



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.

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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



Morton Fischel Kaplon

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

Marshak, was on the theory of meson production.

That same year, Kaplon was appointed instructor and then, soon after, assistant professor, and thus began a long and highly productive association with the physics department at Rochester. Following the death of Bradt and the departure of Peters, Kaplon assumed the leadership of the emulsion group. Under his direction, the group made important contributions to the understanding of cosmic-ray phenomena and studied the abundance of the light elements in the primary cosmic rays. Most notably, it determined the helium-3 to helium-4 ratio, a benchmark even for today's cosmology.

Emulsions were a useful tool not only for studying cosmic rays but also the elementary particles and their interactions. Kaplon and his colleagues were among the first to observe the neutral π meson and eventually to make an estimate of its lifetime. They discovered the tau-prime decay of the K meson, that is, $K^+ \rightarrow \pi^+ \pi^0 \pi^0$, and investigated extensively the $K_{\mu 3}$ decay, $K^+ \rightarrow \pi^0 \mu^+ \nu_\mu$. As the Berkeley Bevatron began delivering separated beams of K mesons, Kaplon's group exposed emulsion stacks in those beams and were able to carry out detailed studies not only of K decays but also of the hyperons produced in the emulsion. However, the bubble chamber was becoming a much more powerful tool for the study of accelerator-produced elementary particles. Kaplon quickly recognized the importance of that development and encouraged his younger colleagues to move in that direction. As a result of his efforts, a fine bubble-chamber film analysis group was established at Rochester.

Kaplon kept pace with the rapidly evolving experimental techniques and recognized their relevance to the problems that interested him. He was convinced that there were sources of γ rays in the sky, and he and his colleagues Everett Hafner, Giovanni Fazio, and J. G. M. Duthie were among the pioneers in the early 1960s to fly in a high-altitude balloon a scintillation Čerenkov-counter telescope to search for point sources. Also during this time, his colleagues Roland Cobb, Duthie, and Joseph Stewart were the first to fly a triggered spark chamber to search for cosmic γ rays. Even though the short flight time and the small detector areas were insufficient to give an unambiguous signal, they were among the first groups to launch the field of γ -ray astronomy. Eventually, the first detection of point sources of γ rays was made in 1972

when William Kraushaar and George Clark and their collaborators at MIT used a satellite-born telescope.

While leading the cosmic-ray group, Kaplon was also heavily involved in the administration of the department of physics and astronomy. He was promoted to associate professor in 1955 and to full professor in 1960. In 1964, he assumed the chair and was instrumental in expanding the size of the faculty and the scope of its research. He made the appointments that led to the creation of a strong observational astronomy program and of the quantum optics group at Rochester; he was able to convince Elliott Montroll to accept an Einstein professorship, and Montroll attracted a strong theoretical group to Rochester. Until he left Rochester (in 1971), Kaplon continued his involvement in cosmic-ray research, primarily on NASA-sponsored missions.

The year 1968 was a tumultuous one at US universities: Students were protesting against the Vietnam War and there was unrest on campus. Differences of opinion with the university administration led Kaplon to resign as department chair. Marshak left Rochester that year to assume the presidency of the City College of New York and asked Kaplon to join him. Kaplon served first as associate provost from 1971 to 1975 and then as vice president for administrative affairs from 1975 to 1986. He again showed his talent for administration and took a hands-on approach in adapting CCNY to the new environment of open enrollment without compromising academic standards.

Kaplon retired from CCNY in 1982 and switched his interests to computer science, which he continued to pursue well after retirement.

Kaplon was a person of the utmost integrity, yet had a genial and generous personality. He was respected by his students and colleagues alike. He is remembered for his scientific contributions, for his wise and fair academic administration, and for the strength of his personality.

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Larry Kevan

Larry Kevan, the Cullen Distinguished Professor of Chemistry at the University of Houston since 1980, died from a heart attack at his home



Larry Kevan

on 4 June 2002. He was working out on the treadmill, reading, and listening to music all at once. Those who knew him will appreciate that he died as he lived: actively pursuing several things simultaneously.

Born 12 December 1938 in Kansas City, Missouri, Larry graduated from the University of Kansas in 1960 with a BS in chemistry. He received his PhD in 1963 from UCLA, where he studied radiation chemistry with Nobel laureate Willard F. Libby. After pursuing postdoctoral research in Newcastle upon Tyne, England, Larry took a post as an instructor of chemistry at the University of Chicago in 1963. In 1965, he returned to the University of Kansas, where he remained for 4 years before moving to Wayne State University. He spent the next 11 years there before joining the University of Houston.

Larry's scientific contributions principally involved applications of electron paramagnetic resonance (EPR) to problems in materials science, chemistry, biology, self-assembly, imaging, and polymers. His research interests in the early days of his career mainly involved the application and extension of various magnetic resonance techniques such as electron-nuclear double resonance (ENDOR), electron-electron double resonance (ELDOR), and electron spin echo to problems in radiation chemistry and physics. In addition to extensive experimental contributions to radiation chemistry and the electronic and conductive properties of molecular solids, his groups at Kansas and Wayne State University in the late 1960s and 1970s made significant theoretical contributions to the electronic struc-