

UCSC ranked first in nation for research impact in physics

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In a new analysis of research publications from top U.S. universities, the University of California, Santa Cruz, ranked first for the impact of its faculty in the field of physics and fifth in the field of space sciences. The new rankings were reported in *Science Watch*, a newsletter published by Thompson Scientific.

Thompson Scientific gathers data from thousands of influential, peer-reviewed journals and conducts analyses to identify trends and measure research performance. A commonly used performance measure, called citation impact, is based on the number of times a published paper is cited by other researchers. The latest rankings are based on the citation impact of research papers published by the top 100 federally funded universities between 2001 and 2005.

UCSC has been highly ranked in similar surveys in the past. Past rankings for the campus, all based on citation impact data, include first among U.S. universities in space sciences (2003), second worldwide in physical sciences (2001), and first among U.S. universities in physics (2000).

"We are a small department, but our faculty have good collaborations with researchers in other departments and at other institutions," said David Belanger, professor and chair of physics. "Our faculty also tend to work on very fundamental problems in physics, and important results in those areas are cited a lot by other researchers."

When researchers publish an article in a scientific journal, they must cite previous papers by other authors that set the stage for their work. Generally, a paper that describes important findings or ideas and influences the work of other researchers receives more citations than less influential papers.

Major areas of research in UCSC's Physics Department include high-energy particle physics, condensed matter theory, and astrophysics and cosmology. The Santa Cruz Institute for Particle Physics (SCIPP) has been at the forefront of both theoretical and experimental research in particle physics for many years. Research on condensed matter physics at UCSC involves a broad range of topics, including the behavior of novel materials, the physics of superconductors, and new approaches to making photovoltaic cells for harvesting solar energy.

UCSC physicists are also making important contributions in the areas of high-energy astrophysics and cosmology--working on experiments to detect gamma rays and other elusive signals from space, investigating the nature of dark matter, and exploring the evolution of structure in the universe. Research in these areas bridges the categories of physics and space sciences.

"There are a lot of connections between physics and astronomy at UCSC. It's not a coincidence that the campus is highly ranked in both categories," Belanger said.

UCSC has long been recognized as a center of excellence for research in astronomy and related fields. The Department of Astronomy and Astrophysics includes leading researchers on both the observational and theoretical aspects of space sciences. The UC Observatories/Lick Observatory and the national Center for Adaptive Optics are both headquartered on the UCSC campus. And the Department of Earth and Planetary Sciences has a growing number of faculty involved in research

on planets and other objects in our solar system and around other stars.

Belanger noted that the Physics Department's graduate program received the highest rating for overall student satisfaction in a 2001 survey of U.S. graduate students. The department also works to engage undergraduates in research and has one of the fastest-growing undergraduate programs in the country, he said.

"We pay a lot of attention to our students, cultivate a good atmosphere in the department, and then they become very productive. We have 19 faculty members and 65 graduate students, and one-third of them are women--twice the national average. All of these things are important in making this a productive department," Belanger said.

For the latest rankings reported in *Science Watch*, analysts calculated the "relative citation impact" in various disciplines for each university--that is, each university's average-citations-per-paper score for the five-year period compared, on a percentage basis, against the average impact of all papers published in each field.

Source: UCSC

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