

obituaries

To notify the community about a colleague's death, subscribers can visit <http://www.physicstoday.org/obits>, where they can submit obituaries (up to 750 words), comments, and reminiscences. Each month recently posted material will be summarized here, in print. Select online obituaries will later appear in print.

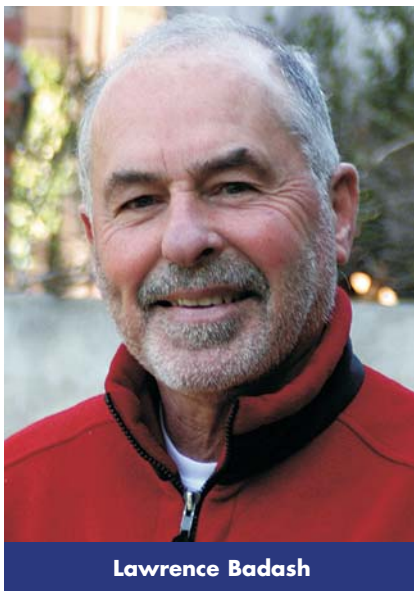
Lawrence Badash

Lawrence Badash, professor emeritus at the University of California, Santa Barbara (UCSB) and renowned historian of physics, passed away on 23 August 2010 in Santa Barbara after a brief fight with pancreatic cancer. A one-time chair of the American Physical Society's history of physics division (now forum), Larry is best known for his meticulous research and lucid writings on the history of nuclear physics and nuclear weapons; his influential publications covered topics ranging from Ernest Rutherford to Los Alamos to the nuclear-winter controversy.

Born on 8 May 1934 in Brooklyn, New York, Larry studied physics, and played lacrosse, at Rensselaer Polytechnic Institute as a Reserve Officers' Training Corps student. After serving three years as a naval aviator following graduation, he returned to the study of physics at Yale University but was soon drawn to the new field of the history of science. He became the first doctoral student of Derek de Solla Price, a historian of science and a founder of scientometrics, often called the science of science.

Larry completed his PhD in 1964 with a dissertation that later appeared as the well-received monograph *Radioactivity in America: Growth and Decay of a Science* (Johns Hopkins University Press, 1979). Even though the book primarily covers developments in the US, the research started Larry's lifelong interest in the life and science of Rutherford as a pioneer of radioactivity and nuclear physics. It led to his editing two valuable reference works, *Rutherford and Boltwood: Letters on Radioactivity* (Yale University Press, 1969) and *Rutherford Correspondence Catalog* (American Institute of Physics, 1974), and to writing *Kapitza, Rutherford, and the Kremlin* (Yale University Press, 1985), which recounted how Rutherford tried to support his Russian physicist protégé Peter Kapitza after the latter was detained in the Soviet Union in the 1930s. In a guest editorial for *Science* in 1971 marking the centennial of Rutherford's birth, Larry remarked that though his subject "was no mathemati-

NANCY HOFBAUER



Lawrence Badash

cal physicist, there is a notable theoretical component" to each of his major discoveries.

Larry arrived at UCSB in 1966; he taught the history of physical sciences there until his retirement in 2002. His course *The Atomic Age*, which innovatively integrated the social, political, and scientific histories of nuclear physics and nuclear weapons, proved popular from the beginning. In that class generations of students were introduced to the doomsday clock, from the *Bulletin of the Atomic Scientists*, as it steadily approached the midnight of nuclear disaster. From the lectures came his book *Scientists and the Development of Nuclear Weapons: From Fission to the Limited Test Ban Treaty, 1939–1963* (Humanities Press, 1995), now a standard course text.

In 1975 Larry organized a popular series of lectures by scientists from the Manhattan Project. Those lectures were later collected in *Reminiscences of Los Alamos, 1943–1945* (Reidel, 1980), which Larry edited with Herbert Broida and Joseph Hirschfelder. The book features Richard Feynman's now famous account "Los Alamos from Below" and the perspectives of Laura Fermi and other women who worked on the project.

Larry's work on the history of nuclear weapons reinforced his interest in science and social responsibility, which

led him to devote increasing attention to the social, political, and moral issues related to modern physics. His last book, *A Nuclear Winter's Tale: Science and Politics in the 1980s* (MIT Press, 2009), examines the debates over what would happen to Earth in the event of a thermonuclear war. Based on interviews with prominent nuclear-winter scientists and on careful studies of government documents and media reports, the book elucidates the gradual realization of what Badash called the "suicidal nature of nuclear war" and the emergence of climate change as a global scientific issue. At the time of his death, he was completing a study of science and McCarthyism he titled "Science in the Haunted Fifties."

A kind and generous man with a warm personality, a quirky sense of humor, and a strong sense of social justice, Larry devoted himself not only to his teaching and scholarship but also to the welfare of his community, from the local to the international. He was a caring mentor who fostered equal and open relationships with his graduate students. An avid hiker, he often led what he playfully called "death marches" in the back country of Santa Barbara, and for many years he was on the local search and rescue team. He viewed his popular writings, such as

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- Rahul Basu
1956 – 5 March 2011
- Oleg Aleksandrovich Lavrentyev
7 July 1926 – 10 February 2011
- Ken Olsen
20 February 1926 – 6 February 2011
- Thomas Hershey Allen
20 May 1929 – 1 February 2011
- Evgenii Pokatilov
27 January 1927 – 1 February 2011
- William Crawford Dunlap
21 July 1918 – 25 January 2011
- Leon Knopoff
1 July 1925 – 20 January 2011
- Willi Dansgaard
30 August 1922 – 8 January 2011
- George Linhart
13 April 1924 – 6 January 2011
- Jan Tauc
18 April 1922 – 28 December 2010
- Albert Ghiorso
15 July 1915 – 26 December 2010
- J. Gregory Dash
28 June 1923 – 28 November 2010
- Alan M. Portis
17 July 1926 – 6 September 2010
- Harry Thomas
16 August 1927 – 18 July 2010

PHYSICS TODAY articles on the discovery of radioactivity (February 1996, page 21) and Marie Curie (July 2003, page 37), as a public service. He promoted international educational and scholarly exchanges and lectured in many countries on the history of science and nuclear policy; when visiting Nepal, he loved to trek in the Himalayas. He exercised his social conscience by joining protests against the Vietnam War, by opposing what he regarded as dangerously aggressive US nuclear weapons policy (and UC management of the weapons laboratories), and by serving as president of the Santa Barbara chapter of the American Civil Liberties Union.

Larry Badash distinguished himself as a leader in the history of physical sciences. His books, papers, and teaching consistently joined two cultures by exploring the intricacies of physics while also explaining the immense impact of science on society.

Zuoyue Wang

*California State Polytechnic University
Pomona*

Peter Neushul

University of California, Santa Barbara

Mukul Ranjan Kundu

Renowned solar physicist and radio astronomer Mukul Ranjan Kundu died on 17 June 2010 near College Park, Maryland, from complications after an automobile accident that occurred when he was returning home from work. A recipient of the American Astronomical Society's 2007 George Ellery Hale Prize, Mukul spent his entire ca-

reer studying the radiophysics of the Sun. His work significantly advanced the understanding of the interactions between accelerated electrons and the magnetized solar corona and of the myriad nonthermal radio phenomena that resulted.

Mukul was born 10 February 1930 in Calcutta, India. After completing his college studies in physics and radiophysics at the University of Calcutta, he went on to earn his DSc degree in radio astronomy from the University of Paris in 1957. His early work involved the study of the terrestrial ionosphere and how it is influenced by the Sun. He was also involved in the development of radio interferometry when he was in Paris. After a brief stay at the National Physical Laboratory in New Delhi, India, Mukul went to the US in 1962, first as an associate research physicist at the University of Michigan and then as an associate professor at Cornell University. In 1965 he returned to India to work for three years at the Tata Institute of Fundamental Research. Then he went back to the US to be a professor at the University of Maryland, College Park, where he worked until the last day of his life.

The radio interferometric work he began during his graduate days became his prime interest in studying solar phenomena at various wavelengths, from millimeters to meters. His 1971 discovery with Timothy McCullough that the Sun's north pole was brighter than the surrounding quiet Sun has had a lasting impact on our understanding of the connection between the solar wind and the Sun's surface features. That phenomenon was later found to be associated with coronal holes in the Sun's polar regions and at low latitudes. The enhanced radio emission indicates that the chromosphere under coronal holes has different physical conditions compared with the quiet chromosphere.

At the other extreme of radio wavelengths, the early argument by Mukul and Robert Stone that the nonthermal electrons responsible for the complex type III solar radio bursts observed at kilometric wavelengths are from the flare site rather than due to shock acceleration has proved to be of enduring usefulness. Mukul did extensive work on solar radio phenomena using interferometric arrays such as the Clark Lake Multifrequency Radioheliograph, the Nancay Radioheliograph, the Nobeyama Radioheliograph, the Westerbork Synthesis Radio Telescope, the Very Large Array, and the Berkeley Illinois Maryland Association array.

Most of the more than 400 research publications Mukul authored or coauthored were about the Sun, but a significant number discussed other areas of astrophysics: radio galaxies, supernova remnants, nebulae, flare stars, and T Tauri stars. He published his influential textbook, *Solar Radio Astronomy* (Wiley), in 1965. He also edited four other books covering solar physics, solar radio physics, solar terrestrial physics, and astrophysics.

Mukul was a member of the editorial board of the journal *Solar Physics* for more than 40 years—from 1967 until his death. For nearly two decades, he helped immensely with the success of the research associate programs of the National Research Council. He also served as a member of NSF's Advisory Panel for Atmospheric Sciences from 1983 to 1986. He trained numerous students and young scientists from the US and abroad.

A great fan of food and wine, Mukul was a regular visitor to the Washington, DC, waterfront to get fresh fish. A jovial person, he enjoyed the company of his colleagues and will always be remembered for his healthy laugh, which identified him in any group conversation or at any dinner table.

Nat Gopalswamy

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Mukul Ranjan Kundu

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