



IN MEMORIAM

Michael T. Ronan
Senior Scientist
Lawrence Berkeley National Laboratory
Lecturer in Physics
UC Berkeley
1949 — 2006

Michael T. Ronan, a senior scientist at Lawrence Berkeley National Laboratory (LBNL) and a lecturer in the Department of Physics at the University of California, Berkeley, fell to his death on 17 October 2006. Mike was a consummate experimentalist in particle physics and he made many significant contributions to physics projects at LBNL. He brought enthusiasm and energy to everything he did and he generously shared his love of physics with colleagues and students.

Mike was born on 15 January 1949 in Fall River, Massachusetts, and received a bachelor's degree from Southeastern Massachusetts University in 1970. He completed his Ph.D. at Northeastern University in elementary particle physics, the study of the basic constituents of matter. According to the current model of the universe, the basic building blocks are particles called quarks and leptons. Quarks can be assembled in groups of two or three to give rise to the more familiar objects like the protons and neutrons that are at the heart of the atom. Leptons (from the Greek word for light) are particles that are themselves elementary; the most familiar example is the electron, the basic element of electricity. Particle physicists seek to validate their model or theory by colliding particles together at high energy to produce and study new particles, those that were likely produced in the Big Bang but do not exist in ordinary matter. Mike was fascinated by the quest to understand the universe and, starting with his graduate work, he probed the world of quarks and leptons. He joined the quest at a time of great activity following the 1974 discovery of the ψ /J particle, the first evidence for a new fundamental particle called the charm quark. In his Ph.D. thesis experiment Mike measured the production of ψ /J particles in collisions of high energy particles at the Fermi National Accelerator Laboratory in Illinois.

Mike came to Lawrence Berkeley Laboratory in 1976 to join a new experiment at the Stanford Linear Accelerator Center (SLAC). A new particle storage ring there collided electrons and positrons (positive electrons) to produce new and heavier particles. Mike contributed first to developing the electronics for the experiment and then took a major role in the physics analysis. The experiment was the first to observe another new particle, the ψ' (3772), an excited state of the ψ /J. This further strengthened the conclusion that there was indeed a new form of matter containing the charm quark.

Shortly after coming to LBL, Mike joined a small but dedicated group who proposed to build the first Time Projection Chamber (TPC) for an experiment at PEP, the Positron- Electron- Proton storage ring at SLAC. The TPC was a new concept in particle detection and presented many technical challenges that were perfectly matched to Mike's expertise in electronics and computing. He designed an ingenious trigger system for the TPC that took advantage of the unique three- dimensional information provided by the detector. As the

experiment was commissioned Mike emerged as one of a very few experts who knew how to make everything work. He came into his own professionally on that experiment and the collaboration came to rely on him more and more for unique expertise in both electronics and software and his mastery of the TPC. He went on to become one of the world's experts on TPCs.

The TPC group grew into a large collaboration by the standards of that time, approximately 100 physicists rather than the 500-2,000 typical of current particle physics experiments. Mike, however, continued to play a crucial role in the operation of the experiment. He served as the scientific spokesman of the experiment and, working closely with the many students who completed their theses on the TPC, he guided a very productive physics program. Over almost a decade the experiment made important contributions to the study of electron-positron annihilation and two-photon collisions (the interaction of two particles of light) with the publication of more than 100 papers.

Following the completion of the TPC program, Mike turned his attention to the commissioning of a new facility and detector at SLAC. This new facility, called PEP- II because it used parts of the earlier PEP facility, was designed to study the properties of yet another new kind of matter associated with what particle physicists have called the B quark. The detector to study the properties of the B quark and its antimatter partner, which physicists denote as a B-bar, was named BaBar after the famous elephant of children's literature. Mike brought his expertise in software and electronics to bear on the timing and control systems for PEP- II and he worked with collaborators in France and the United States to develop a miniature Time Projection Chamber to study backgrounds in that facility. The mini-TPC allowed Mike and his colleagues to measure and minimize background radiation that would have reduced the quality of data from the BaBar experiment.

When the International Linear Collider (ILC) emerged as the first priority for the world's high energy physics community, Mike directed his energy and expertise to the many problems of building detectors for the ILC. He approached this with his usual enthusiasm and he brought to the discussions his passion for the TPC as the obvious choice for the central component of any new large detector. He also worked hard to integrate new software techniques into the simulation of detector systems. He initiated a worldwide collaboration on the research and development for a TPC to match the challenging ILC requirements. This effort developed into one of the four detector concepts being studied by the international community of particle physicists. The concept is known as the Global Large Detector or GLD. Because of his leadership in the field he was named one of the coordinators of the GLD.

Mike approached his personal activities with the same energy and enthusiasm that he brought to his research and teaching. He enjoyed water sports, cycling and skiing, especially with family and friends. He is survived by his wife, Alda, and his grown children, Kevin and Stacey. He will be missed by all who worked with him in the international science community.

Marco Battaglia
Stewart C. Loken
James L. Siegrist