Erwin Max Friedländer

Erwin Max Friedländer, a pioneer in the use of nuclear emulsions for cosmic-ray and, later, accelerator research, died on 22 January 2004 in Oakland, California, of complications from a heart attack.

Friedländer was born on 29 May 1925 in Cluj, Romania, as a Czech citizen. During the war years, which he spent in Bucharest, he was drafted into forced labor because he was Jewish. Shortly thereafter, when the Communists came to power in Romania, he was imprisoned for illegal ham radio operations.

In the early 1950s, after obtaining his physics degrees from the University of Bucharest, he joined his mentor, Josef Ausländer, to found the Cosmic Ray Laboratory at the new Institute for Atomic Physics of the Romanian Academy of Sciences. There, he trained a one-of-a-kind, loyal team of scanners who are still active today and collaborated with cosmic-ray physicists from around the world.

In 1963, Friedländer became head of the laboratory and was elected corresponding member of the Romanian Academy. He was allowed the great perk of traveling abroad (without his family), but was continually subjected to political and anti-Semitic pressures. He wrote eloquently of these pressures in his memoirs, which he finished just weeks before his death. Friedländer never joined the Communist party and took risks few others in his position would have. In the 1960s, for instance, he participated in a high-energy physics seminar that was organized by former colleagues who had been fired from their jobs after applying for emigration.

Erwin Max Friedländer

Friedländer was particularly interested in multiparticle production dynamics. That field became popular in the 1970s in great part due to the important contributions made by his emulsion group, one of the first to discover multiplicity-scaling laws in proton–nucleus reactions.

In 1975, Friedländer defected to West Germany and soon emigrated to the US. After a year-long effort, his wife, Jo, and daughter, Monica, were able to join him. He found employment at the University of Pennsylvania, Cornell University, and Fermi National Accelerator Laboratory before joining Lawrence Berkeley National Laboratory (LBNL) in 1977, where he stayed until his retirement in 1991.

In the late 1970s, Friedländer started a collaboration with theorists at the University of Marburg, Germany, which resulted in a large number of papers that predicted or interpreted new phenomena. Using the methods of quantum optics, that collaboration found a simple explanation of multiplicity scaling regularities (intermittency) observed in hadron–hadron and electron–positron reactions, and thereby settled a long-standing controversy. In analogy with the effect of self-induced transparency in optics, Friedländer and his collaborators predicted a similar phenomenon in hadron–nucleus reactions.

At LBNL, the experimental study of the interactions of relativistic heavy nuclei and their secondary products became one of Friedländer's most intriguing and challenging efforts. He initiated a collaboration using relativistic heavy-ion beams that had become available at LBNL's Bevatron/Bevalac. That work gave rise to increased interest in the burgeoning field of relativistic heavy-ion physics and ultimately to the maturation of this field, now exemplified by the ongoing quest for the quark–gluon plasma under way at the Relativistic Heavy Ion Collider at Brookhaven National Laboratory.

An expert in statistics, Friedländer had an uncanny ability to extract significant information from scant experimental data. During the last few years of his life, he planned to write a textbook on statistics for experimentalists, one of the few projects he didn't finish.

Friedländer was inadvertently responsible for a new term in physics. As an invited speaker, he gave a talk at the University of California, Irvine, about "The Anomalous Scattering of. . . ." A secretary misread his handwritten "anomalous" as "anomalons," and thus a new, hypothetical "particle" was created!

An accomplished musician proficient as a pianist and organist, Friedländer also had a great sense of humor and recounted political jokes from behind the iron curtain. He spoke seven languages fluently and could crack jokes in all of them.

In 1978, Friedländer became an active participant in the worldwide human rights movement SOS (Scientists for Sakharov, Orlov, and Sharansky), which fought to obtain freedom for scientists imprisoned in the former Soviet Union for their political views. Owing to his insight and personal experience, Friedländer played a vital role in the formation of the intellectual goals and procedural tactics that made this movement eminently successful.

During his career, Friedländer wrote around 250 publications. He received a Humboldt Research Award from the Alexander von Humboldt Foundation in 1985 and, in 2003, he became an honorary foreign member of the Romanian Academy of Sciences, a reaffirmation of his broad range of contributions to physics.

The last few years of his life were not easy ones for Friedländer. Illness robbed him of sight and mobility, but he struggled on courageously and

kept abreast of developments in physics.

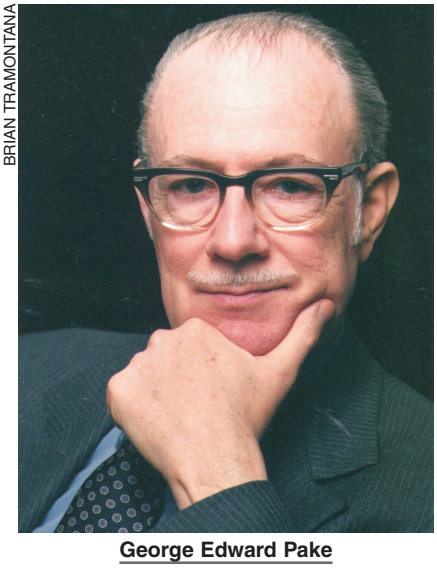
Harry H. Heckman
Berkeley, California
Meinhard E. Mayer
University of California, Irvine
Richard M. Weiner
University of Marburg
Marburg, Germany

George Edward Pake

George Edward Pake, a distinguished condensed matter physicist and past president of the American Physical Society (APS), died on 4 March 2004 in Tucson, Arizona, from multiple system failure. He also was founder of the Xerox Palo Alto Research Center (now the Palo Alto Research Center, or PARC) and of the Institute for Research on Learning, both in Palo Alto, California.

George was born on 1 April 1924 in Jeffersonville, Ohio. He received a BS and an MS in physics from the Carnegie Institute of Technology (now Carnegie Mellon University) in 1945 and his PhD in physics from Harvard University in 1948. George was the second thesis student of Edward Purcell. He undertook a study of the proton resonance of water of hydration in a single crystal of gypsum. To his surprise, he found that the absorption line was a doublet rather than the narrow single lines of liquids.

It was not long before George showed that the doublet arose because each proton in the water molecule experienced not only the magnetic field of the laboratory magnet, but a magnetic field arising from the other hydrogen atom in the molecule. Because the proton has a spin-½, its orientations are quantized into two directions, up or down, in the external laboratory magnetic field. Thus the field of the neighbor either aided or opposed the laboratory field. George further showed that he could use nuclear magnetic resonance to measure the relative positions of the two protons (hence the spatial orientation of the water molecule) and the distance between the protons. That work attracted the interest of Herbert Gutowsky, a chemistry graduate student at Harvard, to learn NMR. The two men collaborated to characterize NMR absorption line shapes of singles, pairs, and triples of protons and to show that, at some temperatures, NMR revealed the presence of molecular rotations in the solid phase. Their research launched Gutowsky's career in NMR.



BRIAN TRAMONTANA

George Edward Pake

Between 1948 and 1956, George served in the physics department of Washington University in St. Louis, Missouri. In 1956, he was lured to Stanford University to replace Nobel laureate Willis Lamb, who had just left for Oxford University. During his time at Washington and Stanford, George wrote several important books, including *Notes on the Quantum Theory of Angular Momentum* (Stanford U. Press, 1953) with coauthor Eugene Feenberg; *Paramagnetic Resonance* (W. A. Benjamin, 1962); and, with Thomas Estle, *The Physical Principles of Electron Paramagnetic Resonance* (W. A. Benjamin, 1973). He began service as executive vice chancellor and provost, and professor of physics at Washington University in 1967. In 1969, the university named him Edward Mallinckrodt Distinguished University Professor of Physics.

From 1965 to 1969, George was a member of the US president's scientific advisory committee under Presidents Lyndon B. Johnson and Richard M. Nixon. He was active on panels of the National Academy of Sciences and NSF. As the chairman of the physics survey committee, which produced the so-called Pake Report, he directed the first of the NAS studies on the status of fields of science. In 1976, George was elected vice president and, in 1977, became president of APS. In 1983, APS established the George E. Pake Prize, an award that recognizes and encourages outstanding work by physicists who have combined accomplishments in original research and leadership in managing research or development in industry.

George is perhaps best known for leading PARC from its inception in 1970 until 1978 and for overseeing Xerox corporate research from 1978 to 1986. Under his leadership, PARC