

LEADING DISCOVERY

UC Berkeley Astrophysics and Cosmology

In astrophysics and cosmology, UC Berkeley is a world leader. Faculty and researchers are answering the oldest philosophical questions: "How was our universe created and why is it expanding?", "How do galaxies, stars, and planets form?", and "Are there other earth-like planets that can sustain life?" World-leading advances in science and technology at Berkeley have brought the Astronomy Department to the brink of answering these historic questions.

EXPLORING THE UNIVERSE

Berkeley is at the forefront of the most profound discoveries in astronomy and cosmology:

- Faint ripples in images of the infant universe offered confirmation of the Big Bang Theory and earned Berkeley Cosmologist, George Smoot, the 2006 Nobel Prize in Physics;
- Berkeley astrophysicists Saul Perlmutter and Alex Filippenko have discovered the accelerating expansion of the universe driven by a mysterious "dark energy;"
- Berkeley Astronomer Geoff Marcy and his team of planet hunters, have discovered the majority of the 250 known planets circling other stars and are now hunting for the first earth-like planet.
- Professor Leo Blitz has partnered with SETI and the Paul Allen Foundation to construct the largest Radio Telescope Array ever built with the goal of performing cutting-edge research while simultaneously searching signals from extraterrestrial intelligence.
- Berkeley is participating with other UC campuses and Caltech in the design and development of a thirty-meter telescope. Once built, this will be the largest optical-infrared telescope in the world, allowing astronomers to see farther into the universe than ever before.

Whether it's exploring how stars, black holes, and planets form and evolve, or discovering new planetary systems outside our solar system, or finding evidence of cosmic radiation left over from the Big Bang or studying the nature of dark energy and dark matter, Berkeley is at the leading the way.

THE NEXT GENERATION

Berkeley's preeminence in astronomical research extends to its teaching program. Berkeley faculty are dedicated to educating the next generation of astronomers and cosmologists. Their impact is far-reaching, both in and out of the classroom. They inspire talented undergraduate and graduate students to pursue interests in science and technology, and they mentor our outstanding postdoctoral scholars to take on the most challenging questions and to approach their research in novel and creative ways. Our success shows: our faculty routinely receive top teaching awards, both locally and nationally. Our graduate program is attracting record numbers of applicants from the most talented students. And those students that have been educated have gone on to become leaders in astrophysics and cosmology around the world.

This passion for teaching goes beyond the boundaries of campus. Berkeley faculty, researchers and students are committed to educating the larger community. They routinely speak to K-12 students, at public lectures and special events, helping the public understand and appreciate what we know about the universe.

A CULTURE OF INNOVATION

The toughest questions in science can only be answered by pursuing them from different angles and different disciplines. At Berkeley, collaboration is the norm. Scientists from a wide range of academic departments and research units are working together. Top faculty, researchers and graduate students from Astronomy, Physics, Geophysics, Chemistry, Atmospheric Science, and Mechanical Engineering are partnering with scientists from the Space Sciences Laboratory and Lawrence Berkeley National Laboratory on science's most complex questions in Astrophysics, Cosmology and Planetary Science. An entrepreneurial spirit and a willingness to take risks are producing substantial results and creating a culture of innovation.

THE PATH TO KNOWLEDGE

To maintain our intellectual leadership in Astrophysics and Cosmology, we must increasingly rely on alumni and friends for essential funding. Your contribution can endow a professorship, provide student support,

fund cutting-edge research, or build dedicated facilities, all of which are critical to maintaining our world-class program. Following are some of the specific areas of need:

New Campbell Hall: Campbell Hall, the current home to the astronomy department, is scheduled for demolition in 2009. A new building housing astrophysics, cosmology, and related disciplines is currently in the planning process. A state-of-the-art building, equipped with excellent computing and research laboratories and a rooftop teaching observatory, is our goal.

Graduate Student and Postdoctoral Fellowships: Graduate student and postdoctoral fellowships are needed to attract the best scholars in astrophysics and planetary science to Berkeley and to support exceptional research once they are here.

Visitor Program: A vibrant visitor program inspires faculty, researchers, and students and stimulates new research. These collaborative interactions that come out of these programs are essential to the enrichment of the creative environment, often leading to new projects and insights.

Computation: Today's research in astrophysics and cosmology requires increasingly sophisticated computational power. Funds are needed for software, hardware, and networks to conduct this research.

Instrumentation: Housed at observatories away from Berkeley, the world's most sensitive telescopes are used by Berkeley's astronomers to provide exquisite observations of the universe. Funds are needed to complete the construction of the newest radio arrays and telescopes, and to provide ongoing operational support.

Education and Outreach: Presentations, materials, and activities need to be developed and made available to the public to bring the excitement of active science to the community beyond the campus. Partnering with schools and colleges can encourage a new generation to pursue successful science and technology careers.

For more information about ways to support astrophysics and cosmology at Berkeley, please contact Sue Wells, at (510) 643-5040 or sawells@astro.berkeley.edu