were reported at CERN in 1984 (see PHYSICS TODAY August, page 17). This is the first time that the Sakurai Prize has been awarded; it is given to "recognize and encourage outstanding achievement in particle theory by a young physicist."

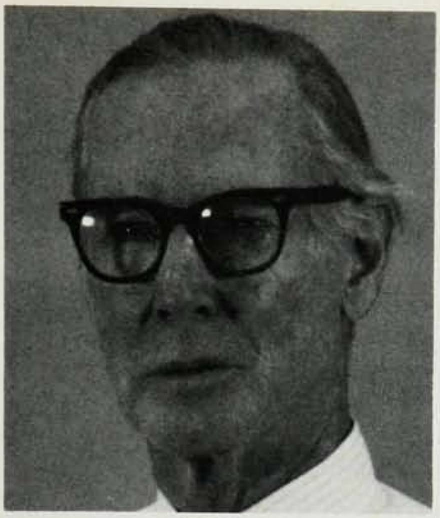
APS awards prizes for research in plasma physics

At its annual meeting last fall, the APS Division of Plasma Physics presented the 1984 James Clerk Maxwell Prize, sponsored by Maxwell Laboratories Inc, to Donald W. Kerst (University of Wisconsin) and the 1984 Prize for Excellence in Plasma Physics Research to the following three teams: Takashi Maekawa, Shigetoshi Tanaka and Yasushi Terumichi (Kyoto University); Stanley C. Luckhardt, Miklos Porkolab and Jack J. Schuss (MIT); and Stefano Bernabei, William M. Hooke, Forrest C. Jobes, Robert W. Motley, James E. Stevens and Schweickhard E. von Goeler (Princeton).

Kerst was cited for "his pathbreaking contributions to plasma physics, including the invention of the levitated toroidal multipole, the elucidation of classical and anomalous transport mechanisms and the demonstration of high-beta plasma confinement; for his seminal ideas on particle accelerators; and for the inspired guidance of a generation of productive experimentalists."

After receiving his PhD from the University of Wisconsin in 1937, Kerst worked at the General Electric X-Ray Corporation before joining the faculty of the University of Illinois in 1938. At Illinois he led a group that built the first betatron—a machine in which electrons are accelerated by magnetic induction. He later constructed a series of betatrons of successively higher energies, culminating in a 300-MeV machine built at Illinois. The success of this machine represented a turning point in the technology of particle accelerators in that it was the first accelerator to be constructed on the basis of a detailed analysis of the relevant phenomena and engineering of all its integral and supporting systems.

From 1953–57, Kerst served as a technical director to the Midwestern Universities Research Association, working in advanced accelerator concepts. While there, Kerst developed the spiral-sector focusing principle that is now used in many spiral-ridge cyclotrons. Under his leadership, the MURA group developed and analyzed the process of beam stacking by means of radio frequency acceleration in fixed-field machines. In 1957, Kerst



KERST

joined General Atomic and began studies of the applications of plasma physics to developing controlled thermonuclear power. He invented a toroidal pinch device and, with Tihiro Ohkawa, the multipole minimum-B configuration. The toroidal octupoles completed at the University of Wisconsin under his direction and the toroidal octupole started by him and Ohkawa at General Atomic (completed by Ohkawa) were the first magnetic confinement devices to achieve a quiet plasma and to exhibit lifetimes exceeding the Bohm limit. This demonstration was a turning point in collisionless plasma magnetic confinement. This observation was subsequently confirmed in many other confinement devices. Kerst joined the physics department of the University of Wisconsin in 1962. In 1970 he directed the construction of a large levitated octupole device at the University.

The plasma-physics teams from Kyoto, MIT and Princeton were cited for "the experimental demonstration of startup, ramp-up and sustainment of toroidal currents by lower hybrid wave." In experiments performed from 1981 through 1983, the MIT group—Luckhardt, Porkolab, and Schuss—using the Versator II and the Alacator-C tokamaks, the Kyoto group—Maekawa, Tanaka, and Terumichi—using the WT-2 tokamak, and the Princeton group—Bernabei, Hooke, Jobes, Motley, Stevens, and von Goeler—using the PLT tokamak, demonstrated that when rf power was applied, the one-turn loop voltage became negative, indicating that lower-hybrid driven currents could replace the inductive ohmic currents. From 1983 through 1984 these groups also succeeded in plasma current startup, ramp-up and sustainment by rf power alone. During these experiments the Princeton group succeeded in generating 160 kA of current for durations of 3 seconds at an electron density of 2×10^{12} cm^{-3}, and the MIT group succeeded in generating the same amount of current for durations of 100 msec, but at electron densities up to 10^{14} cm^{-3}.

IEEE Edison Medal presented to Kraus

John D. Kraus has become the first radioastronomer to receive the IEEE Edison Medal. He was awarded the 1985 medal in recognition of "his sustained career as an innovator, discoverer and educator in the fields of antennas and radioastronomy."

Professor emeritus of electrical engineering at Ohio State University, Kraus is the director of the university's radio observatory. His interest in antennas has been lifelong, beginning with his childhood ham radio hobby. He earned his PhD in physics in 1933 from the University of Michigan. During World War II, he worked at the Naval Ordnance Laboratory and developed antennas at the Radio Research Laboratory at Harvard University. In 1946 he became a professor of electrical engineering at Ohio State; on the basis of courses he developed there he wrote three texts that are now widely accepted standard references: *Antennas*, *Electromagnetics* and *Radio Astronomy*. In 1951 Kraus founded the Ohio State University Radio Observatory. He designed the observatory's 110-m radio telescope, which has produced the most complete maps of the radio sky yet achieved. Kraus has invented many types of antennas, including the corner reflector that is commonly used as a tv antenna, the helical antenna that is used extensively on space satellites, and the close-spaced W8Jk array. In addition to his three texts, Kraus has written two popular science books: *Big Ear* and *Our Cosmic Universe*.

KRAUS