ties to grow on characteristic time scales of fractional powers of the plasma resistivity. Furth has designed various experiments to explore and control such "tearing modes"; for example, with current-profile shaping and feedback control of the plasma. He also did pioneering work in neoclassical and anomalous transport. Furth has done experiments on the Adiabatic Toroidal Compressor tokamak, and he proposed using the large auxiliary heating power input of the Tokamak Fusion Test Reactor at Princeton to sustain the tail of a slightly non-Maxwellian deuteron–triton energy distribution. Experiments now in progress on the TFTR and on other large tokamaks are successfully testing this approach.

Furth received his PhD in physics from Harvard in 1960. He worked at Lawrence Livermore National Lab from 1956 until 1967. He then joined the staff of the Princeton Plasma Physics Lab and became a professor of astrophysics at Princeton University. He was director of the lab from 1981 to 1991.

LAWLER AND SPRUCH HONORED AT APS DIVISION MEETING

At the May meeting of the American Physical Society's division of atomic, molecular and optical physics, held in Chicago, James E. Lawler received the Will Allis Prize and Larry Spruch received the Davisson–Germer Prize.

The Allis Prize, which recognizes outstanding research on the microscopic or macroscopic behavior of ionized gases, was given to Lawler for "the elucidation of cathode fall phenomena in glow discharges through the measurement and analysis of spatial variations in the electric field, and for the development of new methods to determine atomic lifetimes and transition probabilities." Lawler was a pioneer in the development of optogalvanic spectroscopy, which he then used to study the electric field structure of glow discharge plasmas. His experimental and theoretical work on cathode fall phenomena has helped resolve classical problems in this area and also in the study of cold electrons trapped in the negative glow region.

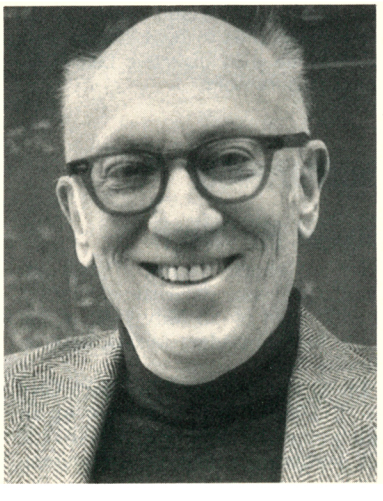
After earning a PhD in physics from the University of Wisconsin, Madison, in 1978, Lawler was a research associate at Stanford University for two years. He then returned to Wisconsin, where he is now a professor of physics.

Larry Spruch received the Davisson–Germer Prize, which is given for outstanding work in atomic or surface physics, "in recognition of his numerous contributions to many areas of atomic physics, including variational principles and bounds, effective-range theory, statistical models of the atom, rearrangement collisions and retardation effects." Spruch is perhaps best known for the application of variational methods and associated bounds to problems in atomic few-body scattering experiments, which he carried out with coworkers. Most recently he and colleagues have studied retardation (Casimir) potentials for Rydberg atoms ($He^+ + e^-$) and Rydberg ions (such as $C^{+5} + e^-$ and $O^{+7} + e^-$, in storage rings) and, more generally, retardation effects involving electrons, atoms, ions and surfaces.

Spruch received a PhD in physics from the University of Pennsylvania in 1948 and then worked at MIT as a postdoctoral fellow. He moved to New York University in 1950 and is currently a professor of physics there.

James E. Lawler

Larry Spruch



ASA APPLAUDS ACHIEVEMENTS IN ACOUSTICS

The Acoustical Society of America has awarded its Gold Medal, the society's highest honor, to Ira J. Hirsh, a Distinguished University Professor at Washington University. Hirsh, who received the medal at ASA's May meeting in Salt Lake City, was cited for "contributions to the understanding of the auditory process." During the 1950s Hirsh worked on the intelligibility of speech, auditory masking and auditory fatigue. Later he studied the perception of temporal order and the relation between temporal processing and other cognitive and communicative abilities. He is the author of *The Measurement of Hearing*, which became a standard text for audiologists and students in psychoacoustics.

Hirsh earned a PhD in experimental psychology in 1948 from Harvard, and he continued to work there for three more years. In 1951 he joined the research staff of Washington University's Central Institute for the Deaf, and from 1965 to 1983 he served as the institute's director of research. He is also a member of the psychology faculty at Washington, and from 1969 to 1973 he was dean of the universi-

Ira J. Hirsh

ty's faculty of arts and science.

Also honored at the ASA meeting was Anthony Armstrong Atchley of the Naval Postgraduate School, who received the R. Bruce Lindsay Award. The award, which recognizes achievements by a young researcher, was given to Atchley for "contributions to the understanding of acoustic cavitation and thermoacoustics." With Andrea Prosperetti and Larry Crum, Atchley demonstrated that cavitation in liquids depends primarily on the characteristics of the liquid and on bubble dynamics. More recently he has experimented on thermoacoustic heat transport at high acoustic amplitudes and on the onset of thermoacoustic oscillations.

Atchley earned a PhD in physics from the University of Mississippi in 1984. He then was the Hunt postdoctoral fellow at Yale University before joining the faculty of the Naval Postgraduate School in 1986.

ASTRONOMICAL SOCIETY HONORS PACZYNSKI, BABCOCK

At the June meeting of the American Astronomical Society held in Columbus, Ohio, Bohdan Paczynski received the 1992 Dannie Heineman Prize for Astrophysics, and Horace W. Babcock received the 1992 George Ellery Hale Prize.

The Heineman Prize, given jointly by AAS and the American Institute of Physics, was presented to Paczynski for his "timely, important and insightful contributions to our theoretical understanding across a wide range of topics in modern astrophysics. These include his contributions to the theory of stellar structure and evolution, of interacting binary stars, and of a variety of puzzling objects in high-energy astrophysics." His work on stars covered the effects of mass transfer and gravitational radiation on the evolution of close binary systems, the formation of planetary nebulae and the evolution of their central stars. He is coordinating an observational search for very rare events of gravitational microlensing of stars in the Galactic bulge by any compact objects—stars, brown dwarfs or planets—in the Galactic disk. The search is being carried out at Las Campanas Observatory in Chile by a team from the Warsaw University and Carnegie Institution Observatories.

Bohdan Paczynski

Paczynski received a PhD in astronomy from Warsaw University in 1964. From 1962 to 1982 he worked at the Institute of Astronomy (which later became the Copernicus Astronomical Center) in Warsaw. He then moved to Princeton, where he now is the Lyman Spitzer Jr Professor of Astrophysics.

The Hale Prize, a biennial award of the AAS solar physics division, is given for outstanding contributions to solar astronomy over an extended time. Babcock, a former director of the Mount Wilson and Las Campanas Observatories, is best known to solar physicists for inventing, in 1952, the magnetograph, a photoelectric instrument that has made practical the mapping of the Sun's magnetic field. In 1953 he proposed a system to correct telescopic seeing, which was the forerunner of adaptive optics.

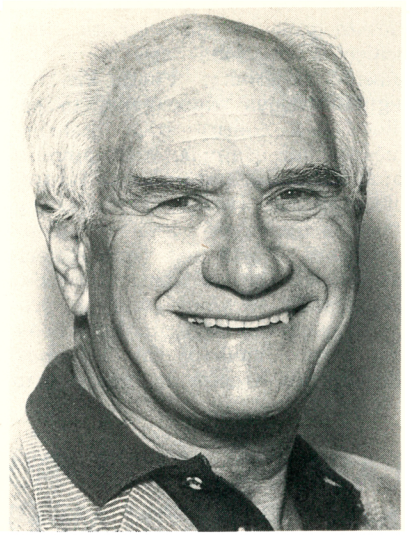
Babcock received a PhD in astronomy from the University of California in 1938 and then worked at Lick, Yerkes and McDonald Observatories. During World War II he worked on various military projects at MIT and then at Caltech. In 1946 he joined the staff of the Mount Wilson and Palomar Observatories and served as director from 1964 to 1974. From 1963 to 1978 he also directed Las Campanas Observatory.

OBITUARIES

David H. Frisch

After a short illness, David H. Frisch, professor emeritus of physics at MIT, died on 23 May 1991 at his home in Cambridge, Massachusetts. He was 73.

David was born in New York City on 12 March 1918 and grew up in San Antonio, Texas. He received his AB degree from Princeton University in 1940 and then became a graduate assistant at the University of Wisconsin. The war sent him to Los Alamos, where he worked until 1945 on basic research toward the development of the fission bomb. After the war he came to MIT, where he obtained his PhD in physics while working under Victor Weisskopf. David ascended the professorial ladder, becoming a full professor in 1958 and retiring (in name only) as professor emeritus in 1988.



David H. Frisch

At MIT, David launched into a program in experimental particle physics. Characteristically, the experiments he pursued were at the frontier of knowledge. This program took him to virtually all the high-energy accelerators in the world at that time: Lawrence Berkeley Laboratory, Brookhaven National Laboratory and CERN. He developed the cylindrical spark chamber with its latest version in a magnetic field. The latter was, in a sense, grandfather to today's large-scale, almost 4π electronic detectors. In this work he trained, inspired and was helped by a truly world-class set of graduate students, who are now productive scientists at many institutions; they remember him with gratitude and affection.

David's urge to share the excitement of physics permeated his teaching at the undergraduate level. His best-known efforts included the movie *Relativistic Time Dilation*, which described measurements with cosmic-ray muons done with James Smith, and the book *Elementary Particles*, written with Alan M. Thorndike. David was at all times a strong proponent of bringing undergraduates into the laboratory, and he initiated many modern physics experi-