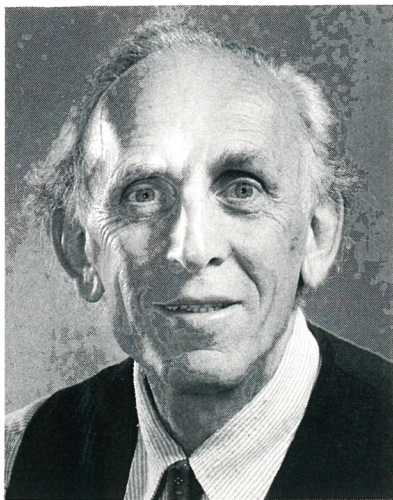




GEORGE BEKEFI

nonlinear wave propagation in hot plasmas and the various emission processes from this novel medium. The work culminated in his classic monograph, *Radiation Processes in Plasmas* (Wiley, 1966).

In the mid-1970s, George was ready to explore new fields. Earlier, during a 1966 Ford Foundation visiting fellowship at the University of Oxford, he had worked with Hans Motz, a pioneer of free-electron lasers. Thus began George's love affair with relativistic electron beams, an affair that flourished until his very last days. In addition to his research at MIT's RLE and Plasma Fusion Center, he was an active participant in experiments at Brookhaven National Laboratory and the CERN Linear Collider.

Also in the 1970s, together with Miklos Porkolab, George conceived the highly original Versator II tokamak research program at MIT. It was the first tokamak to demonstrate the feasibility of driving substantial plasma current with plasma waves, a step that was crucial to the development of the steady-state tokamak reactor concept. In 1972–73, George traveled on a Guggenheim fellowship to the University of Paris in Orsay and to the Hebrew University of Jerusalem. In 1978, he served as chairman of the division of plasma physics of the American Physical Society. During his career, George received seven patents.

George was an enthusiastic and popular teacher with a particular love for the freshman and sophomore physics courses at MIT. He and Alan Barrett were coauthors of the text *Electromagnetic Vibrations, Waves and Radiation* (MIT Press, 1977). In 1976, in collaboration with Abe Bers, George restructured the MIT interdepartmental graduate plasma physics course,

which has been successfully taught since then.

George was much loved for his ready wit and engaging manner. No matter what the subject, a conversation with George was always interesting and joyful. His early life experience, his broad education and his love of physics combined to create a personality that was thoughtful and sympathetic. His passing leaves a great void among his colleagues and many friends.

ABRAHAM BERS

BRUNO COPPI

DANIEL KLEPPNER

MIKLOS PORKOLAB

Massachusetts Institute of Technology
Cambridge, Massachusetts

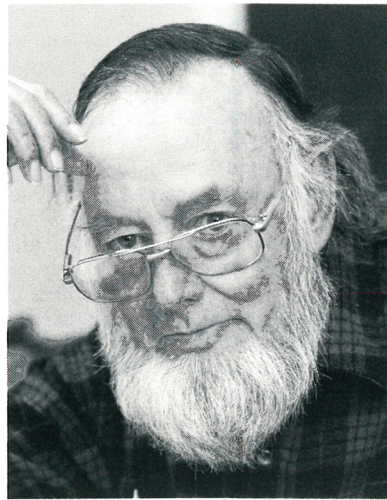
Joseph Murray

Joseph J. Murray, a world-renowned leader in the design, construction and operation of electromagnetic beams for the transport of high-energy particles from accelerators, and a long-time member of the Stanford Linear Accelerator Center faculty, died on 29 January 1996 at the age of 72.

After receiving his PhD in physics in 1954 at Caltech, working on β -ring spectroscopy, Joe Murray joined the accelerator group under Ed Lofgren at what is now the Lawrence Berkeley National Laboratory. There he began a series of designs for a crossed electric and magnetic field particle separator, which led eventually to his major innovation, the use of heated glass plates to maintain gradients as high as 200 kV/cm. The plates were used in almost all of the experiments run by Luis Alvarez's group using the large Berkeley bubble chamber and separated beams of kaons, pions and protons up to energies of 1 GeV.

Joe joined SLAC in 1967, along with the team that had operated the Alvarez 72-inch chamber. In a short time, he designed and installed a single-stage separated beam, based on the radiofrequency structure of the SLAC beam, for the 82-inch chamber and designed the two-stage beam separator for the large-angle solenoid spectrometer. In this work, Joe demonstrated his outstanding ability to combine an intuitive, analytical and practical approach with a deep understanding of the physics principles involved.

He then turned his attention to producing high-energy quasimonochromatic gamma-ray beams by backscattering visible high-intensity laser light off the main electron beam. This gamma-ray beam led to a whole range of successful gamma-ray induced particle experiments. The techniques and analysis developed for this beam have



JOSEPH MURRAY

led recently to a highly successful Compton polarimeter used to measure the longitudinal polarization of the main electron beam from the Stanford Linear Collider (SLC).

In the later stages of his career, Joe applied his knowledge to the beam problems associated with the SLC and his contributions were essential to its success. He also found time to pursue his own ideas and experiments, notably on gamma rays radiated by positrons channeled in crystals.

He spent most of his free time with his family. He loved the sea and was an accomplished diver and sailor.

Joe will be remembered for the precision and completeness of his work and for his willingness to provide guidance to anyone requesting it. His contributions to SLAC and to beam physics in general will benefit many laboratories worldwide for a long time to come.

WOLFGANG K. H. PANOFKY

JOSEPH BALLAM

Stanford Linear Accelerator Center
Stanford, California

David Powell Shoemaker

David Powell Shoemaker died suddenly on 24 August 1995 in Albany, Oregon. He was born in Kooskia, Idaho, on 12 May 1920 and received a BA in 1942 from Reed College, and a PhD in 1947 from Caltech, both in chemistry. Following a fellowship year abroad, he returned to Caltech as a senior research fellow (1948–51) before going on to MIT as an assistant professor. He moved to Corvallis in 1970 as chairman of the chemistry department of Oregon State University and retired there in 1984.

As a graduate student, David was