Six researchers receive awards from APS

The American Physical Society has presented the Biological Physics Prize to Paul C. Lauterbur (State University of New York, Stony Brook), the Oliver E. Buckley Condensed Matter Physics Prize to Alan J. Heeger (University of California, Santa Barbara), the Davisson-Germer Prize in Surface Physics to Earl Ward Plummer (University of Pennsylvania), the International Prize for New Materials to David Turnbull (Harvard University), the Irving Langmuir Prize to Dudley R. Herschbach (Harvard University) and the Earl K. Plyler Prize to William A. Klemperer (Harvard University).

The APS Biological Physics Prize is sponsored by friends of the Biological Physics Division of the APS, including Spectra-Physics Corporation and Boehringer-Mannheim Biochemicals Corporation. Given to recognize and encourage outstanding achievement in biological physics research, the prize includes a $3000 cash award. Paul C. Lauterbur was cited by the Society for "the concept of using controlled field gradients with nmr to obtain internal images [in] physical objects."

Lauterbur received his PhD in chemistry from the University of Pittsburgh in 1962 and continued working for a year following graduation at the NMR Laboratory of the Mellon Institute, where he had worked since 1951 and had helped establish the lab. In 1963 he came to the University of New York at Stony Brook, where he is now Research Professor of Radiology.

He has pursued an interest in nuclear magnetic resonance throughout his career. As part of the Molecular Biology Program at Stony Brook he investigated nmr spectroscopy and its applications in chemistry, biochemistry and biophysics and explored magnetic resonance imaging, including its biological and medical applications. He has also used nmr spectroscopy in studies of the structures of molecules, solutions and solids.

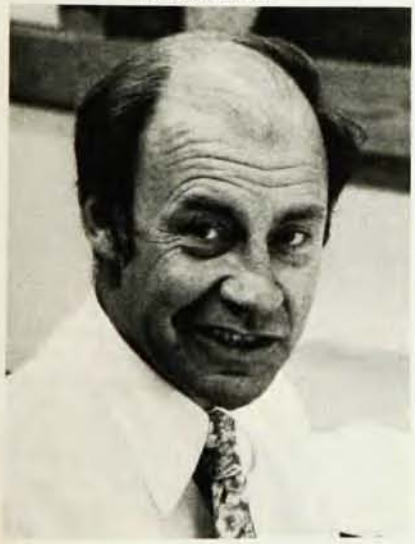
The Oliver E. Buckley Condensed Matter Physics Prize is given for outstanding theoretical or experimental contributions to condensed-matter physics. Endowed by Bell Laboratories, the prize has been presented annually since 1953 and includes a cash award of $5000. Alan J. Heeger was recognized for "his studies of conducting polymers and organic solids, and in particular for his leadership in our understanding of the properties of quasi-one-dimensional conductors."

After obtaining his PhD from the University of California in 1961, Heeger continued his research there for one year. In 1962 he began what was to be a twenty-year association with the University of Pennsylvania. He served as director of the Lab for Research in the Structure of Matter from 1974 to 1981 and was the acting vice provost for research when he left Pennsylvania in 1982 to join the University of California in Santa Barbara.

Heeger has been involved in experimental work on organic polymers capable of conducting electricity. Such quasi-one-dimensional conductors exhibit a variety of novel characteristics; in addition, they are considered promising for a wide variety of applications because they can be adapted at the molecular level for specific uses. Together with Alan MacDiarmid, also of Penn, Heeger has studied polyacetylene, which can be doped with, for example, lithium or iodine, to produce a material with semiconductor or metallic conductivities. As an application of these ideas, Heeger and MacDiarmid have built a battery whose electrodes and storage materials are made of conducting polymers.

The Davisson-Germer Prize is given annually in recognition of outstanding work in atomic physics or surface physics. The prize was established in

HERSCHBACH



HEEGER

KLEMPERER

LAUTERBUR

1965 by Bell Laboratories and includes a cash award of $2500. The APS cited Earl Ward Plummer for "his contributions to understanding the structural, electronic, and vibrational properties of surfaces through the innovative application of electron spectroscopies."

Plummer, currently a solid-state physicist at the University of Pennsylvania, obtained his PhD from Cornell University in 1967. He then joined the technical staff of the National Bureau of Standards, where he served as a National Research Council associate from 1967 to 1969 and as a physicist from 1969 to 1973. Since 1973 he has been at the University of Pennsylvania.

Plummer has employed spectroscopic techniques in his research on many different problems in surface physics. Among his interests are studying the properties of solid surfaces, extending the use and understanding of electron emission spectroscopies, investigating atomic and molecular spectroscopy, and studying electron optics.

The APS presents the International Prize for New Materials for outstanding achievement in the science and application of new materials, including both theoretical and experimental work. The prize is sponsored by the International Business Machines Corporation and includes a $5000 cash award. David Turnbull was cited by the Society for "his advancement of our understanding of nucleation, grain boundary diffusion and precipitation in metals and alloys and his recent contribution to our understanding of the structure, metastability and kinetics of amorphous metallic systems and the criteria for the formation of new amorphous alloys."

Turnbull received his PhD in chemical physics from the University of Illinois in 1939. He then joined the staff at the Case Institute of Technology where he both taught physical chemistry and

served as research project leader. In 1946 he became a research associate at General Electric's Research Lab; he was made manager of the Chemistry of Metallics Section in 1951 and served as physical chemist on the research staff from 1958 to 1962. He has been the Gordon McKay Professor of Applied Physics at Harvard University since 1962.

Turnbull has made numerous contributions to the field of physical chemistry. His interests include thermionic emission, the thermodynamic properties of gases at high pressures, corrosion in nonaqueous media, diffusion in metals, kinetics of nucleation in solid-state transformations, solidification, and general theory of liquids.

The Irving Langmuir Prize in Chemical Physics is given for outstanding interdisciplinary research in chemistry and physics in the spirit of Irving Langmuir. The winner, selected in alternate years by the American Chemical Society and the APS, receives a cash award of $5000, donated by the General Electric Foundation, as part of the prize. The APS cited Dudley R. Herschbach for "his pioneering studies of chemical reactions in crossed molecular beams and the deep insights he has provided into the dynamics of molecular collisions."

Herschbach was educated at Harvard University, receiving his PhD in chemical physics in 1956. He remained at Harvard from 1957 to 1959 as a junior chemistry fellow. After teaching and conducting research at the University of California, Berkeley, from 1959 to 1963, he returned to Harvard. He was chairman of the chemistry department from 1977 to 1980 and has been the Baird Professor of Science since 1976, Exxon Faculty Fellow since 1980 and Master of the Currier House since 1981. During his years at Harvard he has also taught

PLUMMER

TURNBULL

and lectured at numerous universities.

His contributions to our understanding of molecular collisions have come from a persistent interest in this area. Herschbach has been concerned with the theory of molecular spectra and collision processes, the dynamics of chemical reactions and investigations of these processes using molecular-beam scattering.

The Earl K. Plyler Prize is given by the APS to recognize notable contributions to molecular spectroscopy. The prize has been awarded annually since 1977 and is sponsored by the George E. Crouch Foundation. The Society cited William A. Klemperer for "his experimental and conceptual contributions to our knowledge of molecular behavior, particularly of their electronic properties by spectroscopy in every range from radiofrequencies through the ultraviolet, of the structure of van der Waals molecules, and of molecular processes in interstellar clouds."

Klemperer was trained as a physical chemist at the University of California, Berkeley, receiving his PhD in 1954. He then came to Harvard University, where he is now professor of chemistry.

His continued interest in molecular structure and molecular spectroscopy have made important additions to our understanding. Among his major contributions are the measurement of electronic properties of molecules, such as dipole moment and hyperfine constants, to test structure calculations; the first application of supersonic molecular-beam electric-resonance spectroscopy to van der Waal's molecules; the first molecular level-crossing and radiofrequency–optical double-resonance experiments; the first use of molecular-beam electric-resonance techniques to determine how vibration–rotation states are distributed among products of a chemical reaction; the first measurements of state-to-state

rotational energy transfer; a model for the formation of diatomic molecules in interstellar clouds; and identification of the sources of several interstellar spectral lines.

Materials scientist Barrett wins Gold Medal

The Acta Metallurgica Gold Medal for 1982 has been presented to Charles S. Barrett of the University of Denver Research Institute. The winner of this award, which recognizes outstanding ability and leadership in materials research, is chosen by an international panel of scientists from nominations received from as many as 17 countries.

Barrett has made contributions to almost all areas of metallurgy. Among his interests are the study of preferred orientations, structures of metals and alloys, development of x-ray methods, deformation and transformation in metals, low-temperature crystallography and x-ray stress analysis. He is the author of more than 180 technical papers, but is perhaps best known for the text, *The Structure of Metals*, written in the 1930s and still used as a reference by both students and metallurgists. Barrett also serves as co-editor of the annual publication, "Advances in X-ray Analysis."

After obtaining his PhD from the University of Chicago in 1928, Barrett joined the staff at the Naval Research Laboratory. In 1932 he went to the Carnegie Institute of Technology in Pittsburgh, working with a group of metallurgists under the leadership of Robert F. Mehl until 1946. He then joined the Institute for the Study of Metals (now called the Joseph Franck Institute) at the University of Chicago, where he remained until 1970 and is

BARRETT