

# RESEARCH AT CNAS



## CNAS PROGRAM AREAS AND RESEARCH NEWS HIGHLIGHTS

Read more about CNAS research at [cnas.ucr.edu/cnas-science-news](https://cnas.ucr.edu/cnas-science-news)

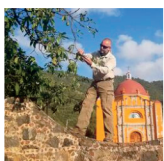
### AGRICULTURE AND NATURAL RESOURCES

At UCR, agriculture and natural resources encompasses both fundamental and practical research aimed at enhancing our food and water supply, protecting our natural resources, and solving emerging problems that threaten these enterprises.



#### [The no-tech way to preserve California's state grass](#)

Though it is disappearing, California's official state grass has the ability to live for 100 years or more. New research by **Loralee Larios**, Assistant Professor and Plant Ecologist in the Botany and Plant Sciences department, demonstrates that sheep and cattle can help it achieve that longevity.



#### [The scent that could save California's avocados](#)

**Mark Hoddle**, Biological Control Specialist and Director of the Center for Invasive Species Research at UC Riverside, is on the hunt for a chemical that disrupts "evil" weevils' mating and could prevent them from destroying California's supply of avocados.

### LIFE SCIENCES

A revolution is happening in the life sciences at UC Riverside, as complexities of diverse organisms and living communities are unraveled through research spanning genes and evolution, biological and biochemical processes, the physiology and dynamics of cells, and the interplay between environment and life's many forms.



#### [Researchers find peptide that treats, prevents killer citrus disease](#)

New research conducted by **Hailing Jin**, Professor & Plant Molecular Geneticist in the Microbiology & Plant Pathology department, affirms a unique peptide found in an Australian plant can destroy Huanglongbing (HLB) the number one killer of citrus trees worldwide and help prevent infection



#### [Soil tainted by air pollution expels carbon](#)

New UC Riverside research conducted by **Peter Homyak**, Assistant Professor of Ecosystem & Soil Microbial Processes in the Environmental Sciences department, and **Johann Puspok**, graduate student in environmental studies, suggests nitrogen released by gas-powered machines causes dry soil to let go of carbon and release it back into the atmosphere, where it can contribute to climate change.

### PHYSICAL SCIENCES & MATHEMATICS

How materials work at the nanoscale, the forces that grip the atom, the earth, and the universe, the mathematical order within data sets, and current issues in algebra and geometry are some of the research areas being explored at UC Riverside.



#### [Unraveling a mystery surrounding cosmic matter](#)

**Yanou Cui**, Associate Professor of Physics & Astronomy, invoked the cosmological collider to explain why matter, and not antimatter, dominates the universe. Professor Cui has been developing new research directions on utilizing gravitational waves to probe new particle physics and cosmology.



#### [The planet that could end life on Earth](#)

A terrestrial planet hovering between Mars and Jupiter would be able to push Earth out of the solar system and wipe out life on this planet, according to a UC Riverside experiment conducted by **Stephen Kane**, Professor of Planetary Astrophysics in the Earth & Planetary Sciences department.

# CNAS RESEARCH FACILITIES SNAPSHOT

## Agricultural Operations

The mission of Agricultural Operations is to operate UC Riverside's experiment stations in the support of field research and greenhouses and other growing facilities for CNAS faculty and staff and the Agricultural Experiment Station. Within that mission, the Agricultural Operations provides and maintains research and growing facilities, and acts as custodian of the land.

## Collections

UCR Botanic Gardens  
Citrus Variety Collection  
Earth and Planetary Sciences Research Museum  
Entomology Research Museum  
Herbarium  
Nematode Collection  
World Phytophthora Genetic Resource Collection

## Instrumentation Facilities

- **Analytical Chemistry Instrumentation Facility:** A campus-wide facility that consists of four components, Mass Spectrometry, X-ray Crystallography, Nuclear Magnetic Resonance (NMR) Spectroscopy, and Optical Spectroscopy.
- **Bioinformatics Core Facility:** The Bioinformatics Core provides state-of-the-art resources for large-scale comparative genomics, data mining, systems modeling, and drug discovery to enable scientists from different experimental and computational areas to master the bioinformatic and cheminformatic aspects of their research independently and proficiently.
- **Institute for Integrative Genome Biology:** A state-of-the-art, 10,000 square-foot shared-use facility providing instrumentation suites in microscopy and imaging, bioinformatics, proteomics, metabolomics, and DNA sequencing and molecular biology.

## Species Protection Program

Citrus Clonal Protection Program  
Insectary and Quarantine Facility  
Nematode Isolation and Quarantine Facility

## UCR Natural Reserves

UC Riverside administers four major reserves that have research facilities and permanent staff; these are the Deep Canyon, Granite Mountains, Motte, and James Reserves. Another four minor reserves are also part of the UCR reserve network. Within the nearly 28,000 acres included in the UC Riverside-managed reserves is a broad representation of Southern California's flora, fauna, and major ecosystems. These lands are an invaluable outdoor laboratory for teaching and research, used by scientists throughout the world. In addition, many endangered or diminishing species are protected from the urbanization occurring in Southern California on "habitat islands" preserved within reserve boundaries.



## RESEARCH VIDEO LIBRARY

Watch more CNAS research videos at [www.youtube.com/UCRCNAS](https://www.youtube.com/UCRCNAS)



### **The Baers and the Bees**

Boris Baer, Professor of Entomology, and Barbara Baer-Imhoof, Research Specialist at the Center for Integrative Bee Research (CIBER), and the married entomologists fighting to save honey bees - and our future.



### **The First Billion Years: Latest Results from the James Webb Space Telescope**

Bahram Mobasher, Professor of Physics & Astronomy, spoke at UC Riverside Homecoming 2022 about the impact of the James Webb Telescope on our growing understanding of the universe as a whole.



### **A Kangaroo Rat's Tale**

California has been able to remove the gentle, seed-eating Stephens' kangaroo rat from the endangered species list this year, thanks in large part to the efforts of Joseph Messin, assistant director at the Motte Rimrock Reserve. For more than two decades, Messin has been tracking Stephens' kangaroo rats at the reserve — an area of natural, undeveloped land managed by UC Riverside on the western edge of the Perris Valley — to help policymakers learn whether efforts to save the species are working.



**UC Riverside College of Natural & Agricultural Sciences**

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