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.

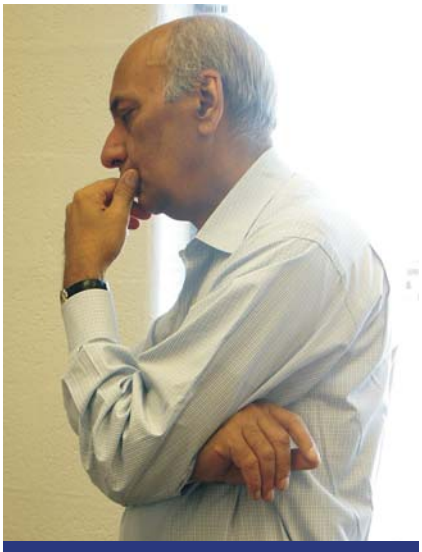
Praveen Chaudhari

An innovator in the field of thin films and high-temperature superconductors, Praveen Chaudhari died of cancer on 13 January 2010 at his home in Briarcliff Manor, New York.

Praveen was born on 30 November 1937 in Ludhiana, India, and grew up in Calcutta, where he lived through the scarring times of the Indian partition and witnessed the bloodshed of the 1947 riots. Sent to boarding school because he would play truant and go fishing, he eventually received his bachelor's degree in metallurgy from the Indian Institute of Technology Kharagpur in 1961 and a PhD from MIT in 1966 in physical metallurgy. His thesis, under adviser Michael Bever, was on the irradiation effects on bismuth telluride.

Praveen then began his 37-year career at IBM Research in Yorktown Heights, New York. He quickly became the source of inspiration in many areas of thin-film physics, including dislocation interactions and superplasticity, stability of Josephson junctions, and coincidence boundaries between crystals. He was a crucial contributor to IBM's product development and provided fundamental research in improving reliability for products such as the IBM 370 and 3081 computers. During the early 1970s, he and colleagues Dick Gambino and Jerry Cuomo worked on amorphous gadolinium cobalt films that were successfully integrated into IBM's magnetic bubble memory devices and adopted later as the basis for read–write media for the magneto-optic disk industry. In recognition of that work, the trio received the 1995 National Medal of Technology.

Appointed vice president of science in 1982, Praveen shaped the evolution of IBM's science research programs in the 1980s. Basic research flourished under his management, and in 1986 and 1987, IBM scientists were awarded the Nobel Prize in Physics for the invention of the scanning tunneling microscope and the discovery of high-temperature superconductivity, respectively.



Praveen Chaudhari

Throughout his professional life, Praveen successfully united careers as an executive and a scientist. During the time that high-T_c superconductivity was discovered, Praveen carried out his responsibilities as vice president during the day and then worked in the lab during nights and weekends. Initially, the cuprate superconductors possessed minute critical current densities, and their potential utility was questioned. Guided by his intuitive understanding of materials, Praveen's team succeeded in growing the first epitaxial yttrium barium copper oxide films with critical current densities two orders of magnitude higher than the earlier results; that increase allayed the utility concerns.

Understanding the role of grain boundaries then became important for polycrystalline high-T_c superconducting cable applications. Praveen conceived the idea of using bicrystalline substrates, in which crystals of two different orientations share a long, controlled grain boundary; a small group that shared his infectious enthusiasm started using that approach to controllably study the effects of the films' grain boundaries. The charismatic IBM vice president did not hesitate to drop by the shielded measurement room at midnight to share cookies and discuss the latest data.

The bicrystal research ultimately resulted in the most widely used technology that employs high-T_c oxides—Josephson junctions. Bicrystal junctions also provided a foundation for the tricrystal-based experimental confirmation of *d*-wave pairing in cuprates, which Praveen, remarkably, did not endorse. With the discovery that the critical current decreases with increasing grain boundary angle, bicrystals also became the basis for the development of high-T_c coated-conductor technology.

In 2003 Praveen retired from IBM and joined Brookhaven National Laboratory as its director. He put BNL on a firm foundation of stability and growth that continues today. His vision led to many successes, including the creation of BNL's Center for Functional Nanomaterials. In 2006 he stepped down as director and, true to form, returned to the lab; he published a paper on superconducting oxides in *Physical Review Letters* in 2008. He continued to work part-time at BNL, joined Columbia University as an adjunct professor, and returned to his old laboratory at IBM in Yorktown, where he could often be found running his experiments in the afternoon. He remained active in scientific work up to a few months before his death.

Deeply involved in national science policy, Praveen was on the advisory council on superconductivity to Presidents Ronald Reagan and George H. W. Bush and served on the US National Critical Technologies Panel in 1992–93. He advised the government of India

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Tony Freake
1937 – 27 December 2009
Saul Raboy
11 February 1920 – 27 December 2009
Charles C. Schnetzler
3 June 1930 – 15 December 2009
Hal Thirlaway
19 August 1917 – 30 November 2009
Albert Crewe
18 February 1927 – 18 November 2009
Richard Jones
18 March 1945 – 18 November 2009
Myron Paul Garfunkel
1923 – 3 September 2009
Chang-Yun Fan
7 January 1918 – 21 January 2009

and reported on science and technology to two prime ministers, Rajiv Gandhi and P. V. Narasimha Rao.

Praveen was a gifted speaker and an excellent motivator who could get others excited about his ideas. He cherished competition, yet he maintained an open door for science discussions and went out of his way to help others with their careers. He switched with ease between hands-on science and demanding management positions, never losing his touch in the lab nor his skills in the conference room. He is greatly missed.

Supratik Guha
Robert Rosenberg
IBM Thomas J. Watson Research Center
Yorktown Heights, New York
Jochen Mannhart
Institute of Physics
University of Augsburg
Augsburg, Germany

AUDIO ENGINEERING SOCIETY

Manfred Robert Schroeder

Manfred Robert Schroeder

Internationally known acoustician Manfred Robert Schroeder died at his home in Göttingen, Germany, on 28 December 2009 after a brief illness. He was renowned for his work in such diverse fields as speech synthesis, architectural acoustics, computer art, and number theory.

Manfred was born on 12 July 1926 in Ahlen, Germany. He studied mathematics and physics at the University of Göttingen and received his doctorate for his thesis on the distribution of acoustic normal modes in enclosures as a student of Erwin Meyer in 1954. Later that year he joined Bell Labs in Murray Hill, New Jersey; he was appointed head of the acoustics research department in 1958 and director of the acoustics and speech research laboratory in 1963. Soon thereafter he assumed responsibility for all areas of Bell's acoustics, ultrasonics, and mechanics research.

In 1969, still maintaining some of his responsibilities at Bell Labs, Manfred was appointed professor of physics and director of the Third Institute of Physics at the University of Göttingen. After retiring from his positions at Bell Labs and the university in 1987 and 1991, respectively, he continued his activities as a scientist and teacher until shortly before his death.

One of the fields Manfred was always enthusiastic about was room acoustics, to which he made many fundamental and far-reaching contributions. The area had already fascinated him during his thesis work. In later publications he described the relations between the eigenmodes and the frequency response of rooms and explained the random character of the response above a certain frequency, today known as the Schroeder frequency.

Other ingenious contributions to room acoustics followed. Among them were the integrated-tone-burst method for measuring reverberation times of enclosures and the use of frequency shifting to suppress feedback in public address systems. Another outstanding achievement is Manfred's invention of pseudo-random surface structures, or Schroeder diffusers, based on number-theoretical schemes. Such devices scatter sound waves in all directions to provide lateral sound reflections and thus improve the acoustics of concert halls.

Receiving great public interest was Manfred's involvement in activities to improve the acoustics of Philharmonic Hall (now Avery Fisher Hall) in New York City's Lincoln Center. Soon after the hall opened in 1962, musicians, conductors, and music critics detected grave deficiencies in its acoustics. Asked along with other acoustic consultants to objectively evaluate the acoustics, Manfred used a novel measuring method based on digital signal generation and processing. Preparation, performance, and evaluation of the experiments turned into a scientifically challenging project for him and his coworkers. Later, while in Göttingen, Manfred and his students evaluated 20 of the world's major concert halls by subjective auditory comparison, and in the process they gathered significant information about lateral reflections and other acoustic parameters. Apart from