COOPERMAN

sity, Fullerton, was shot and killed in his office on 13 October 1984. A Vietnamese student refugee confessed to the shooting, was convicted of involuntary manslaughter, and on 17 May 1985 was sentenced to three years in prison (see PHYSICS TODAY, July, page 71).

Cooperman was born on 4 September 1936 and received his PhD in physics from Pennsylvania State University in 1963. He was trained as a nuclear physicist and worked jointly at Arizona State University and Los Alamos National Lab (1963–64). After an appointment at the University of Strasbourg (1964–67), he joined the Fullerton faculty in 1967. He served the department as acting chairman for three years, chairman for three years and vice-chairman for six years.

Cooperman was known for his commitment to quality teaching, for his tireless efforts and untold hours spent in tutoring students, and for his research and humanitarian activities in the transfer of science and technology to less-developed countries. Cooperman's concern for the "wretched of the Earth," and especially for the children, manifested itself most particularly in his scientific aid to Vietnam. He founded and was president of the US Committee for Scientific Cooperation with Vietnam. He was the principal adviser to UNESCO for scientific assistance to Vietnam. In addition, he was active in the US–Vietnam Friendship Association and became fluent in Vietnamese.

Converting the destruction of war into reconstruction for peace was a major theme of Cooperman's work. For example, he arranged consultations for the conversion of mosquito-infested bomb craters into fish farms. He also encouraged the use of high technology in ways that improved the human condition, such as using microchips to develop inexpensive hearing aids for hard-of-hearing children.

At the time of his death, Cooperman was translating the book *Where There Is No Doctor* into Vietnamese, to provide medical advice to those living in rural areas where trained MDs are unavailable. He had also begun a study of the long-range effects of human exposure to Agent Orange and dioxin, recognizing that Vietnam is a primary human laboratory for such work. In addition, Cooperman was working with the National League of Families to obtain information from the Vietnamese government about US personnel still listed as missing in action. He worked for the release and immigration of prisoners still confined to re-education camps, knowing that some of these refugees would probably oppose his efforts to rebuild Vietnam and that it was probably from such refugee groups that he had received threats against his life.

He also tried as an individual to help establish a rapprochement between the governments of Vietnam and the United States. After virtually every trip to Vietnam, he was contacted by officials of the US State Department regarding his observations and his impressions of the Hanoi government's views. The Vietnamese government knew of and respected his efforts.

Cooperman was known and admired in our university for his personal, active and absolutely unswerving commitment to academic freedom, civil liberties and human rights, and to the collective development of a social responsibility among scientific and technological workers. Our colleague and friend will be sorely missed, but we take consolation in the fact that we had such a close association with him all these years and in knowing that his example survives and that his work will continue.

DOROTHY S. WOOLUM
ROGER DITTMANN
California State University
Fullerton, California

Gerald Chanin

On 8 January 1985, after a year-long illness, Gerald Chanin died in Verrières-le-Buisson, France.

Chanin was born on 25 February 1933 in New York City. He pursued his education in physics at Rutgers University, receiving a doctorate in 1959. At Rutgers he developed a lasting interest in the technology of experimental low-temperature physics, continuing to apply the techniques to other fields of physics throughout his career.

Chanin's PhD thesis on the effect of impurities on the superconducting transition temperatures of indium and aluminum subsequently led to the development of a theory of "dirty superconductors." In 1959 he joined the physics faculty at the University of

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Pittsburgh. He continued his research in superconductivity, determining the critical magnetic field of superconducting aluminum, and started similar measurements on superconducting lead, work which he completed after leaving Pittsburgh.

In 1963, Chanin moved to suburban Paris (Verrières-le-Buisson), where he began research at the aeronomy department of CNRS.

In France, while continuing research in superconductivity, Chanin applied cryogenic techniques to the development and use of infrared detectors on vehicles launched into the upper atmosphere or into space. At the aeronomy department he became an expert on cryogenically cooled infrared detectors and was one of the leaders in advancing a program to exploit high-resolution infrared spectroscopy for the Infrared Satellite Observatory. Although his health during the past year was so poor that he was able to work for only an hour or two each day, Chanin was still actively engaged in the developments associated with infrared detectors for the ISO project.

In addition to his professional work, Chanin had an acute awareness of the impact that science has had on society, particularly regarding the development of military systems. He was an active participant in the debate about the likely success of various programs that were proposed to insure the survival of our society after a nuclear war.

M. P. GARFUNKEL
University of Pittsburgh
Pittsburgh, Pennsylvania

James Howard McMillen

James Howard McMillen, the first program director for physics at the National Science Foundation, died on 26 March 1985. In his 19 years as program director, McMillen provided early leadership for the development of the physics programs of NSF.

Born on 24 April 1904 in Ft. Wayne,

Indiana, McMillen conducted his graduate work at Washington University in St. Louis under the supervision of Arthur Llewelyn Hughes, receiving his PhD in 1930. Under the stringent financial conditions of the Great Depression, McMillen remained at Washington University as a research associate for three years, then held a two-year National Research Council fellowship at Princeton. He returned to Washington University for two more years as a research associate in the school of medicine, where he helped introduce electron microscopy as a tool in medical physics. In 1937 he joined the faculty at Kansas State University, becoming a full professor there in 1939. He returned to Princeton in 1944 to do research under the World War II Committee on Medical Physics. He then joined the Naval Ordnance Laboratory (1946), where he led groups in hydrodynamics and hyperballistics.

When McMillen joined NSF in 1952, physics was already being funded by the Department of Defense and the Atomic Energy Commission, and the appropriate role for NSF was far from clear. To clarify that role, McMillen supported conferences to explore physicists' opinions on the current status and needs of research, as well as possible ways that NSF might address those needs. Examples were the "Rochester" high-energy physics conferences, the accelerator-design studies of the Midwestern Universities Research Association, the Advisory Panel on High-Energy Accelerators and a conference on low-temperature physics that considered what research might be suitable for small liberal-arts colleges. As the NSF physics program and staff expanded, McMillen focused his attention on the elementary-particles program, primarily supporting university cosmic-ray research and user groups at accelerators. By the time of his retirement in 1971, a strong and growing program had been established.

In addition to his many research interests, McMillen was deeply interested in encouraging young researchers and improving teaching techniques. While at the Ordnance Lab he was also an adjunct professor at the University of Maryland, and while at NSF he served as secretary of the physics section of AAAS. As new program staff joined NSF, McMillen provided guidance and counsel in the principles and practices of directing NSF programs. He contributed much to a broad range of basic and applied research; he contributed much as well to those around him and to the standards and traditions of the Federal support of science.

RAYMOND J. SEEGER
National Science Foundation, retired
JOEL A. SNOW
Department of Energy

Sam Legvold

Sam Legvold, emeritus professor of physics at Iowa State University, died in Ames, Iowa, on 17 February 1985. He was born in Huxley, Iowa, on 8 January 1914, and was awarded a BS from Luther College in 1936, after which he was a teaching assistant in mathematics at Iowa State College for one year. He went to Columbia University as a Lydia Roberts Fellow, and after one year returned to Luther College as an assistant professor of physics. Legvold resumed his graduate work at Iowa State two years later and became a research assistant in 1941. After spending 1943–44 as a contract employee with the US Navy Bureau of Ordance, for which he was granted the Meritorious Civilian Service Award, he returned to Iowa State, where he received his PhD in 1946. Legvold joined the faculty of the physics department at that time as associate professor; he retired in 1979 as professor of physics, Distinguished Professor of Sciences and Humanities (awarded in 1976), and senior physicist in the Ames Laboratory of the US Department of Energy.

Legvold established the low-temperature laboratory at Iowa State, and low-temperature work was an important part of his research activity. In collaboration with Frank H. Spedding, he initiated studies in the Ames Laboratory of the low-temperature thermal and transport properties of high-purity rare-earth metals. Legvold and Spedding, who coauthored 27 papers, discovered the multimagnetic transitions in the heavy lanthanide metals in the late 1950s. Legvold's group was the first to prepare single crystals for several of these metals and to investigate their rather remarkable anisotropic magnetic and transport properties. He was the primary adviser for 35 PhD and 19 MS students, most of whom worked on the lanthanide metals, although a number also took part in a smaller ultrasonic research program to study relaxation

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