APS honors seven at spring meeting

The American Physical Society presented five awards at its spring meeting in Washington, DC.

The AIP–APS 1986 Dannie Heineman Prize for Mathematical Physics was presented to A. M. Polyakov (Landau Institute of Theoretical Physics, Moscow) "for his contributions to mathematical physics by his analysis of topological effects in quantum field theory as pertains to statistical systems and elementary particles." Polyakov suggested—independently of and simultaneously with Kenneth G. Wilson (Cornell)—the use of scale invariance and renormalization theory to study critical phenomena. He discovered that monopoles and instantons are features of Yang–Mills field theory. Polyakov has extensively studied conformal invariance in physical theories; most recently he has applied it to the determination of critical indices. In addition he has developed a quantized formulation of string theory.

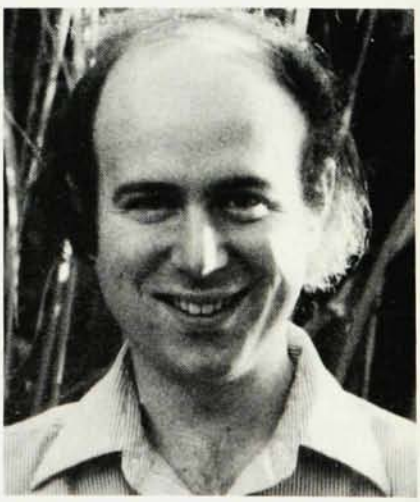
David Gross (Princeton), H. David Politzer (Caltech) and Frank Wilczek (Institute for Theoretical Physics, Santa Barbara) received the J. J. Sakurai prize "for their analyses of non-Abelian gauge theories at short distances and the implications of these insights for the understanding of the strong interaction between quarks." Gross received his BSc from Hebrew University in Jerusalem, Israel, in 1962 and his PhD in physics from the University of California at Berkeley in 1966. He then went to Harvard as a junior fellow. In 1969 Gross came to Princeton; he became a full professor in 1971, and this year was named Higgins Professor. Politzer received his PhD in physics from Harvard in 1974. He remained there as a junior fellow; in 1977 he was named an associate professor of physics. In 1979 Politzer moved to Caltech to become a professor of theoretical physics. Wilczek received both his MA (1972) and his PhD (1974) from Princeton. He remained there as an assistant professor of physics until 1977, when he became a member of the Institute for Advanced Study. He returned to Princeton in 1978 as an associate professor, and was named a full professor in 1980. Wilczek will begin a Regents Fellowship, sponsored by the Smithsonian Institution, this summer at the Harvard–Smithsonian Astrophysical Observatory in Cambridge, Massachusetts. In 1973 Gross, Politzer and Wilczek discovered the phenomenon of asymptotic freedom: In non-Abelian gauge theories (such as quantum chromodynamics) the strength of the gauge force weakens at shorter distances relative to an inverse-square law. The opposite behavior (vacuum polarization) is found in quantum electrodynamics. The discovery of asymptotic freedom led Gross and Wilczek to propose a non-Abelian theory of strong interactions to explain the short-distance behavior of hadrons, and thus led to the development of QCD.

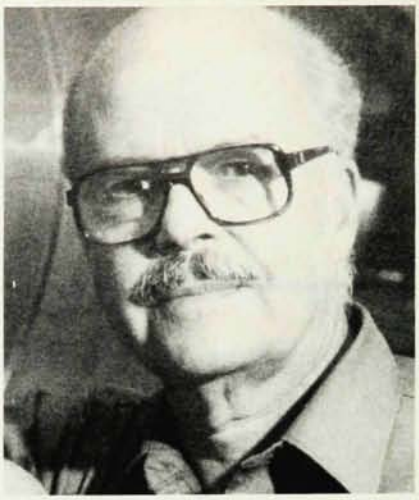
Lowell M. Bollinger (Argonne National Laboratory) received the APS Tom W. Bonner prize "for his contributions to and leadership in the development of the superconducting linear accelerator for the production of high-quality ion beams, a new technology that broadens the base for nuclear structure research." Bollinger received his AB (1943) from Oberlin College and his PhD (1951) from Cornell University. He has been at Argonne since 1951. In his earliest research Bollinger developed the fast-chopper technique and early versions of the multichannel analyzer to study the radiative properties of neutron resonances. He served as director of the Argonne physics division in 1963–72 and again in 1974–75. In 1972 he became director of the superconducting linac project, in which he played a major role, pioneering with Ken Shepard and Richard Pardo the rf linac technology that led to the machine's successful operation in 1978. This effort culminated in 1985 with the completion and operation of the national heavy-ion facility ATLAS.

GROSS

POLITZER

WILCZEK





BOLLINGER

KLEPPNER

Daniel Kleppner (MIT) received the Davisson–Germer prize "for his innovative and pioneering studies of the fundamental properties of Rydberg atoms and their interactions with electromagnetic fields." Kleppner received bachelor's degrees from Williams College (1953) and from Cambridge (1955) and a PhD from Harvard (1959). He remained at Harvard until 1966, initially serving as a research fellow in physics and later advancing to assistant professor. In 1966 Kleppner became an associate professor at MIT. He was named a full professor there in 1973, and Lester Wolfe Professor of Physics in 1985. In 1960 he and Norman Ramsey invented the hydrogen maser. At MIT, Kleppner and his colleagues have made pioneering studies of Rydberg atoms—that is, atoms in which one electron is in a bound state very near the continuum and has a Bohr orbit very far from the core of the atom. Most recently he has extended these studies to inhibited spontaneous emission in "circular" Rydberg states. In 1980 Kleppner and his colleagues reported the discovery of a new approximate symmetry in hydrogen in a uniform magnetic field.

Judith Young (University of Massachusetts, Amherst) received the first APS Maria Goeppert-Mayer Award "for her studies of the structure of galaxies, and in particular for her extensive measurements of the molecular distributions in these galaxies and their correlation with star formation" (see May, page 111).

Maxwell, Plasma and Laporte awards

The American Physical Society presented the following three awards at its divisional meetings last November:

The Division of Plasma Physics presented the 1985 James Clerk Maxwell Prize to John H. Malmberg (University of California, San Diego) "for his outstanding experimental studies which extended our understanding of wave–particle interactions in neutral plasmas and increased our confidence in plasma theory, and for his pioneering studies of the confinement and transport in pure electron plasmas." Malmberg received his MS in 1951 and his PhD in physics in 1957, both from the University of Illinois. His early research was on neutral plasmas: As a member of the plasma-physics staff of the General Atomic division of General Dynamics Corporation (1957–69), he developed the "T-machine," which became operational in 1963. Malmberg and his collaborators made the first measurements of Landau damping and the plasma-wave echo. They demonstrated nonlinear Landau-damping saturation due to trapped electrons and the nonlinear dynamics of the interaction between a weak, cold beam and a

MALMBERG