

Astrophysics in Munich, Germany (1961), and the British Atomic Energy Establishment in Harwell (1961). He received the Turkish Presidential Science Prize in 1972 and the Kemal Ataturk Society Prize from that society in 2000. He was particularly pleased by this honor because of his lifelong adoration of Ataturk.

Behram possessed a sharp wit and an open demeanor, qualities important not only for attracting leading scientists to the center, but also for enlisting the participation of local philanthropists to host conference banquets in their homes and on their yachts.

Behram's life was characterized by two powerful visions. First, there was his own research on unified field theory, which persisted when gravitation became a central issue in astrophysics and particle physics. In his later work, he emphasized a running fundamental length parameter related to the cosmological constant and stressed the capacity of his theory to encompass both short- and long-range attractive and repulsive interactions. That work had profound implications for the expansion of the universe. His second vision, which resulted from a deep humanist belief in the interactions of humans, was to convene, in an atmosphere of calm deliberation, some of the greatest minds of our time to investigate the scientific, political, and economic problems facing our civilization. His success in fulfilling both of those visions is noteworthy.

Arnold Perlmutter

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Edward Bryant Nelson

Edward Bryant Nelson's long professional career as a physics teacher and research physicist is identified principally with Columbia University and the University of Iowa. He died of age-related complications on 30 April 2004 in Gainesville, Florida, where he and his wife Judith moved after his retirement from the Iowa faculty in 1983.

Born on 26 July 1916 in McHenry, Kentucky, Nelson earned a BS (1937) from Western Kentucky State Teachers College in Bowling Green, an MS (1938) from Vanderbilt University, and a PhD (1949) from Columbia University, all in physics. During the period 1938–49, he taught physics at Western Kentucky and at Columbia and was a research physicist in the Columbia component of the Manhattan Project.



Edward Bryant Nelson

Nelson and John E. Nafe, fellow graduate students in I. I. Rabi's laboratory at Columbia, used the atomic beam magnetic resonance method to make the first experimental measurements of the hyperfine structure of atomic hydrogen and deuterium. The findings of Nafe, Nelson, and Rabi were published in the *Physical Review* in 1947. Behind the closed door of their laboratory, the two hard-working students referred to their mentor as "I. I.," as in "Aye, aye, sir," after responding to his frequent inquiry, "Any results yet?"

In an extended follow-up paper (*Physical Review*, 1948), Nafe and Nelson reported values of the hyperfine transition frequencies with improved precision, namely 1420.410 (± 0.006) MHz for hydrogen and 327.384 (± 0.003) MHz for deuterium. The relatively small (0.25%) but glaring discrepancy between their experimental values and the prevailing theoretical expectations for the electron spin-flip transition in the ground state of these atoms led theorists to identify the "anomalous" magnetic moment of the electron in the context of relativistic quantum electrodynamics.

In a quite different context, the Nafe–Nelson value for the hyperfine transition frequency in hydrogen facilitated the search for the corresponding emission from atomic hydrogen in remote astrophysical systems. Such emission, discovered by Harold I. Ewen and Edward M. Purcell in 1951, soon became a major component of radio astronomy. Nelson and Nafe also collaborated on two closely related *Physical Review* papers (1949), "The Hyperfine Structure of Tritium" and "A Comparison of the g Value of the Electron in Hydrogen with That in

Deuterium," based on their respective PhD dissertations.

In 1949, Nelson joined the physics faculty at Iowa and turned his talents to teaching and to research in experimental nuclear physics using proton beams from Iowa's nuclear accelerators. In collaboration with James A. Jacobs, Richard R. Carlson, and a sequence of graduate students, he specialized in nuclear gamma rays, nuclear energy levels, and the spectra and angular correlations of the products resulting from the bombardment of a wide variety of elements. After Iowa acquired a large Van de Graaff accelerator, he conducted experiments with helium-3 beams up to 6.2 MeV and with lithium beams up to 13.8 MeV.

Throughout his long tenure at Iowa, Nelson was a devoted and enthusiastic teacher. He was a leader in the development and supervision of the undergraduate laboratories and in the training of graduate teaching assistants. His *Physics Laboratory Manual*—the first edition was published in 1961 (William C. Brown)—was used for many years at Iowa and elsewhere. The career total of enrollments in his courses exceeded 10 000 student-semester. He was active in the programs of the Iowa Academy of Science and the American Association of Physics Teachers, and he wrote and edited examinations for the American College Testing Service.

During the 1960s, Nelson helped design the new buildings for housing the physics and astronomy department and gave special attention to lecture rooms and teaching laboratories. From 1963 until his retirement in 1983, he served as associate head of the department and as principal adviser of undergraduate majors.

Nelson is remembered with affection and admiration by his colleagues at Iowa and elsewhere and by many friends in Iowa City and Gainesville.

James A. Van Allen

Edwin Norbeck

*University of Iowa
Iowa City*

John Beverley Oke

John Beverley Oke, emeritus professor of astronomy at Caltech, died on 2 March 2004 of heart failure at his home in Victoria, British Columbia.

Born on 23 March 1928 in Sault Sainte Marie, Ontario, Oke earned his bachelor's degree in physics in 1949 and master's degree in astronomy a year later, both from the University of Toronto. He moved to Princeton University, where he earned his doctorate