

Walter Selove

Walter Selove, an emeritus professor of physics at the University of Pennsylvania, passed away on 24 August 2010 in Wynnwood, Pennsylvania. An experimental high-energy physicist and an expert in electronic detection systems, he made significant discoveries with bubble chambers and spectrometers. His research career spanned more than 50 years, and he is credited with five patents and one particle discovery.

Selove was born on 11 September 1921 in Chicago and studied physics at the University of Chicago, where he obtained a BS degree in 1942. World War II interrupted his studies, and like many other young physicists at the time, he contributed to the war effort; he worked on radar development at MIT. Selove used to tell his graduate students in the early 1960s stories about how everyone at MIT felt motivated to do their utmost for the war effort and how he was often pleasantly surprised when he asked the machine shop workers to build some complicated hardware and would get the finished product the next day.

After the war Selove went back to the University of Chicago, where he studied under Enrico Fermi and Edward Teller. Like Fermi, Selove developed a reputation for his back-of-the-envelope calculations. He obtained his PhD degree in 1949 with a thesis titled "A Rotating-Shutter Time-of-Flight Neutron Spectrometer for the Resonance Region." He then used the detector he made for his thesis to study several nuclear resonances. He joined Harvard University as an instructor in 1950 and in 1952 became an assistant professor there. On 18 December 1955 he married Fay Ajzenberg, herself a renowned nuclear physicist. Selove was a great support to his wife at a time when the physics community had biases against women.

In 1957 Selove joined the physics department faculty at the University of Pennsylvania as an associate professor; he became a professor in 1961 and 31 years later was made an emeritus professor. Even after retiring, he continued to work on various high-energy physics experiments.

Even though his background was in nuclear physics, Selove and three other experimental physics faculty members at Penn created a strong high-energy physics program. Selove was an electronics wizard, and the experiments in which he was a crucial member often benefited from his design ability. One of the first users of computers in high-



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energy physics, he started with the Univac and then used a series of other systems.

Selove began his high-energy physics career performing counter experiments at Brookhaven National Laboratory. In 1961 he realized that bubble-chamber physics was a much better way to study meson resonances. With eight graduate students, including two of us (the Hagopians), Selove studied meson resonances for the next dozen years. With resonances being announced frequently, it was an exciting time in physics. In 1962, using the lab's 20-inch bubble chamber, his group found a new $\pi^+\pi^-$ resonance at about 1260 MeV. Selove told us that when he married Fay, he promised to name the first particle he discovered after her. So we named the particle the fayon, or f_2 , with the 2 designating the particle's spin. We are happy that the name has stayed, even though many other resonances were renamed to bring order to the naming chaos.

Selove also worked at the Princeton-Pennsylvania Accelerator rapid-cycling bubble chamber and observed for the first time the predicted interference between the production of ρ and ω mesons. His bubble-chamber program was one of the first to use the Hough-Powell device, an automated computerized instrument that measured the particle tracks on film with a tiny light source. In total he advised 12 PhD students, many of whom have had successful science careers.

Bubble-chamber physics was exciting, but only resonances with large cross sections could be observed. So in the early 1970s, Selove switched back to

counter experiments, working with colleagues at Brookhaven and then at Fermilab. In the 1980s, with groups from the University of Wisconsin, Fermilab, and Lehigh University, he conducted a series of experiments using calorimeters that he and his colleagues had developed to study high-momentum-transfer jets that yielded information on quarks and gluons. Selove was one of the original designers of the D0 collider experiment at Fermilab. Later he switched to studying CP violations, and with researchers from 18 other institutions, he studied the B meson. For that experiment he and his group at Penn were the prime movers of the silicon tracker, trigger electronics, and the muon trigger. His last experimental effort, BTeV at Fermilab, was canceled in 2005 by the US Department of Energy before construction began.

Walter Selove was passionate about physics. He argued strongly for what he believed was right and often buttressed his views with quick calculations. But in the infrequent instances when he was wrong, good arguments could persuade him to change his mind. He wanted to know every detail of an experiment. He treated his students, collaborators, and staff as colleagues and worried about their well-being. He was a scholar and a gentleman who will be dearly missed by his wife, his students, and his many friends and collaborators.

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