering

Innovation Catalyst Grant

The Innovation Catalyst Grant is a proof-of-concept program focused on providing targeted gap funding, training, mentorship, and support to UC Santa Cruz researchers to help de-risk and/or validate the implementation and adoption potential of early-stage technology innovations. In the inaugural grant cycle, two exciting projects were awarded funding and teams are participating in immersive lean launchpad training and structured engagement with experienced external mentors.

Awardees:

A new approach to growing cells that will transform the realism and scale of experiments possible in biological research.

David Haussler

Distinguished Professor, Biomolecular Engineering
Scientific Director, Genomics Institute

Mircea Teodorescu

Associate Professor, Electrical and Computer Engineering

Jumpstarting drug discovery for cardiac ischemia-reperfusion injury (CIRI)

Ted Holman

Professor, Chemistry and Biochemistry

Office of Research Highlights

Patents

UC Santa Cruz had 26 issued US patents in FY23.

The patents below issued in FY23 and were the first to issue from a patent family.

The remaining 5 issued patents were from continuing applications.

JJ Garcia Luna Aceves Luca de Alfaro*	TECHNIQUES FOR PERIODIC TRANSMISSION OF COMMUNICATIONS PACKETS
Jin Zhang	METHODS OF PRODUCING COBALT NANOPARTICLES AND HOLLOW GOLD NANOSPHERES AND KITS FOR PRACTICING SAME
Ted Holman	INHIBITORS OF PLATELET FUNCTION AND METHODS FOR USE OF THE SAME
Susan Carpenter	METHODS AND COMPOSITIONS FOR TREATING INFLAMMATORY DISEASES
Snigdha Chaturvedi*	SYSTEM AND METHOD FOR ARTIFICIAL INTELLIGENCE STORY GENERATION ALLOWING CONTENT INTRODUCTION
Ed Green	BARCODED SOLID SUPPORTS AND METHODS OF MAKING AND USING SAME
Holger Schmidt	HIGH EFFICIENCY OPTICAL DETECTION OF BIOMOLECULES IN MICRO-CAPILLARIES
Katia Obraczka	APPARATUS AND METHOD FOR EFFICIENT DEPLOYMENT OF NODES IN A NETWORK
Yat Li	CARBON-DOPED NICKEL OXIDE CATALYST AND METHODS FOR MAKING AND USING THEREOF
Miten Jain*	METHODS OF PRODUCING RIBOSOMAL RIBONUCLEIC ACID COMPLEXES
Andrew Smith*	
Ali Yanik	ELECTRO-PLASMONIC NANOANTENNA FOR EXTRACELLULAR OPTICAL DETECTION OF ELECTROGENIC SIGNALS
Hamid Sadjadpour	COMPACT KEY WITH REUSABLE COMMON KEY FOR ENCRYPTION
Emily Brodsky	SYSTEM FOR DETERMINING RESERVOIR PROPERTIES FROM LONG-TERM TEMPERATURE MONITORING
Nobby Kobayashi	BACK-ILLUMINATED PHOTOELECTROCHEMICAL CELL
Keith Corzine	CONTROL AND PROGNOSIS OF POWER ELECTRONIC DEVICES USING LIGHT
Nobby Kobayashi	CRYSTALLIZATION OF TWO-DIMENSIONAL STRUCTURES COMPRISING MULTIPLE THIN FILMS
Ed Green	METHODS OF PRODUCING NUCLEIC ACID LIBRARIES AND COMPOSITIONS AND KITS FOR PRACTICING SAME
Roberto Manduchi	GAZE-CONTINGENT SCREEN MAGNIFICATION CONTROL
Marco Rolandi	NATURALLY SOURCED CHITIN FOAM
Ali Yanik	MICROFLUIDIC ACOUSTIC DEVICES AND METHODS
Peter Weiss-Penzias	SYSTEM AND METHOD FOR SENSING VOLATILE ORGANIC COMPOUNDS

* indicates inventors are no longer at UCSC

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.

FY23 HIGHLIGHTS

- The Genomics Institute (GI) co-led an international consortium to release the first draft of a human pangenome, a revolutionary new reference that will dramatically improve research into human variation. The release was covered internationally as a groundbreaking moment for genomic science.
- GI became the Data Coordination Center for a new wide-scale project from the National Institute of Mental Health to study the genetic underpinnings of neurological conditions.
- The GI Cactus alignment tool powered a large new Zoonomia release, published in a special issue of Science, on comparative genomics. Papers authored by our researchers showed insights into the evolution of sled dogs, using DNA from the famous sled dog Balto, and found methods for predicting which mammal species are more likely to face extinction.
- GI hosted an Advancing Anti-Racist Action in Genomics symposium to inspire ideas for broadening access to genomic science.
- The GI Pathogen Genomics group and Paleogenomics Lab helped solve long-standing mysteries surrounding the origin of introns and animal evolution, respectively.
- GI announced the creation of a new Live Cell Biotechnology Discovery Lab to create tools for remote experimentation in the hope that it will shape the future of STEM education and broaden access to hands-on lab experiences.
- Beth Shapiro, who was inaugurated into the American Academy of Arts and Sciences this year, announced plans to help “de-extinct” the dodo bird, an effort she hopes will lead to the development of new tools for conservation.
- The Genome Browser was named an inaugural Global Core Biodata Resource.

David Haussler
Scientific Director

Russ Corbett-Detig
Max Haeussler
Karen Miga
Associate Directors

Benedict Paten
Lars Fehren-Schmitz
Beth Shapiro

Sofia Salama
Faculty Director, Diversity

Katrina Learned
Executive Advisor

FY23 TOP RESEARCH AWARDS

\$7,491,188

David Haussler (PI)
NIH/NIMH

“Data Resource and Administrative Coordination Center for the Scalable and Systematic Neurobiology of Psychiatric and Neurodevelopmental Disorder Risk Genes Consortium”

\$3,525,000

Benedict Paten (PI)
William James Kent (Co-PI)
CHAN ZUCKERBERG INITIATIVE
“Human Cell Atlas Data Ecosystem”



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.

FY23 HIGHLIGHTS

- IMS Director Dan Costa served on an ad hoc committee that guides the National Science Foundation's Office of Polar Programs on future directions for Southern Ocean and Antarctic nearshore and coastal research, as well as a planning committee for a workshop on Technology Developments to Advance Antarctic Research.
- Eric Palkovacs, Ecology and Evolutionary Biology professor, IMS associate director, and director of the Fisheries Collaborative Program was appointed as Associate Vice Chancellor (AVC) for Strategic Initiatives for the Office of Research (OR).
- Michael W. Beck, IMS senior research scientist, was appointed as director of the Center for Coastal Climate Resilience (CCCR).
- Colleen Reichmuth, IMS senior research scientist, was honored with the 2023 Distinguished Alumni Awards in recognition of her achievements studying comparative cognition, bioacoustics, and behavioral ecology of marine mammals.
- James Gilbert was named a NOAA Team Member of the Year for developing models that profoundly influenced water and fisheries management.
- Dale Robinson received the 2022 NESDIS Outstanding Collaboration Award for his contributions to NOAA CoastWatch.
- IMS researchers Rachel Holser and Borja Reguero were two of twenty-three recipients of UCSC's Center for Coastal Climate Resilience awards.
- Stephanie Brodie, former IMS assistant project scientist, received a three-year, \$500,000 grant to work with the four California marine sanctuaries (Channel Islands, Monterey Bay, Cordell Banks, and Greater Farallones) to project climate impacts on marine predators and their prey.

Dan Costa
IMS Director

Raphe Kudela
Associate Director of Academic Initiatives

Eric Palkovacs
Associate Director of Research Initiatives

Ashley Vizurraga
IMS Assistant Director

FY23 TOP RESEARCH AWARDS

\$4,877,312

Eric Palkovacs (PI)
NOAA MARINE FISHERIES SERVICE
"CIMEAS Investigations in Fisheries Ecology"

\$1,961,934

Michael Beck (PI)
NATIONAL SCIENCE FOUNDATION (NSF)
"Large-scale CoPe: Reducing Climate Risks with Equitable Nature-based Solutions: Engaging Communities on Reef-Lined Coasts"



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.

FY23 HIGHLIGHTS

- The Legacy Survey of Space and Time (LSST) Camera, the world's largest camera, is undergoing final testing at SLAC and is slated to be shipped to Chile for installation on the Vera Rubin Observatory in early 2024.
- SCIPP researchers are playing major roles in Rubin construction, commissioning, and science preparation.
- The Dark Energy Spectroscopic Instrument (DESI) released its first public data with spectra of 1.2 million galaxies and quasars and nearly half a million stars.
- SCIPP researchers are conducting novel scientific analyses including large-scale structure cosmology and mapping of our Milky Way galaxy with DESI data.
- SCIPP theorists explored new possible candidates for dark matter in the universe, including primordial black holes. They released a study of expanded science capabilities with the accelerator complex at Fermilab.
- New silicon particle detectors with improved timing resolution were developed at SCIPP for use in collider physics experiments and accelerator monitoring. The detector design combines semiconductor material science and high-speed electronics. Researchers working on the ATLAS experiment at CERN improved measurements of Higgs boson properties and extended searches for new physics, including dark matter candidates. This research made use of high-throughput computing resources and machine learning to process proton-proton collision data.

Jason Nielsen, *Director*

Tesla Jeltema, *Associate Director*

Stefano Profumo, *Deputy Director for Theory*

Margaret Wuerth, *Assistant Director for Administration and Finance*

FY23 TOP RESEARCH AWARDS

\$3,215,000

Jason Nielsen (PI)

Michael Hance, Tesla Jeltema, Carl Maltzahn

DEPARTMENT OF ENERGY/MISCELLANEOUS OFFICES AND PROGRAMS
"Traineeships for Computational High Energy Physics"

\$908,530

Abraham Seiden (PI)

Anthony Affolder, Vitaliy Fadeyev (Co-PIs)

DEPARTMENT OF ENERGY/MISCELLANEOUS OFFICES AND PROGRAMS
"ATLAS Upgrade Strip Modules"



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.

FY23 HIGHLIGHTS

- Bruce Macintosh joined UCSC as the new Director of UCO. Professor Macintosh has led large international collaborations to build astronomical instruments, studied extrasolar planets, and worked extensively in astrophysics science policy including the most recent astronomy and astrophysics Decadal Survey.
- A UC Observatories team has moved into full development of the Slicer Combined with Array of Lenslets for Exoplanet Spectroscopy (SCALES) infrared spectrograph for the Keck Observatory. SCALES is designed to directly image extrasolar planets - blocking out the bright star so that faint nearby Jupiter-like planets can be studied spectroscopically to understand their atmospheric composition - with sensitivity that exceeds even space telescopes.
- Over its 135 year history Lick Observatory has pioneered technology from photographic plates to adaptive optics.
- Recently, UC Santa Cruz Astronomy Professor Kevin Bundy and Professor Holger Schmidt, of Electrical and Computer Engineering, achieved first light with a photonic device using Lick Observatory's Shane Telescope. A photonic device can detect and manipulate light on small scales, like an optical microchip to miniaturize the methods used to capture information about objects in the night sky.
- A generous grant to UCO from the Gordon and Betty Moore Foundation will enable a large expansion of science education and outreach at Lick Observatory, beginning with a new consortium to bring students from CSUs and community colleges, early in the STEM pipeline, to have research experiences at Mt. Hamilton.

Bruce Macintosh
Director

Matthew Shetrone
Deputy Director

Connie Rockosi
Associate Director for Instrumentation

Anna Korossy
Associate Director for Management and Administration

FY23 TOP RESEARCH AWARDS

\$5,466,932

Bruce Macintosh (PI)
GORDON AND BETTY MOORE FOUNDATION
"UCOLick outreach and education"

\$720,480

Puragra Guha Thakurta (PI)
HEISING-SIMONS FOUNDATION
"Shadow the Scientists astronomical observing outreach initiative"

Divisional Highlights

Divisional Highlights

Division of the Arts

FY23 ACHIEVEMENTS

Focus on Diversity, Equity, and Inclusion:

- The Arts Division was awarded a \$500,000 Advancing Faculty Diversity grant from UCOP for "Diversifying Recruitment through Curricular Reform in the Arts", which will support recruitment and retention of faculty of color; decolonization of the curriculum to represent global knowledges and cultures; and establishing regional pipelines. The central intervention of the grant is connecting curricular reform to faculty recruitment. (PI, Dean Celine Parreñas Shimizu).

Arts' most prestigious award - Guggenheim Fellowships:

Chosen from a rigorous application and peer review process out of almost 2,500 proposals, these successful applicants were appointed on the basis of prior achievement and exceptional promise.

- Professor Sharon Daniel (Film and Digital Media) for "Reasonable Doubt(s)"
- Associate Professor Anna Friz (Film and Digital Media) for "Children of the Sun"

Art / Science Collaborations:

Faculty in the Arts Division continue to drive art / science collaborations, participating in projects that transcend the disciplinary boundaries that compartmentalize knowledge

- Jennifer Parker (Art), serves as co-PI on a CITRUS seed award for "BrightBlue: Customizable, decomposable electrical energy storage". Lead PI, Eric Paulos, UC Berkeley.
- Two Arts Division faculty were awarded Coastal Climate Resilience grants. Jennifer Parker serves as Lead PI for "Climate Action Lab: Combining Science & Art to Help Coastal Communities Understand and Respond to Climate Risks," and micha cárdenas serves as Lead PI for "The Probability Engine: Using Augmented Reality and 3D Printing to Envision Futures of Resilience to Sea Level Rise."

Community-Engaged Arts Research at UCSC:

- Josh Harrison, Director of the Center for the Study of the Force Majeure, was awarded a California Arts Council Creative Corps grant for the project "Stewarding Knowledges: Gardening for the Future," which will facilitate collaborations with tribal members, artists and scientists in Nevada and Placer Counties, with a focus on plants important to Washoe culture bearers.
- Irene Gustafson's (Film and Digital Media) "Between Disparate Bodies" received funding from the UCSF Better Lab, REPAIR, UCSF National Scholars, PRIME, and Center for Community Engagement. The film is a complex meditation on health and healthcare, structures of harm, and what it means to address and repair that harm, through the stories of people who have experienced harm within our broken systems of healthcare.

Fellowships, Residencies, and Awards

- Kailani Polzak, (History of Art and Visual Culture), was awarded the Oceanic Art History Fellow, Center for Public Art History/ SmartHistory
- Ted Warburton (Performance, Play and Design), was appointed Senior Research Fellow for at the Arnhold Institute for Dance Education Research, Policy & Leadership, at Columbia Teachers College
- Anna Friz (Film and Digital Media) was awarded the Rydell Fellowship
- TJ Demos (History of Art and Visual Culture) was awarded the Cinepoetics Research Fellowship, Free University of Berlin
- Sir Isaac Julien, Arts Division-History of Consciousness, was awarded the 2023 Kraszna-Krausz Moving Image Book Award for "Lessons of the Hour – Frederick Douglass"

FY23 TOP RESEARCH AWARDS

\$149,064


Dard Neuman (PI), Music

NATIONAL ENDOWMENT FOR THE HUMANITIES (NEH)
"A Platform for Digitally Transcribing and Archiving Hindustani Music"

\$95,000

B. Ruby Rich (PI), Arts

FORD FOUNDATION
"Project Support for Film Quarterly"



Work of Prof. Marianne Weems' company,
The Builders Association



Divisional Highlights

Baskin School of Engineering (BE)

FY23 FEATURED RESEARCH

Health Engineering

- UC Santa Cruz scientists, along with a consortium of researchers, have released a draft of the first human pangenome—a new, usable reference for genomics that combines the genetic information of 47 individuals from different ancestral backgrounds to allow for a deeper, more accurate understanding of worldwide genomic diversity.
- The UC Santa Cruz Genomics Institute will run the Data Coordination Center for the Scalable and Systematic Neurobiology of Psychiatric and Neurodevelopmental Disorder Risk Genes (SSPsyGene) Consortium, a new major effort from the National Institute of Mental Health (NIMH) to study the 250 most important genes linked to a wide range of neuropsychiatric conditions.
- The California Institute for Regenerative Medicine (CIRM) will provide more than \$2.6 million in total funding for two major stem cell research projects led by scientists at UC Santa Cruz, projects led by Camilla Forsberg and Max Haeussler. This research could lead to improved treatment strategies for the millions of Americans who take drugs to prevent these health risks.
- A key genetic mutation that occurs early on in cancer alters RNA “dark matter” and causes the release of previously unknown RNA biomarkers for cancer early detection, [a new study](#) by UC Santa Cruz researchers published in the journal Cell Reports shows.

Climate resilience projects

- From building more efficient greenhouses to improving wildfire management, Baskin Engineering professors are leading three major projects to address climate crisis issues with funding from UCSC’s newly launched Center for Coastal Climate Resilience. All three of the projects led by engineering faculty are pilot awards, meaning they were previously unfunded efforts to address climate impacts and solutions.

Cybersecurity and AI

- Researchers from UC Santa Cruz will play an important role in protecting the United States’ transportation systems against cybersecurity threats as part of a new national center. UCSC researchers will focus on improving the artificial intelligence systems that power autonomous vehicles such as driverless cars.
- With the support of a nearly \$6 million grant from the National Science Foundation (NSF) through their Cyber-Physical Systems program, researchers at UC Santa Cruz will lead a five year, multi-institutional project to explore a new vision of engineering cyber-physical systems (CPSs).
- Released open-source code for SpikeGPT, the largest language-generating spiking neural network ever, also vastly more energy efficient than typical AI deep learning algorithms.

Leadership in Chip Design and Innovative Hardware

- A [new report](#) from a National Science Foundation (NSF) steering committee led by UC Santa Cruz Professor of Computer Science and Engineering Matthew Guthaus offers guidance for the future of chip design and manufacturing by focusing on revitalizing the hardware workforce by increasing access to education.
- A collaboration between Assistant Professor of Astronomy and Astrophysics Kevin Bundy and photonics expert Holger Schmidt, distinguished professor of electrical and computer engineering, will use spectrometers on a chip to miniaturize the methods used to capture information about objects in the night sky.
- A team of engineers at UC Santa Cruz has developed a new method for remote automation of the growth of cerebral organoids – miniature, three-dimensional models of brain tissue grown from stem cells. Cerebral organoids allow researchers to study and engineer key functions of the human brain with a level of accuracy not possible with other models.
- Associate Professor of Electrical and Computer Engineering Shiva Abbaszadeh will develop an advanced, dual-layer x-ray detector for coronary artery calcification. The novel technology will be an advanced, dual-layer x-ray detector, producing both a traditional image of the body as well as a material-specific image which, in this case, would detect calcium.

FY23 TOP AWARDS

\$5,758,472

**Ricardo Sanfelice (PI), Abhishek Halder, Heiner Litz (Co-PIs)
Electrical & Computer Engineering
NATIONAL SCIENCE FOUNDATION (NSF)**

“Collaborative Research: CPS: Frontier: Computation-Aware Algorithmic Design for Cyber-Physical Systems”

\$1,945,902

**Shiva Abbaszadeh (PI), Electrical & Computer Engineering
NIH/NIBIB**

“A dual-layer flat panel x-ray detector based on an engineered amorphous chalcogenide alloy for quantifying coronary artery calcium”



Divisional Highlights

Division of the Humanities

FY23 ACHIEVEMENTS

- UCSC joined the American Council of Learned Societies (ACLS) Research University Consortium, which plays an essential leadership role in sustaining and enhancing the national infrastructure of humanities research.
- UC Multicampus Research Programs and Initiatives grants totalling over \$400,000 were awarded to Mark Amengual (LAAL) and Greg O'Malley (HIST).
- UC Humanities Research Institute grants totalling \$48,000 were awarded to five Humanities faculty: Renée Fox (LIT), Kathleen Cruz Gutierrez (HIST), Filippo Gianferrari (LIT), Xavier Livermon (CRES) and Christian Ruvalcaba (LAAL).
- Watsonville Is In the Heart, a public humanities project led by Kathleen Cruz Gutierrez (HIST) and Steve McKay (SOC), won 3 awards totalling over \$100,000 from UCHRI, NEH, and the Monterey Peninsula Foundation.
- California State Library's Civil Liberties grant for \$50,000 was awarded to Professor Emeritus and Medal for Distinguished Contribution to American Letters recipient, Karen Tei Yamashita (LIT), and her UCSC alumni collaborator, Tim Yamamura, Ph.D.
- The Center for South Asian Studies received a \$1,000,000 pledge for an endowed professorship by UCSC Foundation Trustee Anu Luther Maitra and her husband Thomas Kailath.
- Several Humanities faculty members' achievements were honored with awards: Gina Dent, Associate Dean of DEI for the Humanities and Professor of Feminist Studies, received the Chancellor's Innovation Impact award for her Visualizing Abolition project; Christine Hong, Professor of CRES and Literature, was awarded the Mary C. Turpie Prize by the American Studies Association for excellence in teaching and her role in developing Critical Race and Ethnic Studies (CRES) at UC Santa Cruz; and Sharon Kinoshita, Professor of Literature and acting Faculty Director of The Humanities Institute, was elected a Fellow of the Medieval Academy of America.
- The Humanities Institute (THI) continued to serve as a research hub in the Humanities Division supporting 6 research centers, 3 clusters, and 14 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 Travel and the Institute hosted more than a hundred events with scholars and public intellectuals, reaching thousands of households around the globe. Notable speakers included Pulitzer Prize-winning science journalist, Elizabeth Kolbert, in conversation with the New York Times columnist and UCSC alum, Ezra Klein.

FY23 TOP AWARDS

\$266,815

**Mark Amengual (PI)
Languages**

UC MULTICAMPUS RESEARCH PROGRAMS
AND INITIATIVES - UC MRPI
"An interdisciplinary approach to the study of
Spanish-English bilingualism in California"

\$143,126

**Gregory O'Malley (PI)
History**

UNIVERSITY OF CALIFORNIA OFFICE OF THE
PRESIDENT (UCOP)
"Routes of Enslavement in the Americas"



Divisional Highlights

Division of Physical & Biological Sciences

FY23 HIGHLIGHTS

- Heather Welch from UCSC's Institute of Marine Science has led the production of a new dataset of intentional disabling of Automatic Identification System devices by fishing vessels, providing a unique insight into illegal, unreported, and unregulated fishing activity. This was one of UCSC most visited news stories over the past year.
- UCSC astronomers are involved in projects spanning all the main science themes being studied by NASA's James Webb Space Telescope. UCSC astronomers are using JWST to study the atmospheres of planets around other stars, revealing complicated weather systems of hot gasses and silicate clouds.
- Former UCSC graduate student Emily Donham and Professor Kristy Kroeker have found that red sea urchin populations are adapted to local environments, but that some populations will suffer more than others as conditions change in the future. This work was supported by the UC Institute for the Study of Ecological and Evolutionary Climate Impacts and the California Ocean Protection Council.
- By reconstructing the sea level history of the Bering Strait, Professor Tamara Pico and her team found that the strait remained flooded until around 35,700 years ago, not long before humans began migrating into the Americas.
- A large UCSC team has identified a novel approach to screening natural products to identify potential new drugs. A new approach using molecular biology, analytical chemistry, and bioinformatics to integrate information from different screening platforms addresses some of the biggest challenges in natural products drug discovery. This research was supported by the National Institutes of Health.

FY23 TOP AWARDS

\$2,768,504

Seth Rubin (PI)
Chemistry & Biochemistry
NIH/MISCELLANEOUS AGENCIES
& DEPARTMENTS
"Molecular Mechanisms of Cell Cycle Dependent Gene Expression"

\$2,203,805

Euseok Kim (PI)
MCD Biology
NIH/MISCELLANEOUS AGENCIES
& DEPARTMENTS
"Developmental Mechanisms of Fine-scale Cortico-cortical Circuit Formation"



Divisional Highlights

Division of Social Sciences

FY23 ACHIEVEMENTS

Faculty crossed diverse disciplines to address current issues of inequality:

- Galina Hale considered the global food system, animal agriculture in particular, as a major but not well understood contributor to climate change, land system change, biodiversity loss, water consumption and contamination, and pollution.
- Vicky Oelze demonstrated that the strontium isotope of Angola greatly improves the ability to assess the possible origins of enslaved African individuals discovered outside of Africa.
- Jean Fox Tree tested how conversational participants felt about a person communicating using mobile telepresence technology versus a person communicating in person.
- Rob Fairlie explored racial disparities in access to capital indicating black-owned startups start smaller and stay smaller over their entire first eight years.
- Juan Manuel Pedroza showed the current era of mass deportation has disrupted a record number of families and households in immigrant communities.
- Saskias Casanova examined how digital platforms serve as contexts that promote positive identity development where Latinx LGBTQ+ emerging adults resist marginalizing narratives and collectively reimagine their intersectional selves.

Social Science research tackled issues of health, climate and ecology:

- Ariel Zucker tested a novel prediction that "time-bundled" contracts can be effective in fostering lifestyle changes critical for the fight against diabetes in India.
- Natalia Ocampo-Peñuela argued conservation actions must consider local communities and focus on win-win situations for biodiversity and people, with the example of birdwatching tourism in Colombia.
- J. Mijin Cha argued privatization of the energy transition is detrimental for workers and for the climate, and a robust labor-climate alliance should advocate for ambitious public sector proposals that democratize the energy transition.

- Stacy Philpott led research demonstrating food production is not at odds with biodiversity conservation, and that urban gardens can positively affect biodiversity, local ecosystems, and the well-being of humans working them.
- Katherine Seto researched unregulated fishing which has largely escaped scrutiny highlighting a profitable fishery, with strong potential for improved management.
- Faculty expanded our community research through newly established initiatives including the UC wide Basic Needs Research Institute (under the Blum Center), the Campus and Community (C+C) initiative, the new Southwest Regional Food Business Center (supported through the Center for Agroecology), and the Center for Labor & Community.

FY23 TOP AWARDS

\$10,000,000

Stacy Philpott (PI), Flora Lu, Maywa Montenegro, Damian Parr, Jeffrey Bury, Rebecca Fenwick (Co-PIs)
Environmental Studies

NATIONAL INSTITUTE FOR FOOD AND AGRICULTURE (NIFA)

"Cultivando Líderes: A regional partnership for training and serving diverse students in agroecology, justice, and equity"

\$1,710,900

Chris Benner (PI), Environmental Studies

SIERRA HEALTH FOUNDATION

"Training and Capacity-Building for the Community Economic Mobilization Initiative"

More Information

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[Office of Research](#)
[Innovation & Business Engagement Hub \(IBE Hub\)](#)
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