

1990 Microwave Career Award

Robert A. Pucel

The *Microwave Career Award* is presented to an individual “for a career of meritorious achievement and outstanding technical contributions in the field of microwave theory and techniques”. It is the highest award given by the Microwave Theory and Techniques Society. The 1990 Microwave Career Award recipient is Dr. Robert A. Pucel.



Robert A. Pucel (S'48, A'52, M'56, SM'64, F'79) attended M.I.T. and received the bachelor's and master's degrees in 1951. Enrolled in the Cooperative Program his first industrial experience was obtained with the General Electric Company. After a year at the newly formed Raytheon Research Division he returned to M.I.T. to pursue doctoral studies in time-domain synthesis under the late Prof. E.A. Guilleman.

Upon receipt of his degree, Dr. Pucel returned to the Research Division at Raytheon where, as a member of the Theoretical Physics Group, he collaborated on basic studies of bipolar transistors and their potential use at high frequencies. Later he turned his interest to microwave devices and in 1962 Dr. Pucel developed the first comprehensive analysis of the tunnel diode as a microwave mixer.

About this time he joined a group which was developing and characterizing ferroelectric materials for microwave applications. In 1964 Dr. Pucel proposed the use of high dielectric constant substrates such as alumina for the miniaturization of microwave circuits. During this period he formed a group that collaborated on basic studies of propagation of microwaves on conductors printed on dielectric and magnetic substrates, now known as “microstrip”. Two results of this work were the discovery of dispersion and a more accurate method of calculating conductor losses on microstrip.

After five years of research in this area, he returned to bipolar transistors, work now centered in another division. In the period 1969–1972 he and a colleague developed (and later patented) a means of interconnecting individual cells of a power transistor, a technique later to be known as the “air-bridge”. Returning to the Research Division in 1972, he collaborated on fundamental studies on microwave semiconductor devices such as avalanche diodes and the then new GaAs FET. These studies, which were described in numerous publications not only covered the signal theory of these devices but also their noise properties. A new model for the GaAs FET developed at Raytheon has served as the basis for many later treatments throughout the industry.

In 1974 Dr. Pucel was promoted to Consulting Scientist, Raytheon's highest technical level. During this period he and colleagues conducted a theoretical and experimental study of the FET mixer, which earned them the 1976 MTT-S Microwave Prize.

By 1978 Robert Pucel and his colleagues embarked on an intensive research program to establish the feasibility of fabricating active microwave circuits on GaAs chips entirely by semiconductor processing methods. This technique, now known as the monolithic microwave integrated circuit (MMIC) approach, has come to dominate the microwave field. Dr. Pucel published one of the first papers on this topic in 1979. In 1981, in recognition of his pioneering work he was selected by the Microwave Theory and Techniques Society to be its National Lecturer. In this role, and in the years to follow, he delivered some eighty lectures to promote the MMIC concept. He was selected in 1984 to be the Editor of the IEEE Press reprint volume on MMICs.

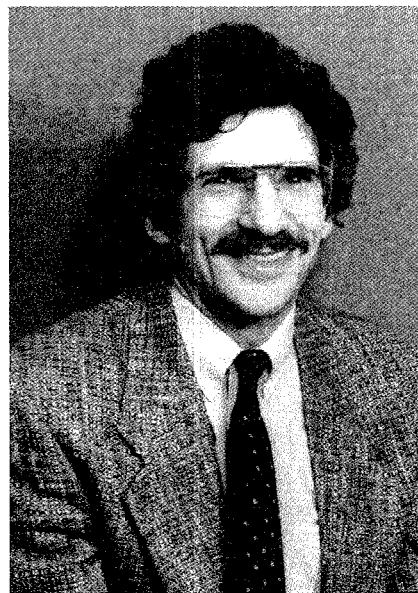
Dr. Pucel, a Fellow of the IEEE, has authored over eighty technical papers and two book chapters on microwave topics and holds twenty-one patents on various microwave components. In 1987 he was granted an Excellence in Technology Award by Raytheon, its most prestigious award, in recognition of his technical contributions.

1990 Microwave Applications Award

Allen F. Podell

“For pioneering practical GaAs MMIC circuits for commercial use in the form of a single chip microwave radio for satellite TVRO systems.”

The *Microwave Applications Award* is presented periodically for an outstanding application of microwave theory and techniques. The eligibility requirements are the creation of a new device, component or technique, novel use of components, or both. This years recipient is Mr. Allen F. Podell.



Mr. Podell has been a long time innovator and leader in the microwave field. From 1960 to 1964 he developed Anzac's unique line of ultra broadband RF couplers, mixers, hybrids, combiners, and switches. Later, at Adams Russell he developed a variety of broadband microwave components. In recent years he has been an advocate of MMIC technology, particularly as applied to commercial products. He has innovated the use of cell libraries for MMIC design, interactions with foundries, and a design philosophy that attempts to match the capabilities of MMICs and systems performance needs.

Allen F. Podell (S'60,M'61,SM'77), Senior Vice President and Director of Technology Development, Pacific Monolithics, Inc., Sunnyvale, CA received the B.S. degree in Engineering Physics from Cornell University and completed graduate courses at the Universities of California and Harvard. From 1960 to 1964 he was the co-founder and chief engineer of Anzac Electronics.

He was a Peace Corps member from 1964 to 1966 and managed road construction performed by 350 Tanzanian laborers, returning to Anzac from 1966 to 1968. In 1968–1970 he was with Adams Russell as Corporate Director of Product Innovation, during which he developed numerous components including broadband hybrids, transformers, phase shifters, amplifiers, and special purpose test equipment. He held key positions at Stanford Research Institute (1970–1972), Hewlett-Packard (1972–1977), Varian Associates (1977–1978), and formed Allen F. Podell & Associates (1978–1984) to consult on a variety of projects including both microwave products and electromechanical applications.

In 1984 he was with the nucleus who founded Pacific Monolithics, Inc. He has written over 30 technical papers and is the author or coauthor of 20 U.S. Patents. Allen Podell is a Senior Member of the IEEE and a regular participant in MTT-S panels and conferences.

1990 MTT-S Microwave Prize

Mitsutaka Hikita

Yoshikatsu Ishida

Toyoji Tabuchi

Kazuhito Kurosawa

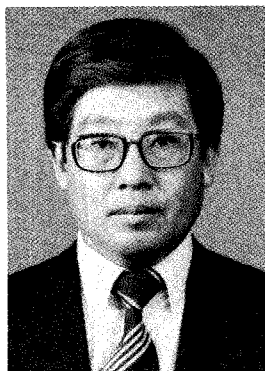
The *Microwave Prize* is awarded annually to the author(s) of that paper, published in the IEEE Transactions on Microwave Theory and Techniques, Proceedings of the IEEE, or any official IEEE publication, which is judged to be the most significant contribution in the field of interest of the Society. The paper must have been published in the calendar year prior to its selection.

The 1990 Microwave Prize has been awarded to Dr. Mitsutaka Hikita, Mr. Yoshikatsu Ishida, Mr. Toyoji Tabuchi, and Mr. Kazuhito Kurosawa, all with Hitachi, for their paper "Miniature SAW Antenna Duplexer for 800-MHz Portable Telephone Used in Cellular Radio Systems", *IEEE Trans. on Microwave Theory and Techniques*, vol. MTT-36, No. 6, June 1988, pp. 1047-1056.

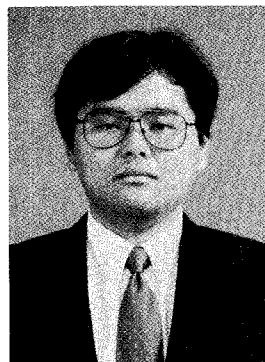
Mitsutaka Hikita (M'87) received the B.S., M.S. and Ph.D. degrees in electronics engineering, all from Hokkaido University, Sapporo, Japan, in 1972, 1974, and 1977, respectively. From 1977 to 1978, he was a Post Doctoral Fellow in Hokkaido University. In 1978, he joined Central Research Laboratory, Hitachi, Ltd., Tokyo. From 1972 to 1978, he was engaged in research on electromagnetic field problems, microwave acoustics, and acoustooptic interactions. From 1978 to 1983, he worked on high performance SAW filters for radio communication equipment. Recently, he has been engaged in RF system design for cellular radio, as well as advanced application of SAW technologies. Also since 1986, he has been a Senior Researcher and a Group Leader of the SAW Design and Development Department at the laboratory. He is a member of IEEE and of the Institute of Electronics and Communication Engineers of Japan.



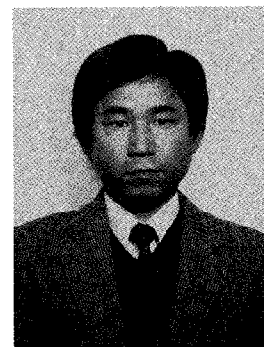
Yoshikatsu Ishida graduated from the electric course of Miyazaki Technical High School, Miyazaki, Japan in 1963. He joined the Taga Works, Hitachi Ltd., Ibaragi, in 1963. Since joining Hitachi's Tokai Works in 1973, he has been engaged in the development of audio equipment, SAW filters for cellular radio, and SAW filter application devices.



Toyoji Tabuchi graduated from the electric course of Tadotsu Technical High School, Kagawa, Japan in 1967. He joined the Central Research Laboratory, Hitachi, Ltd., Tokyo, in that year and worked on laser applications and liquid crystals devices until 1979. Since 1980, he has been engaged in research on low loss SAW filters and their applications for cellular radio. He is a member of the Institute of Electronics and Communication Engineers of Japan.



Kazuhito Kurosawa received the B.S. degree in electronics engineering from Ibaragi University, Ibaragi, Japan, in 1985. He joined Tokai Works, Hitachi, Ltd. in 1985 and has since been engaged in development of SAW filters. He is a member of the Institute of Electronics and Communication Engineers of Japan.



1990 Distinguished Service Award

H. George Oltman

“For his outstanding and dedicated service to the Society.”

The *Distinguished Service Award* is presented to honor an individual who has given outstanding service over a period of years for the benefit and advancement of the Microwave Theory and Techniques Society. The 1990 recipient is Mr. H. George Oltman, Vice President and Director of Engineering at Tecom Industries. George Oltman has served MTT-S in a variety of roles for many years. He has a keen sense of the issues and a knack for problem solving. His advice is constantly sought and usually followed. His steady leadership has greatly benefitted the Society.



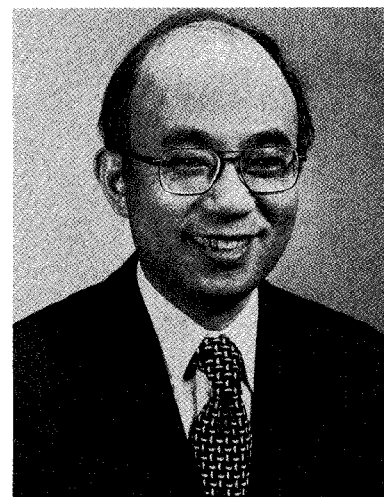
H. George Oltman (A'50, M'55, SM'57, F'83) was educated in physics at University of New Mexico, (B.A. 1950, M.S. 1956), he joined the Antenna Laboratory of the Sandia Corporation, and the IRE in 1950. Prior to Tecom he was a senior scientist in the Missile Division of Hughes Aircraft and a member of the technical staff with the Physical Research Center at TRW Systems. Earlier, he was on the engineering staff of Rantec, and was antenna group manager at Electronic Specialty. He has published 35 papers and numerous patents describing his work on antennas, passive components, mm-wave components, and microwave sources. He received the Lawrence A. Hyland Patent Award, Hughes' most prestigious, for his microstrip dipole antenna patents.

George Oltman has had a longstanding commitment to IEEE. In 1956 he was chairman of the Albuquerque PGAP. Later he served as Los Angeles chapter chairman of both G-MTT and G-AP and vice chairman of the Los Angeles council. Since his election to AdCom 1973 he has held many posts including finance chairman, MTT-S Directory editor, associate editor of the Transactions, vice president, and president (1984). He has continued to serve, most recently as chair of the Symposium Site Selection Committee. Mr. Oltman is a Fellow of the IEEE, a Fellow of the British Interplanetary Society and 1984 recipient of the ARFTG Distinguished Service Award.

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 archival 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-source 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 accommodate 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. Competitiveness. 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.

1990 N. Walter Cox Service Award

Peter W. Staecker

“For exemplary service given in a spirit of selfless dedication and cooperation”

The *N. Walter Cox Service Award* recognizes a individual for his contributions to MTT-S and for the manner in which they have been provided. The Award has been established to perpetuate the memory of N. Walter Cox who worked generously and modestly for the benefit of the Society. Walter Cox approached every person or problem with a positive and enthusiastic attitude. He was diligent, courageous, flexible and untiringly gave support to others. The N. Walter Cox Award is given aperiodically to a society volunteer whose efforts on behalf of MTT-S best exemplify the spirit and dedication of Walter Cox.

This years recipient is Peter W. Staecker. He joined the AdCom of MTT-S as secretary in 1985 and became an elected member in 1986. In his brief time on AdCom he has distinguished himself as Newsletter Editor (1987–1989). He was MTT-S Boston Chapter Chairman (1981–1982) and Special Sessions Chairman for the 1983 International Microwave Symposium. He is the General Chairman of the 1991 Symposium Steering Committee.

Peter W. Staecker (S'63,M'72,SM'87) received the B.S. and M.S. degrees from M.I.T. in 1964 and 1968, respectively, and the Ph.D. in Electrical Engineering from the Polytechnic Institute of Brooklyn in 1970. From 1972 to 1986 he was a member of the technical staff at the M.I.T. Lincoln Laboratory. He is presently Vice President, Engineering, at MA/COM, Burlington, MA.

1990 IEEE Fellow Awards

Twenty-eight members of the Microwave Theory and Techniques Society were elected to the grade of Fellow of the IEEE. Of these, ten were evaluated by MTT-S. The names and citations for these ten are listed below.

John W. Archer	<i>For contributions to low-noise millimeter-wave design.</i>
Anand Gopinath	<i>For contributions to the analysis of microstrip discontinuities and to the development of microwave integrated circuits.</i>
Ho-Chung Huang	<i>For contributions to the understanding of solid-state devices and the development of GaAs FET power amplifiers for space applications.</i>
Louis S. Napoli	<i>For research in GaAs power transistors at microwave frequencies.</i>
John M. Owens	<i>For contributions to the understanding and application of magnetostatic waves in the microwave frequency bands.</i>
Tullio E. Rozzi	<i>For contributions to the theory and modeling of propagation in waveguides with discontinuities.</i>
Joseph A. Saloom	<i>For technical leadership in research and development public policy and in the development and production of microwave devices.</i>
Roberto Sorrentino	<i>For contributions to the modeling of planar and quasi-planar structures for microwave and millimeter-wave circuits.</i>
Rodney S. Tucker	<i>For contributions to microwave frequency optoelectronic circuits and the direct modulation of high-speed semiconductor lasers.</i>
Tsukasa Yoneyama	<i>For contributions to the development of nonradiative dielectric waveguide technology.</i>

The names and citations for those MTT-S members who were evaluated by another Society are given next. The evaluating society is also noted.

Donald G. Dudley, AP	<i>For contributions to electromagnetic target identification, and leadership in education and engineering practice.</i>
Morris Engelson, EMC	<i>For contributions to the practice and application of spectrum analysis, and leadership in its test instrumentation.</i>
Harold R. Fetterman, LEO	<i>For contributions in extending optical technologies into the submillimeter and millimeter wave ranges.</i>
A. Ray Howland, IM	<i>For leadership of the development and production of automated microwave instrumentation systems.</i>
Chenming Hu, ED	<i>For contributions to the understanding of hot-electron effects in MOS devices.</i>
Howard R. Jory, ED	<i>For technical leadership in the development of gyrotrons.</i>
Ismo V. Lindell, AP	<i>For contributions to electromagnetic theory and for the development of education on electromagnetics in Finland.</i>
Christoph E. Mahle, COMM	<i>For contributions to the theory, development, application, and measurement of transponder nonlinearity modeling for communications satellites.</i>

Nino A. Masnari, Ed	<i>For contributions to educational and research program development in electronic materials processing.</i>
Richard E. Matick, COMP	<i>For contributions to the development of digital storage systems.</i>
Umberto Mengali, COMM	<i>For contributions to the theory of synchronization in digital communication systems.</i>
David M. Pozar, AP	<i>For contributions to the electromagnetic analysis, development, and design of microstrip antennas and phased arrays.</i>
John L. Prince, III, CHMT	<i>For contributions to the development of computer-aided design tools for electronic packaging.</i>
Anthony J. Rustako, Jr., VT	<i>For contributions to the implementation of diversity combining techniques in cellular mobile radio systems.</i>
Allen Taflov, AP	<i>For contributions to the development of the finite-difference time-domain numerical solution of Maxwell's equations.</i>
Takeo Takemoto, ED	<i>For technical leadership in development and production of color cathode ray tubes and other display devices.</i>
Leung Tsang, AP	<i>For contributions to wave propagation in discrete random media and the theory of microwave remote sensing.</i>
Carmin Vittoria, MAG	<i>For contributions to the understanding of the microwave properties of magnetic materials and their applications in microwave technology.</i>