AWARDS

Geoffrey F. Chew

Hans A. Bethe

APS Prize

Geoffrey F. Chew, professor of physics at the University of California at Berkeley, has been awarded the 1962 American Physical Society Prize sponsored by the Hughes Aircraft Company. The presentation was made on December 28 by the Society's president, W. V. Houston, during the APS winter meeting at Stanford University. Awarded for significant contributions to physics published prior to the recipient's 33rd birthday, the $2500 prize has been presented on only two other occasions—to Donald A. Glaser in 1959 and to George Feher in 1960.

Professor Chew, who was cited for his continuing efforts to understand the interaction of mesons and nucleons, was born in Washington, D. C., in 1924 and received his PhD at the University of Chicago in 1948. He was a member of the Theoretical Physics Division staff at the Los Alamos Scientific Laboratory from 1944 to 1946, and after completing his graduate work he spent two years at the Radiation Laboratory in Berkeley. He was appointed assistant professor of physics at the University of Illinois in 1950, associate professor in 1951, and professor in 1955. He returned to the Berkeley campus of the University of California in 1957 to accept the professorship he now holds.

During the period from 1948 to 1957 his contributions to the theory of elementary particles were reported in more than two dozen papers appearing in *The Physical Review*. These ranged from analyses of specific scattering experiments to his theoretical development of the "impulse-approximation" method of dealing with scattering problems to his introduction of the highly successful "cut-off" model of the pseudo-scalar meson theory at a time when meson theory had been virtually abandoned as a meaningful approach to the problems of elementary-particle interactions.

Rumford Premium

The American Academy of Arts and Sciences awarded its Rumford Premium to Hans A. Bethe of Cornell University on April 10 in recognition of his contributions to the theory of energy production in stars. Professor Bethe is the 53rd recipient of the prize, which was established in 1796 by Benjamin Thompson, Count Rumford. It consists of two medals (one of gold and the other of silver), together with a cash award of $5000, and is given for "the most important discovery or useful improvement . . . on Heat or on Light".

Born in Strasbourg, Professor Bethe received his doctorate in 1928 at the University of Munich, and for the next five years he taught theoretical physics at the Universities of Frankfurt, Stuttgart, Munich, and Tübingen. After Hitler's rise to power in 1933, Professor Bethe left Germany for England, where he spent two years at the Universities of Manchester and Bristol. He came to the United States as an assistant professor of physics at Cornell in 1935, and in 1937 he was appointed to a professorship in the University. Except for an extended leave of absence during World War II when he headed the Theoretical Physics Division of the wartime Los Alamos Laboratory, Professor Bethe has been at Cornell since his arrival in America.

His scientific contributions include the first development (in 1934, in collaboration with Heitler) of the theory of electron-positron pair creation, the development of an improved theory of the stopping power of matter for fast charged particles, fundamental work on the theory of light nuclei, and (in 1938) the formulation of the carbon-cycle theory of stellar energy production. In recent years he has worked in a number of areas of importance to the development of nuclear physics, including quantum field theory, the meson theory of nuclear forces, and the theory of the internal energy of nuclei.

A fellow and former president (1954) of the American Physical Society, Professor Bethe has been honored on numerous occasions for his work in physics. He was named by the Atomic Energy Commission to receive the Enrico Fermi Award for 1961, and in the same year the British Royal Astronomical Society gave him its Eddington Medal. He has also received the A. Cressy Morrison Prize of the New York Academy of Science (in 1938 and again in 1940), the Henry Draper Medal

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This unit is for demonstration of basic principles and effects; it is ·itable for certain advanced studies; and it is particularly designed ·r teaching the elements of Nuclear Magnetic Resonance in the boratory. It is a portable unit; and, due to its high signal-to-noise tio, it is valuable as a lecture demonstration device.

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P. O. Box 3306 • Hayward, California • Telephone SU 2-1300 of the National Academy of Sciences (1948), the Max Planck Medal of the German Physical Society (1955), and the Franklin Medal of the Franklin Institute of Philadelphia (1959).

Research Corporation Award

This year's Research Corporation Award has been presented to Bernd T. Matthias of the Bell Telephone Laboratories and the University of California at La Jolla. The $10 000 Award was given to Dr. Matthias on April 18th for "his discovery of new and unexpected ferroelectrics and superconductors, including those with the highest superconducting transition temperatures and those which have recently been shown to have the greatest potential for the production of large magnetic fields on a scale heretofore considered impossible. . . ."

Dr. Matthias, who was born in Frankfurt, received his PhD in physics from the Federal Institute of Technology in Zurich in 1943. He came to the United States four years later, and after spending a year at the Massachusetts Institute of Technology he became a member of the technical staff of Bell Telephone Laboratories

Bernd T. Matthias

in 1948. During the academic years 1949–51, while on leave from Bell Laboratories, he served as assistant professor of physics at the University of Chicago, and it was there that he began the intensive studies of superconducting materials that he and his colleagues have continued to pursue for the past twelve years.

In announcing the award, the Research Corporation paid particular tribute to Dr. Matthias for his "foresight in recognizing the tremendous technological potential" of high-temperature superconductors. "Investigators all over the world have been stimulated by his researches," the announcement continued. "The most recent tabulation of superconducting materials lists over 500 entries and points out that most of them have been discovered by Matthias and co-workers. His researches have changed superconductivity from what was considered a rare phenomenon to one that is now known to occur quite commonly. In fact, his collaborative research in the past year has led to the discovery that molybdenum and irridium are superconductors and that the failure of previous investigators to uncover superconductivity in these elements was due to trace impurities of iron. This has opened up the possibility that all nonmagnetic metals will become superconducting when prepared free enough from trace impurities.

"His intuitive, uninhibited way of thinking and experimenting has led him to discover superconductivity where it was not at all expected. An early example is a compound containing elements that are normally ferromagnetic and semiconducting, respectively—namely, $CoSi_2$. He and his collaborators were *first* to synthesize the compound Nb_3Sn and discover it to be superconducting with the highest known transition temperature. This compound, together with V_3Ga, and the alloy system Nb-Zr, all of which were discovered by him and collaborators, have recently been found to possess the unexpected property of retaining superconductivity at unusually high magnetic fields, while carrying large electrical currents. As a result these three materials are currently being used in the production of high-magnetic-field superconducting solenoids.

"The multitude of ways in which humanity will benefit by the utilization of the superconducting properties of these materials which he has discovered are still hard to visualize. Most certainly they will make high (in excess of 100 kilogauss) magnetic fields a tool at the disposal of ordinary laboratories and research institutes in contrast to the present situation where they are restricted to a handful of large, expensive installations. The feasibility of obtaining large-volume high-magnetic fields with very little power consumption is having a great impact on, and causing much activity in, the field of controlled nuclear fusion. The use of high-field well-defined magnetic superconducting lenses gives promise of improving the resolution of electron diffraction cameras significantly and could make possible, for example, the direct observation of the atoms responsible for genetic coding in DNA molecules.

"Aside from the technological impact of Matthias' new superconducting systems, his researches have contributed much insight into the nature of superconductivity and its relation to ferromagnetism. Matthias has found that certain crystal structures such as the beta-tungsten and Laves phases are the most favorable for the occurrence of superconductivity and that within these structures the transition temperature is an oscillatory function of the average valence electron concentration per atom. Empirical relations which he has formulated are known in the literature as 'Matthias Rules' and have proved to be a useful guide. The application of these rules led, for example, to the discovery of the now famous Nb_3Sn.

"Recently he has discovered some systems that are simultaneously ferromagnetic and superconducting de-