

Spinrad receives Heineman Prize for Astrophysics

The American Institute of Physics and the American Astronomical Society presented their joint Dannie Heineman Prize for Astrophysics to Hyron Spinrad (University of California, Berkeley) at the AAS meeting held in January.

The citation noted that over the last 20 years Spinrad "has greatly advanced our understanding of the chemical evolution of galaxies, the properties of extremely faint radio galaxies, and the nature of primitive material in comets." Spinrad received both his BA (1955) and PhD (1961) from Berkeley. From 1961 to 1964, he was a senior scientist at the Jet Propulsion Laboratory, where he was involved in ground-based support for spacecraft observations of the chemical composition of the Martian atmosphere. In 1964 he returned to teaching at Berkeley as an assistant professor of astronomy. He became a full professor in 1968 and was named Miller Professor for 1971-72 and 1978-79. He served as chairman of Berkeley's astronomy department from 1980 to 1984.

In the late 1960s and early 1970s Spinrad made extensive spectroscopic studies of stars in the visible and near infrared. He found a subgroup of older stars rich in metals, with some proto-

types in the solar vicinity, mostly located in the nuclei of external galaxies. Until then it had generally been thought that older stars in galactic nuclei formed too early to have been enriched by supernova explosions and therefore would be relatively poor in metals. Spinrad has recently studied powerful radio galaxies to identify optically luminous standard candles. This work has extended the boundaries of galaxy detection to very large redshifts, or very long look-back times.

Since 1980 Spinrad has measured

mass losses in comets (how much water is boiled off as they round the Sun) through techniques of optical spectroscopy. Additionally, in collaboration with Michael Belton (Kitt Peak National Observatory) and Susan Wyckoff and Peter Wehinger (both at Arizona State University), he has studied bare cometary nuclei at great distances from the Sun.

Spinrad and Richard G. Kron (University of Chicago) are currently writing a graduate-level book on distant galaxies.

in brief

Ami E. Berkowitz, formerly a research physicist at General Electric's research and development center in Schenectady, New York, has been appointed to an endowed chair of the Center for Magnetic Recording Research at the University of California, San Diego, and has been named a professor in the university's physics department.

Robert F. O'Connell, professor of physics at Louisiana State University (Baton Rouge), has been named Boyd Professor by the Louisiana state university system.

In the astronomy department of the University of Texas at Austin, **Frank N. Bash** has been named Frank N. Edmonds Jr Regents Professor, **William H. Jeffreys** has been named Harlan J. Smith Centennial Professor and **J. Craig Wheeler** has been named Samuel T. and

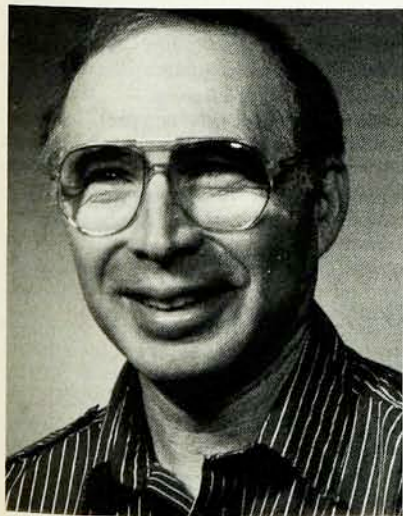
Fern Yanagisawa Regents Professor. Wheeler succeeded Bash as department chairman in September 1986.

John D. Ramshaw, formerly a staff member of the theoretical division at Los Alamos National Laboratory, has accepted an appointment as scientific and engineering fellow in the Idaho National Engineering Laboratory.

Deborah D. L. Chung, formerly associate professor of metallurgical engineering and materials science at Carnegie-Mellon University, has joined SUNY at Buffalo as professor of mechanical and aerospace engineering.

Robert Hanbury Brown, emeritus professor of physics at the University of Sydney, Australia, delivered the 21st Karl G. Jansky Lecture, "Stars, photons and uncommon sense," at the University of Virginia on 2 October.

SPINRAD



obituaries

François N. Frenkiel

François Naftali Frenkiel died in Rockville, Maryland, on 9 July 1986 at age 75.

Frenkiel was born in Warsaw on 19 September 1910. He studied at the

University of Ghent, receiving degrees in mechanical engineering and in aeronautical engineering, and at the University of Lille, where he worked with J. Kampé de Fériet and received a PhD in physics. Until 1943, he had a career in aeronautics at the French Aeronau-

tical Research Station at Toulouse. He was imprisoned by the Nazis and spent two years in concentration camps. His pregnant first wife perished in one such camp. When the Allied armies freed the survivors of Buchenwald prison in 1945, Frenkiel returned to research at Toulouse. In 1947 he came to the United States for a year at the Cornell department of aeronautical engineering; Theodore von Kármán was his sponsor.

Frenkiel worked at the US Naval Ordnance Laboratory in theoretical astrophysics from 1948 until 1950, when he became group supervisor of theoretical and applied mechanics in the Johns Hopkins Applied Physics Laboratory. In 1960 he moved to the US Naval Ship Research and Development Center in Carderock, Maryland, as senior research scientist in the computational mathematics department, where he remained until his retirement in 1981. He served a term as president of the Washington Philosophical Society and one as president of the Washington Academy of Sciences.

Frenkiel's research was in mathematical problems in fluid dynamics. Early in his career he and Kampé de Fériet studied sand dune formation in the Sahara as a representation of atmospheric turbulence near the ground. Perhaps Frenkiel's most influential work was his calculation of the turbulent diffusion of contaminants in the atmosphere of the Los Angeles basin. This work underlay the introduction of clean-air laws there and in other cities and states in the United States. Frenkiel generated tests of mathematical and statistical formulations of turbulent structure in fluids and analyzed measurements made by others in wind tunnels, the atmosphere and the ocean. He pioneered the application of high-speed digital computing methods to the measurement of turbulence and published extensively on the properties of turbulence and its measurement.

Frenkiel frequently organized scientific meetings all over the United States and in Europe and Japan. He served on the executive boards of The American Physical Society, the American Institute of Physics, the American Meteorological Society, the American Geophysical Union and the International Committee for Theoretical and Applied Mechanics. He served a term as chairman of the US National Committee for Theoretical and Applied Mechanics and was its longtime secretary. He served on the Special Committee on Problems of the Environment of the International Council of Scientific Unions from 1970 until 1981.

The US physics community was slow



FRENKIEL

to develop an interest in fluid dynamics. Those active in fluid dynamics research came from adjacent fields: aeronautics, chemical and mechanical engineering, geophysics and mathematics. Only with the declassification of plasma physics after World War II did American physicists begin to pay attention to fluid dynamics—unlike the situation in France, England, Germany and the Soviet Union, where there is an ancient tradition in classical fluid mechanics. In 1957, Frenkiel, recognizing a dearth of publication opportunities in the existing scientific journals, particularly those devoted to physics research, for the increasing volume of exciting developments in fluid dynamics, proposed to AIP the formation of a new journal. In 1958 the first volume of *The Physics of Fluids* appeared, establishing a very high standard for the publication of work in fluid dynamics and plasma research. Frenkiel was sole editor of *The Physics of Fluids* from its founding to his retirement in 1981.

Somewhat young to have participated in a major way when Hugh L. Dryden, John Von Neumann, John G. Kirkwood, Clark B. Millikan, von Kármán, Raymond J. Seeger and Howard W. Emmons arranged for the formation of the division of fluid dynamics within The American Physical Society, Frenkiel was nevertheless one of its charter members and from the beginning played a major role in planning the meetings of the division. He took on the role of secretary-treasurer in 1953–57, was chairman six times from 1954 to 1970 and was twice elected to represent the division on the council of The American Physical Society. Frenkiel had to overcome strong centrifugal tendencies in the physics community to maintain the division of fluid dynamics and provide for the growth of his journal.

Because of his exemplary service to

the division of fluid dynamics and the high level of integrity and quality he brought to *The Physics of Fluids*, Frenkiel came to be called "Mr. Fluid Dynamics" by many.

RAYMOND J. EMRICH
Lehigh University

Bethlehem, Pennsylvania
PHILIP S. KLEBANOFF

Bethesda, Maryland

WALTER M. ELSASSER

The Johns Hopkins University

Baltimore, Maryland

HARRY POLACHEK

Rockville, Maryland

Eduard A. Gerber

Eduard A. Gerber died in Bridgton, Maine, on 8 August 1986. He was born in Fürth, Bavaria, Germany, on 3 April 1907 and received his MS (1930) and PhD (1934) in physics from the Institute of Technology in Munich.

In 1935, Gerber joined the scientific staff of the Carl Zeiss Works, Jena, Germany, where he was in charge of research and development in piezoelectric crystals. From 1947, when he arrived in the United States, until 1954, Gerber was a crystal research consultant to the Signal Corps Engineering Laboratories (Fort Monmouth, New Jersey), where he was involved in developing atomic and molecular frequency sources such as the ammonia maser and the cesium-beam-frequency standard. From 1954 to 1961, he served as director of the frequency control division at the US Army Signal Research and Development Laboratory; he was director of the solid-state and frequency control division at the US Army Electronics Laboratories from 1961 to 1963; and since March 1963 he had been director of the electronic components laboratory at the US Army Electronics Command. All of these positions were at Fort Monmouth. He retired from Federal civil service in 1970. He was also senior coeditor of the two-volume monograph *Precision Frequency Control* (Academic, 1985).

Gerber had a distinct preference for scientific and engineering work, but because of his managerial skills, his amiability and his equitability, he rose through the administrative ranks. This diminished his scientific output but not the locus or intensity of his interests, particularly his greatly loved field of frequency control: From his arrival in the US Gerber played a key, but largely unheralded, role in nurturing the Frequency Control Symposium, which was first held in 1947. Gerber organized and chaired at the 40th Frequency Control Symposium a plenary session devoted to reminiscences of