

# Elected Honorary Life Member



Tatsuo Itoh

**P**ROFESSOR Tatsuo Itoh (born in Tokyo, Japan, in 1940), who is a widely known and highly respected member of the international microwave community, has just been elected an Honorary Life Member of the Microwave Theory and Techniques Society by its Administrative Committee. He becomes the 7th living member of this distinguished group, and the 11th member to be elected over the 42-year existence of the MTT Society. The last person in this group was elected in 1982, a dozen years ago.

The eligibility requirements for election to the position of Honorary Life Member are listed in the Society's By-Laws and Procedures Manual. These eligibility requirements are presented in the accompanying box on the next page, together with a list of the other Honorary Life Members and the years in which they were elected. In satisfaction of the eligibility requirements, Prof. Itoh was found by the Administrative Committee to be truly exceptional in all of the categories listed.

Within the first category, Prof. Itoh's contributions have made important and unusual impacts; they are not only technical in nature, but arise also from his activities as an educator and as an ambassador of good will between the Asian countries and the United States.

Regarding his technical contributions, Prof Itoh is one of the most active and prolific researchers in our field. He has published about 200 journal papers, and about 350 refereed conference publications. In addition, he is the author of 15 book chapters, and editor of two books, a 1987 reprint volume, *Planar Transmission Line Structures* (IEEE Press, 1989) and an edited volume of contributions, *Numerical Methods for Microwave and Millimeter-Wave Passive Structures* (Wiley Interscience, 1989). This exceptional productivity is the result of an unusually fertile technical imagination and a mind that is constantly bubbling with new ideas.

His research contributions fall into two broad categories: the numerical analysis of passive structures and its application to a variety of novel passive components, and electromagnetic-wave approaches to solid-state devices, which he calls device-wave interaction.

Within the first of these two categories, everyone would agree that the spectral-domain method is the most successful

and widely used numerical analysis method for printed-circuit transmission lines for microwave and millimeter-wave integrated circuits. Professor Itoh is generally acknowledged as the major contributor and pioneer in the development of this method; he later generalized the procedure and provided it with greater physical understanding. That alone was a highly important technical contribution, but it formed only the first step in a prolific career. Besides exploring and improving many other types of numerical techniques, Prof. Itoh has investigated a large variety of passive components for closed waveguides, dielectric waveguides, and microwave integrated circuits, such as filters, diplexers, E-plane techniques and structures, and antennas for microwave integrated circuits. In all cases, however, his focus was on nonconventional and novel types of passive components. Most recently, he has been devising new components based on dominant-mode leakage effects in microwave and millimeter-wave integrated circuits; an example is a leaky-wave directional coupler where the coupling lines are spaced apart from each other to avoid manufacturing difficulties and excessive close-spacing sensitivities at higher frequencies.

His second broad research category combines electromagnetic waves with solid-state circuitry, including active and nonlinear devices. At higher frequencies, these devices can no longer be treated as lumped, but require a distributed-wave treatment. Prof. Itoh is characterizing active microwave integrated circuits numerically by using electromagnetic wave techniques rather than network models. In this context, he is currently applying modified finite-difference time-domain (FDTD) methods for modeling microwave circuits containing active devices under large-signal operating conditions. His activities include theoretical analyses, experimental demonstrations, and development. Much of this effort has been directed toward quasi-optical structures and components, such as mixers, frequency doublers, and spatial power combining. Out of these studies, he created a new research area called "active integrated antennas," which is beginning to have important impact on new wireless technology.

Professor Itoh has also engaged to some extent in consulting activities for industry and government agencies. The industrial

concerns include the Hughes Aircraft Company and Superconducting Technology, Inc., and examples of the government agencies are the European Space Agency, the United Nations' International Telecommunication Union, and the U.S. Army Research Office through the Battelle Institute.

From 1983 through 1990, Prof. Itoh was the Hayden Head Professor at The University of Texas at Austin, and during that period he also served as Director of the Electrical Engineering Research Laboratory and as Associate Department Chairman for Research and Planning. Since January 1991 he has been with the University of California at Los Angeles (UCLA), where he holds the position of TRW Professor, the endowed chair in microwave and millimeter-wave electronics. During his stay at these two universities, he guided approximately 30 Ph.D. students. He also hosted about 40 visiting scholars and postdoctoral fellows; this incredibly large number includes many from other countries, such as Japan, China, Germany, France, Taiwan, and Korea. Those from Japan form the largest group, and, together with Ph.D. students originally from Japan, total 25. To honor Prof. Itoh, these 25 persons have recently formed an "Itoh Laboratory Alumni Association" in Japan, and they held their first meeting in December 1994. This Association is indeed a fine tribute to Prof. Itoh and demonstrates the appreciation and respect these individuals hold for him and for his services to them as a mentor.

According to his secretary at UCLA, Prof. Itoh is unusually responsible, never missing deadlines and always responding rapidly to messages or requests. He is idolized by his students, and he is considered by them to be very fair. He often plays tennis or racquet ball with them to deepen their relations and to allow the students a chance to express their concerns in an informal atmosphere.

Professor Itoh's contributions to the MTT Society have clearly been outstanding. He was elected to the Society's Administrative Committee (AdCom) in 1982, and he served for two successive three-year terms. His principal role during that period involved the Society's publications. He was, in fact, the Editor of the IEEE TRANSACTIONS ON MICROWAVE THEORY AND TECHNIQUES from 1982 to 1985, during which time he computerized the editorial process. He was also the Chairman of the Technical Committee on Microwave Field Theory from 1979 to 1988. In 1989 he was elected Vice President, and during 1990 he served as the President of the Society.

During his presidency, he established the Transnational Committee by elevating the status and responsibilities of the International Liaison Committee. In line with his interest in co-operation on an international scale, he also helped to form several new MTT-S Chapters in Asia, including the Taipei, Korea, and Singapore Chapters. During that same year (1990) he was the Co-Chairman of the Technical Program Committee for the International Microwave Symposium in Dallas, Texas. He also helped to found the new journal, IEEE MICROWAVE AND GUIDED WAVE LETTERS and, after his presidency, served as its first Editor-in-Chief for four years, from 1991 through 1994.

Another eligibility requirement for the Honorary Life Member position is "national and international prominence." In the international arena, Prof. Itoh's reputation has been exceptional, and the extent of his activities phenomenal. For

## ELIGIBILITY REQUIREMENTS FOR HONORARY LIFE MEMBER

**4.1.1.1 ELIGIBILITY** - The position of Honorary Life Member may be bestowed upon an outstanding member of the profession who fulfills the following minimum requirements:

**4.1.1.1.1** The candidate's contributions, technical or otherwise, shall have made an important impact in the field of interest of the Society.

**4.1.1.1.2** The Candidate shall have performed outstanding service to the profession and to the Society.

**4.1.1.1.3** The candidate shall have shown national and international prominence.

**4.1.1.1.4** The Candidate shall have been an Elected Member of the Administrative Committee, a member of the Society for, at least, 10 years and shall be a Fellow of the IEEE.

**4.1.1.1.5** The candidate is expected to continue to contribute to the Society and participate in its activities as an individual contributor, an advisor, and/or by serving on Society Ad Hoc and Standing Committees.

## HONORARY LIFE MEMBERS OF MTT-S

Name	Award Date
George C. Southworth	1960
Andre G. Clavier	1961
William W. Mumford	1965
Alfred C. Beck	1967
Donald D. King	1973
Theodore S. Saad	1973
Kiyo Tomiyasu	1973
Seymour B. Cohn	1978
Arthur A. Oliner	1978
Leo Young	1982

example, the European Microwave Conference and the Asia-Pacific Microwave Conference are now recognized by the MTT Society as two of the three major conferences in the microwave field. At the European Microwave Conference, where the rejection rate for papers has been consistently high, Prof. Itoh has presented papers every year since 1976, and he was twice an invited speaker. At the Asia-Pacific Microwave Conference, which is now held annually in a different country in the Asia-Pacific region, he has presented papers at every conference but the first one. In addition, he is and has been on its International Steering Committee, where he plays a very respected and influential role.

His excellent national and international reputation is also reflected in the positions he has held in the International Union of Radio Science (URSI), in which 31 different countries participate. URSI stresses the basic research aspects of radio science and is comprised of 10 Commissions. In 1987 Prof. Itoh was elected Vice Chairman of U.S. Commission D (which is concerned with "electronics and photonics" but has heavy interest in new microwave solid-state devices) and then became the Chairman soon afterwards. During 1990 he was elected to the position of International Vice Chairman of Commission D, for the three-year period from 1990 to 1993, and in 1993 he became the International Chairman, which position he will hold through 1996. He will also be the Vice Chairman of the International Symposium on Signals, Systems and Electronics (ISSSE) 1995, which is organized by Commissions C and D of URSI and held triennially.

Professor Itoh also participates internationally in many other ways. With respect to other conferences, he was an invited speaker twice at MIKON in Poland, and he presented papers at the MICROCOLL in Hungary, and at the MIOP in Germany at their last three conferences. He has also been an invited speaker at many workshops organized by European MTT Chapters, most notably three workshops in Italy on Millimeter Waves. He spent the summer of 1979 at Telefunken in Ulm, Germany. He performed advisory service for the U.S. Army in 1993 for five weeks, assessing technical programs at companies, universities, and Research Institutes in Europe. He has also been on the Advisory Board of the Institute for Mobile and Satellite Communication Technology in Germany since 1993.

With respect to Asia, he has also served as liaison for the U.S. Army in organizing a Workshop on Dual-Use Millimeter-Wave Technology in Kyoto, Japan, in 1993. In addition, he has been an Adjunct Research Officer in the Communications Research Laboratory of the Ministry of Post and

Telecommunications of Japan since 1994. This is a nonsalaried advisory position concerned with research directions in millimeter waves.

Only a few of the many advisory activities in which Prof. Itoh has been engaged around the world are included here. He is so much in demand in this context because of his awareness of major new developments in the field and his ability to sense new technical directions.

The eligibility requirements express the expectation that the Honorary Life Member will continue to contribute to the Society. There should be no concern with respect to Prof. Itoh. In addition to his aforementioned editorship of the journal *MICROWAVE AND GUIDED WAVE LETTERS*, after his presidency of the Society he also served as Chairman of the Long-Range Planning Committee, during which time he promoted the area of wireless communications, and he is currently the Chairman of the Past Presidents Council.

Professor Itoh and his wife, Seiko, have a son, Akihiro, and a daughter, Eiko, 24 and 21 years of age, respectively. In his moments of leisure time, he plays tennis and racquet ball, usually early in the morning before going to his office, and he enjoys long-distance driving, which permits him some solitude. He also relaxes by listening to piano music, his pleasure enhanced by the fact that his daughter plays the piano. He is revisiting classic books that he enjoyed reading as a teenager but didn't have time to finish then, which include German, French, and Russian novels; he is currently reading Tolstoy's *War and Peace*. Books on the key factors that have influenced changes in civilizations fascinate him, and he is intrigued by the history of the Silk Road area in Central Asia. He says "I hate flying," but the frequent-flyer Platinum Card that he recently received from American Airlines states "3 Million Miles"!

ARTHUR A. OLINER