

UNIVERSITY OF CALIFORNIA, ACADEMIC SENATE

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SANTA BARBARA • SANTA CRUZ

COORDINATING COMMITTEE ON GRADUATE AFFAIRS (CCGA)

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ACADEMIC SENATE

University of California

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The University of California is the research arm of California's three-tier public education system. UC is recognized by California's Master Plan of Education to have the sole authority in public higher education to award the doctoral degree in all fields of learning, and to be the primary state-supported academic agency for research.

In its 2009 rankings of national universities, the Washington Monthly used classification criteria that target the ability of a university to graduate students, who significantly contribute to community service and cutting-edge research, while also recruiting and graduating low-income students. Unlike other popular university rankings, the Washington Monthly extracted the critical parameters that allow a university to advance knowledge and benefit society. The rankings revealed that among 258 university campuses surveyed, three UC campuses were at the top of the list. These rankings come as no surprise since the UC faculty has structured its teaching of the professions, science, humanities and the arts to encompass research methodology and critical thinking as invaluable tools to educate its students. In fact, the research excellence of UC is reflected by the Nobel Prizes that 56 of its faculty and researchers have been awarded to date in Medicine, Physics, Chemistry, Economics and Peace. The research breadth of UC faculty has resulted in the emergence and convergence of new fields of study such as in Global Warming, Electronics, Communications, Aging, Global Health, Stem Cell and Regenerative Medicine and the interaction of Neuroscience with Artistic performance, to name a few.

In addition to its striking contributions to scholarship and the economy of the State, over many years, UC has enriched the lives of Californians through contribution of its museums and cultural attractions. For example, The Lawrence Hall of Science, located on the Berkeley campus, provides opportunities for people of all ages to learn about the world of science through its interactive displays for children and adults, programs for schools, extensive classes and workshops at the museum and its online interactive website. Also, on the Berkeley campus are Cal Performances, an extensive series of music, dance and theatrical performances by artists from around the world that is available to the public.

We are reminded that one of the greatest environmental dangers to our planet was unveiled by UC Nobel laureate Sherwood Rowland, who showed that chlorofluorocarbons (CFCs) were significantly damaging the ozone layer and exposing people to cancer-causing radiation. At the Nobel Prize award ceremony, the committee noted that this discovery saved the world from catastrophe. This is the level of research excellence that UC is known for around the world. In fact, this Nobel Prize was also awarded to his postdoctoral fellow, Mario Molina, who was a Ph.D. student at UC.

UC graduates students represent the gem of the graduate programs and are the intellectual capital of the University. Unfortunately, decreased graduate students enrollments due to fiscal constraints are occurring throughout the University. This situation endangers the distinction and excellence of our graduate programs by decreasing faculty research productivity and deflecting the University's research mission from its intended charge assigned to it by the California's Master Plan of Education.

Graduate students are critical to the education mission of the University, especially when they serve as mentors for undergraduates and work as teaching assistants. UC is losing its most talented students to institutions that can offer only 10-20% more support than UC.

UC offers graduate degrees in over 600 different fields, all of which drive discovery, innovation and education. UC's research mission fosters graduate and undergraduate education by creating a resourceful environment for the interchange of information among students at all levels. In an information age where Arts, Humanities and Sciences are becoming increasingly complex, UC graduate degrees will provide the advanced knowledge that a highly educated workforce will need to help California retain its position as a global and worldwide economic force.

In post-graduate endeavors, statistics show that UC graduates are likely to settle in California and earn high salaries that in turn would increase revenues to the state. In addition, UC graduates with Master's and Doctoral degrees contribute to the prosperity of education in California and constitute about 25% of the faculty in the California State University system. Graduate academic students are the future life-blood of academia. They are trained to work relentlessly, to think critically and to play a dynamic role in society while they remain strong advocates to the University.

Furthermore, UC's research has resulted in the birth and growth of biotechnology industries throughout the state and particularly in the San Francisco and San Diego areas. Actually, UC scientists founded a third of California biotech firms, most of which employ UC alumni with graduate degrees. Prominent companies such as Intel and Broadcom that pioneered advances in Electronics and Communications also shaped Silicon Valley and the Internet. Both of these companies had UC doctoral graduates at their helm. Undoubtedly, these and other companies continue to positively impact the economy of California and will help the state to recover from its dire financial situation.

Overall, a matrix of creativity, intellectual flexibility and critical thinking have shaped the research mission of the University and allowed it to advance to new heights as reflected by the panoply of opportunities it has created through the diversity and richness of its graduate programs. It is well known that flourishing societies have great institutions of learning and the close association of UC with the unique California culture continues to impact on the progression and evolution of knowledge in society.

The graduate programs of the University face an unprecedented threat. Steep increases in costs and fees of graduate students paid largely by faculty and Departments, coupled with decreasing block grant allocations to campuses and dwindling of research grants are forcing a steady reduction in graduate students admissions throughout all disciplines, especially the Arts and Humanities. The impact of a decrease in graduate students will undoubtedly take its toll on many educational aspects of our research university including faculty research productivity, student morale, contributions to society and workforce. The Coordinating Committee for Graduate Affairs (CCGA), which includes Senate faculty experts in graduate education from all campuses calls for a greater support to the University's research mission, which is carried at its core by graduate students. We ask that the Regents, the President and Chancellors work together to halt the increases in fees to graduate students, because they negatively impact on the University's mission and our research faculty. In an effort to attract graduate student funds from outside the University, we encourage the Regents and the President to campaign for the extension of Cal Grants to graduate academic students involved in research activities. Currently, Cal Grants, which are funded by the State of California, are intended only for undergraduate students and therefore broadening them to graduate students would empower graduate education in the State and encourage undergraduates to advance their knowledge and contributions to society.

Undoubtedly, past UC research contributions to society have enriched the world and made it a better place to live in. It would be a great loss if we imperil the critical component of the University's research. A modest listing of the most salient accomplishments that faculty, students and researchers

have generated over the years is attached to this letter and highlights the type of work that UC has been known for since its founding. The continued success of the tight and productive relationship between faculty and graduate students is currently at risk and may lead to an interruption in the steady contributions that UC has provided to the state, the country and the world. A call to maintain the affordability of graduate education at all fronts is a necessity that cannot be jeopardized ignored or continuously deferred. We trust that our leaders will heed our concerns and act accordingly to protect and lead graduate education.

The Coordinating Committee for Graduate Affairs (CCGA)

Farid Chehab, Ph.D., Chair (UCSF)
James Carmody, Ph.D., Vice-Chair (UCSD)
Ira Tager, M.D., M.P.H. (UCB)
Rachael Goodhue, Ph.D. (UCD)
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John Sutton, Ph.D. (UCSB)
Sue Carter, Ph.D. (UCSC)
John Hildebrand, Ph.D. (UCSD)
Michael Beattie, Ph.D. (UCSF)

Appendix

Berkeley

- In 1950's, as part of a drive to conserve Native American languages, UCB conducted a survey of all such languages in California to help reconstruct the pre-history of California.
- New Berkeley Diversity Research Initiative that focuses on social issues in multi-cultural societies.
- New public-private partnership to apply information technology to practical social challenges from energy conservation to education and health care.
- 1914-1920—Professors Joseph Grinnell and Tracy Story conduct landmark survey of Sierra Nevada wildlife.
- 1930's —Professor J. Neyman becomes one of the founders of modern statistical theory.
- 1931—E.O. Lawrence designs the first cyclotron—one practical consequence is production of isotopes for medical use.
- 1937—J. Lawrence becomes father of modern nuclear medicine.
- 1952—Physicist Hugh Bradner invents the first wetsuit, now a staple for water sports, commercial and military activities.
- 1960 Donald Glaser winner of the Nobel Prize for Physics and in 1971 establishes the first biotech company, Cetus.
- 1971-1977—Berkeley electrical engineering creates UNIX; release to public and encourage hackers to improve it, which created the new paradigm we now call Open Source.

Davis

- Kit Batten completed her M.S. in Ecology in 2001 and her Ph.D. in Ecology in 2004. Dr. Batten is the Science Advisor to the Deputy Secretary of the Interior in Washington, D.C. She has served in the office of Sen. Dianne Feinstein (D-CA) where she worked as a legislative assistant on climate change, energy, transportation, and agriculture policy. Dr. Batten also served as an American Association for the Advancement of Science Fellow in the office of Sen. Joseph Lieberman (I-CT) where she worked on a number of environmental and natural resource policy issues. In addition, Dr. Batten worked with Sen. Lieberman to investigate allegations of climate science censorship at several government agencies.
- Cherisse Boland completed her M.S. in Forensic Science in 2007. Ms Boland is a Supervising Criminalist in the San Francisco Police Department. She developed the DNA profile that led to the arrest of "Richard Ramirez, the Los Angeles Area Night Stalker". Based on her analysis, he is now a suspect in a 1984 San Francisco homicide of a nine-year old girl. Ramirez may have been involved in more than 17 murders.
- Tracy Ellen Caldwell completed her Ph.D. in Chemistry in 1997. Dr. Caldwell is an astronaut with the National Aeronautics and Space Administration, based in Houston. She has logged over 305 hours in space having completed her first space flight on STS-118 in 2007, the 119th space shuttle flight, the 22nd flight to the International Space Station (ISS), and the 20th flight for Endeavour. She is scheduled to launch again in April 2010.
- Martha Guzman-Aceves completed her M.S. in Agricultural and Resource Economics in 2002. Ms Aceves is a legislative advocate for the California Rural Legal Assistance Foundation. She advocates on a range of issues regarding the quality of rural life, including environmental justice, farm worker health and safety, and safe drinking water in rural areas. She is the Foundation's Director for its Sustainable Communities Project.
- Davor Hrovat completed his Ph.D. in Mechanical and Aeronautical Engineering in 1979. Dr. Hrovat works at Ford Motor Co. in the company's most prestigious technical expert position, Henry Ford Technical Fellow. He is a recognized world leader in the field of automotive system dynamics and is particularly strong in the fields of dynamical physical systems, automatic control and optimization. Dr. Hrovat developed some of the industry's first transmission shift control models and closed loop algorithms, which are still in use. He made key contributions to the design of advanced semi-active and active suspensions and vehicle stability control systems.

- Gurdev Khush completed his Ph.D. in Genetics in 1960. Dr. Khush is perhaps best known for his work at the International Rice Research Institute (IRRI) where he is considered to be the father of the Green Revolution in South Asia through the development of more than 300 rice varieties. These rice varieties are collectively credited with keeping food production in Asia one step ahead of population growth. Today, high yielding rice varieties with disease and insect resistance and excellent grain quality developed by Khush and his team at IRRI are grown on over 50% of the world's rice acreage and the productivity increases attributed to these varieties are estimated to feed 1 billion people globally. Presently Dr. Khush is sharing his knowledge with current UC Davis graduate students as an adjunct professor.
- Nadine Naber completed her Ph.D. in Anthropology in 2002. Dr. Nadar is currently an assistant professor at the University of Michigan. A leading public intellectual on issues of Arab and Muslim Americans and race/religion, she is one of the most highly regarded young scholars of Arab American studies and the study of the intersections of race /ethnicity / gender / sexuality / religion in the US. Dr. Nadar is co-founder of the Arab Women's Solidarity Association, North America (cyber AWSA); Arab Movement of Women arising for Justice (AMWAJ) and Arab Women's Activist Network (AWAN).
- Lisa Poyneer completed the Ph.D. in Electrical and Computer Engineering in 2007, concurrently with her employment at Lawrence Livermore National Laboratory. In 1998 she earned the SB in Computer Science from MIT as the top female and top engineering undergraduate student; she was then selected as a 1999 Rhodes Scholar. During her Ph.D., Lisa developed multiple breakthrough technologies in the field of adaptive optics through application of advanced signal processing techniques. Her work is an essential component of the \$24M Gemini Planet Imager (GPI) instrument. When completed in early 2011, GPI will be the world's most powerful astronomical adaptive optics system. Using Dr. Poyneer's algorithms, GPI will provide up to 100 times better performance than current systems, enabling the direct imaging of planets around other stars. GPI's spectroscopic pictures of these exoplanets will allow astronomers to determine what they are made of and refine theories of how they are formed.
- Pasquale Steduto completed his M.S. in Hydrologic Science in 1990 and his Ph.D. in Hydrologic Science in 1990. Dr. Steduto is the Chief of the Water Resources, Development and Management Service of the Land and Water Development Division of the Agricultural Department in the Food and Agricultural Organization in Rome. His research and policy program focuses on improving agricultural water management in order to increase efficiency and productivity through sustainable water use. During his recent years at FAO, Dr. Steduto has established a network of scientists and a working core group to develop a new crop model (named AquaCrop) that has been requested by thousands of users for use in the formation of national and regional water policies. He is heading the United Nations multi-organization water initiative, UN-Water.
- Jeffrey R. Unruh received his Ph.D. in Geology in 1990. Dr. Unruh is Vice President and Senior Principal Geologist, Fugro, William Lettis & Associates, Walnut Creek, CA. He has made significant contributions to the study of faults and seismic risk in Northern California, including the identification and characterization of blind (concealed) thrust fault between Mt. Diablo and its inclusion in the USGS seismic hazard model for the Bay Area and analysis of active faults and seismic risk in the Sacramento-San Joaquin Delta.

Irvine

- Donald McKayle, recipient of honors and awards in every aspect of his illustrious career, has been named by the Dance Heritage Coalition "one of America's Irreplaceable Dance Treasures: the first 100." His choreographic masterworks, considered modern dance classics are performed around the world. Ten retrospectives have honored his choreography, and in 2005, he was honored at the John F. Kennedy Center and presented with a medal as a Master of African American Choreography. Multiple award recipient Yvonne Rainer was one of the founders of the Judson Dance Theater in 1962, the genesis of a movement that proved to be a vital force in modern dance in the following decades. She has written, produced, and directed seven widely shown feature films, several of which have won multiple awards. Six books dealing with her work have been published.

- Faculty within the School of Biological Sciences have made important discoveries in basic science affecting human health and well being. These include Medal of Science recipient Francisco Ayala's discovery of malignant malaria's origin and Anthony James' development of genetically modified mosquitoes that cannot transmit malaria or dengue fever, James McGaugh's discovery of brain characteristics that give people super autobiographical memory, and Frank LaFerla's finding that stem cells may be used to treat Alzheimer's disease.
- UCI has three professional schools. At the Merage School of Business, Dean Andrew Policano is Chairman of the Board of Directors of the Association to Advance Collegiate Schools of Business (AACSB), the premier global organization overseeing business and management programs worldwide; Professor Connie Pechmann won the 2009 Pollay Prize for intellectual excellence in research on marketing in the public interest; Assistant Professor Kristin Behfar received the Western Academy of Management Ascendant Scholar Award for 2010, an award which recognizes faculty early in their careers who have demonstrated outstanding achievements in research and teaching as well as strong career potential; and Professor David Hirshleifer was chosen to give the keynote address at the European Financial Management Association Annual Meeting in 2007. The UCI Law School, the first new public law school in California in more than 40 years, admitted its first cohort of students in 2009/2010. One recent study released in March 2010 ranked its faculty in the top ten in the nation in scholarly impact and listed founding Dean Erwin Chemerinsky as the nation's most-cited full-time legal academic. Its initial entering class is among the top twenty among all law schools in the country.
- In the School of Medicine, health Sciences faculty have identified virus/disease origins (John Wasmuth identified the gene causing Huntington's disease; Ian Lipkin identified the encephalitis sweeping the U.S. in 2002 as West Nile Virus and found that the drug ribivirin treats it; Taosheng Huang has done seminal work with the OPA-1 gene and the development of optic atrophy; Nick Vaziri has defined the molecular mechanisms of lipid disorders in renal disease), developed new medical devices/procedures (Hans Keirstad's stem cell therapy was first to receive FDA approval for testing in humans; Roger Steinert invented the first laser corneal transplant procedure; Ralph Clayman invented devices to promote minimally invasive urological surgery techniques and performed the world's first laparoscopic removal of a kidney; Scott Goodwin introduced uterine fibroid embolization in the U.S.A.) and contributed important advances to preventive care (Eric Stanbridge discovered a simple test for cervical cancer; Alan Barbour helped discover the cause of Lyme disease and a vaccine to prevent it; Eva Lee found that the abortion pill compound prevents breast tumor growth; Luis de la Maza formulated a vaccine to prevent ocular, respiratory and genital chlamydial infections).
- Faculty in the Henry Samueli School of Engineering have made important green inventions (Scott Samuelsen's group developed the most efficient hybrid fuel cell/gas turbine system) as well as significant medical discoveries (Fan Gang Zeng invented the first frequency modulated cochlear implant to improve hearing aids; Joyce Keyak invented the first radioactive bone cement for cancer treatment). Enrico Gratton developed frequency domain fluorescence spectroscopy, which has had a major impact on the study of biological molecules, as it allows one to follow the dynamics of molecules in real time. Kumar Wickramasinghe led in the development of atomic force microscopy and scanning probe technology, which, as commercial products, have revolutionized modern nano scale science. He has also developed new ideas on ultra sensitive techniques to observe at the single cell level that ultimately help in DNA manipulation.
- Four Department of English faculty have won Pulitzer Prizes, the world renowned Thesaurus Linguae Graecae (TLG), a research center pioneered by the late Ted Brunner that collected and digitized most literary texts written in Greek from Homer to the fall of Byzantium in AD 1453, is used by classic researchers around the world. The UCI MFA Writing Program faculty have given us such novels as *Five Skies* and *the Signal* (Ronald Carlson) and graduates of the program have written many successful novels, including *The Lovely Bones* (Alice Sebold), *The Amazing Adventures of Kavalier & Clay* (Pulitzer Prize 2001, Michal Chabon). And the works of Wa Thiong'o, internationally renowned and award winning novelist, critic, and playwright, have been translated into thirty languages. He has addressed the United Nations General Assembly, and his return to Kenya in 2004 was the subject of a documentary film.

- Information and Computer Science faculty and graduate students have made important contributions to the internet: Paul Mockapetris invented the Domain Name System-DNS— a hierarchical naming system for computers, services, or any resource connected to the Internet or a private network and Roy Fielding (along with seven webmasters) started the Apache Group to redesign and maintain the public domain HTTP server. Others have aided in disaster response: a group led by Professor Sharad Mehrotra contributed to the design of infrastructures to access, share and disseminate critical information to first responders in a timely manner and Professor Chen Li's Family Reunification project aided efforts to reunite families and support search efforts after the Hurricane Katrina disaster and the Haiti earthquake. A UCI research group was the nexus of the "Irvine School" of thought, which led to the development of social informatics and Professor Gillian Hayes has developed technologies to help autistic students in the classroom.
- Two faculty members in the School of Physical Sciences have won Nobel Prizes: Frederick Reines (Physics 1995) for his discovery of neutrinos (also the recipient of the Presidential Medal of Science) and F. Sherwood Rowland (Chemistry 1995) for his discovery that CFC's damage the ozone layer. Irwin Rose shared in the Nobel Prize (Chemistry 2004) for the discovery of ubiquitin-mediated protein degradation. The co-authored work of former faculty member and Chancellor Ralph Cicerone (current President of the National Academy of Sciences and Chair of the National Research Council) led to the discovery of the C10X chain mechanism for depletion of stratospheric ozone.
- School of Social Ecology faculty member Elizabeth Loftus is one of the nation's leading experts on memory and often serves as expert witness on high profile legal cases. Her experiments reveal how memories can be manipulated by suggestions, ideas and facts. Joan Petersilia, a leading expert on California corrections, has served as an advisor to the Governor on parole reform. An advocate for evidence based correctional policy, she developed a parole matrix that is at the center of parole reform in California. Roxane Silver's research on responses to trauma in the aftermath of 9/11 contributes to her work as an appointee on the Secure Borders and Open Doors Advisory Committee of the Homeland Security Council of the U.S. Department of State and Homeland Security.
- School of Social Sciences faculty member Duncan Luce, the first social scientist in the UC system to be awarded the National Medal of Science, conducts path-breaking work on the foundations of measurement and applies these ideas to individual decision making. Jean-Claude Falmagne helped to develop a computer software system for assessing mathematical knowledge in school age children that is used in several hundred colleges and school districts in the country. Frank Bean, Ruben Rumbaut and other Social Science faculty have used demographics and interviews to track the outcomes and issues of immigrant populations in California and nationally. Michael Montoya and Angela Garcia have used medical social science to show, respectively, that social factors such as poverty and housing are more important than genetic factors in diabetes, and that land status in indigenous populations is a key factor in drug abuse. William Maurer established a Gates Foundation Institute for Money, Technology and Financial Inclusion that explores how the world's poor use technology to spend, store and save money, with an aim to construct positive models for development and charitable.

Los Angeles

- Judy Chicago (M.F.A., Art, 1964) became one of a handful of artists who created the Feminist Art Program at the California Institute of Art. This program, along with Chicago's famous 1974-79 work *The Dinner Party*, irrevocably changed the course of late 20th- and 21st century art in the US and beyond.
- Francis Ford Coppola (M.F.A., Directing, 1967) has directed, produced and/or written dozens of films, which include American classics *Patton*, *The Godfather Trilogy*, *Apocalypse Now* and *The Conversation*. These films have earned for Coppola fourteen Academy Award nominations and five Oscar awards, cementing his place as one of the most influential American directors of the past half-century.
- Julie Dash (M.F.A., Motion Picture and Television Production, 1985) is best known for her 1991 film *Daughters of the Dust*, which stands as the first feature-length film made by an African American woman, and it enjoyed both critical acclaim and box office success. Collectively, Dash's films explode stereotypes of

black women. Most recently, *Daughters of the Dust* was placed by the Library of Congress with a select group of American films that are regarded as National Treasures.

- Mike Davis (M.A., History), Distinguished Professor of Creative Writing at the University of California, Riverside, has written more than 20 books and 100 essays and book chapters in the academic and popular press. Exploring urbanism, the built environment, economic history and social movements, Davis's work is exemplary in its ability to expand and change historical writing, and, by extension, change the way readers understand the workings of the world. His best-known book, entitled *City of Quartz: Excavating the Future in Los Angeles*, published in 1990, won the Issac Deutscher Award from the London School of Economics and the award for Best Book in Urban Politics from the American Political Science Association. Davis is also the 1998 recipient of a MacArthur Fellowship (commonly known as the "Genius Grant").
- Brian Min, current graduate student, Political Science, is part of a team led by UCLA Professor of Sociology Andreas Wimmer that challenges the popular wisdom that ethnic diversity is the root cause of conflicts in various parts of the world.
- Elinor Ostrom (Ph.D., Economics, 1965), Arthur F. Bentley Professor of Political Science in the College of Arts and Sciences at Indiana University in Bloomington, received the 2009 Nobel Prize in Economics for her groundbreaking work that challenges traditional market-based views of Economics. She is the third UCLA Ph.D. to earn such a prestigious honor.
- Kay Ryan (M.A., English, 1968), whose poems are renowned for their odd subjects and surprising humor, was named the 16th poet laureate of the US in 2008.
- Vinton G. Serf (PH.D., Computer Science, 1972), Vice President of Google, is widely known as one of the fathers of the Internet. Together with Robert Kahn, Serf, while still a UCLA graduate student, co-designed the basic architecture of the Internet and the first TCP/IP Protocols. He has received both Turing Award and Presidential Medal of Freedom.
- Charles E. Young, (Ph.D., Political Science, 1960), currently Chief Financial Officer of the Los Angeles Museum of Contemporary Art (MoCA), was UCLA Chancellor from 1968 to 1997. During this time, UCLA became one of the nation's top-ranked universities. Under his leadership, UCLA created four Ethnic Studies Centers that 40 years later serve as cornerstones of their various disciplines in the academy. Other accomplishments include: pushing for reforms in intercollegiate athletics, establishing a partnership with the Los Angeles area that emphasizes the key role of the university in community development and service, and championing K-12 education in the city. At MoCA, Young has been responsible for bringing the institution back from the brink of financial disaster.

Merced

- Professors Shawn Newsam and Michael Colvin used techniques originally developed for studying pictures to better understand the motion of biological molecules. These methods are providing information on how mutations can lead to diseases including cancer.
- Professor Roland Winston, Director of the California Advanced Solar Technologies Institute, has developed "solar concentrators" that increase the ability to extract power from solar energy.
- Professor Roger Bales, Director of the Sierra Nevada Research Institute, has developed and advanced methods for hydrologic forecasting based on measures of the Sierra snowpack.
- Professor Thomas Harmon has developed distributed sensor networks for gathering information about nitrates in water and soil, which is useful for environmental management.
- Professor Kathleen Hull's research used new, innovative archeological methods to scientifically demonstrate the resilience of California's native people through the turmoil of colonialism.
- Professor Susan Amussen's literary work on the social and cultural history of English settlement in the Caribbean demonstrated that the impact of slavery on English culture was both earlier and more pervasive than has previously been thought.

- Professor Henry Forman and colleagues showed that proteins that are responsible for drug resistance of lung cancer cells are increased in response to substances present in air pollution and cigarette smoke.
- Professor Anthony Westerling modeled wildfire risks for California and found that the largest potential changes in wildfire tended to occur in forested areas of Northern California, while potential property damages were greatest in wildland/urban interfaces.
- Professor Michael Spivey has helped revolutionize the study of human thought by developing new techniques for measuring how mental processes unfold over time.
- Professor Carlos Coimbra has developed a new method for forecasting solar power availability that reduces costs of solar energy production by optimizing capacity reserves.

Riverside

- Cheryl Hayashi, Professor of Biology at UC-Riverside. She is a nationally renowned expert on spider silk and was a 2007 winner of a prestigious “Genius” MacArthur Fellowship. The understanding of the unusual strength of spider silk helps biotechnologists develop a variety of new materials for industrial, medical applications.
- Diane Elam (UCR Ph.D. Botany, 1994) Dissertation Title “Genetic variation and reproductive output in plant populations: effects of population size and incompatibility.” A chapter from this dissertation was published in Proceedings of the National Academy of Sciences in 2007. Diane is currently a research scientist with the US Fish and Wildlife Service.
- Sean Cutler, Associate Professor of Plant Cell Biology at UC Riverside conducts research in the area of chemical genomics. Cutler’s 2009 SCIENCE paper reported a major discovery of how abscisic acid, a naturally produced plant stress hormone, helps plants survive by inhibiting their growth in times of drought. This discovery has eluded plant scientists for decades and could have major impacts on crop production in arid climates.
- J. Prasad Senesi (UCR PhD Mathematics, 2007): Dissertation, “Finite-Dimensional Representations of the Twisted Loop Algebras”. Senesi was a Postdoctoral Researcher at University of Ottawa and is currently a tenure-track Assistant Professor of Mathematics at the Catholic University of America.
- Nenad Ban (UCR Ph.D. Biochemistry, 1995) Dissertation Title “Crystal Structure of an Anti-Idiotypic Fab and the Idiotypic-Anti-Idiotypic Complex”. His post-doctoral work with Thomas Steitz at Yale involved the X-ray structure determination of the ribosome, work for which Prof Steitz earned the 2009 Nobel Prize in Chemistry. Dr. Ban is currently a Professor and Group Leader at the ETH in Zurich, Switzerland.
- Anil Deolalikar, Professor of Economics at UCR is an internationally renowned expert on global poverty, hunger and health. His research on understanding the causes and consequences of child undernutrition throughout the developing world has been widely recognized and has influenced the health and nutrition policies of many developing countries.
- Yu Lei (UCR Ph.D. Chemical and Environmental Engineering, 2004) Dissertation Title “Biosensor and Bioremediation for an Organophosphorus Nerve Agent”. Lei published seven technical papers from his Ph.D. dissertation in premier journals in the field of biosensors and bioremediation. He is currently an Assistant Professor at University of Connecticut.
- Chris Reed, Distinguished Professor of Chemistry at UC Riverside, has synthesized the world’s strongest (yet gentlest) acid. It is used in fuel cells and acid-catalyzed chemistry for a cleaner, greener world. He is the recipient of the UCR Faculty Research Award for 2010.
- Vincent Lavallo (UCR Ph.D. Chemistry, 2008) Dissertation Title “Novel Stable Carbenes/Transition Metal Catalysts”. At UCR he published 16 papers that include 2 in Science, 1 in Proc. National Acad. of Science, and 10 in Angew. Chem); also 4 patents were filed. Dr. Lavallo is currently a postdoctoral fellow with Nobel Prize winner Robert Grubbs at Caltech.
- Carl Cranor, Distinguished Professor of Philosophy is an internationally renowned expert on issues at the intersection of philosophy, science, and the law pertaining to toxins in our environment. He has taught

courses on the role of science in the law to federal and state judges and has helped to inform the public discussion of the proper regulation of environmental toxins as well as legal remedies for those who have been harmed.

San Diego

- UCSD Libraries was the first academic library in Southern California to partner with Google on its global digitization project. UCSD Arts Library was the first academic library in the U.S. to digitize an entire slide collection for a now-global image collection known as ARTstor.
- A Scripps Institution of Oceanography scientist was the first to confirm the buildup of carbon dioxide in the atmosphere. Charles David Keeling's precise measurements, started in 1958, produced a data set now known widely as the "Keeling Curve" that has become a benchmark of global warming studies. The Weather Channel recognized this "discovery of global warming" as history's Biggest Weather Moment.
- In 2005, the Jacobs School Department of Structural Engineering opened the world's first full-scale outdoor shake table, able to handle structures weighing 2,200 tons and as tall as 100 feet. The shake table, which is able to create realistic simulations of the most devastating earthquakes on record, is being used to verify advances in seismic safety designs for buildings and bridges. UC San Diego structural engineers have pioneered a wide range of retrofit and design strategies to improve earthquake safety of bridges. These innovations have been adopted as standards by the California Department of Transportation (Caltrans) and continue to influence bridge and structure design across the United States and around the world.
- UC San Diego electrical engineering professors played a crucial pioneering role in the development of direct sequence spread spectrum communications—the wireless communications technology which evolved into CDMA (Code Division Multiple Access), the current world standard for 3rd generation wireless communications.
- UC San Diego computer science researchers developed the first automated method for automatically identifying worm and virus attacks across the Internet and other high-speed networks almost as soon as outbreaks occur. Cisco acquired the technology.
- UC San Diego mechanical engineering faculty developed the first therapeutic hypothermia treatment system, technology that is crucial in the treatment of people suffering from stroke or heart attack.
- The National Science Foundation designated SDSC one of the first four national supercomputer centers in the United States along with centers at the University of Illinois, Cornell and Princeton. SDSC was the first academic supercomputer center in the United States to hit the once unimaginable computational speed of 1 trillion calculations per second, or 1 "teraflops." SDSC was the first academic supercomputer center to build a digital data center 1,500 times the digital text equivalent of the Library of Congress, or 36 petabytes.
- In 2005 Calit2 rolled out the first free, public traffic-information phone service offering customized commuting tools for drivers on San Diego roadways. The California Wireless Traffic Report service has since expanded to Orange County, Los Angeles, and the Bay Area.
- Roger Tsien shares the 2008 Nobel Prize for Physiology and Medicine with Shimomura (Marine Biological Laboratory in Woods Hole) and Chalfie (Columbia University) for the development and application of fluorescent protein probes to monitor cellular function. Tsien describes his life's work as "building molecules to look inside of cells, allowing us to see beyond what the human eye can see." This method has revolutionized biomedical research and is advancing innovative clinical treatments such as gene therapy.
- Since 1983, the Institute on Global Conflict and Cooperation has engaged in facilitating innovative research into the causes of international conflict and cooperation, building project teams from all UC campuses and the UC-managed Lawrence Livermore and Los Alamos National Laboratories. The Institute is committed to educating the next generation of international problem-solvers and peacemakers through its research and teaching activities, and is one of the largest sources of dissertation and fellowship support for international studies students in the United States.

San Francisco

- “UCSF is one of the premier health centers in the world, and has developed health care technologies and innovations that have saved and improved countless lives. “Advancing health worldwide” is the UCSF mission.”
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- The birth of the biotechnology industry worldwide and in California can be traced to the discoveries and application of recombinant DNA by Hebert Boyer (UCSF) and Stanley Cohen (Stanford). Boyer founded in 1976, the pioneering biotech company, Genentech, which spawned a biotech industry that currently encompasses in California over 2,700 companies employing 258,000 Californians. In 2006, these companies generated \$72.8 billion in revenues.
- In 1975, UCSF geneticist and hematologist, Y.W. Kan discovered that alpha thalassemia, an inherited blood disease, was caused by the absence of the gene for alpha globin, a major component of hemoglobin. It was the first time the deletion of a gene was identified as causing human disease. Kan applied this discovery to the development of a DNA test that was used successfully in 1976 to diagnose alpha thalassemia in an unborn fetus. This innovation heralded the beginning of DNA testing for human diseases in adult and prenatal diagnosis. Later in 1979, Kan also discovered that DNA polymorphisms could be linked to human disease. This finding led to the mapping and eventually the sequencing of the Human Genome.
- UCSF physician/scientists spearheaded by Jay Levy were the first to identify the AIDS virus in 1983 leading to rapid diagnosis and therapeutic strategies. As a result, AIDS patients now live long and productive lives, and UCSF physicians continue to provide new treatments and public health approaches.
- In 1982, UCSF pediatric immunologist Arthur Ammann warns the Centers for Disease Control that tainted blood can transmit AIDS. Nine months later, the blood bank at Stanford School of Medicine becomes the first to screen blood to prevent AIDS transmission.
- UCSF scientists Michael Bishop and Harold Varmus were the first to discover the role of retroviral ‘oncogenes’ that produce susceptibility to many types of cancer, leading to further discoveries that have led the way to novel cancer therapies. They received the Nobel Prize in Physiology or Medicine in 1989. Dr. Varmus now co-chairs President Obama’s Council of Advisors on Science and Technology.
- Dr. Stanley Prusiner (Nobel Prize, 1997) discovered a totally unknown form of disease transmission by ‘prions’ that accounts for the spread of devastating brain disorders including ‘mad cow’.
- Dr. Michael Harrison’s pioneering work in fetal surgery.
- First recombinant hepatitis B vaccine developed by William J. Rutter has simplified manufacture of the vaccine such that it could be used for universal vaccination of all newborns. This vaccine has prevented perinatal transmission of hepatitis B virus in millions of babies born to HBsAg-carrier mothers.

Santa Barbara

- In 2008, UC Santa Barbara Chemistry Professor Galen Stucky received the Department of Defense's Advanced Technology Applications for Combat Casualty Care Award for his role in the development of a blood-clotting gauze that is helping save soldiers who suffer severe, life-threatening injuries in Iraq and Afghanistan.
- UCSB is leading the MacArthur Foundation’s \$10-million national program on the law and neuroscience, the first systematic effort to bridge the fields of law and neuroscience in considering how courts should deal with new brain-scanning techniques as they apply to matters of law.
- The invention and development of revolutionary new light sources by UC Santa Barbara Professor Shuji Nakamura. He invented the blue, green, and white light-emitting diodes and the blue laser diode. Forbes magazine described him as the successor to Thomas Edison. In recognition of his accomplishments, Nakamura was awarded the 2006 Millennium Technology Prize (worth one million euro, or about \$1.4 million USD).

- A real-time sensor for detecting cocaine –made with inexpensive, off-the-shelf electronics –has been developed by a team of researchers at UC Santa Barbara. Two local high school students and a Nobel laureate, Alan Heeger, participated in the discovery. The potential applications of the sensor are far-reaching and include bioterrorism detection and important medical uses. Heeger and the students coauthored a paper on their research that appeared in the Journal of the American Chemical Society.
- UCSB marine scientists played a key role in developing Ocean in Google Earth, which enables users to dive beneath the sea in Marine Protected Areas worldwide: earth.google.com/ocean/.
- The campus is home to the California NanoSystems Institute, one of the first California Institutes for Science and Innovation. A research partnership with UCLA, the institute is on its way to creating revolutionary new materials, devices, and systems that will enhance virtually every aspect of our lives.
- The English Department's "Transcriptions" project (recipient of a National Endowment for the Humanities research grant which are incredibly competitive, since there are only a handful given out relative to other government agencies). "Transcriptions" makes not only unpublished but completely unknown materials available to all, and is a major research project.
- The Professional Artists Lab, which combines the resources of the Media Arts & Technology Department, Theater, and Film and Media Studies, to provide an experimental lab "in which artists create work relevant to the lives we lead - lives influenced by incredibly sophisticated technological and scientific advances". Nancy Kawalek (Film & Media Studies and Media Arts & Technology) is the founder and director of the lab. They've done a lot of work on the brain, memory, and so on, in relation to post-war traumatic stress disorder and theater production.
- University-sponsored research and outreach programs via the "IV Arts Program" grew from the conviction that art, theater, and film could be responsive and integrated with local communities. This is made possible through the Interdisciplinary Humanities Center (IHC).
- UCSB is the home campus of the UC Research Institute in the Arts, and it is actively promoting collaborative projects on the environment and the arts, taking students in the arts to places as diverse as Antarctica (via Makrolab, of which Marko Peljhan is a founding member, and also a co-director of the UCIRA and professor in Art and in Media Arts and Technology) or the deserts which converge in southwestern California. This is a system wide research group but the directors are developing programming around environmental issues and communities through arts research.

Santa Cruz

- In a survey of U.S. engineering schools reported in ASEE Prism, UCSC ranked 3rd in the nation in the percentage of master's degrees awarded to women (44.2 percent).
- In 1994, UCSC became the first UC campus to offer a doctoral program in environmental studies, and in 2005, the first UC campus to offer a Ph.D. in music composition.
- New Ph.D. programs in film and digital media, in visual studies, and in technology and information management are admitting students for fall 2010.
- In 2008, four graduate students in engineering took first place in a national student robotics competition for their design of a solar-powered robot climber, demonstrating a concept essential to a "space elevator" that would transport material into space.
- In 2008, graduate student Tadashi Nakamura's documentary Pilgrimage was screened during the Sundance Film Festival, one of only 83 short films selected out of 5,107 submissions from around the world.
- A teacher and award-winning composer, Young-Shin Choi was attracted to the doctorate of musical arts program in music composition at UC Santa Cruz, where he studies computer-assisted composition, because of the collaborative nature of the program, generous financial package, and what he calls "perfect California weather." Choi prepared extensively to enter the doctorate of musical arts program. Having earned a Master of Arts degree in music composition from Kyungpook National University in Korea, he then earned a second master of arts in the same field from San Diego State University in order to further develop

his English skills before entering a U.S. doctoral program. In his compositions, Choi is working on developing an original musical sound combining traditional Korean music and Western idioms. He has received numerous awards for his music, including the Daejeon Contemporary Music Festival prize. Choi currently sits on the board of the New West Electro-Acoustic Music Organization, which organizes a prestigious international annual music festival.

- The 2008-09 Cowell College Puknat fellow, Michael Ursell (Literature), taught two independent courses for the college in addition to the fall core course. Michael's research investigates the relations between history of the book and the history of medicine. In 16th- and 17th-century Europe, printed books were beginning to circulate in unprecedented numbers, thanks to the spread of new printing technologies. The printed book as technological advancement coincided historically with new knowledge in a number of scientific fields, including human anatomy, physiology, cartography, and optics. Michael studies the ways in which new conceptions of the human body---of the workings of the heart, the lungs, the skeleton, and the skin---seeped into poetic thinking about love, inspiration, and the 'life' of books and led poets to write about books themselves as living bodies. Michael taught one of his Puknat seminars on the heart, from the perspectives of literary, artistic, medical, and popular culture from the ancients to today. For his other seminar, Michael turned to the consistent theme of friendship in lyric poetry across the ages to offer a seminar that picked up on the Cowell College motto ("The Pursuit of Truth in the Company of Friends"). That course was on friendship, from Plato, Aristotle, and Cicero to Facebook.
- In 1982, the total population of California condors was just 22 birds. Four years later, as the wild population continued to plummet, biologists decided to capture the remaining wild condors and breed them in captivity. Now, 140 captive-bred California condors are flying free in California, Arizona, and Baja California. Conservationists have long believed that the problem results from the use of lead ammunition by hunters. Condors feed on carrion and can ingest fragments of lead bullets from animal carcasses and gut piles left behind by hunters. Past efforts to ban lead ammunition in California have been stymied by opposition from hunting groups. But as a direct result of a scientific study led by UCSC graduate student Molly Church, the California Department of Fish and Game recommended a ban on the use of lead bullets throughout the range of the California condor. Church, who earned a master's degree in environmental toxicology in 2004 was able to match the lead in blood samples from condors to the lead in ammunition obtained from a variety of sources throughout central California. She used a proven "fingerprinting" technique based on the unique isotope ratios found in different sources of lead. Donald Smith, professor and chair of environmental toxicology, was Church's adviser and a coauthor of the scientific paper reporting her findings. "Had it not been for the outstanding science in Molly's paper, the professional lobbyists for hunter- advocacy groups testifying in opposition to the bill would have gone unchallenged," Smith says.