

liant gift for generating ideas, which he shared lavishly with his colleagues. He was able to persuade people, charge them with his energy and assure them of success. He will be sorely missed by all those who came into contact with him.

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Zoltan Bay

Zoltan Bay, one of the lesser known of the great Hungarian physicists, died painlessly on 4 October 1992 at his home in Chevy Chase, Maryland, while working on a paper on experimental checks of special relativity. He was 92.

Bay had a remarkable career in both fundamental and applied research, in Hungary as well as in the US. In 1926 he earned his PhD in physics from the University of Budapest, after which he worked at the German Bureau of Standards in Berlin. Bay taught from 1930 to 1936 at Szeged University (where he befriended Albert Szent-Györgyi) and was a professor of atomic physics at the Budapest Technical University from 1938 to 1948. Concurrently he directed research at the Tungstam and United Incandescent Lamp companies in Budapest. In that position he built electron multipliers, and in 1938 he was the first to propose their use in particle physics. During the war he developed radar, independently of Allied and German efforts. In January 1946, after the siege of Budapest, he managed under the most difficult circumstances to record radar echoes from the Moon—a feat accomplished just weeks before in the US.

Threatened personally by the Communist regime, which deprived him of his citizenship, he escaped from Hungary in 1948. He settled in Washington, DC, where he worked at George Washington University (1948–55), the National Bureau of Standards (1955–72) and American University (from 1972 onward). At GWU he and his collaborators developed simple but ultrafast coincidence techniques, and they used them to establish simultaneity in the Compton effect to extraordinary accuracy. With the advent of lasers, he focused his attention on the direct measurement of the absolute frequency of an optical transition. Using an ingenious idea that he and Harold S. Boyne had advanced in 1963, Bay, Gabriel G. Luther and John A. White succeeded in making the first such



Zoltan Bay

measurement in 1972. This, plus Bay's long-term effort that proved that the velocity of light in a vacuum is independent of frequency, led to his proposal for the unified standardization of time, length and frequency, wherein c , the velocity of light, is a defined quantity. This proposal, now internationally adopted, constituted the greatest advance in metrology since Albert Michelson replaced the physical meter stick with an optical wavelength.

Zoltan Bay was a deep and original thinker, one who could identify important questions and provide elegant experimental solutions for them. Though he was never duly appreciated in his lifetime, he will be long remembered.

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Hillard B. Huntington

Hillard B. Huntington, a physicist whose early research on electromigration of atoms ultimately hastened the development of reliable integrated circuits and computer chips, died at his home on 17 July 1992, after a long bout with cancer. He was 81.

Born in Wilkes Barre, Pennsylvania, Huntington received his bachelor's (1932), master's (1933) and doctoral (1941) degrees from Princeton University. He then taught at Culver Military Academy, the University of Pennsylvania and Washington University in St. Louis. During World War II Huntington was a research associate in the Radiation Lab at MIT, where he worked on refinements of radar.

Huntington joined the faculty at Rensselaer Polytechnic Institute in 1946. He served as chair of the RPI physics department from 1961 to 1968. He continued his work at Rensselaer for 12 years after his formal retirement in 1976.

One of the world's first solid-state physicists, Huntington worked on a variety of important problems. He is perhaps best known for his pioneering work in electromigration. This work was undertaken long before anyone recognized the impact it would have on integrated circuit technology.

Huntington's early research also classified the electric constants of crystals, and his measurements became very important in geological research. He was also a specialist in problems dealing with diffusion and the conductivity of metals.

Huntington was always sympathetic to the needs of his graduate students, and it was a pleasure to interact with him. He was a gentle and humble man, always interested in the physics of the problems. When things did not work out he took the blame, and when things did work out the students got the praise.

An accomplished painter, Huntington was active in the Rensselaer County Council for the Arts and served as a member and officer of the Friends of Chamber Music.

Those of us fortunate enough to have been his students are trying to emulate him the best we can.

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Herbert Pomerance

Herbert Pomerance, a physicist at the Oak Ridge National Laboratory since 1943, died of heart failure on 9 September 1992. He was 75.

Pomerance began his career in 1942 as an analytical spectroscopist with the Manhattan Project's metallurgical laboratory at the University of Chicago. Upon coming to Oak Ridge in 1944, Pomerance, together with Ernest O. Wollan, developed the pile oscillator for measuring the thermal neutron cross sections of the elements.

Pomerance used this method in 1947 to identify hafnium as a strongly neutron-absorbing trace element in commercial zirconium. Pomerance realized that zirconium, if purified of the contaminating hafnium, would be ideal as a structural material

WE HEAR THAT

and fuel-element cladding in the pressurized-water submarine reactor, which was then being developed to power the Nautilus. This discovery led to the widespread use of purified zirconium and its alloys as the cladding for fuel elements in the world's commercial light-water reactors. Pomerance's recognition of the high neutron absorption of hafnium led to the use of hafnium in control rods.

Pomerance received his PhD from the University of Chicago in 1950.

During the rest of his career, at ORNL, Pomerance taught at the Oak Ridge School of Reactor Technology and became an expert in the handling of scientific information. Pomerance also served for one year in 1960 as an adviser to the Portuguese Atomic Energy Commission in Lisbon, and for two years (1964-66) as technical editor of the International Atomic Energy Agency's journal *Nuclear Fusion* in Vienna, Austria. Pomerance's memory was prodigious: As the years went by, he became a more or less one-man corporate memory for all of ORNL. He retired from the laboratory in 1982.

Herb was a Renaissance man: an accomplished cellist and a veritable fount of knowledge on history, music and spectroscopy. All his many friends at ORNL will sorely miss his ubiquitous presence, his many anecdotes about the earlier, more innocent days of nuclear energy and his indefatigable enthusiasm.

ALVIN M. WEINBERG
Oak Ridge Associated Universities
Oak Ridge, Tennessee

Richard G. Fowler

Richard G. Fowler, George Lynn Cross Research Professor Emeritus at the University of Oklahoma, died in Norman, Oklahoma, on 8 October 1992, after a long struggle with cancer. His research on radiative lifetimes, lightning and gaseous electronics was at the center of the Oklahoma physics department's graduate program during the decades following World War II.

Fowler was born in Albion, Michigan, on 13 June 1916. He graduated with a degree in chemistry and mathematics from Albion College in 1936, worked for Dow Chemical for two years and earned a PhD in physics at the University of Michigan in 1942. After a year at North Carolina State University and three years of spectroscopic research at Michigan, Fowler joined the physics faculty at the University of Oklahoma in 1946, and he remained there until his re-

tirement in 1980. He was chair of the department in 1956-60 and 1966-68.

Fowler's work was both experimental and theoretical. He began with ultraviolet spectrochemical analysis and determination of organic structure by infrared techniques. At Oklahoma he became interested in electrically generated shock waves and plasma-driven shock tubes. The pursuit of these interests led Fowler to work to get better data on lifetimes of atomic and molecular excited states to support refinements in diagnostic techniques. Among Fowler's contributions were the development of optical methods for measuring electron temperature transients and clarification of the nature of electrical breakdown wave propagation.

Fowler wrote textbooks on general physics and electromagnetic field theory. He was fond of pointing out that his most-cited book was one of his earliest—a report on the methods used for determining the structure of penicillin, which he coauthored with Michigan colleagues Harrison Randall, Robert Dangel and Nelson Fuson. In addition, he served for 20 years as physics adviser to the *World Book Encyclopedia*.

Fowler headed the fluid dynamics division of the American Physical Society from 1967 to 1969.

While department chair at OU in the mid-1960s, Fowler instituted a program to encourage young women to study physics, which involved recruiting women to the faculty and providing tailored academic support and mentoring.

Fowler was deeply concerned about the inequitable distribution of the world's wealth, the squandering of nonrenewable resources and pollution. In the early 1980s he cofounded the Oklahoma Institute for a Viable Future.

Among Fowler's qualities that his colleagues and former students will miss most are his enthusiasm, optimism and humor. His voracious reading and his worldwide travels gave him a breadth of knowledge in history, literature, music and art that few could rival. He remained a role model to the end—showing remarkable dignity and courage as he dealt with the illness that took his life.

ROBERT ST. JOHN
University of Oklahoma, Norman
ROGER N. BLAIS
University of Tulsa
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