Louis Goldstein

Louis Goldstein, a former group leader at the once-named Los Alamos Scientific Laboratory, died in Los Alamos, New Mexico, on 26 August 1999. He had broken his hip on 4 July, and died from the complications that followed.

Louis was born in Dombrad, Hungary, on 25 March 1904. Barred as a Jew from attending a Hungarian university, he moved to Paris in the early 1920s. He earned a bachelor's degree in physics from the University of Paris in 1926 and a doctor of science degree in theoretical physics from the same university in 1932. His thesis was entitled "The Quantum Theory of Inelastic Collisions." He remained in Paris until the spring of 1939, when he emigrated to the US. Five years later, he became a US citizen.

Shortly after arriving in the US, he began teaching theoretical physics at City College in New York City. From 1944 to 1946, he worked with the wave propagation group at Columbia University. In 1946, he moved to Los Alamos Scientific Laboratory, where he served as a group leader in the lab's theoretical division. His position was unique: He was the sole member of his group, and his assignment was to work on whatever subject he chose!

Among Louis's first, and most appreciated, contributions to postwar research at Los Alamos were to the work of the low-temperature physics group. Shortly after World War II ended, preliminary investigations of thermonuclear reactions began at the lab. Experimentally, this effort required tritium, which made available, for the first time, pure helium-3.

LOUIS GOLDSTEIN

Louis was aware of Fritz London's 1938 suggestion that helium-4 behaves anomalously at 2.17 K because it was a Bose–Einstein fluid. Knowing that ^{3}He obeys Fermi–Dirac statistics, Louis recognized that it would show no such behavior. Other theorists had suggested that ^{3}He would be hard to liquefy because of its high zero-point energy, but Louis was undeterred. Even before any ^{3}He arrived at Los Alamos, he organized a crash course of experiments on liquid helium. It was therefore a rewarding experience for Louis when two of us (Grilly and Keller) and Stephen Sydoriak liquefied this isotope on 13 October 1948. Eleven months later, the team reported that liquid ^{3}He exhibited no anomalous behavior down to a temperature of 0.84 K.

In his later years, Louis continued to write many journal articles that explored the statistical thermodynamics of condensed phases of the stable helium isotopes, including the magnetic properties of solid ^{3}He. He retired in 1971, but continued to be involved with the lab for many more years. He made a deep impression on his younger colleagues through his commitment to physics and to the integrity the subject requires and fosters. Physics for Louis was not merely important, but personally encompassing. His memory is cherished by everyone he mentored and influenced.

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Lawrence Marvin Langer

Lawrence Marvin Langer, an early leader in experimental tests of the theory of nuclear beta decay, and in studies of neutrino properties, died on 17 January 2000 in Bloomington, Indiana, after a long battle with multiple sclerosis.

Langer was born in New York City on 22 December 1913. He received three physics degrees from New York University: his BS in 1934, MS in 1935, and PhD in 1938. The same year he earned his doctorate, he went to Indiana University as one of four new faculty members hired to start a modern research program. He contributed to the construction of a cyclotron, and applied the beta–gamma coincidence

LAWRENCE MARVIN LANGER

method to the study of the energy levels of atomic nuclei.

As World War II approached, Langer was recruited to work in the MIT Radiation Laboratory, where he was very much involved in flight-testing of radar prototypes in fighter planes. He was then called by the US Navy to San Diego, where he worked on the development and testing of sonar detectors. In 1943, he was invited to Los Alamos, where he worked on developing and testing the "gun" mechanism used to set off the uranium-235 bomb. He accompanied the weapon to the western Pacific island of Tinian, where he supervised its final assembly.

In 1946, he returned to the Indiana University faculty and developed one of the world's major laboratories for the study of beta-ray spectra shapes and other work in nuclear spectroscopy. Langer's ingenuity as a physicist was evident in the way he improved instruments and carried out experiments. He was among the earliest physicists to use a shaped-magnetic-field spectrometer to study spectrum shapes, and was a leader in source and detector techniques.

In the late 1940s and early 1950s, Langer and his students made important contributions to confirming the Fermi theory of beta decay for "allowed" transitions. In 1949, he and his student H. Clay Price found the first clear example of a "unique-forbidden" shape. In 1952, he and his student R. Douglas Moffat set a significant upper limit on the mass of the neutrino from studies of the beta spectrum of tritium near its endpoint. He returned often to neutrino-related studies, including questions of neutrino–antineutrino identity, a