Shockley, for the invention of the transistor (PHYSICS TODAY, January 1957, page 16). He came to the University of Illinois in 1951, where he worked with Leon N. Cooper and J. Robert Schrieffer in developing a successful microscopic theory of superconductivity; the three received a Nobel Prize for this work in 1972 (PHYSICS TODAY, December 1972, page 73). Bardeen is also known for his instrumental role in the development of the xerographic photocopying process while serving as an advisor to the Xerox Corporation.

Edward E. David Jr, president of the Exxon Research and Engineering Company, received the Arthur M. Bueche Award for his "seminal influence on engineering and science policy." David served as science advisor to President Richard M. Nixon from 1970–72; in that position he helped reorganize the Federal Government's scientific complex, initiated reciprocal agreements with several countries including the USSR and Poland, and promoted basic technological research. Prior to becoming science advisor, he worked for 20 years at Bell Telephone Laboratories. David then served as private consultant and executive vice president of Gould Inc from 1973–77 before joining Exxon. He has also worked to improve the quality of engineering education and to promote government–industry–university relations. His concern for the quality of engineering education prompted him to serve as coauthor of a pre-college text and curriculum, *Manmade World*. David holds a PhD in electrical engineering from the Massachusetts Institute of Technology.

Welch Award in chemistry to Kenneth S. Pitzer

Kenneth S. Pitzer, professor of chemistry at the University of California, Berkeley, has been named recipient of the 1984 Welch Award in chemistry. Pitzer is widely known for his theory on the internal rotation of groups within molecules and its extension to molecules with unsymmetrical groups; he has also compiled tables for the contribution of internal rotation to various thermodynamic properties. In a landmark paper in *Science* magazine, Pitzer showed that the internal rotational potentials contributed to the strain energies of ring molecules. He has also developed a semi-empirical form of series expansion to describe the statistical treatment of complex and concentrated ionic solutions. Pitzer is the ninth recipient of the Welch Award, established in 1972 "to foster and encourage basic chemical research and recognize research that will contribute to the betterment of mankind."

Wannier elected posthumously to Swedish academy

The late Gregory H. Wannier, professor emeritus of physics at the University of Oregon until his death in October 1983 (see May, page 100), has been elected to the Royal Society of Sciences of Uppsala, Sweden. A pioneer in theoretical condensed-matter physics, Wannier also made pivotal contributions to fluid and statistical mechanics and to the study of the dynamics of atoms in gases. His research provided the theoretical foundations for understanding amorphous materials and the crystalline systems of semiconductors and insulators.

Born in Basel, Switzerland, Wannier attended Cambridge University and, in 1935, received a PhD in mathematical physics from the University of Basel. He became a US citizen in 1939. Wannier is only the 33rd foreign member of the Society since 1937; it is the oldest of the Swedish academies, having been given its royal charter in 1728.

Shoemaker and Stevenson receive astronomy prizes

The Division for Planetary Sciences of the American Astronomical Society has presented the Kuiper Prize to Eugene M. Shoemaker of the US Geological Survey and the Urey Prize to David Stevenson of the California Institute of Technology.

Shoemaker was honored for "multidisciplinary contributions to understanding the geological histories of the solid bodies in the solar system." In addition to his position at USGS in Flagstaff, Shoemaker is also a professor of geology at the California Institute of Technology. He received his PhD from Princeton University in 1960; earlier he had participated in explorations for uranium deposits in Colorado and Utah (1948–50) and in regional geological studies of the Colorado Plateau (1951–56). One of his primary research interests has been the mechanics of meteor impact and explosion craters, and he discovered—with Edward C. T. Chao and B. M. Madsen—coesite at Meteor Crater in Arizona. The significance of the find is that coesite, a silicon-based mineral, can be formed in nature only under conditions of extreme pressure—indicating that the crater was indeed formed by meteor impact. Shoemaker was the principal investigator in the geological field studies of the Apollo lunar landings, and he initiated the Palomar planet-crossing Asteroid Survey in 1973. He continues his studies on the implications of cometary bombardment in the solar system and on

the potential influences that major terrestrial impacts may have had on the evolution of life on Earth.

Stevenson received the Urey Prize for his "broad achievement in planetary physics, especially concerned with planetary formation and planetary interiors." The Urey Prize is awarded annually to recognize outstanding achievement in planetary research by a young scientist. Stevenson received his PhD in theoretical physics from Cornell University in 1976, and has held academic posts at the Australian National University and the University of California at Los Angeles. He pioneered studies of the chemistry of multicomponent materials at the high pressures characteristic of planetary interiors; he has developed a new conceptual framework for understanding atmospheric abundances in the Jovian planets. Stevenson's studies of planetary interiors have provided new insights into tidal dissipation effects, heat transport, mixing, core formation and the generation of magnetic fields in the solar system. In addition, he has studied the geophysics and topography of icy satellites.

ASP Bruce Medal to Wilson; Trumpler Award to Hunter

The Astronomical Society of the Pacific has presented the Catherine Wolfe Bruce Medal to Olin C. Wilson and the 1984 Robert J. Trumpler Award to Deidre Hunter, both of the Carnegie Institution of Washington.

Wilson, staff member emeritus of the Mount Wilson and Las Campanas Observatories, received the Bruce Medal in recognition of his pioneering contributions in stellar spectroscopy. Much of his research has concerned certain spectral emission lines arising in the chromospheres of stars, and his studies have resulted in the development of methods both to determine the absolute magnitudes, and thereby the distances, of certain stars and to estimate stellar ages. Systematic investigations Wilson initiated at Mt. Wilson in 1966 have demonstrated that sunlike stars exhibit activity cycles similar to those of our own Sun; these studies continue to yield information on stellar rotation and other properties. Wilson joined the Mount Wilson Observatory in 1931 as a research assistant, becoming a staff member in 1936. He holds the first PhD in astronomy awarded by Caltech and served as president of the Astronomical Society of the Pacific in the 1950s. Since his official retirement in 1974, he has continued his professional work as staff member emeritus of Carnegie's Mount Wilson and Las Campanas Observatories.

Deidre Hunter is the first woman to receive the Trumpler Award, which is presented annually for a PhD thesis of unusual importance to the field of astronomy. She received her doctorate in 1982 from the University of Illinois at Champaign—Urbana, where she worked under the guidance of Jay Gallagher. For her thesis, she investigated in detail the formation of stars in irregular galaxies. She and her colleagues found that giant irregulars produced stars at rates equaling or exceeding those of spiral galaxies; thus the wave pattern thought to compress raw material into new stars in spirals is evidently not everywhere necessary for extensive star formation. At the same time, Hunter found that smaller irregulars were less successful in making new stars. Before coming to Carnegie, Hunter served for two years as a research associate at the Kitt Peak National Observatories (now the National Optical Astronomy Observatories.)