Frank C Shoemaker, a leading high-energy particle physicist, died on 11 February 2009 in Hightstown, New Jersey, aged 86. Frank was born in Ogden, Utah, the second of five sons, all of whom went on to earn PhDs. He spent his high-school years in Boise, Idaho, where he met his future wife, Ruth Elizabeth Nelson; they both attended Whitman College in Walla Walla, Washington and were both elected to Phi Beta Kappa. Following graduation and marriage, the Shoemakers worked at the Radiation Lab at Massachusetts Institute of Technology on the development of radar for use during the Second World War. After the war Frank received his PhD in physics from the University of Wisconsin, Madison, and moved to Princeton to begin his nearly 40-year career with the university’s physics department. He was made a full professor of the university in 1962.

Frank was a founder member of the university’s experimental particle-physics group. He led the reconstruction of the university’s Palmer Cyclotron following a fire in 1952 and, in the course of his research, performed pioneering experiments on the strong focusing of particle beams. He then went on to lead the design and construction of the 3 GV Princeton-Pennsylvania Accelerator and served as associate director of the accelerator programme from 1962 to 1966. In 1968–69, he took a year-long leave of absence from Princeton to become the first head of the Main-Ring group at the National Accelerator Laboratory (later named Fermilab) in Illinois and led the design and construction of the facility’s 1 km radius main accelerator ring. He also suggested the introduction of the herd of bison that still grazes around the accelerator.

Returning to Princeton in 1969 Frank played critical roles in the university’s experiments at the Brookhaven National Laboratory and Fermilab, which provided confirmation of the new QCD theory of strong interactions and the unified theory of weak and electromagnetic interactions. He served as principal investigator from 1972 to 1985. Following his retirement from teaching in 1989 he played a major role in the Booster Neutrino Experiment, MiniBooNE, at Fermilab.

During the course of his career he authored or co-authored more than 100 papers and articles, became a Fellow of the American Physical Society and a member of Sigma Xi. He was awarded an honorary doctor of science degree by his Alma Mater, Whitman College, in 1978.

Frank served as director of undergraduate physics studies from 1981 to 1989. It was in this role that he transformed the teaching of introductory physics at Princeton. He was a dedicated teacher and served as mentor to generations of students and junior faculty.

In addition to physics, his main passions were his family, classical music, sailing and dogs. His home was never without a canine companion until the few years just prior to his death and music always filled the air. After his retirement he travelled the globe together with his wife Ruth, visiting all 50 states and 5 continents. After nearly 57 years of marriage, Ruth died in 2001. Frank is survived by his daughters Barbara Shoemaker and Mary Mittnacht, and a brother, Sydney Shoemaker.

His family and colleagues.