Owen Chamberlain 1920–2006

Owen Chamberlain, who shared the 1959 Nobel Prize for the discovery of the antiproton, passed away quietly in his home in Berkeley, on 28 February 2006, following a long struggle with Parkinson’s disease. He was 85. Chamberlain, an emeritus professor of physics at the University of California, Berkeley, had an almost 60 year association with Lawrence Berkeley National Laboratory (LBNL).

Chamberlain, working with Emilio Segrè, Clyde Wiegand and Thomas Ypsilantis, discovered the antiproton in 1955 at the Rad Lab (now LBNL). The accelerated protons to an energy of 6 GeV, just enough to produce proton–antiproton pairs (CERN Courier November 2005 p27). Chamberlain and his collaborators used a magnetic spectrometer to select fixed-momentum particles from proton–copper collisions. Two scintillation counters were used to measure the time of flight over a 10 m flight path. The time-of-flight system was supplemented with two Cherenkov counters, also to measure velocity. The combined Cherenkov identification and time-of-flight velocity measurement provided the 40,000 to 1 rejection factor needed to separate single candidate antiprotons from background particles, mostly negative pions and kaons. An expanded collaboration later used a stack of emulsion to confirm the discovery.

Chamberlain was born in San Francisco on 10 July 1920, the son of W Edward Chamberlain, a prominent radiologist who had a strong interest in particle physics, and Genevieve Lucinda Owen. His family moved to Philadelphia in 1930. After obtaining a bachelor’s degree from Dartmouth College in 1941, Chamberlain entered graduate school at UC Berkeley.

In early 1942, at the prompting of Ernest Lawrence, Chamberlain joined the Manhattan Project, the effort to build an atomic bomb. In 1944, he worked at Oak Ridge and in 1945 at Los Alamos. Chamberlain investigated nuclear cross-sections for intermediate-energy neutrons and the spontaneous fission of heavy elements. After the war, he returned to graduate work at the University of Chicago to study under Enrico Fermi. Chamberlain’s doctoral project was a study of the diffraction of slow neutrons in liquids. After receiving his PhD in 1948, he returned to UC Berkeley and began his research at the Rad Lab, initially studying proton scattering on various targets. This included some of the first experiments with polarized-proton beams.

Chamberlain’s later research covered a variety of fields. After the antiproton discovery, he went on to study antiproton interactions in hydrogen, deuterium and other elements, and then observed antineutron production from antiproton interactions.

In the early 1960s, Chamberlain pioneered the application of polarized targets to high-energy physics. He spent much of the next 20 years using polarized targets to study spin physics and other topics. This included notable early experiments on the parity of the Σ baryon, and tests of time reversal. He did this work at a variety of accelerators, including the LBNL 184 inch cyclotron, the Bevalac, accelerators at SLAC and Fermilab and others.

Even later in life, he continued his hands-on work. In the late 1970s and early 1980s, he worked on the high-voltage field cage for the SLAC/PEP-9 Time Projection Chamber; this required considerable study of material properties. Despite ill health, after retirement, he maintained his interest in physics, often appearing at seminars and colloquia.

In his later years Chamberlain became an outspoken activist for nuclear arms control and other issues of social concern. In the 1960s he supported the Free Speech Movement at UC Berkeley, and strongly advocated increased minority recruitment and enrollment there. He spoke out against the repression of scientists in the former Soviet Union, demonstrated against the Vietnam War and was a founder of the nuclear-freeze movement of the early 1980s.

"As a Nobelist, I've been made prominent and well known," he once said in an interview. "My advice was sought in a number of areas and I felt a responsibility to speak up on important issues."

Spencer Klein and Lynn Yarits, Lawrence Berkeley National Laboratory.