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

x-ray masks.

Vratny followed his interests in integrated-circuit technology to packaging, where he produced inventive solutions to the packaging problems posed by modern VLSI circuitry. His work in this area again focused on materials and processes required for the solution of practical problems. In all, Vratny was awarded 18 patents for inventions in sputtering technology, plating, imaging devices, x-ray lithography and device fabrication. A like number of patent applications remained pending at the time of his death.

Vratny was a dedicated, generous colleague whose presence at Bell Laboratories will be missed.

H. J. Leamy
AT&T Bell Laboratories
Murray Hill, New Jersey

Orren C. Mohler

Orren Mohler, professor emeritus of astronomy at the University of Michigan, died on 17 September 1985. Mohler was born in Indianapolis, Indiana, on 29 July 1908. He received his AB from Michigan Normal College (now Eastern Michigan University) in 1929, his MA in 1936 and his PhD in astronomy in 1933 at the University of Michigan. From 1933 to 1940 he held appointments as astronomer at the Cook Observatory of the University of Pennsylvania and as instructor in astronomy at Swarthmore College. One of his papers written in this period foreshadows his lifelong devotion to the development of instrumentation and its application to the study of the Sun: "Measurement of the intensity of sunlight in the extreme ultraviolet" describes an application of photoelectric Geiger–Müller counters to the solar problem.

In 1940 Mohler became the first full-time professional astronomer at the McMath–Hulbert Observatory of the University of Michigan. From 1942 to 1945 the observatory's staff concentrated on military R&D (Mohler's contribution being recognized by a Naval Ordnance Development Award), but in 1944 Mohler wrote the first of a long series of papers describing solar instrumentation and research at the observatory. He was appointed professor of astronomy in 1956, and director of the McMath–Hulbert Observatory in 1961. In 1962, following a year in Liège, he became chairman of the astronomy department at the University of Michigan, serving in this capacity until 1970. He retired in 1979.

Mohler loved fine instrumentation. With Robert McMath he designed spectrographic equipment to exploit the wartime development of the Cashman lead sulfide photoconductive cell, and

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in 1955 he published his "Table of solar spectrum wavelengths 11 984 Å to 25 578 Å," which gave data at a resolving power about 100 times higher than had previously been possible. In the visible spectrum, his experiments made it evident that poor "seeing" in the spectrograph prevented the full resolving power of a superb new Babcock grating from being achieved. This discovery led to the design and construction of the first astronomical vacuum spectrograph, which inaugurated a new era in solar spectroscopy.

Mohler's interests covered a wide range of topics in astronomy and its history. As a member of the Board of Governors of the Association of Universities for Research in Astronomy from 1962 to 1974 he contributed in many ways to the planning and operation of the Kitt Peak National Observatory and the Cerro Tololo Interamerican Observatory.

Freeman D. Miller
University of Michigan
Ann Arbor, Michigan

Henry Lewis McMurry

Henry Lewis McMurry died in Idaho Falls, Idaho, on 9 June 1985, at the age of 73. At the time of his death he was actively involved in theoretical studies to explain the interatomic forces in molecules and crystals.

McMurry was born on 28 March 1912 in River Vale, New Jersey, and received his PhD in physics from the University of Chicago in 1941. He taught at Rensselaer Polytechnic Institute in 1941–45 and was a research physicist with Phillips Petroleum Company in Bartlesville, Oklahoma, in 1945–51. He then moved to the National Reactor Testing Station at Idaho Falls, Idaho, working first for Phillips, then for the Idaho Nuclear Corporation and finally for the Aerojet Nuclear