in the US Navy during World War II, he attended the University of California, Berkeley, and graduated with a BS in chemistry in 1949. He attended graduate school at MIT, beginning in chemistry but soon switching to physics. He received his PhD under Philip Morse in 1953 for his thesis "A Variational Calculation of Electron Scattering from a Static Potential."

That year, he joined the GTE Sylvania Electronic Defense Laboratory in Mountain View, California, as a theoretician in the microwave physics division. For the next four years, he studied the propagation of microwaves in plasmas.

Lyman joined the physics department faculty at the University of New Hampshire in 1957; he became a full professor in 1964. He was the thesis adviser for one of the first students in that department to receive a doctorate.

After arriving at UNH, Lyman carried out his first project with the microwave gas discharge group, headed by Sanborn C. Brown and William P. Allis, in MIT's Research Laboratory of Electronics. In collaboration with Brown and Solomon J. Buchsbaum of AT&T Bell Laboratories, Lyman developed a method of using a microwave cavity as a plasma diagnostic tool. The technique was suitable for both high- and low-density magnetized plasmas.

During a sabbatical in 1964, Lyman was one of 11 visiting fellows in the newly formed Joint Institute of Laboratory Astrophysics at the University of Colorado at Boulder. At JILA he worked on the development of a practical method to calculate the spontaneous and stimulated transition and decay probabilities between several closely coupled unstable states. The technique involves a Green function formulation, with states selected by suitable projection operators, and produces accurate results in a variety of situations. As was characteristic of his work, Lyman emphasized practicality, simplicity, and the inclusion of many useful examples. His technique has been applied to studies of sequential atomic transitions produced by one or multiple bands of intense electromagnetic radiation.

Lyman taught many of the more demanding graduate courses during his years at UNH. His ability to provide elegant, clearly organized solutions to a variety of problems was widely recognized. He chaired the physics department from 1969 to 1972.

After retiring in 1990, Lyman carried out genealogical research in the US and Scandinavia and published five books on his results, two of which were coauthored with his wife, Karen Hoiriis Mower. A sixth book will be published posthumously. In the course of his research, he taught himself Danish.

He also made several startling discoveries. The first was that by moving to Durham, he had by chance settled two miles from lands that his ancestors owned in the 1600s. Second, he learned that his Norwegian ancestry crossed paths with his wife's Danish history; his ancestors had owned properties that were later farmed by hers. Finally, he unearthed the tidbit that he was a descendant of Margrethe Ottesdatter Brahe, sister of the astronomer Tycho (Tyge). As Lyman noted, if you go back far enough, we're all related.

John F. Dawson
Richard L. Kaufmann
University of New Hampshire
Durham

George T. Reynolds

George T. Reynolds, whose insights led to developments in elementary particle physics, environmental science, and biological physics, died of cancer on 19 April 2005 at his Skillman, New Jersey, home.

Born on 27 May 1917 in Trenton, New Jersey, George never strayed far from his central New Jersey roots. He received his bachelor's degree in physics from Rutgers University in 1939 and his physics PhD, under Walker Bleakney, from Princeton University in 1943.

George's thesis work was on shock waves, so he was quickly sought out for the Manhattan Project, which he refused to join. Instead, he tried to enlist in the US Navy but was turned down because he wore eyeglasses. Not one to take "no" for an answer, George succeeded in having that policy waived. After he enlisted, he married, and then awaited orders. To his dismay, he was immediately assigned to Los Alamos, where he worked with George Kistiakowsky on the Fat Man plutonium bomb. He was among the first sent to Hiroshima and Nagasaki to assess damage. He received the Army–Navy Certificate of Appreciation for his contributions.


George T. Reynolds

In 1946 George accepted a faculty position at Princeton, where he remained until the end of his life. Influenced there by John A. Wheeler, he formed a group to study the high-energy-particle aspect of cosmic rays. By 1949 he had begun staffing the group with cloud-chamber experts Ronald Rau from Caltech and Joseph Ballam from the University of California, Berkeley, for a major effort in high-altitude experiments at Echo Lake, Mount Evans, Colorado. George had a knack for identifying young talent. In 1952 he hired a promising young PhD from the University of Chicago, Sam Treiman, as an instructor. He also brought Jack Keuffel, Georgio Salvini, Riccardo Giacconi, Val Fitch, and Jim Cronin on board as members of the cosmic-ray group.

George tried to grow large organic scintillation crystals—because of the low cosmic-ray flux—-as ionizing particle detectors. To get around cracks in the crystals, he tried dissolving the organic scintillator in a liquid. Contrary to the prevailing theory of scintillation, the solution's scintillation efficiency was comparable to that of crystals. George and his collaborators, Salvini and Francis B. Harrison, reported their results in 1950 in a letter to the editor of the *Physical Review*. Liquid scintillators soon became pervasive across the sciences.

By the 1960s, the group's activities centered on particle experiments at Brookhaven National Laboratory's Cosmotron, Berkeley's Bevatron, and the Princeton-Penn Accelerator. George, while pursuing his own studies in luminescence, continued as director of the cosmic-ray lab (later the elementary-particles lab). He created a wonderful place to do physics, where professors, postdocs, and graduate students mixed in a friendly and productive atmosphere.

Protein crystallography was becoming important in the late 1960s, but it involved slow, cumbersome filming of diffraction patterns. George realized that image intensifiers could be used to acquire diffraction data, and with graduate students Thomas Minor, James Milch, and one of us (Gruner), he began the development of automated x-ray detectors. That work led to the CCD detectors that now collect most of the world's protein-structure data.

When concern for the environment began sweeping the world's university campuses in the late 1960s, George, along with Marvin Goldberger, Irvin Glassman, and Robert Jahn, persuaded Princeton's president and provost to establish a new research unit independent of the university's department structure, at a time when Princeton had few nondepartmental units. That unit, the Center for Environmental Studies, was established in 1971. One of George's memorable phrases was that a university needed to guard against "the hardening of the categories."

George served as the first director of the center. At considerable personal cost, he championed its independence and established standards of excellence and internal peer review. He guided and encouraged the center's first investigators as they chose unconventional cross-disciplinary research topics—in energy conservation in buildings, indoor air quality, the connection between nuclear power and nuclear weapons, and the values involved in environmental decision making. George inspired people with the adage that a good university researcher should write only the first or the last paper on any subject.

Around 1970, George, in his middle fifties, changed career directions and took an interest in biology. He became deeply committed to working with his own hands on what he then called "weak light," a light-hearted unifying concept that captured his early work on cosmic rays and his later work on bioluminescence. Seeking to combine his love of sea and science, George sought and received an appointment with the Marine Biological Laboratory in Woods Hole, Massachusetts, where he spent many summers studying marine luminescence. In his last decade, he focused on luminescent phenomena pertaining to hydrothermal vents in midocean ridges. During that time, he was an adjunct scientist at Woods Hole Oceanographic Institution.

George was blessed with the ability to foresee scientific opportunities and worked tirelessly to bring those to fruition. His colleagues and students, and his family—to which he was devoted—remember him as the person who saw the way and then made it a reality.

Sol M. Gruner
Cornell University
Ithaca, New York
Pierre A. Piroué
Robert H. Socolow
Princeton University
Princeton, New Jersey

Lawrence Talbot

Lawrence Talbot, a fluid dynamicist with extraordinarily broad interests, died of heart failure at his home in Berkeley, California, on 17 March 2005.

Larry was born in New York City on 30 December 1925. After schooling at Brooklyn Technical High School and a year of engineering at the University of Alabama in Tuscaloosa, he completed undergraduate and graduate study in the department of mechanical engineering of the University of Michigan, Ann Arbor. He did his PhD work in the engineering mechanics division and received his degree in 1951.

In 1951 Larry joined the faculty of mechanical engineering in the division of aeronautical sciences at the University of California, Berkeley. He retired in 1991, after 40 years with the department. Being retired, but not tired of research, he maintained his connection with colleagues at the Lawrence Berkeley National Laboratory for the rest of his life.

Larry was a prime example of the researcher for whom the American Physical Society's division of fluid dynamics was a godsend. His wide interests encompassed supersonic and hypersonic rarefied gas dynamics, nonequilibrium effects in flows of


UC BERKELEY

Lawrence Talbot