California, Riverside, where she eventually became a full professor in the department of biochemistry and a research scientist in the agricultural experiment station. At Riverside, Jurnak worked on the structure-function relationships of elongation factor Tu and on pectate lyases, which led to the discovery of the parallel beta helix fold.

In 1997, she moved to UCI's department of physiology and biophysics. There, she has focused on the structures of proteins involved in carcinogenic mechanisms and in advanced molecular biological strategies for the preparation of soluble, folded proteins suitable for structural studies. She directs UCI's protein expression facility and codirects the structural molecular biology program in the Chao Family Comprehensive Cancer Center, which is in UCI's College of Medicine. Over her career, Jurnak has chaired or served as a member of numerous university committees on undergraduate and graduate education.

"I am delighted by this opportunity to serve the ACA," says Jurnak. She adds that she is "looking forward to preserving the best of the past while fostering technical innovations that will advance crystallographic goals in the future."

In other ACA election results, three individuals also took office in January, all for four-year terms. **Louis T. J. Delbaere** (University of Saskatchewan, Canada) was elected to the communications committee. **Katherine Kantardjieff** (California State University, Fullerton) began her term on the continuing education committee. Elected to the data committee was **Robert Sweet** (Brookhaven National Laboratory).

In Brief

At a ceremony in February in Washington, DC, the National Academy of Engineering awarded the 2003 Charles Stark Draper Prize, one of engineering's top honors, jointly to **Ivan Getting** and **Bradford Parkinson** for "pioneering the concept and development of a Global Positioning System that, with incredible precision, tells you where you are and helps you get to where you want to be." Getting, president emeritus of the California-based Aerospace Corp, and Parkinson, emeritus professor of aeronautics and astronautics at Stanford University, will share the $500 000 cash prize.

Roger-Maurice Bonnet took a new post as executive director of the International Space Science Institute in Bern, Switzerland, this past January. He previously was deputy director general of science at CNES, France's space agency. Before that, Bonnet served for 18 years as science program director of the European Space Agency.

Obituaries

Oreste Piccioni

Oreste Piccioni, an imaginative, innovative, and controversial particle physicist, died of complications from diabetes and lung cancer on 13 April 2002 at his home in Rancho Santa Fe, California.

Piccioni was born 24 October 1915 in Siena, Italy, and graduated in 1938 with a PhD in physics from the University of Rome under Enrico Fermi. He then began working under Gilberto Bernardini on cosmic rays, looking in particular at the newly discovered penetrating particles now known as muons.

By 1943, Piccioni was working independently, developing fast electronics that led to a precise measurement of the muon lifetime. Working under the exceedingly difficult wartime conditions of German occupation and Allied bombing, Piccioni, together with Marcello Conversi and Ettore Pancini, performed one of the most important experiments of early particle physics. Using a magnet for charge separation, they measured the decays of positive and negative muons individually, thus showing that the negative and the positive particles often end their lives by decaying rather than by being absorbed in matter. From that result, scientists soon realized that the muon could not be the one proposed by Hideki Yukawa to mediate the strong force.

After World War II, Piccioni went to MIT to work with Bruno Rossi. He then moved on to Brookhaven National Laboratory (BNL), where he developed fast electronics and beam transport magnets for the Cosmotron program. Piccioni's knowledge of strong-focusing quadrupole lenses influenced the work of Clyde Wiegand, a member of the Emilio Segrè group at the Lawrence Radiation Laboratory (Rad Lab) in Berkeley, California. Wiegand designed a quadrupole lens to transport the external proton beam of the Rad Lab's 184-inch cyclotron. Piccioni also invented a way of extracting circulating beams from weak-focusing proton synchrotrons. After successful use at the Cosmotron, the idea was adapted to the Berkeley Bevatron during the 1962 upgrade.

From December 1954 to January 1955, Piccioni visited the Rad Lab to discuss with Segrè, also a former member of Fermi's Rome group, a Bevatron experiment to discover the antiproton. Piccioni's plan was to extract a momentum-selected secondary beam that would be long enough for a time-of-flight determination of particle mass. The beam transport would require strong focusing lenses, for which Piccioni had some new ideas. After returning to BNL, he applied for a longer visit to the Rad Lab—not a trivial matter, because it was then difficult for foreigners to obtain the security clearance required for employees and long-term guests.

Having lost effective contact with Piccioni, Owen Chamberlain and Wiegand decided to duplicate Wiegand's cyclotron quadrupole for their antiproton beam line. Meanwhile, as Bevatron performance improved steadily, other groups also planned antiproton experiments. The Segrè group's counter-based experiment, which was in competition with that of Edward Lofgren's group and that of a collaboration of emulsion groups, was ready to begin running in late summer 1955, about the time that Piccioni returned to Berkeley for a long visit. The Segrè group, however, did not accept him as a member of its team, a blow from which he never recovered. His protests to other Rad Lab leaders were not persuasive, because he had been out of touch during the critical periods of design, fabrication, and setup. His contributions to the experiment were acknowledged at the 1959 ceremony during which Segrè and Chamberlain were awarded the Nobel Prize in Physics for the discovery of the antiproton. Seeking damages and public acknowledgment of his contributions, Piccioni later (1972) filed a lawsuit against Chamberlain and Segrè, but the lawsuit was unsuccessful.

By the end of 1955, there were few who doubted the discovery of the antiproton. But an important confirmation of both experiment and underlying particle theory would be the discovery of the antineutron. In late 1955, Piccioni joined Bruce Cork, Glen Lambertson, and William Wenzel of the Lofgren group to begin a search for the antineutron. For that

Oreste Piccioni

search—and for making the first accurate measurements of the interaction cross sections of antiprotons in matter—the researchers achieved a two-orders-of-magnitude increase in antiproton intensity by taking advantage of the continued improvement of Bevatron performance, the addition of more quadrupoles, and the development of faster electronics. The success of the experiment meant more to Piccioni than "confirmation." He had preferred to say that, unless the antineutron could be produced by charge exchange, the apparent discovery of the antiproton was in doubt.

That same year, Piccioni and Abraham Pais published a theoretical paper that added regeneration to the Gell-Mann–Pais neutral kaon mixing theory. To detect the effect, Piccioni became a member of a large Bevatron collaboration that used a hydrogen target and a propane bubble chamber with internal lead and steel plates for regeneration. The successful results were published in 1961.

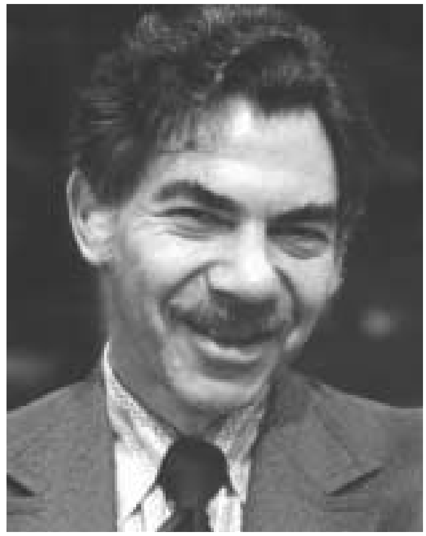
Piccioni joined the faculty of the University of California, San Diego, in 1960. There, he formed two small experimental groups: a counter/spark chamber group (with Werner Mehlhop and Robert Swanson) and a group doing bubble-chamber film analysis (with Richard Lander and Nguyen-Huu Xuong). In 1964, the counter group began a much improved experiment to measure the K_1–K_2 mass difference at the Bevatron by observing the interference of K^0 from K^+ charge exchange with K^0 regenerated in a movable regenerator. Combined with the group's measurement of the kaon forward-scattering amplitude at BNL, this experiment also gave, in 1968, the first measurement of the sign of the K_1–K_2 mass difference. During the same period, the bubble-chamber group published work on deuteron stripping, the properties and decay modes of some of the then newly discovered meson resonances, and the $\Delta S = \Delta Q$ rule.

In subsequent years, the Piccioni group designed and implemented a tagged beam of high-energy neutrons produced by dissociation of deuterons at the Bevatron (1972) and carried out another Bevatron program from 1971 through 1975 using the deexcitation gamma rays as a signature of the diffractive nature of the interaction to study nuclear excitation by high-energy particles. Piccioni gave many scientific talks, everything from reviewing the critical developments during his early career to his newer ideas regarding instrumentation. He retired as a professor emeritus in 1986, but continued to give review talks and investigate fundamental problems of correlations in quantum mechanics. In 1999, he was presented with the Matteucci Medal by the Accademia Nazionale Delle Scienze (National Academy of Sciences) in Italy.

Piccioni's fertile imagination, coupled with a deep understanding of fundamentals, created both challenging models and provocative experimental proposals, each accompanied by a show of conviction strong enough to overwhelm potential allies and detractors alike. It was almost impossible for him to concede that some of his ideas might have been shared by others, and it was often left to others to deal with the realities of schedule and cost. But as both ingenious inventor and essential spark plug, Piccioni contributed much to answer some of the most timely and important questions in particle physics.

William A. Wenzel
Lawrence Berkeley National Laboratory
Berkeley, California
Robert A. Swanson
University of California, San Diego
La Jolla, California
Werner A. W. Mehlhop
Julian, California

Morton Fischel Kaplon



Morton Fischel Kaplon

Morton Fischel Kaplon, a pioneer in cosmic-ray physics, died of cancer on 4 July 2002 in Bethlehem, Pennsylvania, at the age of 81.

Kaplon was born in Philadelphia on 11 February 1921 and earned his BS degree in engineering physics from Lehigh University in 1941. After graduation, he served for the next five years during World War II as a second and then a first lieutenant in the US Army Air Corps.

Following his discharge from the air corps, Kaplon returned to Lehigh, where he earned his MS in physics in 1947, and then enrolled in the graduate program at the University of Rochester. The π and K mesons had recently been discovered and an effort to determine their properties and production mechanisms was of central concern among both theoretical and experimental physicists.

In 1948, the Rochester 130-inch cyclotron became operational. Soon after came C. L. Oxley's discovery of nuclear polarization, followed by detailed studies of the p–p scattering matrix. The cyclotron had been designed to be above the threshold for the production of μ "mesons," the only new particle known when construction of the cyclotron began. Nevertheless, as a consequence of the Fermi motion of the nucleons in the target, beams of low-energy π mesons could be produced. At the same time the cyclotron began operating, an important effort in cosmic-ray physics was under way, led by Helmut Bradt and Bernard Peters of Rochester. They used nuclear emulsions flown in balloons to an altitude of almost 100 000 feet. Kaplon worked closely with the emulsion group and played a leading role in the discovery of an "event" in which an extraordinary number of outgoing tracks (56) were seen, and which provided evidence for the production of neutral π mesons. (This event became known as the Rochester-star.) He earned his doctorate from Rochester in 1951; his PhD thesis, under the direction of Robert