Dr. Hannes Alfven honored for plasma physics, astrophysics achievements

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Dr. Hannes Alfven, professor of applied physics in residence, University of California, San Diego, has been granted the highest award of the Soviet Academy of Sciences for 1971 for "outstanding achievements in plasma physics and astrophysics."

Alfven was notified by cable from Moscow that the presidium of the academy had voted to award him the Lomonosov gold medal. Academy president Matislav V. Keldysh, who signed the cable, said the medal is the organization's highest recognition.

Alfven, regarded as the father of the modern discipline of classical physics known as hydromagnetism, or magnetohydrodynamics, was awarded the Nobel prize for physics in 1970. In 1971, he received the Franklin Medal from the Franklin Institute.

The Swedish scientist, who divides his time between UCSD and the Royal Institute of Technology in Stockholm, is the author of numerous books and more than 100 articles in his fields of specialization.

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Dr. Hannes Alfven was born in Norrkoping, Sweden, on May 30, 1908, of parents who were both practicing physicians. He became docent and Ph.D. at the University of Uppsala in 1934; Professor of Electronics, Royal Institute of Technology, Stockholm, 1940-64; Professor of Plasma Physics, 1964 to the present, also at the Royal Institute of Technology.

Alfven is usually regarded as the father of the modern discipline of classical physics known as hydromagnetism, or magnetohydrodynamics, a first-class discovery of our era, with wide applications in geophysics, planetary sciences, and astrophysics. He systematically developed the subject, essentially one in which there is fluid flow of an electro-conducting medium of planetary extent in the presence of a magnetic field, a part of the physics of large dimensions. As such, it has been used by Alfven and by such workers as Elsasser, Bullard, and others in modern dynamo theories of the geomagnetic field and its secular variation. He also developed a theory of magnetic storms which examines the encounter of the earth's magnetosphere with solar streams of plasma. In this area his theory is different from others in estimating consequences of a weak electrical field in the plasma interacting with charged particles in the atmosphere to produce aurora and associated polar magnetic disturbances as well as magnetic storms.

His book on "Cosmical Electrodynamics" which appeared in 1950 is certainly of classical interest in the foregoing areas. Many results have been checked experimentally in the laboratory in which he and his students studied features of the flow of liquid mercury in a strong magnetic field. His more recent books are entitled "Origin of the Solar System," 1959; (with C. G. Falthammer) "Cosmical Electrodynamics, Fundamental Principles," 1963, and "Worlds - Antiworlds," 1966.

He also applied his electrodynamics to solar physics, and especially to electrical phenomena of the sun, and his studies, together with those of many others, are basic today. Another contribution to geophysics, though on a loftier scale, is his re-examination of theories of the origin of the solar system, in which he has found significant

effects due to electrical properties of an initial gaseous medium. Alfven has developed theories of the origin of cosmic rays and cosmic magnetic fields. He has also pioneered in studies of the stability of a magnetized plasma. He has published over one hundred papers on plasma physics, magnetohydrodynamics and astrophysics.

Alfven served as Senior Lecturer in UCSDs Department of Applied Physics and Information Science from 1967 to 1970 when he became Professor in Residence in the department. He spends six months of each year at UCSD, and the balance of each year at the Royal Institute of Technology, Stockholm.

Alfven became a Nobel laureate in physics in 1970. In 1971 he was awarded the Franklin Medal of the Franklin Institute. Also in 1971, he was granted the Lomonosov gold medal, highest award given by the U.S.S.R. Academy of Sciences, for "outstanding achievements in plasma physics and astrophysics."

Alfven is a Foreign Associate Member of the National Academy of Sciences (U.S.) and a member of the Akademia Nauk (U.S.S.R.).

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