

contribution of Ramanna's was a geometrical interpretation of atomic and nuclear binding energies.

India's first nuclear test, in 1974, is undoubtedly a moment of great achievement for Ramanna and his associates at BARC. While the credit for the success of the test goes to many spread over several institutions, it was at BARC where all the design and development work had been done under the direct leadership of Ramanna.

Ramanna's influence on India's nuclear program carried over into the area of human resource development. He singularly contributed to the creation in 1958 of the Atomic Energy Training School of what was then the Atomic Energy Establishment, Trombay. Under the leadership of Ramanna, the school trained staff in multiple disciplines for the country's nuclear establishment. Apart from the nuclear program, he was involved in the development of several higher institutions of learning and research in India.

Ramanna occupied many prestigious positions in the Indian government and shaped its programs. He was scientific adviser to India's defense minister (1978–82) and chairman of the country's Atomic Energy Commission (1983–87). As the chief of defense research and secretary for defense research, Ramanna made important contributions to India's efforts to design and manufacture its own defense equipment. He also had a brief stint in 1990 as minister of state for defense in the government's Union Cabinet.

Ramanna's death is indeed a loss to India, particularly to the Indian scientific community.

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Dale Edward Sayers

Dale Edward Sayers, a professor of physics at North Carolina State University who made pioneering contributions in x-ray spectroscopy, died on 25 November 2004 in Raleigh. He had suffered a heart attack while jogging several weeks earlier.

Born on 29 November 1943 in Seattle, Washington, Dale earned his bachelor's degree in 1966 in physics at the University of California, Berkeley, and his master's and doctoral degrees, both in physics, in 1972 at the University of Washington, Seattle. His PhD research, completed in 1971 under the direction of one of us (Stern), centered on developing a new local-structure determination tech-

nique named extended x-ray absorption fine structure.

The first EXAFS paper, which Dale wrote with Stern and Farrell Lytle in 1971, opened this new field. EXAFS became an important experimental technique for local-structure studies at synchrotron radiation sources worldwide. The researchers' effort also led to the establishment of the International XAFS Conferences, the 12th of which convened in 2003 in Sweden. Dale was also instrumental in establishing the International XAFS Society (IXS), now a subunit of the International Union of Crystallography. The IXS organizes the International XAFS Conferences, sets standards in the field, and conducts other activities.

Soon after he started his PhD research, Dale began experiments at the Boeing Scientific Research Laboratory in Seattle in collaboration with Lytle. On completing his PhD, he became a research engineer at Boeing Aerospace Co in Seattle before returning to the University of Washington as a postdoctoral research associate. In 1976 he joined the physics faculty at NC State and flourished there for the remainder of his career. Dale went on sabbatical in France as a visiting professor at the Université de Paris–Sud in Orsay from 1982 to 1983 and at the Université Joseph Fourier in Grenoble in 1996. He also was a visiting scientist at the European Synchrotron Radiation Facility in Grenoble in 2000 and the Advanced Light Source in Berkeley, California, in 2000.

A master in the art of collaboration, Dale had wide-ranging scientific interests, from his primary focus on the applications of synchrotron-radiation-based techniques to the study of complex materials. He applied the EXAFS technique to studying many systems,

including amorphous alloys, the semiconductor–metal interface, catalysts, electrochemical systems, environmentally contaminated systems, and metalloproteins. Other techniques that he developed and used were anomalous scattering and x-ray diffraction, fluorescence microprobe, and microscopy. In 1995 he was part of a team that discovered a new x-ray imaging modality called diffraction enhanced imaging, or DEI. Shortly before his death, Dale had been investigating the potential of DEI in medical research as a clinical tool for mammography, osteoarthritis, and bone density studies.

In recognition of his many accomplishments, Dale received international and local research awards. In 1979 he shared the American Crystallographic Association's Bertram E. Warren Diffraction Physics Award with Lytle and Stern, and he won the IXS's Outstanding Achievement Award in 2003.

Dale's genius lay in his ability to apply the right techniques to the problem at hand. That skill manifested itself in his administrative roles in the department, college, university, and international research community. His colleagues often viewed him as a sort of "WD-40" that one could spray on problems or situations that were stuck and needed help to gain momentum. A member of innumerable committees, Dale was a highly valued source of reason who recognized what should be done and directed forces toward the reality of what could be done.

Dale quickly developed and thoughtfully nurtured relationships with a host of colleagues and was known as a clever raconteur. He loved to travel and dine, and reveled in the fact that his research took him to synchrotrons far and wide, where at the end of a day of research, he could socialize while enjoying escargots in Orsay, bratwurst in Berlin, or borscht in Dubna. Dale thrived in academe: He delighted in being a mentor to students, a supporter of junior faculty, and a team player who could use his many skills to advance causes and projects in which he believed.

The breadth of his contributions and the warmth of his character magnify the loss of our dear friend and colleague.

Michael Paesler

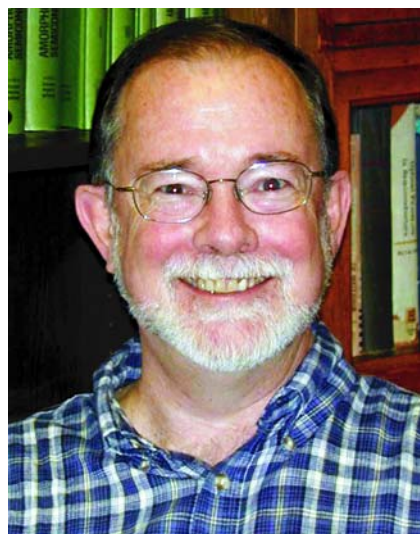
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