

terest in mycology, contributing his expertise in optics and photography in the preparation of her book on mushrooms of Colorado.

A highly motivated and creative researcher, Ken exhibited incredible enthusiasm and optimism every day he spent in the laboratory. He made experiments work because he expected them to work and confronted setbacks or failures with a list of new approaches to try. His attitude was infectious. He accumulated a broad circle of friends and colleagues throughout his career, including many who periodically returned to Boulder to work on a project in Ken's lab. At a symposium in 2001 honoring Ken, John Brown, a physical chemist at Oxford University and frequent visitor to Ken's lab, described him as the "most creative and gifted laboratory scientist I have ever had the pleasure to work with."

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Michael John Rice

Michael John Rice, a distinguished condensed matter physicist, died on 3 November 2002 at his home in Webster, New York, after a long battle with colon cancer. During his career, he made important contributions to the theory of liquid helium-3, to work on super-ionic conductors and superconductors, and to the field of quasi-one-dimensional conductors and conducting polymers.

Michael was born on 25 December 1940 in Cowes, Isle of Wight, England. He received a BSc (1962) and PhD (1965), both in physics, from Queen Mary College, London. His dissertation work, on the statistical mechanical theory of nonequilibrium phenomena, was completed in 1965 under the guidance of Ricardo K. Eisenshitz. Michael's relationship with Eisenshitz was somewhat stormy, which led to one of the formative events of his career: an all-day thesis defense. In front of the external examiner, Ernest Sondheimer, Michael was grilled by Eisenshitz for four hours during which he derived the formulas in his thesis on the blackboard, was dismissed to correct typographical errors in the copies of his thesis while the committee enjoyed a leisurely lunch, and was then grilled for four more hours. Passage of the oral defense was hardly automatic, but he did pass, and the experience colored his view of the rigors of theoretical physics and his expectations of his coauthors for the rest of his life.

Michael accepted a postdoctoral



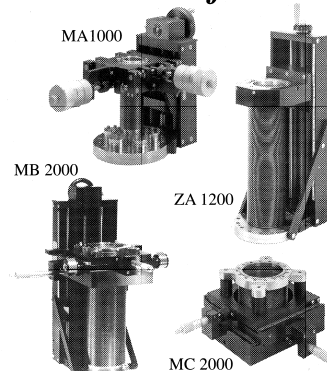
Michael John Rice

appointment at Imperial College, London. There, between 1965 and 1968, he worked on the transport properties of Fermi liquids and published key papers with Seb Doniach on "Spin Fluctuations in Liquid ^3He " and with Tony Leggett on "Spin Echoes in ^3He and Mixtures."

In June 1968, he crossed the pond to the General Electric Research and Development Center in Schenectady, New York, to take the post of member of the technical staff. He published 16 papers on tunneling, transport in dilute magnetic and liquid metal systems, and super-ionic conduction. One of Michael's colleagues at GE, Ivar Giaever, was also a runner. Michael, who suffered from chronic back pain, was nevertheless an enthusiastic runner who won many championships. Giaever bet him a dollar that he could not reduce his time from six to five minutes for a mile. Michael trained religiously and on the appointed day missed his goal by only three seconds. To pay his debt, he invited Giaever to his office, produced two exquisite crystal sherry glasses, poured a fine port into both, and delivered the dollar to Giaever with great flourish while they toasted Michael's ability to run a mile in one minute less than Giaever.

In 1971, Michael returned to Europe to take a position as a member of the technical staff with the Brown Boveri Labs in Baden, Switzerland. There, he expanded his work on Fermi liquids and ionic conductors and began new research on quasi-1D conductors. During the next few years, he acquired a new set of coauthors, most notably J. Bernasconi, G. A. Toombs, and S. Strässler. His work with Strässler on Peierls transitions in quasi-1D metals is particu-

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larly well known.

One of us (Duke) successfully recruited Michael in 1974 to join an active research effort on organic quasi-1D metals at the Xerox Research Center in Webster, New York. At Xerox, Michael made pioneering contributions: He extended the theory of Peierls and charge-density-wave transitions to organic solids. With Duke and Nunzio Lipari, he expanded the theory to include electron interactions with the intramolecular vibrations that characterize quasi-1D materials such as the charge-transfer salt TEA-(TCNQ)₂. His original paper on solitons in doped polyacetylene (published in 1979 in the *Physics Letters*), followed soon after by the papers of S. A. Brazovskii and W. P. Su, and Bob Schrieffer and Alan Heeger, formed the theoretical foundation for much new physics. Michael and many others helped develop the field of conducting polymers; work in this field was recognized by the Nobel Prize in Chemistry in 2000 to Heeger, Alan MacDiarmid, and Hideki Shirakawa.

Because of his chronic back pain, the standard-issue office furniture at Xerox never satisfied Michael. He imported his own rocking chair, but remained intensely dissatisfied with the beautiful table that management had provided for his office. Thus, over a weekend, the controller of the group for which Michael worked—and who managed many tens of millions of dollars daily—went into the office and personally sawed off the legs of the table to meet Michael's specifications.

Later in his 24-year tenure with Xerox, Michael developed novel models of superconductivity in layered high-temperature superconductors and in doped fullerenes. In 1998, he retired from Xerox and embarked on a career as a university professor in Europe. He spent a year in Dresden, Germany, as a Humboldt fellow, collaborating with Joerg Fink, and a year in Groningen, the Netherlands, as a professor of materials science.

Michael never gave up actively doing physics. Until shortly before his death, he worked on doped fullerenes, phenylene-based polymers, magnetism in the Hubbard model, and novel excitonic states in polymers.

Michael has now run his last race. He is remembered as a charming, eccentric, and devoted physicist.

Esther M. Conwell

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Robert Hugh Tanner

After a career in acoustics and engineering science that spanned more than 65 years, Robert Hugh Tanner died quietly on 2 November 2002 in Naples, Florida.

Bob was born on 22 July 1915 in London, England. His early education in England culminated in a BSc in engineering from Imperial College, London, in 1936. After graduation, he began his professional career with the British Broadcasting Corporation as a pioneering audio engineer who developed audio techniques and studied the acoustics of coupled rooms for the world's first high-definition television station.

During World War II, Bob served with the Royal Signals regiment of the British Army, doing R&D in artillery sound ranging, ultralow frequency microphonics, sound-ranging recording, and other military applications. Following military service, he returned to the acoustics section of the BBC research department, where he worked on the acoustical design of broadcast studios and concert halls. He participated in an investigation of the difficult acoustics of London's Royal Albert Hall and, in 1946, became holder of a patent on an early automatic reverberation meter.

In 1947, Bob and his young family immigrated to Belleville, Ontario, Canada, where he began a 22-year career with the Northern Electric Co. He was responsible for numerous developments in audio, including speech-input equipment for radio and television applications, professional-quality public-address and sound-system equipment, the design of two innovative large master-control switching systems for the Canadian Broadcasting Corporation's facilities in Montreal and Winnipeg, and the development of a practical electret microphone.

Bob began a parallel career in acoustical consulting in 1955. Five years later, he moved to Ottawa to form Northern Electric's R&D division, Bell Northern Research, for which he managed the development of products ranging from audio equipment to microwave relay stations. In 1962, he earned an MSc degree from his alma mater, Imperial College, with a thesis entitled "The Acoustical Design of a Festival Theatre."

Bob was active for many years in professional society activities, particularly those supporting the Institute of Electrical and Electronics Engineers. After serving as director of the IEEE Canadian Region, he chaired



Robert Hugh Tanner

the IEEE long-range planning committee. He then became, successively, the organization's secretary, executive vice-president, and, in 1972, president. He was the first and only member of the Canadian engineering profession to hold the presidency, and he was the first person from outside the US ever to be elected to that position.

In recognition of his skills as an engineer and as a manager, Bob was appointed in 1973 as director of industrial research at the Canadian Department of Communications, in Ottawa, Ontario. In 1975, he relocated his acoustical consulting practice to Naples, Florida, where it flourished for the rest of his life. He was consultant of record on more than 1000 projects in the US, Canada, and overseas. Especially proud of his work on the Philharmonic Hall in Naples, Italy, he regularly attended concerts, musicals, and traveling Broadway shows there, a testament to the successful acoustics he helped create.

Bob received many honors in his lifetime. In 1974, he received the IEEE Canadian Region's highest honor, the McNaughton Gold Medal. In 1981, the IEEE presented him with the Haraden Pratt Award.

Bob was a kind, caring, able, and devoted individual who helped immeasurably to advance the acoustics profession. He was a truly accomplished and creative acoustical engineer who was greatly admired by colleagues and clients alike.

William W. Lang

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Poughkeepsie, New York*

William J. Cavanaugh

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