Hubert Heffner

1924-1975

By John R. Whinnery

Hubert Heffner, Professor of Applied Physics at Stanford University, died on April 1, 1975. He was a brilliant researcher, an inspiring teacher, and a tireless contributor to the Academy, to the U.S. Government, and to his profession.

Dr. Heffner was born in Lincolnton, North Carolina, on December 26, 1924. He received his Bachelor of Science degree in physics in 1947, his Master's degree in electrical engineering in 1949, and his Doctor of Philosophy degree in electrical engineering in 1952, all from Stanford University. Following two years of research at the Bell Telephone Laboratories, Murray Hill, New Jersey, he was appointed Assistant Professor of Electrical Engineering at Stanford in 1954, was advanced to Associate Professorship in 1957, and became Professor of Electrical Engineering and Applied Physics in 1960. He was Acting Chairman of the Applied Physics Division at Stanford in 1962, Associate Provost and Dean of Research for the period 1963-67, and was Chairman of the Applied Physics Department at the time of his death.

On a leave from Stanford in 1960-61, Dr. Heffner served as Scientific Liaison Officer for the London Office of the U.S. Office of Naval Research. His most important assignment with the Federal Government came on a second leave in 1969-71, when he served as Deputy Director of the Office of Science and Technology of the President. Lee DuBridge was Director at that time, and Much important policy was formulated on a variety of issues,

including transportation, telecommunications, and early studies of the energy problem. Dr. Heffner was a member of many important advisory committees for the Government and for his professional societies. Among these were the "Tycho" Space Science Study Group for the National Aeronautics and Space Administration and the Advisory Group on Electron Devices of the Department of Defense. He was Chairman of the Working Group on Microwave Devices of this last organization for the period 1961-67. Other prestigious boards on which he served included the Defense Science Board, the General Advisory Committee of the Atomic Energy Commission, the President's Committee on the National Medal of Science, and the National Science Board.

Dr. Heffner was active on Academy assignments as well. He was a member of the National Academy of Engineering (NAE) Committee on Engineering Manpower Policy and Chairman of the Panel on Education of the NAE Project Committee from 1972 to 1975. In the National Research Council he served on the U.S. National Committee for the International Union of Radio Science (URSI) and was U.S. Chairman for Commission VII of that body. He served also on the Committee for AEC Postdoctoral Fellowships and the Evaluation Panel for the National Bureau of Standards' Institute of Applied Technology. In the Institute of Electrical and Electronics Engineers (IEEE), he was a Member of the Editorial Board for the Transactions of the Professional Group on Electron Devices (GED), Vice-Chairman of the GED, Chairman of the Inter-Society Joint Council on Quantum Electronics, and a member of the Board of Directors from 1968 to 1970. He was a Fellow of both the IEEE and the American Physical Society.

While at the Bell Laboratories, Heffner, working with Clogston, did some of the first fundamental work on periodic focusing for traveling wave tubes, resulting in a classic paper and several patents on that subject. Traveling wave tubes before that time were solenoid-focused, but now almost universally employ the lighter and less costly periodic focusing methods. His analysis of the backward-wave tube in 1954 was also the standard reference on that device during the important period of its development. At Stanford University he continued his definitive analyses of the

newer microwave devices, including parametric amplifiers, E-type traveling-wave devices, and masers. The latter part of his work focused on quantum electronics with special analysis of quantum noise problems, nonlinear effects, and the quantum limits on measurement. He guided the work of many influential graduate students in both the microwave and quantum electronics fields and was known as a clear and incisive teacher. He was a much sought-after consultant both for industry and for policymaking organizations of the government.

At the time of Dr. Heffner's death, Norman Hackerman, Chairman of the National Science Board and President of Rice University said, "It is with deep regret that the Board learned of the death of Dr. Heffner. We knew him as an especially able scientist, and a thoughtful and dedicated administrator particularly interested in and knowledgeable in the area of science policy. Equally important, he was recognized by his students and his colleagues as a skillful teacher. His wisdom will be greatly missed." H. Guyford Stever, then Director of the National Science Foundation, stated, "Dr. Heffner made substantial contributions to the academic and scientific communities, industry, and international bodies through his scientific expertise and wise counsel. Significant among these were his efforts as a member of the Science Policy Working Group of the U.S.-U.S.S.R. Joint Commission on Scientific and Technical Cooperation. He will be missed by his colleagues and by the larger community he served so willingly and so well."

Hu Heffner is much missed by all who knew and worked with him, but he left a fine legacy of classic, fundamental papers and enduring contributions to sound policy for our country.