The nucleus of new ideas. UC graduate students are at the core of discoveries that drive our knowledge and economy forward.
Curiosity that makes the ingenious possible.

Improving wind turbines, scouring historical sites, searching the skies and sub-atomic particles, UC graduate students work to advance what we know. They bring intellectual firepower, leading the nation in National Science Foundation Fellowships and earning top awards in arts and humanities.

These prestigious scholars select UC for the unrivaled opportunities it offers to work on scientific and technological solutions to vexing problems in the world. And they deliver – authoring papers, developing medical treatments, starting new businesses, influencing the art world and mentoring the next generation of researchers and educators.

Their work creates jobs and has also spawned entire industries – in biotechnology, nanotechnology and film industry special effects, to name a few.

With 26,000 of the world’s most promising new researchers tackling the toughest problems head on, this is just the start of what is possible.

From mending weak hearts to exploring the cosmos, UC graduate researchers ask: How can we do better, work faster, know more?

The answers result in discoveries that transform the way we do business, protect our planet, improve our health and enrich our lives.
Building the brain trust

Graduate education is central to creating the intellectual capital necessary for California and the nation to maintain a robust, globally competitive economy. Together, the 10 campuses of the UC system comprise the strongest graduate enterprise of any university in the U.S.

Awarding 3,600 doctoral degrees a year — 7 percent of the nation's Ph.D.s — UC's graduate programs ensure California will be the place to find the talent needed for tens of thousands of new jobs expected to require advanced degrees.

As mentors and teaching assistants, UC graduate researchers give undergraduates first-hand exposure to the process of unearthing new ideas. Many of our doctoral candidates go on to become the professors who will inspire the next generation of students to think critically, explore, discover and lead.

They also become legislators and business executives, start-up directors and art luminaries, community leaders and social entrepreneurs.

UC graduate students and researchers make discoveries and produce the workforce that will help our economy grow, and attract industry, and human and capital investment from around the world.

Berkeley

Building an artificial kidney
Peter Sofer, a UC Berkeley chemical engineering student and National Science Foundation (NSF) graduate research fellow, is part of a pioneering effort at UCSF to build a small implantable device that will mimic the human kidney. The invention could save or change the lives of 2 million people with end-stage renal disease.

Testing toxic pesticides
The health risks of long-term exposure to many environmental contaminants are not well known. But Brandon Gaytan, a student in nutritional sciences and toxicology and NSF fellow, has taken the novel approach of using mutated yeast cells to test toxicity of pesticides and other chemicals.

Debugging apps
Computer scientist Adrienne Felt, a former NSF fellow, specializes in security and permission systems for those who install games, music and other applications into their smartphones or web browsers. She built a permissions analysis tool for Android that is now used by a number of companies and researchers.

Davis

Diving in Antarctica
Geology student Tyler Mackey dives into ice-covered Antarctic lakes to study microbes similar to those in the earliest fossils on Earth. His research, funded by NASA and NSF, could offer insight on the beginnings of this planet and clues to life on other worlds.

Helping kids overcome obesity
Nutritional biology student Gretchen George works with overweight and obese minority youth from low-income communities in the Central Valley. Funded by a USDA fellowship, her work with high-risk youth at a summer program helps them adopt healthy habits year round.

Exploring via virtual reality
The W. M. Keck Center for Active Visualization in Earth Sciences (KeckCAVES), supported by NSF, allows computer science and geology students to explore groundwater pathways and earthquake faults and to "visit" the bottom of Lake Tahoe and the surface of Mars.

Irvine

Seeking a cleaner, more efficient battery
In a Department of Energy (DOE)-funded project, Wenyi Yan investigates single nanostructured metal oxides that show promise for replacing lithium batteries. Her research aims for new cathode materials to meet the growing need for clean, cheap and renewable energy sources.

Better way to test cancer drugs
Moving a new therapy from lab to market can be slow and costly. With a National Institutes of Health (NIH) grant, chemical engineering student Seema Ehsan is creating an in-vitro 3-D system to speed discovery of new anti-cancer agents that have minimal cardiac side effects.

UC Los Angeles

Turning cell phones into microscopes
Graduate students — funded with NIH, NSF, Army Research Office and Office of Naval Research grants — are developing microscopes to help health care workers diagnose and treat patients using standard cell phones. This technology may reduce health care costs in the U.S. and improve disease monitoring in underserved areas of the world.

Using math to fight crime
Graduate students are working closely with the Los Angeles Police Department to analyze crime patterns and predict crime hotspots. They have designed a mathematical algorithm to identify gangs involved in violent crimes. Their work is supported by NSF, Office of Naval Research and the Army Research Office.

Riverside

Training the next generation of biomedical innovators
UC/IA's Chemistry-Biology Interface Predoctoral Research Training Program, funded by NIH, provides research training at the frontiers of chemistry, biomaterials and nanotechnology. Alumni of the program have gone on to pursue careers in the biomedical industry, federal government and academia.

Merced

Inducing heart cells from stem cells
Drew Glaser, an NSF research trainee, studies biomedical signals in cells that line blood vessels and vascular muscle cells. The goal is to build blood vessel structures from stem cells that may help patients with damaged hearts.

Clues to how the brain searches, finds
Using an online virtual game, cognitive science student Brian Kerster found that foraging patterns in dozens of species of wild animals were similar to patterns in human memory. His NSF-funded study offers insights into how animals forage and how the brain solves difficult search tasks.

Getting order from disordered magnets
Physics student Chris Ferri looks at geometrically "frustrated" magnets. His NSF-funded research using optics to study the magnetic properties of crystals may lead to new applications for energy storage and information processing devices.

San Diego

Seeing deep into the sea floor
Using electronic imaging technology onboard a U.S. Navy research vessel, Samer Nafl helped discover an unexpected layer of liquefied molten rock that may cause sliding in the Earth's mantle. The NSF-funded research at the Scripps Institution of Oceanography provides geological insight on earthquakes and volcanism.

Using algae to produce medicines
Algae are a proven protein production platform for drugs and vaccines, but commercialization is costly. Elizabeth Specht, a chemical and biomolecular engineering student and NSF fellow, is designing a method to help grow therapies in algae effectively and at a lower cost.

Preserving houses and history
Ian Breckenridge-Jackson, sociology student and NSF fellow, studies activism and volunteerism in post-Katrina New Orleans. He is also co-founder of the Lower Ninth Ward Living Museum, which depicts the vibrant history of a unique neighborhood in that city.

Shifting birds tell of climate change
Biologist student Sonya Auer examines why some bird species in North America alter their range boundaries and whether these shifts correlate with climate change. Her research is funded by a grant from the U.S. Forest Service Northern Research Station.

Eradicating polio
Gabrielle Goodman, a bioengineering student and recipient of a NSF Graduate Research Fellowship, is working on an affordable and easy technology to deliver a life-saving polio vaccine to people in developing countries.
Lessons from boom and bust of fishery
Ethan Deyle, a graduate student at the Scripps Institution of Oceanography, used mathematical models to explore the impact of environmental factors on the Pacific sardine fishery, which boomed in the 1940s and collapsed in the 1950s. Lessons on ecosystem-based management have value today. His research was funded by NSF, Environmental Protection Agency (EPA) and the National Marine Fisheries Service.

San Francisco
Thwarting tuberculosis bacteria
NIH grants support graduate students in microbiology and immunology who study the genes and factors that play a vital role in controlling the bacteria that cause tuberculosis. The hope is that their findings will lead to novel treatments for a disease that affects 1.7 billion people worldwide.

Understanding the role of genes in autism
Graduate students in bioengineering and therapeutic sciences are conducting research on genetic mutations associated with the spectrum of disorders linked to autism. NIH-funded studies in mice with forms of the disease may pave the way towards new treatments for humans.

Developing new brain cancer treatments
Graduate students played a key role in research that led to clinical trials of a new therapy for a rare form of brain cancer, primary central nervous system lymphoma. It is the hope that this treatment will be more effective and less toxic than current therapies. This research is supported by the National Cancer Institute.

Santa Barbara
Reprogramming cells, remaking organs
Misty Riddle, a molecular, cellular and developmental biology student, reprograms cells. She found that heart-like cells can be forced to change their identity to intestine cells by expressing a single protein. The research, funded by NIH and the California Institute for Regenerative Medicine, could lead to new ways to create patient-matched replacement tissues and organs.

Lighting the world with the tiniest materials
Materials student Cyrus Dreyer focuses on the electronic and atomic structures of nitrides that are necessary to engineer optoelectronic devices. Such work, funded by NSF and DOE Office of Science, could revolutionize general lighting and display technologies by increasing efficiency and durability and decreasing environmental impact compared with current technologies.

Santa Cruz
Journey beneath the surface
Earth and planetary scientist Kan Mankoff repurposes devices to give others a view of difficult to reach places. The NASA fellow adapted a video game console to map glacial caves, and with NSF support he helped drill into an Antarctic subglacial lake to view microbial life.

Managing energy resources
Tiffany Wise-West, a civil engineer and student in environmental studies, focuses on sustainable municipal infrastructure projects, from renewable energy efficiency to developing and training the energy workforce. NSF has funded her studies in U.S. urban communities and abroad.

Insight from cells that never die
Laura Gaydos studies germ cells, which have fascinating features, including immortality. She investigates the health and survival patterns of these cells in tiny worms. She is supported by a NIH Training Grant in Molecular, Cell and Developmental Biology.

Maintaining research and educational excellence
The federal government is a key partner in supporting graduate research and education at the University of California.

Using a network of resources – such as federal loans and institutional and outside research fellowships, teaching assistantships and training awards – UC graduate students are able to pursue their education while advancing groundbreaking scientific and technological discoveries.

A number of federal agencies, including the National Science Foundation, National Institutes of Health, Health Resources and Services Administration, Department of Energy, Department of Agriculture, Department of Defense, NASA and NOAA, are instrumental in providing research funding that supports graduate students at UC. In addition, agencies like the Department of Education, the National Endowment for the Humanities and the National Endowment for the Arts are critical sources of funding for our graduate students.