UC SANTA BARBARA

THE Current

October 27, 2005
Gail Gallessich

Physics Professor Shares European Physical Society Prize

UCSB Physics Professor Harry Nelson is in Switzerland this week to celebrate receiving the High Energy and Particle Physics Prize of the European Physical Society for 2005. Nelson is part of a team called the "NA31 Collaboration," a group that performed experiments concerning anti-matter.

The celebration today is at CERN, the world's largest particle physics laboratory, located near Geneva. The award goes to an entire group of researchers---73 in all but including only four Americans---who worked on the experiments that "showed for the first time direct charge-parity violation in the decays of neutral K mesons," according to the award citation. Charge-parity, or CP, violation is thought to be the reason why the universe is made of matter, even though equal amounts of matter and anti-matter should have been created in the Big Bang.

The European Physical Society prize has been awarded since 1989. David Gross, director of the Kavli Institute for Theoretical Physics at UCSB and winner of the 2004 Nobel Prize in physics, won the EPS prize in 2003.

This year's EPS award to the NA31 Collaboration, which is led by Heinrich Wahl, is the first time an EPS award has been given to a group. Nelson explained that in particle physics, unlike theoretical physics, the scientists must work in large teams to carry out experiments. Nelson arrived at CERN in 1987 and helped build the portion of the apparatus that distinguished among the various types of particles that

traveled at speeds approaching the speed of light.

Nelson is currently working with another group of physicists in the highly competitive international search for "dark matter." His group is called the Cryogenic Dark Matter Search, or CDMS, and is considered the leading research endeavor on this issue. He explained that reliable data indicate that most of the matter in the universe emits no detectable light. The "dark" matter is inferred, generally, from the gravitational pull that it exerts on the matter that does emit light. A simple explanation would be that the dark matter consists of protons and other atomic nuclei, which for some reason do not emit light. However, Nelson noted that this explanation is inconsistent with our understanding of the Big Bang, and that the dark matter must consist of a new type of "exotic" particle.

The CDMS team includes scientists from Case Western Reserve University, Fermilab, Lawrence Livermore Laboratory, the National Institute of Standards and Technology (NIST), Princeton University, Santa Clara University, Stanford University, UC Berkeley, UC Santa Barbara, University of Colorado at Denver, and the University of Minnesota.

About UC Santa Barbara

The University of California, Santa Barbara is a leading research institution that also provides a comprehensive liberal arts learning experience. Our academic community of faculty, students, and staff is characterized by a culture of interdisciplinary collaboration that is responsive to the needs of our multicultural and global society. All of this takes place within a living and learning environment like no other, as we draw inspiration from the beauty and resources of our extraordinary location at the edge of the Pacific Ocean.