## Wilfrid Basil Mann

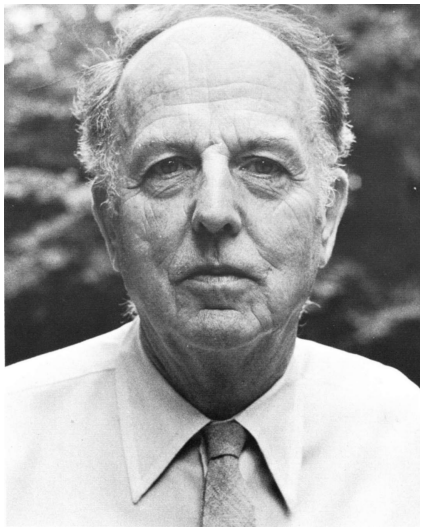
Wilfrid Basil Mann, a preeminent radionuclide metrologist who served his native Britain and the US, died of cardiac arrest on 29 March 2001 in Towson, Maryland.

Mann was born on 4 August 1908 in the London suburb of Ealing. In 1930, he received a bachelor's degree in math and physics from Imperial College, London. He then did graduate work in Copenhagen and in Berkeley, California.

In Copenhagen, he worked on gas phase thermodynamics with Martin Knudsen, but Niels Bohr extended to Mann an open invitation to attend seminars and functions at his Institute for Theoretical Physics of the University of Copenhagen (now the Niels Bohr Institute). Bohr also referred him to a boarding house for students, where Werner Heisenberg was residing at the time. At Mann's birthday party in 1933, Heisenberg played a bit of a Beethoven piano concerto that he was rehearsing for a performance in Berlin.

At Berkeley, Mann worked with Ernest Lawrence on the cyclotron in the radiation laboratory. Mann's work with accelerated helium atoms on copper and zinc targets led to the discovery of the radioisotope gallium-67, which is much used today in nuclear medicine. In 1934, Mann completed his doctorate in physics under G. P. Thompson at the University of London; his thesis was on the exchange of energy of gas molecules with solid surfaces.

In 1938, Mann took a position as lecturer in the third-year physics laboratory at Imperial College and began work with Thompson to build a Van de Graaff accelerator. At the outbreak of World War II, Thompson was in charge of the "tube alloys" project, the British nuclear program later incorporated into the Manhattan Project. He had Mann assigned as the physicist to the British Central Scientific Office at the British Embassy in Washington, DC. At the embassy, Mann's interactions with his coworkers Kim Philby and Guy Burgess gained him considerable notoriety when Philby and Burgess were implicated in the biggest spy scandal of midcentury. Stories about his possible involvement in the spy ring were to surface periodically for the next 50 years. In memoirs written much later, Mann made a strong case that he was not involved in their nefarious activities, but he relished the stories of intrigue from these exciting days. He even suggested that his old coworker



WILFRID BASIL MANN

Philby, by then a colonel in the KGB, was the source of rumors of a fifth spy with the code name "Basil."

In 1946, Mann wrote to John Cockcroft, the director of the National Research Council of Canada's Chalk River Laboratory, with an aim to continuing work with cyclotrons. Cockcroft said that he had a position for a physicist to make accurate measurements of radioactivity. At that time, Mann began careful measurements to compare the national radium standards of the UK, Canada, and the US. From 1946 to 1951, Mann was the UK delegate to the United Nations Atomic Energy Commission.

In 1951, Lauriston Taylor recruited Mann to head the radioactivity section at the National Bureau of Standards (NBS) in Washington, DC. Mann became a US citizen in 1959. His friends and acquaintances in Washington during the 1950s were an eclectic group of diplomats, ranging from Henry Tizard and James Jesus Angleton to various representatives of the British and Soviet embassies. His NBS colleagues included Ugo Fano (whose obituary appeared in PHYSICS TODAY, September 2001, page 73) and the team that did the famous fall of parity experiment in 1957: Ernest Ambler, Raymond Hayward, Dale Hoppes, and Ralph Hudson.

For 40 years, Mann was one of the most influential researchers in his field. At NBS, he developed a full suite of experimental techniques for standardization of nuclides, including coincidence counting, internal gas counting, and microcalorimetry. He made early, definitive measurements of the half-lives of tritium and carbon-14, and built an isotope separator to prepare isotopically pure standards of krypton-85 and xenon-133. At intervals of a few years over this period of four decades, Mann prepared books, handbooks, and extended monographs to completely describe the current state of the art in radionuclide metrology.

Perhaps Mann's most lasting contribution was the monumental *A Handbook of Radioactivity Measurements Procedures* (National Council on Radiation Protection, 1978). In the latter stages of his full and active career, he was the editor of *Applied Radiation and Isotopes* and the president of the International Committee for Radionuclide Metrology.

His quick humor, love of life, and uncompromising attention to careful measurements and clear exposition brought joy to his friends and colleagues, as well as trepidation and gratitude from his staff and the hundreds of authors whose manuscripts fell under his pen! His legacy is the generation of scientists whom he mentored and the accuracy with which radioactivity measurements are made around the world.

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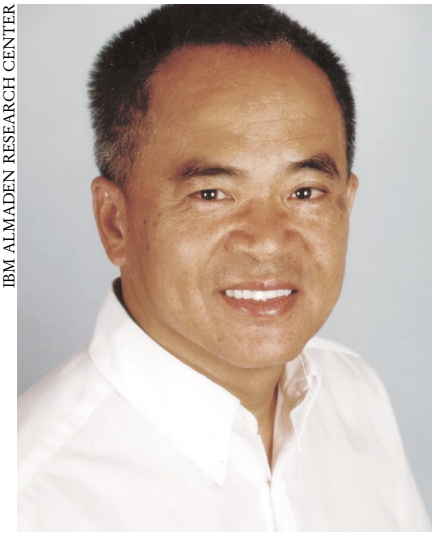
## Andrew Ching Tam

Andrew Ching Tam, an IBM research scientist who was a pioneer and internationally respected expert in the field of laser-induced photoacoustic and photothermal phenomena, died peacefully at a hospital in San Jose, California, on 23 February 2001 after a massive stroke.

Andrew was born on 13 October 1944 in Fushan, which is in the province of Canton, China. His potential was recognized early in his career. He entered the University of Hong Kong in 1964 as a Hong Kong Government Scholar. He received his BS in physics and mathematics there in 1967, a BS with a specialization in physics in 1968, and his MPhil in physics in 1970.

In 1970, Andrew enrolled in graduate school at Columbia University. After receiving his PhD in 1975 for his work in atomic, molecular, and laser physics, he was appointed an assistant professor of physics. His impressive scientific creativity became apparent at Columbia. Two of his important discoveries are the first magnetic resonance imaging experiment in laser-polarized sodium vapor, and "laser snow," clouds of alkali-hydride crystals formed when reso-



IBM ALMADEN RESEARCH CENTER

ANDREW CHING TAM

nant light is absorbed by alkali-metal vapors in hydrogen gas.

In 1978, Andrew joined Bell Laboratories in Murray Hill, New Jersey, as a member of the technical staff. There, he pioneered the detection of laser-induced acoustic transients with ultrasound transducers and made numerous contributions to the emerging field of photoacoustic or optoacoustic spectroscopy. Using these techniques, he demonstrated the capability of ultrasmall optical absorption measurements in solid, liquid, and amorphous media in the presence of large scattering losses. His energy and skill at attacking new problems successfully were legendary at Bell Labs.

After joining IBM's San Jose Research Laboratory (now the IBM Almaden Research Center) in 1979, Andrew expanded the scope of his work to include transient thermal processes. He constantly pushed the detection limits of these techniques to higher time resolution and greater sensitivity to explore the spectral, thermal, and acoustical properties of materials of scientific and technical interest. With ever higher laser-induced temperature transients, he studied the thermal properties of these materials during laser-induced melting, vaporization, and ablation. More than 150 publications in the scientific literature are a permanent record of his work in photothermal phenomena.

In parallel, Andrew pursued applications of these phenomena in the computer industry. This aspect of his work resulted in 38 US patents, which focused on texturing the head-parking zone of magnetic hard disks. In 1995, he developed a technique to roughen the supersmooth disks in a well-controlled fashion to prevent a Van der Waals interaction from irreversibly joining the magnetic read/write element with the recording media when a disk drive is powered down. Andrew not only studied the underlying physics in great detail, but also developed the manufacturing tools and the diagnostic procedures that made his texturing process a success throughout the industry. In 2000, he was the manager of exploratory magnetic recording processes at IBM Almaden.

Andrew's other notable industrial contributions included the development, in 1987, of high-power laser techniques for stripping the insulation off delicate wires—with diameters smaller than a human hair—used to connect disk drive recording heads to the rest of the drive and to clean submicrometer dust particles from lithography masks (1991).

In early 2001, Andrew received an Engineering Excellence Award from the Optical Society of America for his development of laser-based manufacturing processes for the disk drive industry.

Andrew was active in professional societies and involved in creating scientific exchanges within his field. As a conference organizer, he offered enthusiastic support and an intimate knowledge of the physics and physicists involved. He was instrumental in starting and organizing a series of international conferences on photoacoustic and photothermal phenomena and the corresponding Gordon Conferences. Those who listened to his intense and very outspoken lectures will never forget them. His colleagues admired his drive, his experimental skills, his deep understanding of the physical phenomena involved in laser-induced transient heating, and his skill in applying those phenomena to solve critical technological problems.

Andrew also was a passionate cook, a charming host, and a great friend and companion to those people who got to know him. His career reminds us of the laser pulses that he used so successfully: bright, intense, and short—unfortunately, too short.

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