

## **Garwin, Edward Lee**

Edward Lee Garwin, 75, passed away in Stanford, California on 11 November, 2008. He is survived by his life-partner, Zora; three children Steve, Laurel and Lawrence; and one grandchild.

Ed was born on 22 March, 1933 in Cleveland, Ohio, son of Robert Garwin and Leona Schwartz Garwin, and brother of Richard Lawrence Garwin. Ed received his Bachelor's degree in physics from the Case Institute of Technology. He obtained his PhD in physics from the University of Chicago in 1958 with Valentine Telegdi as his advisor. Ed married Elaine Judith Katz of Cleveland in 1954, who found employment in the Physics department at the University of Chicago, working for Telegdi as a scanner of photographic emulsion detectors of nuclear events. After Ed received his doctorate, he and Elaine moved to the University of Illinois at Champaign-Urbana. From there they went to Redondo Beach, California, where Ed worked briefly for the GTC Corporation before joining the Stanford Linear Accelerator Center of Stanford University (SLAC) in 1962.

Among his first activities at SLAC was the laying out of the beam lines and experimental facilities for the two-mile-long electron linear accelerator. Ed was co-inventor of the "beam dump" for harmlessly dissipating the two megawatts of electron beam power from the linear accelerator. He became head of the Physical Electronics Group and ultimately Professor of Applied Research.

In the design and building of the linear accelerator and later facilities at SLAC, such as the Stanford Positron Electron Accelerating Ring (SPEAR), Ed played a key role in applying his expertise in surface physics and material interactions to the design of the vacuum systems, microwave windows and means for suppressing and handling particle emission from surfaces under intense bombardment by electrons, ions and light of all wavelengths. He designed the SPEAR vacuum chamber and with insight included a tangential port to allow synchrotron radiation to emerge, facilitating a vast field of research at SLAC.

According to Richard Taylor, who shared the 1990 Nobel Prize in Physics for his work at SLAC, Ed provided an understanding of classical physics that supported collaborative projects undertaken with the high-energy particle physicists in the team. He also brought a scientific approach to many engineering tasks at the lab. SLAC founder and long-time director, W.K.H. "Pief" Panofsky, relied on Ed for technical judgment on many projects. In addition, Ed's programs in surface physics created expertise in vacuum systems that enabled major SLAC advances in synchrotron radiation sources and highly polarized electron sources, which led to major additions to SLAC capabilities and reputation.

Ed contributed greatly to the high-efficiency polarized electron sources at SLAC and worked in many other areas, such as ultra-fast magnetic switching, using the high magnetic field close to the short electron "bunches" of the tiny-diameter, linear accelerator electron beam. After his retirement from SLAC in January 2005, Ed became Professor Emeritus of Applied Research and his broad knowledge and experience made him a valued consultant on a wide range of technical matters.

Ed enjoyed scuba-diving, down-hill skiing, puns, wine and chocolate. He was a devoted counselor at Kara ("grief support and education for our community") in Palo Alto, California from 1989 until his unexpected death. Edward Garwin was loved and will be missed.