Five honored by The American Physical Society

The American Physical Society has presented the Tom W. Bonner Prize to Charles D. Goodman (Indiana University), the Herbert Broida Prize to Theodor W. Hänsch (Stanford University), the Fluid Dynamics Prize to Stanley Corrsin (Johns Hopkins University) and the High Polymer Physics Prize jointly to Hiroyuki Tadokoro (Osaka University) and Motowo Takayanagi (Kyushu University).

The Tom W. Bonner Prize is bestowed annually to recognize outstanding experimental research in nuclear physics and includes a $2000 cash award. Charles D. Goodman was cited "for his persistent and innovative efforts in the study of (p,n) reactions, exhibiting so clearly the giant Gamow–Teller resonance, the spin–isospin sound excitation in nuclei. The understanding of this resonance and its connection with beta decay adds a new quantitative dimension to nuclear structure."

Goodman has been instrumental in the search for Gamow–Teller strength in nuclei and was the first to recognize the need for very large volume detectors with subnanosecond time resolution. The search for Gamow–Teller reactions was made possible by the selectivity of the (p,n) reaction for the spin-flip isospin-flip portion of the nucleon–nucleon reaction. Goodman used the discovery that this portion of the reaction became dominant at proton energies of 100–200 MeV to map Gamow–Teller transitions. He is also recognized for his leadership role in the development of the time-of-flight facility at the Indiana University Cyclotron Facility.

GOODMAN

Currently in the department of physics at Indiana University, Goodman obtained his PhD from the University of Rochester in 1955. He was a research scientist at Oak Ridge National Laboratory from 1955 to 1980. He has been at Indiana University since 1980 and has been involved with the time-of-flight facility at the university cyclotron since its conception. His research interests include nuclear structure, nuclear reactions, neutron time-of-flight spectrometry and nuclear instrumentation.

The Herbert Broida Prize is given to recognize outstanding experimental advances in atomic and molecular spectroscopy. The prize includes a $5000 cash award and is given biennially in odd-numbered years. Theodor Hänsch was cited "For the invention of Doppler-free spectroscopic techniques using broadly tunable lasers and for their application to precision measurements of properties of the hydrogen atom. His elegant experimental methods have been widely emulated and contributed greatly to our outstanding of atomic and molecular structure."

TADOKORO

TAKAYANAGI

Hänsch is recognized for the contributions he has made to the development of techniques in high-resolution laser spectroscopy. He developed the saturation method for eliminating the effects of Doppler broadening of spectral lines (developed independently by Chrétien Bordé in France), and the first narrow-band but broadly tunable laser. He applied these lasers to resolve the fine structure in the hydrogen atom. He was the first to resolve the Lamb shift in the hydrogen atom and used the improved resolution to make more precise measurements of the Rydberg constant. He also developed the technique of polarization spectroscopy, an even more sensitive method for eliminating Doppler broadening. He was able to observe the two-photon Doppler-free transition between the 1s and 2s orbits in the hydrogen atom. Soon after this he was able to make a precise comparison between the visible and uv transitions and thus became the first to measure the Lamb shift in the ground state of hydrogen. He also pioneered the use of resonant fluorescence to detect small numbers of atoms, and, for example, was able to detect sodium atoms at densities

as low as 100 atoms/cm^3.

Hänsch received his PhD from the University of Heidelberg in 1969. In 1970 he came as a NATO fellow to Stanford University, joining the faculty in 1972, and is now professor of physics at Stanford.

The Fluid Dynamics Prize is awarded annually for major contributions to fundamental fluid dynamics and includes a $3000 cash award. Corrsin was given this year's prize "in recognition of his contributions to the understanding of turbulent transport, through ingenious experiment and physical insight; his unique experimental approach and critical view of fluid mechanics have touched a legion of students and associates."

Corrsin pioneered descriptions of turbulent flow, in particular describing the transport of heat and other scalar properties. He gave the form of the spectrum of a passive scalar in isotropic turbulence; he investigated the behavior of passive scalars in uniformly sheared turbulence and gave the equation for the dissipation of scalar variance; he extended Onsager's model to include scalars undergoing chemical reactions. His interest in the transport of scalars lead him to study the relation between Eulerian and Langerian quantities and to his description of the form for the Langerian time spectrum and of the relation between the Eulerian and Langerian integral scales. Corrsin carried out extensive experimental work on the mixing of scalar stripes and the angular dispersion of fluid line elements.

CORRSIN

Corrsin received his PhD in aeronautics from the California Institute of Technology in 1947. He came to Johns Hopkins University in 1947; from 1947 to 1955 he was in the department of aeronautics; from 1955 to 1960 he served as professor and chairman of the department of mechanical engineering; from 1960 to 1979 he was professor of fluid mechanics in the department of mechanics and materials science. Since 1979 he has been a professor of fluid mechanics in the department of chemical engineering, and he has simultaneously served as professor of environmental health science in the School of Public Health (a position he has held since 1977) and as a professor of biomedical engineering in the School of Medicine (since 1980). He is now continuing his fundamental research in turbulent flows.

The High Polymer Physics Prize has been presented jointly to Hiroyuki Tadokoro and Motowo Takayanagi "for their pioneering and complementary contributions to understanding of the structure and properties of polymeric solids." This prize is given annually to recognize outstanding contributions to high-polymer physics and includes a cash award of $3000.

Now at Osaka University, Tadokoro has concentrated on the analysis of the exact solid-state structure of crystalline polymers, analyzing more than 75 polymers in the course of his career. Characteristic of his technique is the cooperative use of x-ray diffraction and infrared and Raman spectroscopy. He has also used calculations of inter- and intramolecular interaction energies to enhance his study of the structural features of polymers and to reveal factors governing the stable crystal structure and molecular conformation of polymers. These calculations now enable one to describe the stability of crystal modifications in terms of free energy. He has been able to clarify

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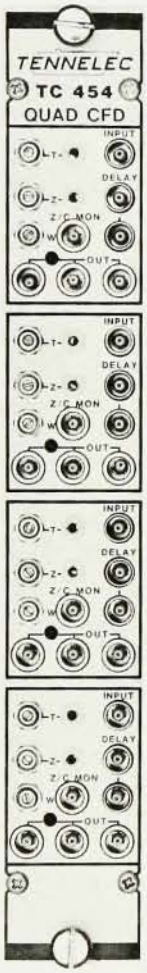

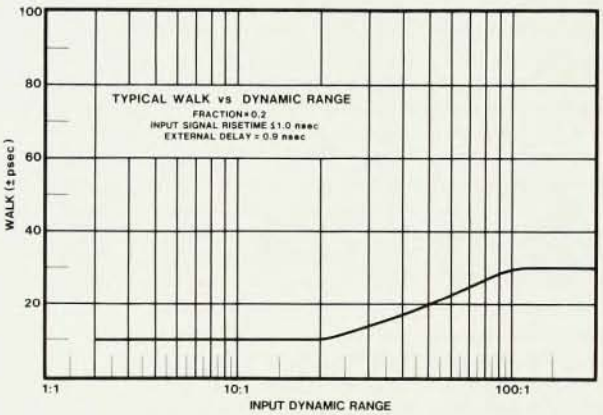

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quantitatively the relationship between structure and properties of crystalline polymers by lattice-dynamical theory and by using data he has accumulated through structural analysis and spectroscopy.

Tadokoro obtained his doctorate from Osaka University in 1959. Since then he has continued his research activities there and was a professor in the department of polymer science when he retired this April. In addition to his extensive contributions to technical journals in both English and Japanese, Tadokoro is the author of the text *Structure of Crystalline Polymers*.

Recognized as one of the leading authorities on the relationship between the solid-state structure mechanical properties in polymeric solids, Takayanagi performed pioneering work in the area of dynamic mechanical analysis, now used to classify solid-state dispersion phenomena. He invented the "Rheovibron," a direct-reading viscoelastometer widely used as a tool for investigating the relation of properties to structure in polymers. He developed the Takayanagi model, a mechanical model to describe the viscoelasticity of two-phase polymeric systems. Takayanagi established the viscoelastic relaxation response of polymer crystals by measuring the dynamic viscoelasticities of single-crystal mats of polymers. One recent outgrowth of his extensive studies of the physical properties of solid-state polymers, is the possibility now being investigated of extruding polymers in the solid-state.

Takayanagi received his doctorate in engineering from Kyushu University in 1960, where he had obtained his bachelor's degree in 1944 and had been teaching since that time. From 1960 to the present he has been a professor in the department of applied chemistry at Kyushu University. In addition to his research contributions, Takayanagi has been honored for his contributions to education. He has also served the scientific community by organizing international conferences in his field and by serving on the editorial boards for several journals.

Whipple receives RAS Gold Medal

Fred Lawrence Whipple, Phillips Professor of Astronomy emeritus and a former director of the Smithsonian Astrophysical Observatory, has been awarded the Gold Medal of the Royal Astronomical Society in London. He was recognized by the Society "for his work and leadership in geophysics and astronomy."

Whipple has made many contributions to astronomy, including developing the first optical tracking system for artificial satellites using a network of Baker–Nunn cameras; a modified version of this network, enhanced by laser systems, is still used today to gather geodesic and geophysical data. His techniques for photographically measuring the speeds and decelerations of meteors, his methods for computing the orbits of comets and asteroids, and his theoretical model for describing the structure of comets, are considered scientific standards.

He came to Harvard University in 1931, after obtaining his PhD in astronomy from the University of California at Berkeley. At Harvard he served as chairman of the astronomy department from 1949 to 1956, as director of the Smithsonian Astrophysical Observatory from 1955 to 1973, and as Phillips Professor of Astronomy from 1970 until his retirement in 1977.

Under his leadership as director of the Observatory, the Mt. Hopkins installation was conceived and constructed. Whipple was instrumental in the development of this facility, including selecting the site in the Santa Rita Mountains and serving as a member of the planning group for the Multiple Mirror Telescope installed at Mt. Hopkins. In recognition of his leadership role the Mt. Hopkins facility was recently renamed in his honor "The Fred Lawrence Whipple Observatory."

Whipple still plays an active role on the senior scientific staff of the Observatory.

obituaries

Robert d'Escourt Atkinson

Robert d'Escourt Atkinson, professor emeritus of astronomy at Indiana University, died 28 October 1982 at the age of 84.

Atkinson was born in Wales and graduated from Oxford University in physics. In 1928, he received his PhD from Göttingen, working under James Franck. He was on the faculty at Rutgers University before returning to England in 1937 as Chief Assistant at the Royal Observatory, Greenwich. He remained at the Royal Observatory until his retirement in 1964, after

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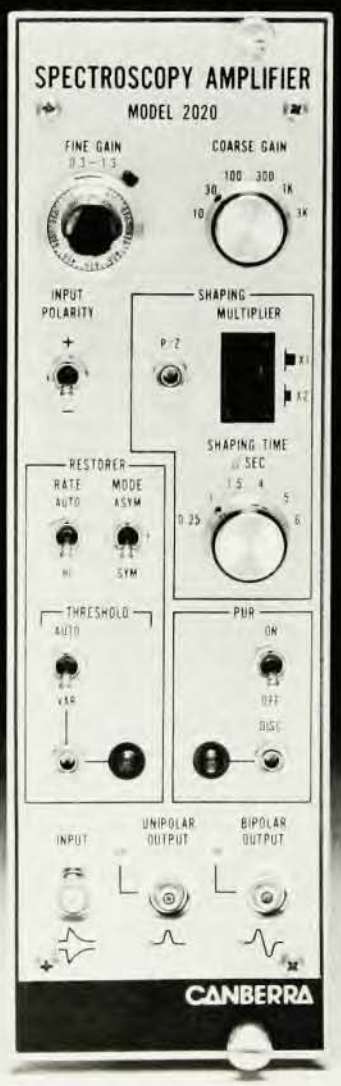

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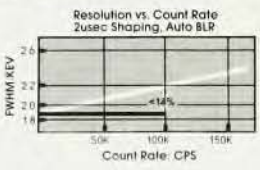

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