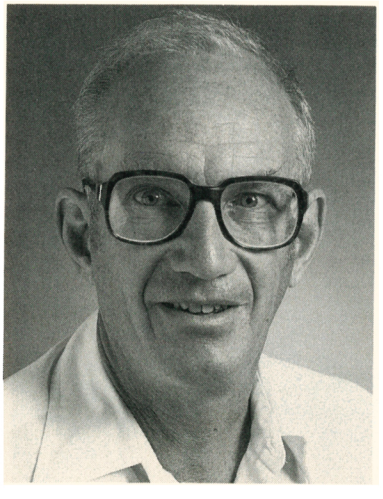
# APS PRESENTS PRIZES IN FLUID DYNAMICS AND PLASMA PHYSICS

The annual meetings of two divisions of the American Physical Society—fluid dynamics and plasma physics—were the settings for the presentation of several APS prizes and awards.

At the division of plasma physics meeting on 16–20 November in Seattle, John M. Greene was presented with the James Clerk Maxwell Prize. Greene was cited for "outstanding contributions to the theory of magnetohydrodynamics equilibria and ideal and resistive instabilities, for discovery of the inverse scattering transform leading to soliton solutions of many nonlinear partial differential equations and for the invention of the residue method of determining the transition to global chaos." Greene is perhaps best known for the discovery, with Cliff Gardner, Robert Miura and Martin Kruskal, of the inverse scattering method of solving the Korteweg–de Vries equation, which proves that solitons pass through one another without scattering, even though they are nonlinear structures.

After earning a PhD in physics from the University of Rochester in 1956, Greene worked as a research physicist at the Princeton Plasma Physics Lab. Since 1982 he has been a senior technical adviser in the core physics division at General Atomics Co in San Diego.

John M. Greene



The Excellence in Plasma Physics Research Award was presented at the plasma physics meeting to Nathaniel J. Fisch, for "fundamental theoretical investigations of noninductive current generation in toroidally confined plasmas." Fisch pioneered the field of noninductive current drive, discovering how electric currents could be sustained at low cost in plasmas by waves and other steady-state means. Such currents, which make possible the continuous operation of a tokamak, are now a critical element in tokamak experiments worldwide and in the design of fusion reactors.

Fisch earned a PhD in electrical engineering from the Massachusetts Institute of Technology in 1978 and then joined the staff of the Princeton Plasma Physics Lab. He is currently a professor in the astrophysical sciences department at Princeton University and director of the plasma physics program there.

Also recognized at the Seattle meeting was Wim Pieter Leemans, who received the Simon Ramo Award for "elegant experimental and simulational contributions to three aspects of laser-plasma physics: stimulated Compton scattering, tunneling ionization and beat-wave chaos." The Ramo Award recognizes outstanding doctoral thesis work in plasma physics. Leemans's thesis dealt with Compton scattering of laser light from very underdense plasmas, nonlinear aspects of plasma waves driven by beating laser beams, and tunnel ionization of gases.

Leemans received a PhD in electrical engineering from the University of California, Los Angeles, in 1991 and is now a staff scientist at Lawrence Berkeley Laboratory.

At the division of fluid dynamics meeting, held on 22–24 November in Tallahassee, Florida, William R. Sears was given the 1992 Fluid Dynamics Prize. Sears was cited for "outstanding contributions to steady and unsteady aerodynamics, aeroacoustics, magnetoaerodynamics and wind tunnel design; for his leadership in and devotion to aeronautical engineering education; and for his service to the nation on aerospace policy." In earlier work, Sears developed the physical and mathematical foundation for unsteady airfoil theory and introduced what is now known as the Sears function, which gives the forces and moments on a wing due to a gust. More recently he has developed new techniques for wind tunnel testing, especially of high-lift and high-drag configurations. Sears founded the graduate school of aeronautical engineering and the Center for Applied Mathematics at Cornell University and served as the first director of both.

Sears earned a PhD in aeronautics from Caltech in 1938 and worked there for several years as an instructor and then an assistant professor. During World War II he worked at Northrop Aircraft, where he played a key role in the development of the XB-35 and YB-49 airplanes, which later provided the basic aerodynamic design for the Stealth bomber. Sears

William R. Sears

then became a professor of aeronautical engineering at Cornell University. He joined the University of Arizona in 1974, where he is now a professor emeritus in the department of aerospace and mechanical engineering.

Also recognized at the fluid dynamics meeting was William C. Reynolds, who received the Otto Laporte Award. APS cited Reynolds for "his experimental, theoretical and computational work on turbulent flows, including innovations in turbulence modeling and control, and his leadership in direct numerical simulation and large eddy simulation."

Reynolds has spent almost his entire career at Stanford, where he earned a PhD in mechanical engineering in 1957 and then joined the faculty. He is currently a professor of mechanical engineering and chairman of the department there.

## AAS PLANETARY SCIENCE AWARDS PRESENTED IN MUNICH

The division for planetary sciences of the American Astronomical Society presented several awards at its 1992 annual meeting, held in Munich in October. Peter Goldreich of Caltech received the Gerard P. Kuiper Prize; Jack J. Lissauer of the State University of New York at Stony Brook received the Harold C. Urey Prize; and Harlan J. Smith, formerly of the University of Texas at Austin, was posthumously honored with the Masursky Award for Meritorious Service.

Goldreich was chosen "in recognition of sustained and fundamental contributions to problems in planetary science"—in particular his studies of the origin of the Moon, the effect of tidal forces on the orbits and spins of planets and their moons, the formation of the solar system and the dynamics of planetary rings. His current research deals with solar oscillations.

Goldreich earned a PhD in physics from Cornell University in 1963. After working at Cambridge University and the University of California, Los Angeles, he joined the Caltech faculty, where he is now the Lee A. Dubridge Professor of Astrophysics and Planetary Physics.

The Urey Prize, which recognizes achievements by a young scientist, was given to Lissauer for his "observational and theoretical research on fundamental problems in celestial mechanics." Lissauer has studied the complex resonant structure of the orbits of co-orbital satellites; he pioneered theoretical investigations of corotation resonances as a cause for Neptune's ring arcs; and he proposed and developed dynamical models of planetary formation.

Lissauer earned a PhD in applied mathematics from the University of California, Berkeley, in 1982. He was next a postdoctoral fellow, first at NASA Ames Research Center and then at the University of California, Santa Barbara. He is now an assistant professor in the department of Earth and space sciences at Stony Brook.

Smith, the recipient of the Masursky Award, played a key role in obtaining NASA funding for ground-based observatories during the 1960s, and later, as chair of the NASA Space Science Board committee on space astronomy and astrophysics, he was a leading proponent of the Great Observatories series of orbital telescopes.

Smith earned a PhD in astronomy in 1955 from Harvard. He was a member of the astronomy faculty at Yale before joining the University of Texas in 1963. He directed the McDonald Observatory there for 26 years. At the time of his death, in October 1991, Smith was the Edward Randall Jr Centennial Professor in Astronomy.

## IN BRIEF

The winner of the 1992 Kilby Young Innovator Award is **John Hagelin**, chair of the physics department at Maharishi International University in Fairfield, Iowa. He was cited for "his pioneering work in the field of supersymmetric unified quantum field theories, for his relentless pursuit of the answers to compelling global issues, and for his innovative accomplishments in digital music reproduction."

**Richard Smalley** was a 1992 Kilby Award winner for his discovery of buckminsterfullerene, $C_{60}$, also known as the buckyball. He is a professor in both the chemistry and physics departments at Rice University. In October Smalley also received the 1992 Robert Welch Award in Chemistry from the Welch Foundation in Houston in recognition of "his outstanding contributions to the field of physical chemistry."

Oak Ridge National Laboratory and the University of Tennessee have named **Ward Plummer** as Distinguished Scientist. He was previously William Smith Professor of Physics at Pennsylvania State University.

# OBITUARIES

## Pavel Alexeyevich Cherenkov

Pavel A. Cherenkov, head of the department of high-energy physics of the P. N. Lebedev Institute of Physics of the Academy of Sciences of the USSR, died on 6 January 1990.

Cherenkov was born on 28 July 1904 in the middle of Russia, near Voronezh, and graduated from the University of Voronezh in the department of physics and mathematics in 1928.

In 1930, after teaching in a high school, Cherenkov moved to Leningrad and entered the Institute of Physics and Mathematics of the Academy of Sciences of the USSR as a postgraduate student. In 1932 he started his research, under Sergei I. Vavilov, on luminescence activated by gamma rays in different liquids. Shortly thereafter the institute's department of physics, which Vavilov headed, was transformed into a new institute—the P. N. Lebedev Institute of Physics—and transferred to Moscow. Although at that time it was quite a small research institution, it nevertheless had already attracted several bright physicists. Cherenkov's research activity and scientific career were closely connected with the history of the institute, at which he spent the remaining 56 years of his life.

Cherenkov's first five years of research under Vavilov were crowned by the discovery of the beautiful phenomenon named after him, Cherenkov radiation, and its interpretation by Ilya M. Frank and Igor E. Tamm.

In 1946 Cherenkov joined Vladimir I. Veksler to construct electron accelerators, first the betatron and then a

Pavel Alexeyevich Cherenkov