AWARDS

Nobel Prizes

On December 10, in Stockholm, the 1964 Nobel Prize in physics was awarded jointly to Charles H. Townes of the Massachusetts Institute of Technology, who received half of the $53 000 prize money, and to Nikolai G. Basov and Aleksandr M. Prokhorov of the Lebedev Institute of Physics in Moscow, who shared the other half. The three men were honored for "fundamental work in the field of quantum electronics which led to the construction of oscillators and amplifiers based on the maser-laser principle".

Work on masers dates back to 1951 when Purcell and Pound produced induced emission in a LiF crystal. However, the gain was well below unity. In 1953, J. Weber published a paper proposing means of obtaining stimulated amplification from crystals and from gases. The following year Gordon, Zeiger, and Townes of Columbia University reported that they had produced an operating maser. Meanwhile Basov and Prokhorov had been working independently in Moscow, and in 1954 they also reported that they had achieved maser action.

The next step was the extension of the stimulated emission technique from microwave to optical wavelengths. Possible approaches were discussed by Prokhorov and by R. H. Dicke, and in 1958 Townes and Schawlow proposed that an optical maser could be produced with a Fabry-Perot interferometer. Two years later, T. H. Maiman constructed the first operating laser.

Dr. Townes, who was born in Greenville, S.C., earned his bachelor's degree at Furman University and did his graduate work at Duke University and the California Institute of Technology. He received his PhD from Caltech in 1939. After several years with Bell Telephone Laboratories, Dr. Townes joined the faculty of Columbia University, where he later served as head of the Physics Department (1952-55) and director of the University's Radiation Laboratory (1950-52). In 1961, he was appointed provost of MIT.

1964 Nobel laureates in physics: A. M. Prokhorov, C. H. Townes, and N. G. Basov

A. M. Prokhorov graduated from Leningrad University in 1939. After service in the Soviet army during World War II, he joined the Lebedev Institute as a senior associate, and he became chief of the Oscillation Laboratory there in 1954.

N. G. Basov was graduated from the Moscow Engineering and Physics Institute in 1950. Two years before, he had joined the staff of the Lebedev Institute as a laboratory assistant. He earned the degree of Doctor of Physical-Mathematical Sciences in 1957 and in 1958 became deputy director of the Institute.

The 1964 Nobel Prize in chemistry was awarded to an English crystallographer, Dorothy Crowfoot Hodgkin, Wolfson research professor of the Royal Society and professorial fellow of Somerville College, Oxford. Professor Hodgkin was honored "for her determinations by x-ray techniques of the structures of important biochemical substances". Notable among her achievements was the analysis of the complicated molecule, vitamin B_{12}, announced in 1955, which enabled the vitamin to be synthesized and used in the treatment of pernicious anemia. She and her coworkers are also credited with the complete structure analysis of pencillin.

J. M. Burgers

Bingham Medal

On October 27, during the annual meeting of the Society of Rheology at the Mellon Institute in Pittsburgh, the Society's Bingham Medal for 1964 was presented to Johannes M. Burgers of the University of Maryland. The medal, which is given annually for outstanding contributions to rhe-

ology, was awarded to Dr. Burgers for his contributions to general rheology and for his work on the flow of crystalline solids. His research on crystal imperfections and the effect of dislocations in plastic flow is regarded as fundamental to the subject and has been recognized by the naming of the Burgers circuit in lattice theory and the Burgers vector in dislocation theory.

A native of Arnhem, Holland, Dr. Burgers received his doctoral degree in mathematics and physical science from the University of Leiden in 1918. He subsequently served as professor of aerodynamics and hydrodynamics at the Technical University of Delft, and in 1955 was appointed to his current position of research professor in the Institute for Fluid Dynamics and Applied Mathematics at the University of Maryland. He is a fellow of the American Physical Society.

Franklin Institute awards

Gregory Breit, professor of physics at Yale University, received the 1964 Franklin Medal, highest honor of the Franklin Institute, at ceremonies held in Philadelphia on October 21. Professor Breit was cited by the Institute for "his more than forty-five years of research in physics, during which he pioneered in fields of increasing importance to our knowledge of nuclear structure, and especially for his theoretical analyses of the results of scattering experiments, which have given us an understanding of the quantitative features of nuclear forces". The

Gregory Breit

E. W. Mueller

gold medal, established in 1914, is awarded annually in recognition of achievements leading to the advancement of the knowledge of physical science or its applications.

Professor Breit is widely recognized for his part in the development of the Breit-Wigner theory of nuclear resonances and for his many contributions in areas of physics ranging from quantum theory to ionospheric research. A native of Nikolaiev, Russia, he emigrated to the United States in 1915 and was educated at Johns Hopkins University. He served as a mathematical physicist at the Carnegie Institute in Washington for several years, and later taught physics at New York University and the University of Wisconsin. After war-time service in the Manhattan Project, he joined the Yale faculty in 1947, and in 1958 was appointed the first Donner professor of physics at Yale.

In other awards, the Franklin Institute presented one of two Elliott Cresson Gold Medals given this year to Sir Richard Southwell of Trinity College, Cambridge, for his work in solving buckling problems in elastic materials, and for applying the relaxation method to solve differential equations having arbitrary boundary conditions. The second Elliott Cresson Medal went to Robert R. Wilson, professor of physics and director of the Laboratory of Nuclear Studies at Cornell University, for his contributions to particle-accelerator research, and in particular for his work in designing the instrumentation to control, measure, and direct beams of high-energy particles. The Cresson Medal has been given since 1848 for discoveries or applications of research "adding to the sum of human knowledge, irrespective of commercial value".

The Howard N. Potts Gold Medal of the Franklin Institute was awarded to Erwin W. Mueller, professor of physics at Pennsylvania State University, for his invention and perfection of the field-electron-emission microscope and the field-ion microscope. The Potts Medal for distinguished work in science was established in 1906.

Two of the Institute's John Price Wetherill Silver Medals went to Bernd T. Matthias of the University of California at San Diego and Bell Telephone Laboratories and to John K. Hulm of Westinghouse Research Laboratories for their low-temperature studies on more than three hundred superconducting materials, more than half of which they discovered or significantly re-evaluated. A third Wetherill Medal was given to J. E. Kunzler, also of Bell Telephone Laboratories, for his discovery of the remarkable capabilities of superconductors when subjected to strong magnetic fields and high current densities. P. R. Bell of Oak Ridge National Laboratory received an Edward Longstreth Silver Medal for his work in developing a scintillation spectrometer used in medical research and diagnosis.

Michelson Award

Haldan K. Hartline of the Rockefeller Institute has received the annual Albert A. Michelson Award of the Case Institute of Technology. The $5000 award was presented to Dr. Hartline in recognition of his research on sense organs and especially his discoveries in the physics and biology of visual perception.

Dr. Hartline is known for his pioneering work in applying measuring techniques to minute parts of the nervous system in order to gauge the electrical activity associated with sight. Through his work on the human retina in the 1920's, he demonstrated the feasibility of studying the electrical events in the eye and the visual response of the subject at the