1990 Pioneer Award

Hatsuaki Fukui

"For the introduction of constant noise figure- and constant gain-circles on the Smith chart, and their impact on microwave amplifier design".

The recipient of the first MTT-S *Pioneer Award* is Dr. Hatsuaki Fukui. This new award recognizes important technical contributions that have had continuing impact on the practice of microwave engineering for a period exceeding twenty years. Eligibility is based on publication of the contribution in an archieval journal by an individual or team not exceeding three persons. The work was reported in the paper: H. Fukui, "Available Power Gain, Noise Figure, and Noise Measure of Two-Ports and Their Graphical Representations", *IEEE Trans. on Circuit Theory,* vol. CT-13, pp. 137–142, June 1966.

Hatsuaki Fukui (SM'69,F'83), born in Yokohama, Japan, in 1927, was graduated from Miyakojima Technical College, Osaka, and received a Doctor of Engineering degree from Osaka University, Osaka.

Between 1949 to 1954 he did research on microwave electron tubes (Osaka City University) and worked on microwave test equipment (Shimada Physical and Chemical Industrial Co., Tokyo.) In 1955 he joined what is now the Sony Corporation to work on semiconductors. He is regarded as a pioneer in realizing the all-transistor TV. In 1960 after successfully producing prototype transistors for TV use, he managed the development of the then new Esaki (tunnel) diodes. He authored forty papers and a book on this topic. In January 1962 he became Manager of the Advanced Technology Department of the Engineering Division to develop the future generation of consumer electronics products such as solid-state UHF TVs and advanced audio equipment.

In October 1962, Dr. Fukui joined Bell Telephone Laboratories, Murray Hill, NJ, as a Member of the Technical Staff. He worked first on microwave transistor amplifiers, then on Ge and Si transistors, GaAs bulk-effect devices and Si avalanche diodes, and their circuit applications. From 1966 to 1973 he led research and development of electro-optical devices and subsystems for future PICTUREPHONE use. He also supervised work on the new vacuum deposition technique for III-V compound semiconductors which brought the invention of the gas-dource MBE and its practical use in 1970. From 1973 to 1981 Dr. Fukui was involved in GaAs FET development, working on device modeling, design, fabrication, characterization and reliability studies. In 1981 he became the technical liaison to accomodate long-wavelength lasers for undersea lightwave communication systems. He retired from the AT&T Bell Laboratories at the end of 1989.

Dr. Fukui is the author or co-author of three technical books, the editor of an IEEE Press book, and a contributor to a semiconductor handbook. He has published more than 100 technical papers. He is a Fellow of the IEEE, a member of the MTT-S Transactions Editorial Board, and a member of the IEEE Committee on U.S. Competitivness. As a member of the Electron Devices Society, he served on the Standards Committee (P642) on Microwave Transistor Characterization. He was a member of the Steering Committee on the Institute of Television Engineers of Japan from 1973 to 1974. He received the MTT-S 1980 Microwave Prize and the Inada Award of the Institute of Electrical Communication Engineers of Japan in 1959.