

Previous Von Hippel Winners

The Von Hippel Award bears the name of its first recipient, **Arthur Robert von Hippel**, whose pioneering research and unfettered spirit inspired the prize. Emeritus professor of the Massachusetts Institute of Technology, von Hippel's research in dielectrics, semiconductors, ferromagnetics and ferroelectrics resulted in the publication of two visionary books, *Molecular Science and Molecular Engineering* and *Molecular Designing of Materials and Devices*.

Von Hippel studied electrophysics at the University of Goettingen, which granted him a PhD in 1924. After a decade of teaching and research in Europe he joined the MIT faculty in 1936. It was in his lab that the example of scientists working cooperatively to solve the mysteries of materials from the atomic to the microstructural level first challenged the parochialism that had prevailed before and demonstrated the utility of the interdisciplinary approach which the Materials Research Society fosters and embodies.

The second recipient of the prize, in 1978, was **W. O. Baker**, president of Bell Telephone Laboratories. Baker joined Bell Labs in 1939, having received his PhD in physical chemistry from Princeton the previous year. First as member of the technical staff and subsequently in various leadership positions, he studied solid state materials and macromolecules, dielectric and dynamic mechanical properties of crystals and glasses, information processing technology, and plastics, fibers and natural and synthetic rubbers.

In addition to his research, Baker has devoted himself to numerous civic, governmental and scientific committees and commissions. In 1957 Washington University, where he had done his undergraduate work, awarded him its honorary Doctor of Science degree. At least 17 other institutions of higher education have presented him with similar awards.

David Turnbull, Gordon McKay Professor of Applied Physics at Harvard, was the Von Hippel Award recipient in 1979. A physical chemist by training, Turnbull's research has encompassed a broad range: thermionic emission, thermodynamic properties of gases at high pressures, corrosion in non-aqueous media, diffusion in metals, kinetics of nucleation in solid state transformation, solidification, theory of liquid and glass.

Turnbull received his PhD from the University of Illinois in 1939. He began his career at Case Institute of Technology, then joined the research laboratory of the General Electric Company in 1946, where he remained until he joined the Harvard faculty in 1962.

W. Conyers Herring, 1980 recipient of the prize, is professor of applied physics at Stanford University. He has had a seminal influence on materials science and solid state physics, contributing to the understanding of solid state surfaces that underpins the field of crystal growth, sintering and plastic flow at high temperatures. Together with J. K. Galt he realized and demonstrated that whiskers of high crystalline perfection would exhibit extraordinary mechanical properties.

Herring received his PhD from Princeton in physics in 1937. He taught at MIT, Princeton and the University of Missouri, and from 1941 to 1945 was a member of the War Research staff at Columbia University. He joined Stanford in 1936 after 30 years at Bell Laboratories.

James W. Mayer, the Society's 1981 honoree, is Francis Norwood Bard Professor of Materials Science and Engineering at Cornell University. Mayer has had a profound influence on the development of modern materials science with particular emphasis on semiconductor materials. Almost every area he has worked in has turned out to be important. For example, his research on implantation identified the damage and epitaxial regrowth phenomena long before the technique was accepted as an integral part of the semiconductor industry. He has been a pioneer in the use of ion beam techniques for materials analysis.

Mayer received his PhD in physics from Purdue in 1960. He was with Hughes Aircraft Company until 1967, when he became professor of electrical engineering at Caltech, where he remained until joining Cornell in 1980. Among his other accomplishments at Caltech, he taught scuba-diving for a decade.

Clarence M. Zener, emeritus university professor of Carnegie-Mellon University received the Von Hippel Award in 1982. His contributions to the physics of metals and to mathematics are among the most fundamental and original of any 20th-century scientist. He performed the definitive work on internal friction in solids, and provided the theoretical foundation for a line of research that resulted in the invention of the Zener diode and may be said to underlie the development of semiconductors.

A graduate of Harvard, which granted him his PhD in 1929, Zener accepted a series of academic appointments, interrupted by a 15-year association with Westinghouse Electric Company, during which he built a research institution among the finest in the world. He was appointed university professor at Carnegie-Mellon in 1968.

The Von Hippel Award in 1983 was presented to **Sir Peter B. Hirsch**, Isaac Wolfson Professor of Metallurgy at the University of Oxford and Chairman of the United Kingdom Atomic Energy Authority. The first person to observe dislocations in transmission of electron microscopy, Sir Peter is the author, with others, of the fundamental text in the field, *Electron Microscopy of Thin Crystals*. His *The Physics of Metals*, Vol. II, *Defects*, is equally important. With his colleagues and students, Sir Peter is largely responsible for the elevation of electron microscopy to its preeminent position in the study of the microstructure of materials.

Sir Peter obtained his PhD at Cambridge in 1951. He pursued an academic career, culminating in his appointment to Oxford in 1966 as head of the Department of Metallurgy and Science of Materials. A Fellow of the Royal Society and a recipient of its Royal Medal, Sir Peter has received scores of prizes and honorary degrees, notably the Rosenhain Medal of the Institute of Metals, and the C. V. Boyes Prize of the Institute of Physics and Physical Society. He was made Knight Bachelor in 1975.

Walter L. Brown, Head: Radiation Physics Department, AT&T Bell Laboratories, was the 1984 Von Hippel Award recipient. He has demonstrated an extensive record of achievement in the field of semiconductor science and technology and leadership in university-industry collaboration. His early experiments with Brattain, Schockley and Fletcher laid the foundation of understanding of surface states and inversion layers in silicon and germanium and made possible the developments of MOSFET technology. His interest in semiconductors led to the design of solid state radiation detectors that were flown in the first Telstar experimental communications satellite and were used to determine the nature of the particles that are trapped in the Van Allen belts.

His interest in particle detectors and high energy particle damage led to his involvement in the organization of the Rutgers-Bell Labs Accelerator Program which has served as a model for industry-university collaboration. Brown nurtured an early research program on particle channeling that proved to be an important adjunct to the development of ion implantation doping of semiconductors. His research in sputtering similarly led to significant contributions to application in chemical analysis.

Brown received his PhD from Harvard University, and began his career with Bell Laboratories in 1950.