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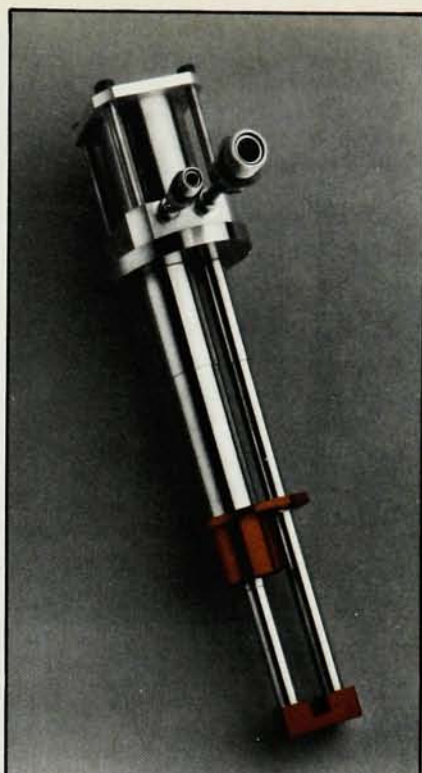
Institute of Physics 1985 awards

The Institute of Physics has presented its awards for 1985 to the following: Michael Pepper (GEC Hirst Research Center, Wembley, and the University of Cambridge) received the Guthrie Medal and Prize; John Gunn (University of Glasgow) was presented the Glazebrook Medal and Prize; Eric Rogers (Nuffield Foundation) received the Bragg Medal and Prize; Adrian Edmund Gill (University of Oxford) received the Charles Chree Medal and Prize; David John Smith (Arizona State University) was awarded the Charles Vernon Boys Prize; Colin Edward Webb (University of Oxford) was presented the Duddell Medal and Prize; Alan J. Bray (University of Manchester) and Allan Peter Young (Imperial College of Science and Technology, London) were honored with the Maxwell Medal and Prize; Colin Edwin Conisbee Wood (GEC Hirst Research Center, Wembley) received the Pater-son Medal and Prize; and John David Lawson (Rutherford-Appleton Laboratory) was awarded the Thomas Young Medal and Prize. IOP and the German Physical Society have named George R. Isaak (University of Birmingham) as the recipient of the 1985 Max Born Medal and Prize.

Pepper was cited "for his pioneering experimental work on the physics of two-dimensional systems." Pepper received his PhD from the University of Reading in 1967. He studied silicon devices at Plessey and in 1973 joined the Cavendish Laboratory. At the Cavendish, Pepper studied low-temperature properties of the two-dimensional electron gas in the silicon inversion layer; he has described the inversion layer of silicon metal oxide-semiconductor junctions as "a laboratory of solid-state physics" for studying such effects as the Mott-Anderson localization and disorder-dominated transport. In addition, Pepper and his colleagues have studied the effects of gradually decreasing the dimensionality of a system, using Si and GaAs semiconductor structures. Pepper was a coauthor of the original paper on the quantized Hall effect; he and his colleagues have recently demonstrated the existence of

fractional quantization at high frequencies in systems that do not exhibit the effect when subject to direct current. He is currently studying very small structures produced by molecular-beam epitaxy.

Gunn was cited "for his contributions to the establishment of large UK facilities for physics research through his chairmanship of the SRC Nuclear Physics Board and of the University Grants Committee Physical Sciences Subcommittee." Gunn received his MA in mathematics and natural philosophy from Glasgow University in 1937 before moving to St. John's College in Cambridge. In 1939 he began studies with R. H. Fowler on order-disorder transformations. With the onset of World War II he joined the Admiralty Scientific Service, working under Harrie Massey. After the War, he first accepted a lectureship in mathematics at Manchester University, where he studied relaxation phenomena in shock waves and linearized supersonic aerofoil theory, then accepted a position at University College in London (1946) as a lecturer in the applied mathematics department headed by Massey. There he studied scattering of vector mesons. In 1949 Gunn was appointed to the Cargill Chair of Natural Philosophy at Glasgow University, where he remained until his retirement in 1982. His early research there concerned nuclear structure and meson photoproduction; in the late 1950s he worked to develop high-energy physics in the UK and on an international level. Gunn was involved in the early planning of the Daresbury Laboratory's NINA electron synchrotron. For 1968-72 he was a member of SRC, becoming chairman of the Nuclear Physics Board in 1970. For 1972-81 Gunn served on the University Grants Council, most of that time as chairman of the physical service and equipment subcommittees; he worked extensively to develop the "new blood" appointments proposal and to increase the level of university grants. He was head of the Glasgow natural philosophy department for 1972-82 and was vice-principal of the University for 1971-75.



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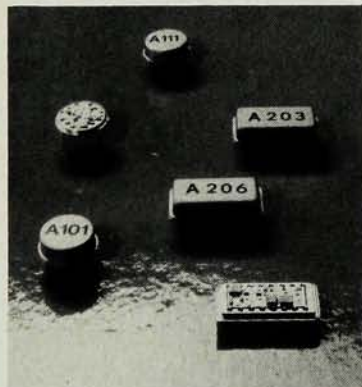
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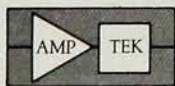
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GUNN



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WOOD



BRAY



YOUNG



LAWSON



ISAAK

Rogers was cited "for his many contributions to physics education in the United States and the United Kingdom through his lectures, writing and work on both the PSSC and Nuffield teaching projects." Rogers graduated from Trinity College in Cambridge, then taught at Clifton College and Charterhouse. After World War II, he became chairman of the physics department at Princeton University. He played a large role in developing the PSSC educational reform, which led to worldwide revisions in physics instruction. He returned to the UK in the early 1960s and became the organizer of the Nuffield Physics Project.

Gill was cited "for his outstanding contributions to geophysical fluid dynamics." Gill received his MA from the University of Melbourne, Australia, in 1960 and his PhD at Cambridge University for work on the stability of axisymmetric flows. He spent a year as a research associate at the Massachusetts Institute of Technology, where he did theoretical work on the stability of pipes and made pioneering studies of over-reflection in hypersonic flows. He returned to Cambridge in 1964, where he served as assistant director of research in dynamical oceanography until 1978. In 1984 Gill moved to the Oxford University Hooke Institute; he is currently chairman of the scientific steering group of the Tropical Ocean and Global Atmosphere program of the World Climate Research Program, for which the Hooke Institute will be developing coupled atmosphere-ocean numerical models. Recently he has developed models of the El Niño phenomenon. Gill has written *Atmospheric Ocean Dynamics* (1982) and has been editor of the informal newsletter *Ocean Modeling* since 1978.

Smith was cited "for his achievements in commissioning the Cambridge 600-kV high-resolution electron micro-

scope" and for its application "to the elucidation of the atomic structure of materials." Smith received his PhD from the University of Melbourne, then accepted a postdoctoral position at the Cavendish Laboratory in 1976, working with V. E. Cosslett and W. C. Nixon to complete and commission the 600-kV microscope. In 1980 he was appointed director of the project, and in that capacity attained a consistent resolution of 1.7 Å with the instrument. In 1984 Smith became an associate professor in solid-state science at Arizona State University, where he continues his research on high-resolution electron microscopy and its application to the study of structural defects.

Webb was cited "for his outstanding contributions to the development of gas and vapor lasers." Webb received his DPhil in physics from Oxford University in 1964. He then joined the optical services department of Bell Laboratories, where he developed inversion techniques for continuous-wave noble-gas ion lasers. In 1968 he moved to the Clarendon Laboratory in Oxford; in 1976, under his supervision, Andrew Kearsley became the second person to achieve discharge-only excited rare gas halide laser operation. Webb's group designed a cryogenic gas purifier for these lasers as well as a low-divergence, high-central-brightness laser that allowed them to convert the rare-gas laser to the Lyman-wavelength region of the uv for the first time. Webb, with Kearsley, Tony Andrews and Rhys Lewis, developed a copper-vapor laser in 1983, which is used in pumping high-power dye lasers for photochemical or spectroscopic applications, and a gold-vapor laser in 1984, which finds application in the photoradiation therapy of cancer.

Bray and Young were cited "for their contributions to the theory of disordered systems and particularly for

their recent work on spin glasses." Bray received his PhD from the University of Kent. He held a postdoctoral position at the University of Maryland (1973-76), then joined the faculty of the theoretical physics department at the University of Manchester, eventually becoming senior lecturer. Bray introduced the concept of "replica symmetry breaking" to the study of disordered systems and spin glasses. He pioneered the study of metastable states in spin glasses and has studied the role of anisotropies in this type of material. In studying the spin-glass ground state, he has accumulated much evidence supporting the hypothesis that spin-glass properties may be due to a phase transition. Young received his DPhil from Oxford University in 1973. After a year at the Institut Laue-Langevin in Grenoble and at Cornell University, he became a lecturer in mathematics at Imperial College in London in 1978, and a reader in mathematical physics in 1984. His research has focused on critical phenomena and phase transitions in disordered systems, especially spin glasses.

Wood was cited "for his pioneering work on the application of molecular-beam epitaxy to the design and fabrication of novel devices and structures." After receiving his PhD in physical chemistry from the University of Nottingham, Wood joined the Philips Research Laboratory in Redhill, Surrey. He developed a high-efficiency indium phosphide Gunn diode, using liquid-phase epitaxy to prepare indium phosphide films. Wood introduced pioneering modifications to ultrahigh vacuum systems in conjunction with his work on molecular-beam epitaxy; recently, he has investigated the effect of growth parameters on the optical and electrical properties of molecular-beam epitaxial films. In addition, much of his research has concerned doping phenomena and techniques, and the properties of metal-semiconductor heterojunctions. Wood was a senior research associate at Cornell University for 1978-82 and then became the manager of General Electric's III-V research and development at the Hirst Research Center.

Lawson was cited "for his many contributions in the field of charged-particle beams." Lawson was educated at St. John's College in Cambridge and began his research career in the 1940s as a member of D. W. Fry's group at TRE (now RSRE), designing microwave antennas. Under Fry and F. K. Goward he later worked on problems associated with accelerator physics. In 1951 he became a member of the general physics division of the Atomic Energy Research Establishment, where he did pioneering work on fusion: He established what has become

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known as the "Lawson Criterion," which relates temperature, particle density and confinement time for the operation of a fusion reactor. Lawson received his ScD from Cambridge University in 1959. After a short time at Stanford University, he joined the Rutherford Laboratory (now Rutherford-Appleton) as project leader for the design and construction of the Harwell variable-energy cyclotron, the first to accelerate medium-to-heavy ions; he was appointed deputy chief scientific officer of the Laboratory in 1978. Lawson has written *The Physics of Charged-Particle Beams* (1977), which is considered a standard work. More recently he has incorporated lasers into accelerator design and has conducted studies in conjunction with the University of Maryland on beam transport near the space-charge limit.

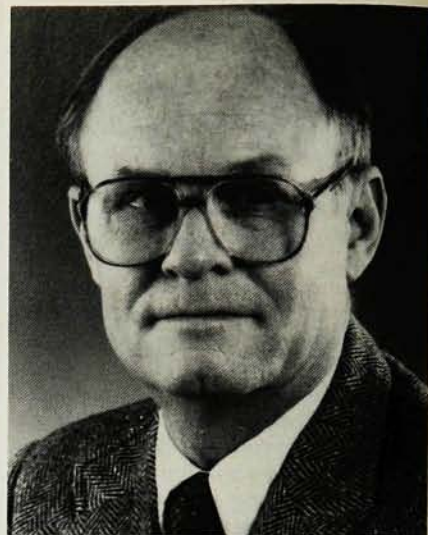
Isaak was cited "for his outstanding contributions to Mössbauer effect, Earth and solar physics." Isaak studied at the University of Melbourne and then accepted a position as a research physicist at Imperial Chemical Industries Australia and New Zealand, where he developed the atomic-beam resonance spectrometer during the late 1950s. In 1961 he joined the faculty of the University of Birmingham, becoming a full professor in 1984. His early research, with P. B. Moon, centered on the Mössbauer effect and resulted in an experimental determination of the upper limit of Earth's speed through the "ether." In 1969, Isaak began fundamental studies of oscillations of the Sun's surface, as evidenced by the displacement of absorption lines in the solar spectrum. Isaak and his colleagues have discovered that these oscillations occur at a well-defined series of frequencies.

Porter receives Society of Rheology Bingham Medal

Roger S. Porter (University of Massachusetts) has been named the 1985 Bingham Medalist of the Society of Rheology. The medal is presented annually to an individual for outstanding contributions to rheology.

Porter received his PhD in chemistry from the University of Washington at Seattle in 1956. He then joined the research staff of the Chevron Research Company, eventually becoming a senior research associate. In 1966 he became an associate professor of polymer science and engineering at the University of Massachusetts in Amherst; he served as head of the department for 1966-76 and was made a full professor in 1973.

Porter's research interests have centered on the characterization, rheology



PORTER

and processing of thermoplastics and liquid crystals. He reported the first entanglement characteristics for many polymer systems, including polyethylene. He has used compressed powders and single crystals to reduce molecular entanglements in drawing polymers to produce thermoplastics of high tensile modulus. Porter has used ammonia as a reversible plasticizer for producing aliphatic nylon polymers of high tensile strength by compressing ammonia gas into them prior to extrusion, then evaporating the ammonia from the drawn nylon. In addition, he has described in detail the effect of a polymer's composition on its viscosity-temperature characteristics, the effect of its molecular weight and distribution on its shear viscosity, and the effects of pressure on viscosity. In the early 1960s, Porter developed one of the earliest experimental programs in the US on the flow properties of liquid crystals. He made pioneering studies of the order and flow of low-molecular-weight mesophases. His current research focuses on liquid crystals in polymer systems. Porter has been active in the Society of Rheology for 20 years, and served as an assistant editor of its *Transactions* during 1966-69.

Washington ins and outs: NSF and SSC consortium

Edward A. Knapp, senior fellow and research adviser at Los Alamos National Laboratory, was elected president of the Universities Research Association on 1 August. Based in Washington, D.C., URA is a consortium of 56 universities that operates Fermilab and the Department of Energy's Central Design Group for the Superconducting Super Collider. Knapp, who had been director of the National Science Foundation for less than two years when he