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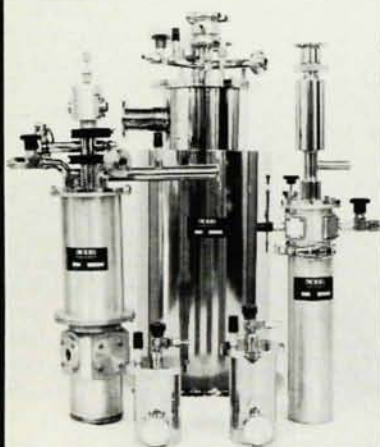
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BOLLINGER

Daniel Kleppner (MIT) received the Davison-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 stud-



KLEPPNER

ies 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





WONG

plasma. In 1969 Malmberg became a professor of physics at San Diego. His most recent research has focused on electron plasmas. In addition to developing practical methods of producing and confining electron plasmas, he and his collaborators have begun experiments to cool such plasmas to the liquid and crystalline states.

In addition the division presented the 1985 Excellence in Plasma Physics Research Award to Alfred Y.-F. Wong (University of California, Los Angeles) "for the first definitive experimental demonstration and fundamental study of self-focusing and collapse of Langmuir waves using laboratory techniques developed over a period of several years." Wong received both his bachelor's (1958) and master's (1959) degrees from the University of Toronto, an MSc (1961) from the University of Illinois and a PhD in plasma physics (1963) from Princeton. He remained at Princeton as a research associate in the plasma-physics lab in 1962-64, then became a member of the teaching faculty, first as an assistant professor and later as an associate professor. In 1972 Wong became a full professor of

physics at the University of California, Los Angeles. In 1974 he and his group discovered the "caviton," a density cavity created by Langmuir waves. Wong and P. Y. Cheung reported in 1984 the first observation of the three-dimensional collapse, or self-focusing, of Langmuir waves in an unmagnetized, homogeneous plasma. The waves, or oscillations, are induced in the plasma by an incident electron beam; they become spatially collapsed due to radiation pressure in the wave. The mechanism is thought to explain many radiative phenomena, but had not been thoroughly investigated under laboratory conditions until Wong's work. Wong is the director of the HIPAS laboratory in Alaska, where he is applying the caviton concept to stimulate the auroras.

The Division of Fluid Dynamics presented the 1985 Otto Laporte Award to Hans W. Liepmann (Caltech) "for insight and creativity in science and engineering, for outstanding success as author, lecturer and teacher, and for promoting vigor and vitality in the fluid-dynamics community." Liepmann received his PhD in physics in

1938 from the University of Zurich. He came to Caltech in 1939 as a fellow in aeronautics and became an assistant professor there in 1945. Liepmann was one of the first to study shock wave-boundary layer interactions, and he contributed extensively to transonic aerodynamics and turbulence studies. He extended the use of shock tubes—which field Laporte pioneered—to the rarefied-gas regime and to magnetohydrodynamic flow. In addition he constructed a shock tube that used superfluid helium as its constituent liquid, and he demonstrated that superfluid helium transmits shock waves at two distinct velocities. In his work on turbulence, Liepmann demonstrated that the Tollmien waves that initiate the transition from laminar to turbulent flow can be canceled by introducing feedback-controlled disturbances. In 1976 he was named the Charles Lee Powell Professor of Fluid Mechanics and Thermodynamics at Caltech. Liepmann was director of GALT, the graduate aeronautics lab at Caltech, from 1972 until 1985. In 1983 he was named the first Theodore von Kármán Professor of Aeronautics at Caltech.

Commonwealth Award to Aspect

The Bank of Delaware has presented its 1985 Commonwealth Award in Science to Alain Aspect for "his experimental research on confirmation of the predictions of wave-particle duality."

Aspect was educated at the Université de Paris-Sud (Orsay). He worked on Fourier-transform holography at the Institut d'Optique (Orsay) from 1969 until 1971, when he accepted a position teaching physics at the University of Yaoundé in Cameroon. In 1975 he became an assistant professor at the École Normale Supérieure de l'Enseignement Technique (Cachan).

From 1975 until 1984 Aspect and his

collaborators at the Institut d'Optique performed a series of experiments in which they produced pairs of photons having a total angular momentum of zero by laser-pumping calcium-40 atoms to the top state of a cascade. Aspect and his group then looked for correlations in the polarizations of the photon pairs: If their polarization behavior were governed by a local-hidden-variables theory, the correlations would obey Bell's inequality. To achieve locality, Aspect and his collaborators introduced a delicate procedure into the correlation experiment: Acousto-optical switches changed the



LIEPMANN



Alain Aspect (center) with Albert Messiah (left) and John S. Bell at the Kastler Memorial Symposium held in Paris in January 1985.