gel developed what appeared to be "critical opalescence"—a sudden clouding and a strong increase in the intensity of the scattered light (see PHYSICS TODAY, January 1981, page 18). Further study revealed the critical nature of the phenomenon. The phase transition involves a discontinuous and reversible change in the volume of the gel by as much as two orders of magnitude. He has further shown, both theoretically and experimentally, that among gels this phenomenon is universal—it is as real as the gas–liquid phase transition. Tanaka's work has led to a more general understanding of polymer gels and to research on a wide variety of technological applications, including the use of gels as switches, memories, display units, selective absorbants, mechanical actuators for robots and artificial muscles.

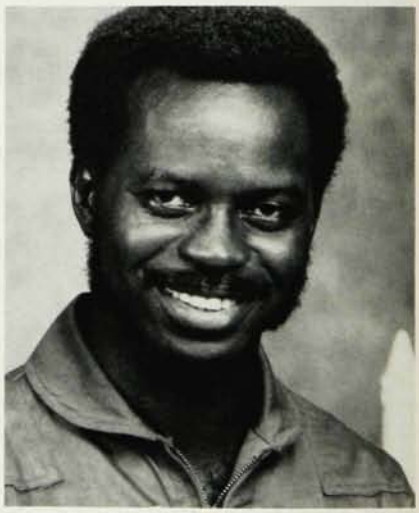
The Nishina Memorial Prize is named after Yoshio Nishina, one of the founders of modern physics in Japan, and has been awarded annually since 1955. It consists of a citation, a silver medal and a cash prize of $3000.

TANAKA

Although the prize is usually given in recognition of exceptional scientific achievement in nuclear physics and related areas, Tanaka was honored for having made a "fundamentally important contribution to physics."

obituaries

Ronald E. McNair



MCNAIR

Astronaut Ronald E. McNair was among those who perished in the explosion that destroyed the space shuttle Challenger and its seven-member crew on 28 January 1986.

McNair was born in Lake City, South Carolina, on 21 October 1950. He received his BS in physics from North Carolina A&T University (1971) and his PhD in physics working with Michael Feld at the Massachusetts Institute of Technology (1976), where he specialized in quantum electronics and molecular spectroscopy.

McNair was named a Presidential Scholar in 1967 and a Ford Foundation Fellow in 1971. During 1974–75 he was a National Fellowship Fund Fellow and a NATO Fellow.

McNair was actively involved in many organizations throughout his life: He was a member of the American Association for the Advancement of Science, the Optical Society of America, The American Physical Society, the APS Committee on Minorities in Physics, the North Carolina School of Science and Mathematics Board of Trustees and the MIT Corporation Visiting Committee. In addition he served as a visiting lecturer in physics at Texas Southern University.

While at MIT McNair was responsible for some of the earliest development of HF/DF and high-pressure CO lasers. His later experiments and theoretical analysis on the interaction of intense CO_2 laser radiation with molecular gases provided new understanding of and applications for highly excited polyatomic molecules. Following graduation from MIT, he became a staff physicist at the Hughes Research Laboratory in Malibu, California, where he performed research on energy storage and transfer in molecules for optically pumped lasers. He also conducted research on electro-optic laser modulation for satellite-to-satellite space communication, the construction of ultrafast infrared detectors and ultraviolet atmospheric remote sensing. He coauthored several papers on laser-induced energy storage and transfer in molecules and on the physics of karate.

In 1978 he was selected as an astronaut candidate and in 1979 he became eligible for assignments as a mission specialist on space shuttle crews. Feld, director of the MIT Laser Spectroscopy Laboratory, said of him: "McNair was one of the most technically well trained of all the astronauts. His expertise in lasers made him ideally suited to conduct the many space experiments involving laser-radiation technology."

An individual of diverse talents, McNair was a performing jazz saxophonist, the recipient of an AAU karate gold medal (1976) and the holder of five regional black-belt karate championships. As an astronaut he gave of his time through speaking engagements to promote the space program of the United States. His contributions to his profession and the many benefits derived therefrom will be missed by the physics community.

STEPHEN C. MCGUIRE
Alabama A&M University
Huntsville, Alabama

Frederick W. Vratny

Frederick W. Vratny, Distinguished Member of the Technical Staff at AT&T Bell Laboratories, died 4 September 1985 after a prolonged illness.

Vratny received a BS in chemistry in 1953 from the University of Michigan and his PhD in physical chemistry in 1956 from the University of Indiana, where he wrote a thesis on the analytical aspects of Raman spectroscopy. Prior to joining Bell Laboratories in 1960, Vratny spent four years as a professor of physics and chemistry at Purdue University. His early work at Bell Labs was devoted to the study of thin films for circuits and discrete devices. He also contributed at that time to the understanding of conduction in thin dielectrics and applied this knowledge to the invention of novel switching devices and varactors. Vratny next contributed extensively to the technology and metallurgy of tantalum, tantalum oxide and tantalum nitride thin films and their application in thin-film circuitry. He pioneered in understanding the sputter deposition and etching of these materials, and much of the insight gained in this period was crucial to the successful manufacture of thin-film circuits.

Following his work in thin-film-circuit technology, Vratny became involved in the development of materials and processes for integrated-circuit fabrication. He studied photoresist materials, cleaning processes and the source and nature of VLSI-circuit defects. In addition, Vratny contributed to the development of x-ray-lithographic technology by studying the materials and fabrication processes required to form