



**IEEE  
ULTRASONICS,  
FERROELECTRICS,  
AND  
FREQUENCY CONTROL  
SOCIETY  
NEWSLETTER**



Number 26: September 1998

Editor: Fred S. Hickernell

ISSN 1060-0264

**1998 IEEE  
International Ultrasonic Symposium**



**Sendai, Japan**

**October 5-8, 1998**

# 1998 IEEE International Ultrasonics Symposium

## Members of the Local Committee in Japan for the 1998 IEEE Ultrasonics Symposium



**Sendai Local Committee Members**



**Guest Tour Committee Members**

**GENERAL CHAIRMAN:** N. Chubachi  
**TECHNICAL CHAIRMAN:** K. Yamanouchi  
**FINANCIAL:** Y. Shimizu, J. Yamada, K. Yamanouchi, Y. Tomikawa, K. Nakamura, M. Takeuchi  
**PRESENTATIONS & TOURS:** K. Nakamura, K. Tsubouchi, K. Yamanouchi, K. Masu, J. Kushibiki, K. Yamanaka, H. Kanai, Y. Koiwa, Y. Saijo, H. Asai  
**LOCAL ARRANGEMENTS:** H. Kanai, K. Yamada, H. Asai, S. Yonechi  
**EXHIBITS:** Tetsuo Yoshida, Seiji Hirose  
**PUBLICITY & WEB:** Y. Cho, Y. Tsukahara, T. Hoshimiya, K. Yamanaka  
**GUEST PROGRAM:** K. Yamanaka, N. Wakatsuki, S. Nitta  
**HOTEL & TRAVEL ARRANGEMENTS:** T. Takano, T. Kojima

Noriyoshi Chubachi received the B.S., M.S. and Ph.D degrees in electrical engineering from Tohoku University, Sendai Japan, in 1956, 1962 and 1965, respectively. He spent 32 years at Tohoku University until he moved to Tohoku Gakuin University as a professor of electrical engineering in April of 1997. He is continuing to research and develop ultrasonic microspectroscopy including ultrasonic microscopy as

well as new ultrasonic diagnostic equipments. He is very happy to continue teaching and researching at the new environments where he has many old friends since he studied at Tohoku Gakuin High School in his boyhood. He is expecting to have more time to enjoy his hobbies, such as playing the violin, choring, playing "go-game", swimming and playing golf after this symposium in Sendai.



**Dr. Chubachi**

Kazuhiko Yamanouchi received the B.S., and Ph.D degrees in communication engineering from Tohoku University, Sendai, Japan, in 1959, and 1965, respectively. In 1965, he joined the Research Institute of Electrical Communication, Tohoku University, where he was an Associate Professor from 1968 to 1979. Since 1979 he has been a Professor. From 1979 to 1980 he was a Visiting Professor of Cornell University, Ithaca, NY. Since 1965, Dr. Yamanouchi has worked on surface acoustic wave (SAW) transducer (IDT, named Sudarejou Denkyoku in Japa-



**Dr. Yamanouchi**

*IEEE Ultrasonics, Ferroelectrics, and Frequency Control Society Newsletter* is published two times per year by The Institute of Electrical and Electronics Engineers, Inc., 445 Hoes Lane, Piscataway, NJ 08855.

© 1998 IEEE. Information contained in this newsletter may be copied without permission provided that copies are not made or distributed for direct commercial advantage, and the title of the publication and its date appear on each copy. Printed in the U.S.A.

nese), propagation characteristics of SAW (128-degree Y-X LiNbO<sub>3</sub>) and leaky SAW (41-degree Y-X, 64-degree Y-X LiNbO<sub>3</sub>), and various kinds of SAW devices. He also studied the super high coupling SAW substrates of KNbO<sub>3</sub>. He also worked on submicron fabrication techniques using electron beam exposure and obtained 20 GHz-range SAW filters. In 1995, he was elected a Fellow of the IEEE. He received the Invention Award from Invention Association of Japan in 1979 and Ichimura Contribution Award from Ichimura Association in 1984. He received the Achievement Award from IEICE of Japan in 1995. He is an ADCOM member of IEEE Society on UFFC. He was a Co-Chairman of the International Symp. on SAW Devices for Mobile Communication held in Sendai, in 1992. He is a Chairman of 150th Committee of Elastic Wave Devices on JSPS, from 1993.



**Dr. Shimizu**

Yasutaka Shimizu was graduated from Tokyo Institute of Technology in 1964, and received Master and Doctor of Engineering in 1966 and 1971. Since 1969 he has been working with Tokyo Institute of Technology and is currently Professor and Dean of Graduate School of Design Science and Technology. From 1972 to 1973 he was Post Doctoral Fellow at Polytechnic Institute of New York where he began research on Surface

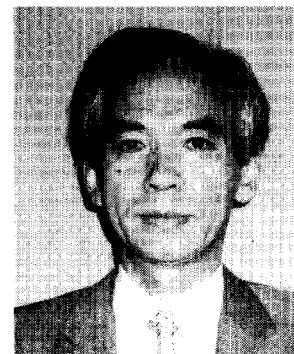
Acoustic Waves and he discovered several new cuts for SAW devices such as LST-cut of quartz. Dr. Shimizu served as Chairman of IEEE UFFC Tokyo Chapter in 1993-1995. He was elected an IEEE Fellow "for contributions to research and development in the field of educational technology, electromagnetic compatibility, and surface acoustic waves" in 1994.

Ken Yamada was born in Sendai, Japan in 1951. He graduated from Tohoku University in 1974, and received the Master and Doctor of Engineering in 1976 and 1979. Since 1980 he has been working with Tohoku University and is currently Associate Professor of the Graduate School of Engineering. From 1994 to 1995 he was a Visiting Scholar at Stanford University. He has been working on trapped-energy mode piezoelectric resonators, planar structure focusing lens for acoustic microscope, weighted conical transducer for generation of limited diffraction beam, and broadband transducer using functionally graded piezoelectric material.



**Dr. Ken Yamada**

Kiyoshi Nakamura received B.S., M.S., and Dr.Eng. degrees from Tohoku University in 1966, 1968, and 1975, respectively. From 1968 to 1976 he was a Research Associate at the Department of Electrical Communications, Tohoku University and in 1976 he became an Associate Professor. Since 1988 he has been a Professor at the Graduate School of Engineering, Tohoku University. He worked on SH-SAW in 36Y-X LiTaO<sub>3</sub> and domain inversion induced by heat treatment of piezoelectric crystals. His current interests include piezoelectric resonators, SAW devices, acousto-optic devices, piezoelectric actuators and transformers, and ferroelectrics. He served as Vice-Chairman of IEEE UFFC-S Tokyo Chapter in 1993-1994.



**Dr. Nakamura**



**Dr. Kushibiki**

Jun-ichi Kushibiki was graduated from Tohoku University in 1971, and received the Master and Doctor degrees in electrical engineering in 1973 and 1976. Since 1976 he has been working with Tohoku University and is currently a Professor at the Department of Electrical Engineering. He has been studying ultrasonic metrology, especially acoustic microscopy and its applications, and established a method of material character-

ization by line-focus-beam acoustic microscopy. He also has been interested in biological tissue characterization in the higher frequency range applying both bulk and acoustic microscopy techniques.

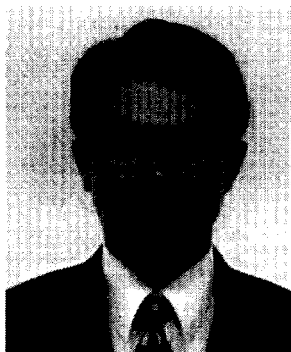
Hiroshi Kanai was born in Matsumoto, Japan in 1958. He received the B.E. degree from Tohoku University, Sendai, Japan in 1981, and the M.E. and the Dr. Eng. degrees, also from Tohoku University, in 1983 and in 1986, both in Electrical Engineering. From 1986 to 1989 he was with Tohoku University, as a Research Associate. From 1990 to 1992 he was a Lecturer at the Department of Electrical Engineering, Tohoku University. Since 1992 he has been an Associate Professor at the Department of Electrical Engineering, Faculty of Engineering, Tohoku University.



**Dr. Kanai**

His present interest is in ultrasonic measurements of small velocity signals with high frequency components up to several hundred Hertz in the tissue and digital signal processing for noninvasive diagnosis of the heart diseases and arteriosclerosis.

Hitoshi Asai was born in Sendai, Japan, in 1963. He graduated from the Department of Electronic Engineering, Yamagata University, Yonezawa, Japan, in 1986. He received the M.E. and Dr. Eng. degrees from Tohoku University, Sendai, Japan, in 1988 and in 1997, respectively, both in electrical engineering. In 1990 he became a Research Associate at the Department of Electrical Engineering, Faculty of Engineering, Tohoku University. He has been interested in ultrasonic measurements, especially in the medical ultrasonic diagnosis.



**Dr. Asai**



**Dr. Yamanaka**

1997, he moved to Tohoku University, as a professor in the Department of Materials Processing. His current research includes development of a new laser ultrasound measurement, Phase Velocity Scanning method and a method for materials characterization with nanometer spatial resolution, Ultrasonic Atomic Force Microscopy.

Kazuo Tsubouchi was graduated from Nagoya University in 1969, and received the M.S. and Ph.D degrees in Electronics Engineering from Nagoya University in 1971 and 1974, respectively. Since 1974, he has been with Research Institute of Electrical Communication, Tohoku University and is currently Professor of the Acoustoelectronics Integration Division. In 1982, he was at Purdue University as a Visiting Associate Professor. His current interests are highly reliable GHz CDMA wireless communication system, GHz surface acoustic wave devices and materials, low-power RF Si

CMOS circuits, and Si CMOS circuits/device/process technology. Prof. Tsubouchi received Hattori-Hoko Award in 1982, Ichimura Award in 1994, Telecommunication Foundation Award in 1996, and Inoue-Harushige Award in 1997.



**Dr. Tsubouchi**



**Dr. Cho**

Yasuo Cho was graduated from Tohoku University, Sendai, Japan, in 1980, and received the Master and Doctor of Engineering in 1982 and 1986. From 1985 to 1990, he was involved in Tohoku University. From 1990 to 1997, he joined the Department of Electrical and Electronic Engineering at Yamaguchi University where he was an Associate Professor. He is currently an Associate Professor of Research

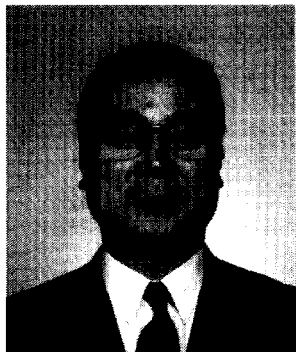
Institute of Electrical Communication, Tohoku University. His research interests include nonlinear phenomena in ferroelectrics and piezoelectric materials and their application to communication devices.

Yoshiro Koiwa was born in Sendai, Japan, in 1944. He graduated from Tohoku University, Sendai, Japan, in 1969. He received the M.D. degree from Tohoku University in 1977. He is presently Associate Professor of Internal Medicine of Tohoku University. His main research interest is cardiovascular disease, especially cardiac function and heart failure. Dr. Koiwa is a member of American Federation for Clinical Research, the Japanese Circulation Society, and the Japan Society of Medical Electronics and Biological Engineering.



**Dr. Koiwa**

Shin-ichi Nitta was born in Miyagi, Japan on Aug. 23, 1939. He received an M.D. degree in 1966 and a Ph.D. degree in 1970 from Tohoku University, School of Medicine in Sendai, Japan. He was involved in the Department of Cardiac Surgery at the Tohoku University School of Medicine from 1971-1979. He was a Research Fellow of the Texas Heart Institute, Houston, Texas in the USA from 1976-1977. Since April 1980, he has



**Dr. Nitta**

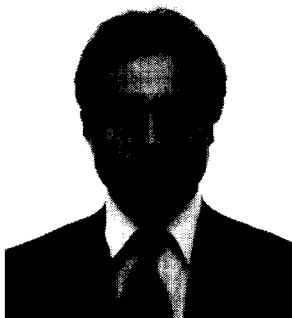
been at the Institute of Development, Aging and Cancer, Tohoku University, where he became Professor of Medical Engineering and Cardiology. He is the president-elect of the International Society for Artificial Organs and a member of the American Society for Artificial Internal Organs, IEEE. He is also the president of Japanese Society for Artificial Organs.



**Dr. Hoshimiya**

city, and is currently Professor of the Department of Applied Physics and Professor of the Graduate School of Engineering. From 1992 to 1993 he was a Visiting Scholar at Stanford University. He has been working on the development of the photoacoustic microscope and its applications to NDE of magnetic disk heads, corrosion on metal surface, and surface defects. He is member of OSA, IEEE, Japan Society of Applied Physics, Japan Society of Optics, IECE(Institute of Electrical Communication Engineering), and JSNDI(Japan Society of NDI).

Yoshifumi Saijo received the M.D. degree from Tohoku University School of Medicine, Sendai, Japan, and was authorized as a medical doctor, in 1988. He has been involved in developing scanning acoustic microscopy for medicine and biology, and measured the acoustic properties of myocardial infarction, normal and atherosclerotic aorta, and coronary artery. He received the Ph.D. degree from the Post Graduate School of Medicine, Tohoku University in 1993. Since 1997, he has been an Instructor of Medical Engineering and Cardiology, at the Institute of Development, Aging and Cancer, Tohoku University.



**Dr. Saijo**



**Dr. Wakatsuki**

Noboru Wakatsuki was born in Sendai in 1944. He was graduated from Tohoku University in 1967, and received the Master and Doctor of Engineering in 1967 and 1972. From 1972 to 1994 he worked with Fujitsu LTD., where he engaged in the research and development of piezoelectric devices for computer and communication. Since 1994 he has been a Professor of Engineering at Ishinomaki-Senshu University. His current research work focuses on piezoelectric crystal bulk wave devices.



**Dr. Takano**

Takehiro Takano received the B.S. degree in electrical engineering in 1966 from Yamagata University, Yonezawa, Japan, and the Degree of Doctor of Engineering in 1993 from Tokyo Institute of Technology. From April 1966 to March 1967, he was a Research Associate with the Faculty of Engineering, Yamagata University. Since 1967 he has been working with the Tohoku Institute of Technology, Sendai, and

is a Professor with the Faculty of Engineering. His research interest is in an ultrasonic motor and a piezoelectric actuator, and its application to a powder feeding device.

Tsutomu Hoshimiya was born Sendai in 1949. He graduated from Tohoku University and received the B.S. degree in Electronic Engineering in 1972. He also received the Master and Doctor of Engineering degrees in 1974 and 1978, respectively. Since 1978 he has been working with Tohoku Gakuin Univer-

Yoshiro Tomikawa was born in Saitama, Japan on October 12, 1939. He received the B.S. degree in Electrical Engineering in 1962 from Yamagata University, Yonezawa, Japan and the Ph.D. degree (Doctor of Engineering) from the University of Tokyo, Tokyo. From April 1962 to December 1962, he worked in Hitachi Co. Ltd., Totshuka, Yokohama. Since January 1963, he has been with Yamagata University, where he is currently Professor of Electrical Engineering and Information Science. From April 1969 to March 1970, he was a researcher at the Institute of Industrial Science, the University of Tokyo (after 1970, several times) and from September 1975 to October 1976, he was a Visiting Scholar at the University of California, Los Angeles. His research interest includes electromechanical resonators and ultrasound applications to develop ultrasonic motors, piezo-actuators and vibratory gyro-sensors.



**Dr. Tomikawa**

Seiji Hirose received the B.S. degree in electronics in 1971 from Yamagata University, Yonezawa, Japan and the Ph.D. degree in 1989 from Tohoku University, Sendai, Japan. Since April 1971, he has been working with Yamagata University, Yonezawa, Japan, where he is a professor of Electrical and Information Engineering. His research interest is in the high-power characteristics of the piezoelectric material and the piezoelectric transformer. Dr. Hirose is a member of the Institute of Electronics, Information, Communication Engineers of Japan, the Acoustical Society of Japan and the Material Research Society of America.



**Dr. Hirose**

Tetsuo Yoshida was graduated from the department of Electrical and Communication Engineering, Faculty of Engineering of Tohoku University in 1968, and entered Tohoku Metal Industries Co. Ltd (The name was changed to Tokin Corporation) in the same year, and received the Doctor of Engineering from Tohoku University in 1995. Since he entered the company, he has mainly engaged in researching and developing piezoelectric devices such as ceramic filter, ultrasonic motor and vibratory gyroscope.



**Dr. Yoshida**



**Dr. Kojima**

Toshihiro Kojima was graduated from the University of Electro-communication in 1960 and received the Doctor of Engineering from Tohoku University in 1989. Since 1962, he has been working at the Faculty of Engineering of Tamagawa University and is now a Professor. His main subjects of research are the equivalent circuit models of SAW-IDT/ devices and the development and applications of

SAW resonators. Since 1997, he has been chairman of the Committee on Electromechanical devices of the Institute of Electrical Engineers of Japan. And, since 1987, he has been chairman of Japanese national committee on SAW and dielectric devices of IEC TC49 (International Electrotechnical Commission).

Masao Takeuchi received the B.S. degree in electrical engineering from Kanagawa University in 1969, and the M.S. and Ph.D. degrees in electrical communication engineering from Tohoku University, Sendai, Japan in 1973 and 1976, respectively. He became an associate professor at the Research Institute of Electrical Communication, Tohoku University in 1985 and professor at Tamagawa University in 1997. He has been engaged in research works on surface acoustic waves and ultrasonic micromanipulation of micron-sized particles.



**Dr. Takeuchi**

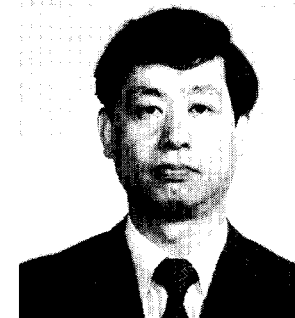


**Dr. Tsukahara**

Yusuke Tsukahara has been with the Technical Research Institute of Toppan Printing Co. Ltd., Saitama, Japan, since 1982 to present, where he is currently a research manager at Process Technology Center. He has been involved in the study of surface layers by ultrasonic spectroscopy. Current activity also includes the laser ultrasonics and its application to the materials evaluation. He was elected an Industrial Fellow of Wolfson

College, Oxford University, from 1998 to 2000. From 1992 to 1993, he stayed at Industrial Materials Institute, National Research Council Canada, as a Summit Postdoctoral Fellow. From 1986 to 1987, he stayed at Tohoku University, Sendai, Japan, as a visiting researcher. From 1976 to 1982, he was engaged in research and development of instruments for nondestructive testing at Ishikawajima Inspection Services Co. Ltd., Tokyo, Japan. He was given the Outstanding Paper Award of the 1989 IEEE Transactions on Ultrasonics, Ferroelectrics, and Frequency Control. He is an Associate Editor for the IEEE Transactions on Ultrasonics, Ferroelectrics, and Frequency Control (Physical Acoustics).

Jun Yamada graduated from Osaka University in 1969, and received the B. S. degree in Solid State Physics in 1969. Since 1969 he has been working with Hitachi Ltd. and currently a Senior Manager of Semiconductor & Integrated Circuits Division. His interests include ferroelectric materials, surface acoustic wave devices and their applications to telecommunication systems



**Dr. Jun Yamada**

## Members of the Cooperating Committee in the USA for the 1998 IEEE Ultrasonics Symposium

**GENERAL CHAIRMAN:** Bernhard R. Tittmann  
**TECHNICAL CHAIRMAN:** James F. Greenleaf  
**FINANCIAL:** Herman van de Vaart  
**PRESENTATIONS & TOURS:** Fred S. Hickernell  
**PROCEEDINGS:** Susan Schneider  
**PUBLICITY:** Doron Kishoni

### Bernhard Tittmann

Bernhard Tittmann is PennState University's Schell Professor of Engineering Science and Mechanics, since 1989. He spent his childhood in Vienna, Austria, became a US Citizen in 1956 and obtained his B.S., Physics, at the George Washington University, Washington D.C. He earned his M.S. and Ph.D. in Physics, at the University of California, Los Angeles in 1965, in part as a Howard Hughes Fellow. Dr. Tittmann has a broad background in Physical Acoustics gained during his tenure of almost a quarter-century at the Science Center of North-American/Rockwell International. He is probably best known for his work in geophysical ultrasonics, NDE and acoustic sensors. He investigated and explained the dramatic reduction of anelastic attenuation of lunar return samples when subjected to lunar environment. His main interest is in material characterization, using surface acoustic wave dispersion, internal friction, ultrasonic attenuation, and diffraction to characterize polymers, ceramics and metal alloys. He is currently engaged in studies of coatings, thin films, and multi-layered media with the aid of acoustic microscopy and the use of acoustic sensors for in-situ monitoring of materials processes. He has been an active member of the IEEE-UFFC since about 1970, and pioneered the first overseas Ultrasonics Symposia as Technical Co-Chairman in Cannes, France and as General Co-Chairman in Sendai, Japan. He has about 250 publications and is a Fellow of the Institute of Electrical and Electronic Engineers, a member of the Acoustical Society of America, the Materials Research Society, the American Ceramics Society and a Peer Review member of the National Research Council and the National Science Foundation.



### Jim Greenleaf

James F. Greenleaf (IEEE/M'73) was born in Salt Lake City, UT, on February 10, 1942. He received the B.S. degree in Electrical Engineering from the University of Utah, Salt Lake City, in 1964, the M.S. degree in Engineering Science from Purdue University, Lafayette, IN, in 1968, and the Ph.D. degree in Engineering Science from the Mayo Graduate School of Medicine, Rochester, MN, and Purdue University in 1970.

He is currently Professor of Biophysics and Medicine, Mayo Medical School, and Consultant, Department of Physiology, Biophysics, and Cardiovascular Disease and Medicine, Mayo Foundation. He has served on the IEEE Technical Committee for the Ultrasonics Symposium for five years. He served on the IEEE UFFC-S Subcommittee on Ultrasonics in Medicine/IEEE Measurement Guide Editors, and on the IEEE Medical Ultrasound Committee. Doctor Greenleaf was President of the UFFC Society in 1992 and 1993. Doctor Greenleaf has six patents and is recipient of the 1986 J. Holmes Pioneer award from the American Institute of Ultrasound in Medicine and is a Fellow of IEEE and AIUM. Doctor Greenleaf was the Distinguished Lecturer for IEEE Ultrasonics, Ferroelectrics, and Frequency Control Society (1990/1991). Doctor Greenleaf received the 1998 William J. Fry Memorial Lecture Award from The American Institute of Ultrasound in Medicine. His special field of interest is in ultrasonic biomedical science and has published more than 260 articles and edited five books in the field.



### Herman van de Vaart



Herman van de Vaart was born in Arnhem, The Netherlands. He received the Ingenieurs Degree in Applied Physics in 1958 and the Ph.D. Degree in Technical Sciences in 1969, both from the Delft University of Technology, Delft, The Netherlands.

From 1958 to 1960 he served in the Dutch Army Signal Corps as a Radar Officer. He came to the US in 1960 and joined Transitron Electronic Corporation in Wakefield, Massachusetts, where he worked on diffusion processes in silicon. In 1962 he joined the Sperry Research Center in Sudbury, Massachusetts, where initially he did research on magneto-elastic and magnetostatic waves and non-linear effects in ferrites, and later worked on surface acoustic wave devices. In 1973 he became the Manager of the Signal Processing Department, and from 1980 until the Sperry Corporation closed the Research Center at the end of 1983, he was Director of the Applied Physics Laboratory. During 1984 he was with SAWTEK in Orlando, Florida, as Director of Research. In 1985 he joined Allied Signal Inc. in Morristown, New Jersey as Manager of



the Solid State Devices Program, Corporate Research and Technology. He retired in 1996.

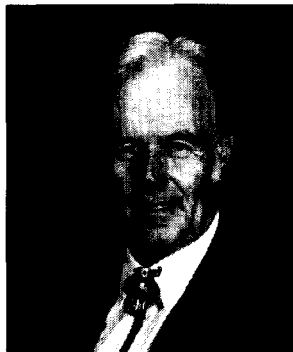
Dr. van de Vaart has been active in the IEEE Ultrasonics, Ferroelectrics and Frequency Control Society since 1970. He was Secretary/Treasurer (1970-71) and Chair (1971-72) of the Boston Chapter, Chair of the Awards Committee (1973-80), Secretary-Treasurer (1980-83) and President (1984-85) of the Society, and has served as Chair of the Finance and Operations Committee since 1986. During his Presidency the transition from Group on Sonics and Ultrasonics to Ultrasonics, Ferroelectrics and Frequency Control Society was implemented. He has been a member of the Ultrasonics Symposium Technical Program Committee (1976-89), Chair of that Committee in 1980 and served as General Chair of the 1989 Symposium in Montreal and Co-Chair of the 1994 Symposium in Cannes, France. From 1986 to 1989 he was also a member of the IEEE Technical Activities Board (TAB) Finance Committee. He was a recipient of the IEEE Centennial Medal in 1984 and was elected a Fellow of the Institute in 1988.

Herman's free time (lots of it now since he retired!) is occupied nursing his investments, working on the house and in the garden. He is married to Tania Skrinnikov, who has attended the Ultrasonics Symposia and has been active in the Social Programs since 1980, and from 1989 to 1996 worked for IEEE-TAB. Together, they enjoy traveling and have been adopted by three cats.

### Fred S. Hickernell

Fred Hickernell is a Member of the Technical Staff at Motorola's Space and Systems Technology Group in Scottsdale, Arizona. He joined Motorola in 1960 and worked on the development of high-power microwave ferrite materials and devices. In 1963 he started the work in the field of microwave acoustics at Motorola investigating the elastic and piezoelectric properties of III-V and II-VI compounds and their applications to bulk-acoustic-mode traveling-wave-amplifiers and diffusion-layer transducer delay lines. Since 1969 the acoustics work has been in the development of SAW components in standard, hybrid, and semiconductor monolithic form for system applications. In 1978 this work was expanded to include SAW and BAW acoustooptical signal processing devices. Over the past 25 years he has also been actively involved in the investigation and application of dielectric and piezoelectric films to enhance the performance of acoustical and optical microelectronic devices. Dr. Hickernell became a Science Advisory Board Associate at Motorola in 1972 and a Dan Noble Fellow of Motorola in 1987.

He was elected to the Administrative Committee of the IEEE Ultrasonics, Ferroelectrics, and Frequency Control (UFFC) Society in 1974 and presently serves as an ex-officio



member of that committee as Newsletter Editor. He was a General Co-Chair of the 1977 Ultrasonics Symposium and General Chairman of the 1992 Ultrasonics Symposium. He was a Guest Editor for the May 1995 special issue on "Thin Films for Acoustoelectronics" of the IEEE Transactions of the UFFC Society. He received the IEEE UFFC Society Achievement Award in 1995. Dr. Hickernell is president-elect of the UFFC Society

### Susan C. Schneider

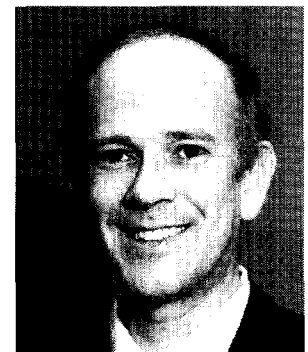


Susan Schneider received a B.S. in physics and mathematics from the University of Wisconsin-Stevens Point in 1972, and a Ph.D. in physics from the University of Wisconsin - Milwaukee in 1981. In 1981, she joined the Department of Electrical and Computer Engineering at Marquette University and was promoted to Associate Professor in 1988. Her research interests include theoretical studies

of SAW attenuation and velocity changes produced by electron-phonon, magneto-elastic and acousto-elastic interactions in conducting and superconducting thin films; experimental studies to characterize charge transport mechanisms across the interface between dissimilar materials. In addition to membership in the IEEE UFFC-S, Dr. Schneider is also a member of the American Physical Society, Eta Kappa Nu, and Sigma Xi. Dr. Schneider has also served as the co-director of Marquette University's Young Engineering and Science Scholars program, and a summer science camp program for middle school students, since 1993.

### Doron Kishoni

Doron Kishoni received his Ph.D. from Cornell University, Ithaca, NY, where he conducted research in ultrasonic NDE. Prior to that he received his Practical Engineering degree from Ort Technikum Givataim; a B.S. from the Technion, Haifa; and M.S. from Tel-Aviv University, where he worked on fatigue and residual stress measurements.



Some of his professional career include founding and managing an electronics company; serving as an officer in the military; and having an extensive industrial experience in diverse engineering fields. As a recipient of National Research Council awards three years consecutively he worked as a Resident Research Associate at NASA Langley, Virginia, where he conducted research in advanced ultrasonic NDE and signal processing, and received NASA achievement awards.



Since then, he continued to work on developing advanced methods in NDE and signal processing through NASA grants and contracts as a Senior Research Scientist and a Research Professor in the College of William and Mary. Since '92 he was also teaching as an Adjunct Professor. He also served as a consultant for industrial companies.

Dr. Kishoni is holding ASNT level III certifications in several methods (UT, MT, PT, VT, AET). He has been involved in numerous activities serving on the technical and the organizing committee of IEEE Ultrasonics symposiums since '85: as a member of the Technical Program Committee, Finance Chair/Treasurer, and Publicity Chair. He has been serving as a treasurer and a secretary in the Hampton Reads section of IEEE; has been a member of the Peninsula Engineers Council

representing the IEEE, has served as the elected treasurer of the Colorado section of ASNT and was recently elected to serve as Vice President of the section.

Prof. Kishoni is currently serving as a Senior Research Scientist at the University of Denver Research Institute, along with an appointment in the Engineering Department of the university. He has complementing his education in the executive MBA program in the University of Denver and was selected to the Beta Gamma Sigma (business) national honor society. Being in Denver area over a year now, Dr. Doron Kishoni, along with his wife Sara and their three children, have adjusted to the pleasant Colorado weather and beautiful view of the mountains.

## 1998 IEEE International Frequency Control Symposium

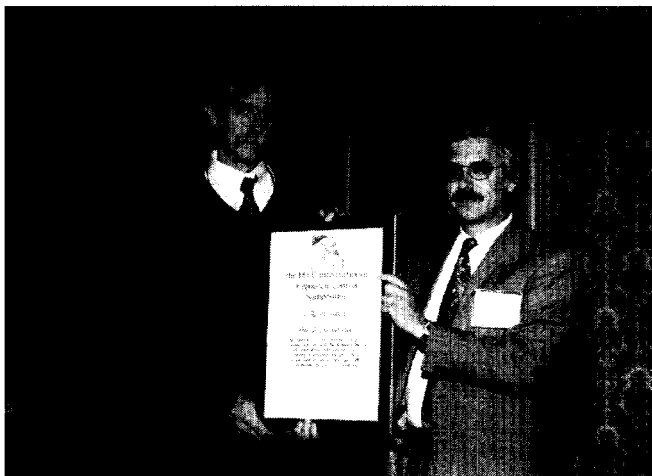
The 1998 IEEE International Frequency Control Symposium and Tutorials were held from May 26 to May 29, 1998 at the Ritz-Carlton Hotel in Pasadena, California, USA. The tutorials were held on Tuesday, May 26, with 127 attendees taking advantage of this opportunity to learn more about frequency control and related technologies. The symposium followed on Wednesday through Friday. We had 447 attendees for the conference and 15 registered guests. Of the 447 who attended, 316 were from the U.S. and 131 were from other countries. There were outstanding sessions on cold atom frequency standards (on the ground and in space), high accuracy frequency and time transfer, sensors, and plastic packaging. A total of 158 papers were presented including 62 poster papers and 96 oral papers (of which 9 were invited). We also had 22 exhibitors. Social functions included a welcoming reception

Wednesday evening and a tour of the Jet Propulsion Laboratory on Thursday. Many thanks go to Lute Maleki (Tutorial Chair), Gary Johnson (Technical Program Chair), the Group Vice Chairs, the Technical Program Committee members, and all of the other Organizing Committee members who worked very hard to make this years symposium a great success. Special thanks go to Wendy Ortega, Barbara McGivney and Mike Mirarchi who handled most of the details that are so critical to a successful symposium.

Again we had a strong travel support program thanks to UFFC matching funds and many outside organizations who provided financial support. Thirteen students received support to attend the symposium along with 17 other attendees including invited speakers and overseas authors who would not have otherwise been able to attend.

## Award Winners

**I. I. Rabi Award:** to David J. Wineland, "for the first laser cooling of any atomic species and the demonstration of innovative methods for laser cooling of trapped ions, providing the foundation for the next generation of atomic frequency standards".



**Sam Stein (right) presented the I.I. Rabi Award to David J. Wineland (left).**

**W. G. Cady Award:** to Gary K. Montress, "for outstanding contributions in the research, development, and implementation of precision SAW oscillators based on 'all quartz package' SAW devices."



**Tom Parker (left) presented the W.G. Cady Award to Gary K. Montress (right).**



**Len Cutler (left) presented the C.B. Sawyer Memorial Award to Donald B. Sullivan (right).**



**“The Magnificent Seven”, (left to right), Gary Johnson, Tom Parker, Gary Montress, Len Cutler, Don Sullivan, Sam Stein, David Wineland.**

C. B. Sawyer Memorial Award: to Donald B. Sullivan, “for leadership in supporting and encouraging the development of frequency and time standards technology”.

**Submitted by Tom Parker  
General Chair**

---

## **International Conference on Microwaves and Radar — MIKON-98**

Your Newsletter Editor was invited to present a paper at the International Conference on Microwaves and Radar, MIKON-98, held in Krakow, Poland, May 20-22, 1998 and is privileged to share a brief report on the conference. The first such conference was held in 1970 and until 1991 was primarily attended by the Polish microwave community. In 1991, English was for the first time announced as the official language of MIKON, stimulating international participation. In 1994, with support from the IEEE Microwave Theory and Techniques Society, MIKON received the status of an international conference and since then has been organized biannually. The organizer of MIKON-98, as well as the four preceding conferences, was the Telecommunications Research Institute (PIT) which was founded 65 years ago and is the leading research center in radar technology in Poland. Jozef Modelski was Chairman of the MIKON-98 conference and was ably assisted by Professor E. Sedek, Chairman of the Organizing Committee and Ms. E. Godlewska, the Conference Secretary. There was a large contingent of helpful committee members on hand, and special sightseeing, banquet, bonfire picnic, and concert events.

Some conference statistics were the following:

conference attendees - 268

(only registrants without exhibitors and organizer staff)

foreign attendees - 78 (from 19 countries)

accepted papers - 167 (83 oral, 84 poster)

foreign accepted papers - 72 (from 22 countries)



**Opening Ceremony. Dr. Roman Dufrene, Director TR1, Dr. Jozef Modelski, Conference Chair, Prof. Edward Sedek, Organizing Comm. Chair**

presented papers - 148

(77 oral, 71 poster) 19 foreign authors did not arrive from the Former Soviet Union countries because of their financial problems.

invited presentations - 21 (foreign-13)

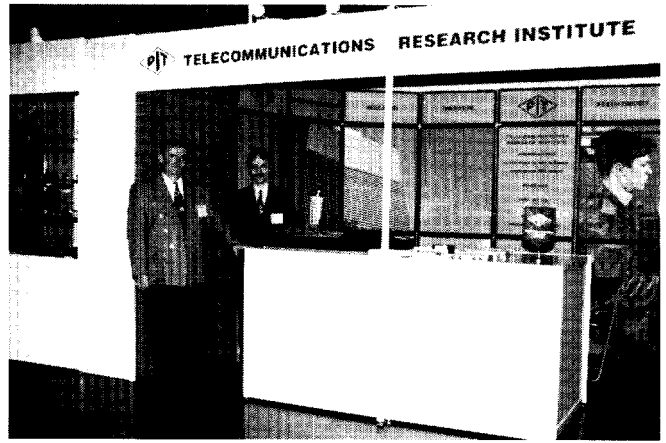
MIKON-98 Prizes:

a) Student Paper Competition - two prizes

b) Poster Paper Competition - two prizes



**Attendees at MIKON-98**



**Telecommunications Research Institute Exhibition**



**Break time between sessions**



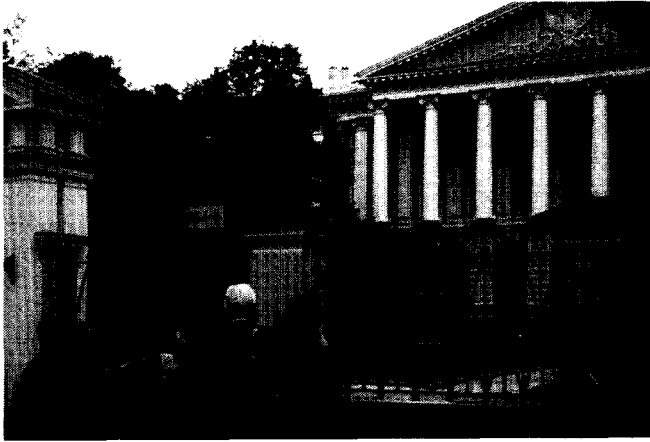
**Bob Hill emphasizes a point at his presentation**

The conference was held at the Japanese Art and Technology "Manggha" Center, Krakow, overlooking the Vistula River and the Wawel Castle. Krakow, the old capital of Poland, is a gem of the Polish Culture, most highly ranked by UNESCO. With its castles, churches, statues, universities, market square, and old European architecture, Krakow is a unique place with a special atmosphere. We (Thresa traveled with me) are indebted to Eugene Danicki, and Adam Kawalec who were gracious hosts in Warsaw and at the conference, Aleksandra Kocanda, a university student, who assisted us while at the conference, and Jozef Modelski who provided conference information for this article and the accompanying pictures.

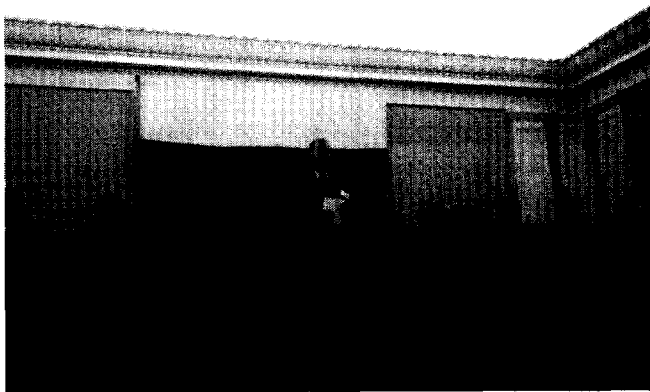


**Bob Hill re-emphasizes the same point over coffee**

## Report On St. Petersburg, Russia Acoustic Conferences



**Smolny Institute**



**Professor Kulakov brings greetings at the Plenary Session – Smolny Institute**



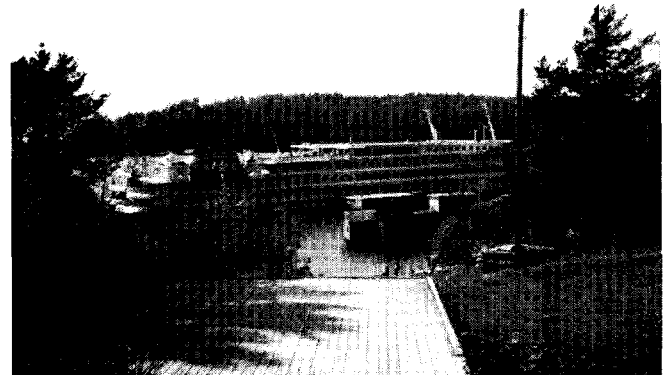
**Prof. Mario Armenise brings greetings to the conference attendees**

Three conference, all cosponsored by the IEEE UFFC, covering all aspects of the theory and application of surface and bulk acoustic waves were held in St. Petersburg, Russia and on board the ship “St. Petersburg” from 7 - 12 June 1998. The three conferences were the: 1) Yakovkin Memorial 4th International Symposium on Surface Waves in Solid and Layered Structures (ISSWAS-4) 2) 1998 International Symposium on Acoustoelectronics, Frequency Control, and Signal Generation and 3) International Conference for Young Researchers on Acoustoelectronic and Acoustooptic Information Processing. ISSWAS-4 was held in memory of Igor B. Yakovkin - a world-renown Russian acoustic scientist and organizer of the first three ISSWAS conferences. Academician Yuri Gulyaev chaired the conferences with his co-chairmen Mario Armenise (Italy), Raymond Besson (France), Dennis R. Pape (USA), and Fred Hickernell (USA). About 175 people attended - some 50 of whom were from outside Russia.

The plenary session took place on Sunday afternoon on 7 June at the beautiful Smolny Institute on the banks of the Neva River in St. Petersburg. The setting of this session was unique - the institute, built in the early 1800's, was formerly a girls school for noble women. Now it is the seat of the St. Petersburg city government. More importantly historically, the institute was the headquarters of the communist October revolution in 1917. Our session was held in an ornately deco-



**Along the banks of the Svir River**



**The cruise ship at Valaam**

rated hall now used for city government meetings. This hall was just a few doors away from Lenin's 1917 office which is now a museum. The conference began with greetings from the Vice Mayor of St. Petersburg and remarks from the organizers. Dennis Pape and Fred Hickernell brought greetings from the UFFC Society, which was one of the sponsors of the symposium. The name badges and abstract booklet carried the IEEE and UFFC Society Logo. The technical program, organized by George Mansfeld and Valery Proklov, began with invited talks by Besson, Hickernell, Jun Jamada (Japan), and Victor Alshits (Russia) covering various aspects of acoustic waves, piezoelectric oscillators, and SAWs.

Following the plenary session, the conference attendees were taken to the ship "St. Petersburg" which was our home

and meeting place for the next 4 days. A ship is an interesting venue for a conference — the attendees all sleep, eat, and attend technical sessions together. This "forces" a high degree of social interaction between attendees with no distractions like telephone calls, no worries about "crises" back at the lab or office, and no opportunity to leave the meeting early! (Perhaps the UFFC might consider such a venue for one of its



**Lozan Spassov and Velichka Georgieva, Poster Session presenters**



**The winter church on Khizi Island**



**Church near Peterhof outside St. Petersburg**



**Yuri Gulyaev and Raymond Besson exchange pleasantries**



**On tour at Khizi Island**

meetings). The ship held about 250 people. Cabins were located on 4 decks with the conference halls on the top deck. Two of the four days were devoted to meetings and the other two days were opportunities for sightseeing.

We set sail on Sunday evening and traveled on the Neva River to Ladoga Lake — arriving at the island of Valaam on Monday morning. Monday was spent sightseeing on Valaam, an island with a monastery with origins from the 17th century, and many trails through coniferous forests leading to beautiful wooden churches. After the fall of communism in 1991, the monastery has reopened and is now home to about 100 monks. On Tuesday, as the ship sailed from Ladoga Lake to Onega Lake on the Svir River, we attended technical sessions on physical acoustics, acoustic devices, and acoustic waves. On Wednesday the ship docked at the island of Kizhi in Onega Lake. This day was spent sightseeing at Kizhi and later at the capital of Russia's northern state of Karelia, Petrozavodsk. Kizhi island is an open air museum containing many magnificent wooden structures, the main one being a tremendous



**Kyrill Volyansky and Anastassia Shianskaya (Russia) at the Poster Session**

wooden church from the 1700's with many wooden domes. The domes were covered with aspen bark in a tiling that appeared to be metallic in the sun. On Thursday, as the ship sailed from Petrozavodsk back to St. Petersburg we attended technical sessions on acousto-optics, frequency control, and signal generation. physical acoustics, acoustic devices, and acoustic waves. The meeting was over, it seems, too quickly when we arrived early Friday morning back in St. Petersburg.

The organizing committee, chaired by Sergei Kulakov, did a fabulous job in providing attendees with technical sessions intermixed with social gatherings and sightseeing. The technical sessions were all well organized and covered the breadth of acoustics with high quality papers. The organizers expect to hold this meeting again in 2000 - I strongly suggest everyone put this conference on their calendar.

**Dennis R. Pape  
Co-Chairman**



**Oral Session – Vladimir Kulakov speaking, Valeri Proklov presiding**



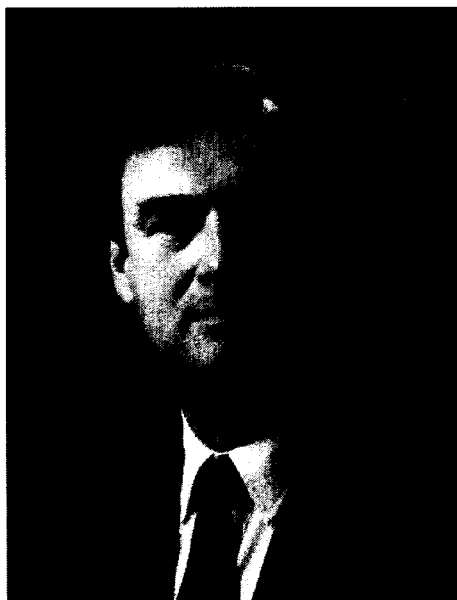
**Yuri Gulyaev and friends sing at the shipboard banquet**

# In Memoriam

## Christopher M. Fortunko

### 1948-1998

Chris Fortunko passed away on June 27, 1998 due to a heart attack. He was born in Siemianowice, Poland on December 7, 1948 and came to the U.S. in 1964. Fortunko received a B.S. degree from Tufts University in 1970 and a Ph.D. in Applied Physics from Stanford in 1975. At Stanford, he studied surface-acoustic-wave delay lines under Professor H. John Shaw in the Microwave Laboratory. His research involved considerable work in wave propagation in anisotropic media, broadband transducer development, impedance matching and instrument design.



In 1976, Dr. Fortunko joined the technical staff at the Rockwell International Center in Thousand Oaks, California. As a member of the Ultrasonics Applications Group, he received six patents for the development of high performance circuitry for ultrasonic inspection systems. He made significant contributions to the development of electromagnetic acoustic transducers, eddy current instruments, and inspection systems for quality assurance.

Dr. Fortunko worked for the National Institute of Standards and Technology from 1980-1983 and from 1988 to 1998. From 1983-1988, he was Chief Scientist and Engineering Manager for the Aerojet Ordinance Company working on electronics and sensor applications. At NIST, Dr. Fortunko was supervisor of the Materials Characterization Group in the Materials Reliability Division. His unique contribution was to bring the discipline and rigor of measurement science

to the less orderly world of material testing and nondestructive evaluation (NDE). Specific accomplishments include the development of ultrasonic instruments for materials characterization, gas coupled ultrasonic inspection systems, and standards for nondestructive evaluation.

Dr. Fortunko was a leader within the NDE community. He held adjunct faculty appointments at Johns Hopkins University and Iowa State University. He served on the Editorial Board of the journal "Measurement Science and Technology"; the Industrial Advisory Board of the Center for Nondestructive Evaluation at Iowa State University and

the NDE Group of the Interagency Committee on Materials Technology. Dr. Fortunko published about 100 technical papers, chaired the Gordon Research Conference on NDE, and was the U.S. organizer for the "European American Workshop (1997) on Determination of Reliability and Validation Methods on NDE. In 1993, he received the Department of Commerce Silver Medal award for developing ultrasonic instruments for evaluating the quality of advanced materials.

Dr. Fortunko is remembered for his remarkable scientific knowledge and his broad technical experience. He used these skills to provide leadership for his research group at NIST and for the worldwide NDE community. He will be sorely missed by his colleagues, friends and family. He is survived by his wife Mira, daughter Jacqueline and brother Andrew.



# IEEE Ultrasonics, Ferroelectrics, and Frequency Control Society

## Administrative Committee

### SOCIETY OFFICERS

President	J. R. Vig	<i>U. S. Army Communications-Electronics Command, Fort Monmouth</i>
President-Elect	F. S. Hickernell	<i>Motorola, Inc., SSTG</i>
Vice-President, Ferroelectrics	A. Safari	<i>Rutgers University</i>
Vice-President, Frequency Control	J. A. Kusters	<i>Hewlett-Packard Company</i>
Vice-President, Ultrasonics	J. F. Greenleaf	<i>Mayo Clinic</i>
Vice-President, Publications	J. Brown	<i>JB Consultants</i>
Secretary-Treasurer	G. K. Montress	<i>Raytheon Company, Research Division</i>

### ELECTED COMMITTEE MEMBERS

1996-1998	K. W. Ferrara	<i>University of Virginia, Charlottesville</i>
1996-1998	D. A. Hutchins	<i>University of Warwick</i>
1996-1998	J. G. Smits	<i>Boston University</i>
1996-1998	P. V. Wright	<i>Thomson Microsonics</i>
1997-1999	W. D. Hunt	<i>Georgia Institute of Technology</i>
1997-1999	D. R. Pape	<i>Photonic Systems Incorporated</i>
1997-1999	B. R. Potter	<i>Vectron Technologies Incorporated</i>
1997-1999	K. Yamanouchi	<i>Tohoku University</i>
1998-2000	T. R. Gururaja	<i>Hewlett-Packard Company</i>
1998-2000	D. B. Hauden	<i>LPMO-CNRS</i>
1998-2000	A. H. Meitzler	
1998-2000	K. Uchino	<i>The Pennsylvania State University</i>

### EX-OFFICIO COMMITTEE MEMBERS

Awards	R. H. Tancrell	<i>Tancrell Associates</i>
Fellows*	R. M. White	<i>University of California, Berkeley</i>
Finance	H. van de Vaart	<i>VDV Associates</i>
Long Range Planning	H. L. Salvo, Jr.	<i>Northrup Grumman Corp., Electronic Sensors &amp; Systems Division</i>
Membership-Chapters	E. S. Furgason	<i>Purdue University</i>
Newsletter*	F. S. Hickernell	<i>Motorola, Inc., SSTG</i>
Nominations	B. R. Tittmann	<i>The Pennsylvania State University</i>
Standards	A. Ballato	<i>U. S. Army Communication-Electronics Command, Fort Monmouth</i>
Transactions*	W. D. O'Brien, Jr.	<i>University of Illinois, Urbana</i>
Past President (1996-1998)	H. L. Salvo, Jr.	<i>Northrup Grumman Corp., Electronic Sensors &amp; Systems Division</i>
Past President (1998-2001)	D. C. Malocha	<i>University of Central Florida, Orlando</i>
Student Member* (1998)	C. H. Frazier	<i>University of Illinois, Urbana</i>

### IEEE HEADQUARTERS

Director, Division IX*	E. K. Reedy
Managing Director, TAB*	M. Ward-Callan
General Manager, IEEE*	D. J. Senese

\* Non-Voting Position

## ADCOM BRIEFS

The Administrative Committee (AdCom) meeting of the *Ultrasonics, Ferroelectrics, and Frequency Control Society (UFFC-S)* was called to order at 11:00 A.M., June 12th, 1998, by J. R. Vig, *UFFC-S* AdCom President, at the Sofitel Hotel, Chicago (Rosemont), Illinois. Introductions of attending members were conducted.

J. R. Vig, *UFFC-S* AdCom President, introduced C. H. Frazier, the newly appointed *UFFC-S* AdCom Student Member for 1998.

J. R. Vig, *UFFC-S* AdCom President, introduced M. Ward-Callan, Managing Director of the IEEE's Technical Activities Department.

G. K. Montress, *UFFC-S* Secretary/Treasurer, moved to approve the minutes of the October 5th, 1997 *UFFC-S* AdCom meeting. The motion was seconded by R. H. Tancrell. The motion passed.

G. K. Montress, *UFFC-S* Secretary/Treasurer, reported that one e-mail/FAX ballot had been conducted during the time period from 6th October 1997 to 11th June 1998. This ballot was to confirm the *UFFC-S* President's Committee Chair and Representative appointments for 1998. The appointments were all approved by the *UFFC-S*'s elected AdCom members.

J. Brown, *UFFC-S* Publications Board Vice-President, presented a report on the various electronic media options available, both now and in the near future for the *UFFC-S*'s Transactions and Conference Proceedings. Consideration will be given to placing accepted *UFFC-S* Transactions papers on the Web, after a suitable methodology is established.

W. D. O'Brien, Jr., *UFFC-S* Transactions Editor-in-Chief, presented oral and written reports. The American Dairy Science Association's (ADSA's) handling of the editing and printing operations for the *UFFC-S* Transactions continues to go very well. A continued arrangement for 1999 is planned.

W. D. O'Brien, Jr., *UFFC-S* Transactions Editor-in-Chief, reported that the *UFFC-S* Transactions is available on-line now, beginning with the January 1998 issue. All *UFFC-S*

members in good standing should be able to access the *UFFC-S* Transactions on-line.

W. D. O'Brien, Jr., *UFFC-S* Transactions Editor-in-Chief, reported that the *UFFC-S* Transactions page budget for 1998 will be exceeded due to the unusually large number of manuscript submissions for the special issue on Sensors & Actuators. The *UFFC-S* AdCom approved an increase to the page budget in order to publish all of the special issue papers this year.

F. S. Hickernell, *UFFC-S* Newsletter Editor-in-Chief, submitted a written report. The deadline for submission of material for the September 1998 (Fall) issue of the *UFFC-S* Newsletter is July 6th, 1998. This earlier than usual deadline is due to the fact that the Ultrasonics Symposium is scheduled for 5th - 8th October 1998, and the *UFFC-S* Newsletter will contain information describing the Ultrasonics Symposium.

H. van de Vaart, *UFFC-S* Finance & Operations Committee Chair, presented oral and written reports. The *UFFC-S* remains in good financial shape, with reserves of approximately \$600k as of 31st December 1997. The *UFFC-S*'s 1999 budget was approved as submitted.

J. A. Kusters, *UFFC-S* Frequency Control Vice-President, presented an oral report. E. P. EerNisse was approved as the General Chair for the 2001 and 2002 IEEE International Frequency Control Symposia. The 2001 IEEE International Frequency Control Symposium will be held in Seattle. Total attendance at the 1998 IEEE International Frequency Control Symposium, in Pasadena, was 429. This is a slight increase over recent years.

J. A. Kusters indicated that the 1999 IEEE International Frequency Control Symposium will be held in Besançon, France, as a joint meeting with the European Frequency & Time Forum meeting. The meeting will likely be scheduled for April 1999. D. B. Sullivan will serve as General Chair for the symposium.

J. F. Greenleaf, *UFFC-S* Ultrasonics Standing Committee Chair, presented an oral report. Nashville, Tennessee was approved as the venue for the 2001 IEEE International





Ultrasonics Symposium. The dates for the 1998 IEEE International Ultrasonics Symposium are the 5th - 8th October 1998, in Sendai, Miyagi, Japan.

J. F. Greenleaf, *UFFC-S* Ultrasonics Standing Committee Chair, indicated that the 1999 MEE International Ultrasonics Symposium will be held in Lake Tahoe, Nevada; the 2000 IEEE International Ultrasonics Symposium will be held in San Juan, Puerto Rico; and the 2002 IEEE International Ultrasonics Symposium will be held in Munich, Germany.

R. H. Tancrell, *UFFC-S* Awards Committee Chair, presented oral and written reports. B. R. Tittmann is the current *UFFC-S* Distinguished Lecturer for 1998-1999. The title of his presentation is: "Turning Up the Heat on NDE". He has already started his activities as the *UFFC-S* Distinguished Lecturer for 1998-1999.

R. H. Tancrell, *UFFC-S* Awards Committee Chair, is formulating a plan for a uniform set of *UFFC-S* sponsored awards which spans the three primary technical areas of focus to the *UFFC-S*. He is coordinating this effort with the Ferroelectrics, Frequency Control, and Ultrasonics Standing Committees.

E. S. Furgason, *UFFC-S* Chapter/Membership Services Committee Chair, presented oral and written reports.

E. S. Furgason, *UFFC-S* Chapter/Membership Services Committee Chair, has prepared an updated *UFFC-S* membership brochure for general use. It should be available very soon.

A. Ballato, *UFFC-S* Standards Committee Chair, submitted a written report. The *UFFC-S*'s Standards Committee is currently responsible for nine items: eight standards and one project.

B. R. Tittmann, *UFFC-S* Nominations Committee Chair, presented oral and written reports. The election for new *UFFC-S* AdCom. members will be held during the Summer (1998), with their three year terms in office starting on 1st January 1999. The slate of nominees from EEEE Regions 1 - 7 is A. Amin, L. Maleki, S. M. Pilgrim, S. Trolrier-McKinstry, H. F. Routh, and B. A. Tuttle. Nominees from EEEE Regions 8 - 10 are: K. Takagi and M. Yamaguchi. Three new *UFFC-S* AdCom members will be elected from among the Regions 1 - 7 candidates, while one new *UFFC-S* AdCom member will be elected from among the Regions 8 - 10 candidates. B. R. Tittmann introduced a motion to approve the slate of candidates. The motion was approved.

The revised *UFFC-S* Bylaws and Constitution became effective on 1st January 1998.

The next *UFFC-S* AdCom meeting will be held at 9:00 A.M., on October 4th, 1998, in conjunction with the 1998 EEEE International Ultrasonics Symposium, in Sendai, Japan.

The *UFFC-S* AdCom meeting adjourned at 5:05 P.M.

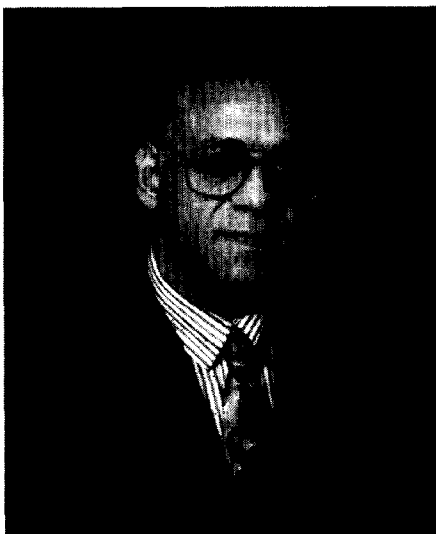
**Gary K. Montress**  
*UFFC-S* AdCom Secretary/Treasurer, 1998



## Ahmad Safari has been appointed as Vice-President, Ferroelectrics, of the IEEE UFFC Society

Dr. Ahmad Safari is a Distinguished Professor of the Department of Ceramic and Materials Engineering and a member of the Center for Ceramic Research at Rutgers, The State University of New Jersey. He received his B.S. and M.S. in Physics from Tabriz University, Iran in 1972 and 1974, and his Ph.D. in Solid State Science from The Pennsylvania State University in 1983. After working as a Research Associate at the Materials Research Laboratory at Penn. State, he joined Rutgers University in 1986 as an Assistant Professor.

Professor Safari is a Fellow of The American Ceramic Society since 1993, a Centennial Fellow of College of Earth and Mineral Science, The Pennsylvania State University (1996), Honorary Professor of Harbin Insti-



tute of Technology, Harbin China (1997). He chaired the US-Japan Meeting of Ferroelectric and Dielectric Materials (1995) and the 10th International Symposium on the Applications of Ferroelectrics (1996).

Professor Safari is Internationally recognized as a leading authority in processing and development of Piezoelectric Ceramics and Ceramic/Polymer Composites for Transducer Applications.

Dr. Safari's main field of interest includes: Layered Manufacturing of Functional Ceramics, Electroceramic Materials for Dielectric, Piezoelectric and Ferroelectric Applications, Ferroelectric Thin Films for Non Volatile Memories, Electroceramic and Ceramic-Polymer Composite for Transducers, Sensors, and Actuators.

## FUTURE UFFC-S SPONSORED SYMPOSIA

### ULTRASONICS SYMPOSIA

#### 1998 IEEE International Ultrasonics Symposium

Sendai, Miyagi, Japan - 5 - 8 October 1998

*For information contact:*

Noriyoshi Chubachi, *General Co-Chair*

Tohoku Gakuin University

Faculty of Engineering

Tagajo, Miyagi 985

JAPAN

(81) 22-368-1115 (Phone)

(81) 22-263-9230 (FAX)

chubachi@tjcc.tohoku-gakuin.ac.jp (e-mail)

or

Bernhard R. Tittmann, *General Co-Chair*

The Pennsylvania State University

Department of Engineering & Mechanics

210 Hammond Building

University Park, Pennsylvania 16802

USA

(814) 865-7827 (Phone)

(814) 863-7967 (FAX)

brt4@psu.edu (e-mail)

Kazuhiko Yamanouchi, *Technical Program Co-Chair*

Tohoku University

Research Institute of Electrical Communication

Katahira, Aoba-ku

Sendai 980-77

JAPAN

(81) 22-217-5 526 (Phone)

(81) 22-217-5526 (FAX)

yamasaw@riec.tohoku.ac.jp (e-mail)

James F. Greenleaf, *Technical Program Co-Chair*

Mayo Clinic

Ultrasound Research

200 First Street SW

Rochester, Minnesota 55905

USA

(507) 284-8496 (Phone)

(507) 284-1632 (FAX)

jfg@mayo.edu (e-mail)

#### 1999 IEEE International Ultrasonics Symposium

Lake Tahoe, Nevada

*For information contact:*

Pierre B. T. Khuri-Yakub, *General Chair*

Stanford University

Department of Electrical Engineering

E. L. Ginzton Laboratory

Room 11

Stanford, California 94305-4085

USA  
(415) 723-0718 (Phone)  
(415) 725-7509 (FAX)  
khuri-ya@ee.stanford.edu

#### **2000 IEEE International Ultrasonics Symposium**

San Juan, Puerto Rico

*For information contact:*  
Madjid A. Belkerdid, *General Chair*  
University of Central Florida  
Department of Electrical & Computer Engineering  
Orlando, Florida 32816-2450  
USA  
(407) 823-5793 (Phone)  
(407) 823-5835 (FAX)  
mab@engr.ucf.edu (e-mail)

#### **2001 IEEE International Ultrasonics Symposium**

Nashville, Tennessee *For information contact:*

Mack A. Breazeale, *General Chair*  
University of Mississippi  
National Center for Physical Acoustics  
University, Mississippi 38677  
USA  
(601) 232-7490 (Phone)  
(601) 232-7494 (FAX)  
breazeal@olemiss.edu (e-mail)

#### **2002 IEEE International Ultrasonics Symposium**

Munich, Germany, October 8-11

*For information contact:*  
Reinhard Lerch, *General Chair*  
University of Linz  
Institute fuer Elektrische Messtechnik  
Altenberger Strasse 69  
A-4040 Linz  
AUSTRIA  
(43) 732-2468-9209 (Phone)  
(43) 732-2468-822 (FAX)  
r.lerch@jk.uni-linz.ac.at (e-mail)

#### **FREQUENCY CONTROL SYMPOSIA**

##### **1999 IEEE International Frequency Control Symposium**

Besancon, France, April 12-16

*For information contact:*  
Donald B. Sullivan, *General Co-Chair*  
National Institute of Standards & Technology  
Time & Frequency Division  
Division 847  
325 Broadway  
Boulder, Colorado 80303

USA  
(303) 497-3772 (Phone)  
(303) 497-6461 (FAX)

or

Raymond J. Besson, *General Co-Chair*  
LCEP-ENSMM  
Ja Bouloie - route de Gray  
25030 Besancon Cedex  
FRANCE  
(31) 81-66-66-32 (Phone)  
(31) 81-88-57-14 (FAX)

Frederick L. Walls, *Technical Program Chair*  
National Institute of Standards & Technology  
Time & Frequency Division  
Division 847  
325 Broadway  
Boulder, Colorado 80303  
USA  
(303) 497-3207 (Phone)  
(303) 497-6461 (FAX)

##### **2000 IEEE International Frequency Control Symposium**

Kansas City, Missouri – 6 - 9 June

*For information contact:*  
Donald B. Sullivan, *General Co-Chair*  
National Institute of Standards & Technology  
Time & Frequency Division  
Division 847  
325 Broadway  
Boulder, Colorado 80303  
USA  
(303) 497-3772(Phone)  
(303) 497-6461 (FAX)

#### **FERROELECTRICS SYMPOSIA**

##### **1998 IEEE International Symposium on Applications of Ferroelectrics**

Montreux, Switzerland

*For information contact:*  
Nava Setter, *General Chair*  
Ecole Polytechnique Federale de Lausanne (EPFL)  
Laboratoire de Ceramique  
MX-D Ecublens  
CH-1015 Lausanne  
SWITZERLAND  
(41) 21-693-2961 (Phone)  
(41) 21-693-5810(FAX)  
nava.setter@epfl.ch (e-mail)

# Joint Meeting of the 13<sup>th</sup> European Frequency and Time Forum and 1999 IEEE International Frequency Control Symposium

12-16 April 1999

## Background on the Joint Meeting

The European Frequency and Time Forum (EFTF) and the IEEE International Frequency Control Symposium (FCS) are the two most prominent international conferences addressing frequency and time technology. This joint meeting is one of two such meetings planned by agreement of the leadership of both conferences. The second joint meeting will be held in the United States in 2003 at a location to be determined. These two meetings constitute a trial of the concept. There is no commitment on the part of either conference to more joint meetings, but both conferences recognize that other joint meetings might be scheduled if the first two joint meetings are well received by participants.

## Format for the Joint Meeting

The meeting format will be familiar to participants of both conferences, since both include plenary speakers, parallel sessions with contributed and invited papers, and poster sessions. The banquet and awards ceremonies will be held Wednesday evening, 14 April.

## Local Environment

Besançon is a city of ~ 150,000 people near the Jura Mountains close to Switzerland. The weather should be mild in April with trees in blossom and average temperature of 13 °C (55 °F). Considered the best "green city" in France, the town, birthplace of watchmaking, has an old historical center with museums, Roman remains, monuments, excellent restaurants, shops, the unique "Citadelle" zoo and many cultural attractions. Located on a major rail line, 2 ½ hours from Paris by TGV, Besançon allows easy access to central Europe.

## Exhibition

In conjunction with the meeting, an exhibition will be held at the Micropolis. Exhibitors can obtain detailed information on this exhibition from the Secretariat.

## Language

The working language of the Joint meeting is English, which will be used for all presentations, discussions, and printed material.

## Call for Papers

Authors are invited to submit papers dealing with recent and original work of interest to the EFTF and FCS communities in the following subject areas:

- piezoelectric materials
- crystal oscillators
- SAW oscillators

- crystal/SAW filters
- crystal sensors
- crystal transducers
- microwave oscillators
- optical oscillators
- atomic frequency standards
- clocks for space
- optical frequency standards
- noise and aging
- GPS/GLONASS systems
- time transfer
- measurement methods
- frequency synthesis

## Instructions for Preparing Abstracts

Authors should indicate their intention to submit a paper on the attached form. The abstract, outlining the scientific or technical contribution, should be prepared according to the instructions below. The specific nature of the contribution should be described in the first one or two sentences, and the abstract should emphasize the specific results of the work.

- The single-spaced abstract can be prepared on A4 or 8 1/2x 11 paper, and should fit on one page within a space that is 16 cm wide and no greater than 24 cm high.
- It is recommended that you use this or a similar size font. This font is TIMES 12.
- The title should be all capital letters and centered on the margins. Author names should be capitalized and again centered with author 'institutions Just below this in mixed capital and lower-case letters. Spaces should separate the title, the author list, and the text.
- The name of the corresponding author should be placed at the bottom of the same page or a separate sheet. The author's address, telephone number, fax number, and e-mail address should be included.
- Completed camera-ready abstracts can be sent by regular mail or e-mail to the Technical Program Committee Chairman. A faxed copy will be accepted for review by the Program Committee, but the e-mail or hard copy of the abstract should be sent immediately thereafter.
- Please indicate your preference for oral or poster session on the pre-registration form and the abstract.

## Schedule

Second call for papers	August 1998
Deadline for abstracts	27 October 1998
Selection of papers (in Paris)	Mid-December 1998
Confirmation to authors	January 1999
Program	February 1999

## Conference Location

The Conference will be held in Micropolis, the Parc des expositions et des congrès de Besançon. Various accommodations exist within the city of Besançon. Transportation between the Micropolis and the hotels will be provided.

## Registration Fee

The early registration fee of 320 US\$ will include 1 copy of the proceedings and 1 ticket for the evening banquet. Late registration will be 350 US\$. Students and retirees will pay 50 US\$ (without proceedings).

## 1999 Conference Co-Chairmen

Dr. R.J. BESSON                      ENSMM (France)  
Dr. D.B. SULLIVAN                NIST (US)

## 1999 Technical Program Chairman

Dr. F.L. WALLS  
NIST Time and Frequency Division  
325 Broadway  
Boulder, CO 80303, USA  
fax: 1 303 497 6461                      e-mail: [efft.fcs@nist.gov](mailto:efft.fcs@nist.gov)

## 1999 Local Organization Chairman

Prof. R.J. BESSON  
ENSMM  
26 Chemin de l'Epitaphe  
F-25030 Besançon Cedex, France

## Conference Secretariat

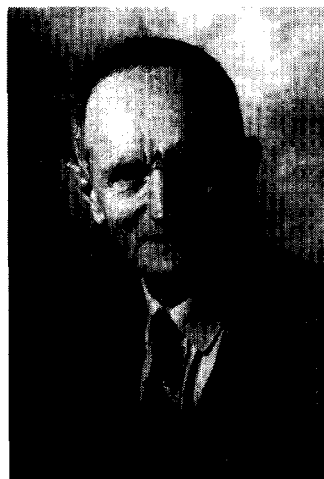
Isabelle BOURGON  
SFMC, co/ENSMM  
26 Chemin de l'Epitaphe  
F-25030 Besançon Cedex, France  
tel: 33 3 81 40 28 21                      fax: 33 3 81 88 57 14  
e-mail: [isabelle.bourgon@ens2m.fr](mailto:isabelle.bourgon@ens2m.fr)

## Raymond J. Besson Conference Co-Chairman

Raymond J. Besson was born in Villars St. Georges, Doubs, France on May 2, 1938.

He was first a teacher in Physics in a High School of Dole, Jura, France. He received his Ph.D. in 1968 and his "Doctorat d'Etat" in 1970, both in Physics from Besancon University. He taught Electricity in Besancon University (1966-1974) and then joined Ecole Nationale Supérieure de Mécanique et des Microtechniques, Besancon, France, in 1974 as a Professor in Electronics.

Co-creator, co-organizer of European Frequency and Time Forum (1987), organizer of laboratoire de Chronometrie, Electronique et Piezoelectricite, creator of an industrial company for industrialization of quartz resonators and oscillators (1991), R. J. Besson has also been regional deputy of French Ministry for research and technology since 1982. He has produced over 80 articles on time and frequency devices, resonators, oscillators, and sensors (This includes a contribution to



Physical Acoustics (1975). He is the inventor of new resonators, oscillators, and sensors (18 patents).

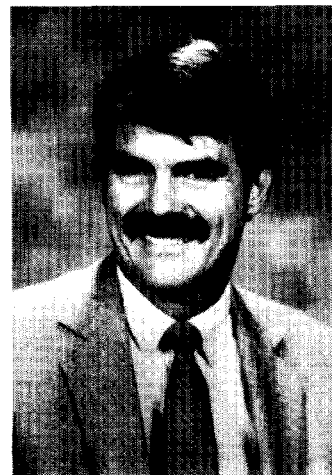
R. J. Besson is the recipient of the Silver Medal CNRS, Paris, 1980, the Grand Prize in Electronics Gen. Ferrie, Paris, 1980, the Science and Defense Award French Dept. of Defense, Paris, 1984, the W. G. Cady Award, 1992, and the 1993 Outstanding Paper Award (co-author) IEEE, UFFC. He was named Officer of

Legion of Honour (1997). He is currently President of Societe Chronometrique de France (which supports the 1999 joint meeting in France).

He likes working in his country house, but also skiing and practicing foreign languages.

## Donald B. Sullivan Conference Co-Chairman

Donald B. Sullivan was born in Phoenix, Arizona in 1939. He received the BS degree in physics from the University of Texas at El Paso in 1961 and the MA and PHD degrees in physics from Vanderbilt University in 1963 and 1965. From 1965 to 1967 he served as an officer in the U.S. Army at Edgewood Arsenal, Maryland and in 1967 he joined the National Bureau of Standards (now the National Institute of Standards and Technology, NIST) as a National Research Council Postdoctoral Fellow. In 1969, he joined the permanent staff of the NIST Boulder Laboratories to work on applications of superconducting devices to high accuracy and high speed measurements. He moved into program management in 1977 serving as the Leader of the Cryoelectronics Group for 5 years, as a Program Analyst at NIST headquarters, and as Acting Deputy Director of the Center for Electronics and Electrical Engineering. In 1984, he made a major shift in technical field, becoming Chief of the Time and Frequency Division. He has published more than 50 articles on electronic devices and measurement instruments. In 1985, he was recognized by NIST with the Samuel Wesley Stratton Award (shared with Richard Kautz) for establishing the feasibility of the series-array Josephson volt standard now used widely for maintaining the volt.





## EFTF/FCS Facts

1. Nobel Prize winners C. Cohen-Tarmoudji and William Philips have been invited to deliver papers at opening session.

2. A web site has been created: <http://www.ens2m.fr/eftf>

3. Final selection of papers is December 11, 1998, at the T. P. C. meeting in Paris Airport (Charles de Gaulle).

4. Mike Mirarchi and Barbara McGivney will welcome the American participants in France and help the European organization.

- The "Micropolis" localization includes:
  - a great auditorium (2000 seats or less)
  - two smaller meeting rooms (400 seats each)

- 3000 square meters for posters and exhibitions
- transportation will be continuously available
- 5. Instead of organizing visits we plan to have several organizations exhibiting on the conference site.
- 6. Award ceremony will be downtown in the evening of April 14, 1998.
  - two European awards (European frequency and time award plus young scientist award)
  - three American awards (Cady, Rabi, and Sawyer)
- 7. First call for papers has been launched. We anticipate participation of 500 to 600 persons and 40 exhibitors.

**Raymond Besson**  
Co-Chairman

---

## O'Brien's Travels

You can follow the travels of our Distinguished Lecturer for 97-98, Bill O'Brien, by these photos from his picture album.



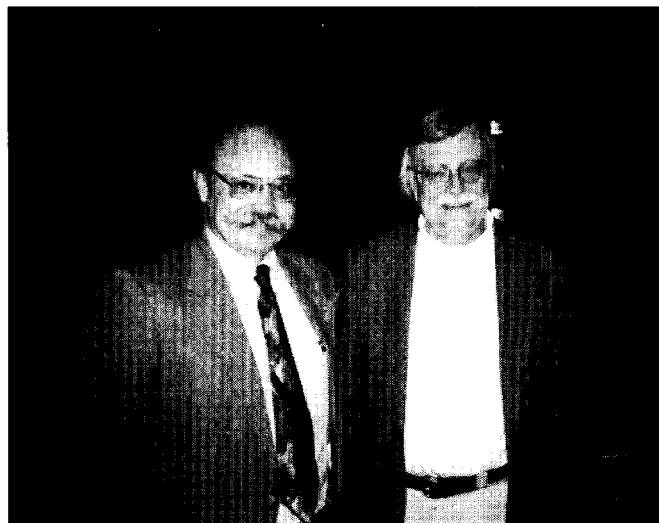
Dinner with the IEEE Waves and Devices Chapter in Phoenix. Left to right: Adolfo Reyes, Ali Baghai-Wadji, Tom and Brenda Hickernell, Bill O'Brien, Fred and Thresa Hickernell, Irv Kaufman, and Milt Crane.



Houston hosts. Left to right: Dave Shattuck, Don Wilton, Craig and Kathy Hartley, Jon and Karen Ophir, Bill O'Brien, and Joanne Wilton.



Bill O'Brien's DL hosts John Abbott (middle) and Helen Routh (right) in Bothell, Washington.



Bill O'Brien's DL visit to Seattle with Jack Reid (right).



**Dinner in Orlando as part of the DL program. Left to right: Eric Adler, Don Malocha, Bill O'Brien, Karen Malocha, and Lee Adler.**



**Lunch in Florence, Italy as part of the DL program. Left to right: Gabride Guide, Piero Tortoli, Bill O'Brien, and Francesco Guidi.**



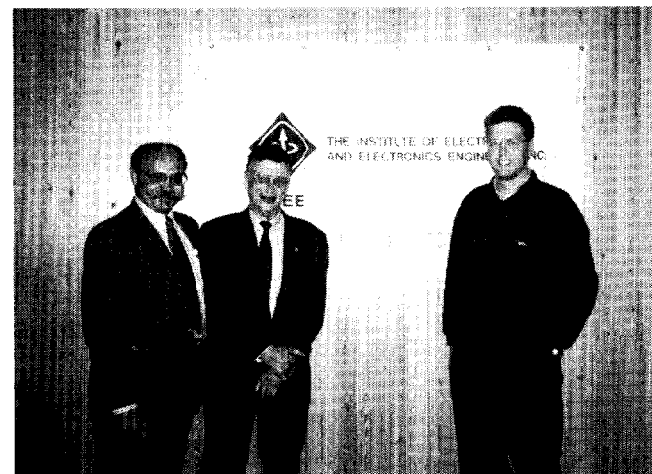
**Distinguished Lecturer Bill O'Brien visiting Kathy Ferrara's (center front) laboratory in Charlottesville, VA.**



**Enjoying the Italian coast off of Genoa as part of the DL program. Bill O'Brien and Andrea Trucco (right).**



**Durham hosts. Left to right: Bill O'Brien, Gregg Trahey, Olaf von Ramm, and Steve Smith.**



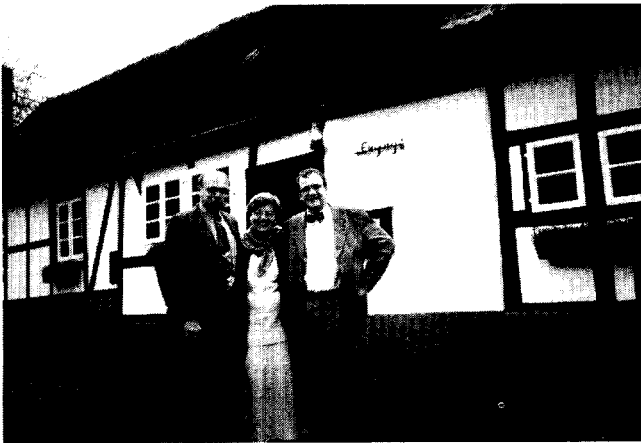
**Visiting the Denmark IEEE Section as part of the DL program. Left to right: Bill O'Brien, Peer Martin Larsen (former IEEE Region Director), and Joergen Jensen.**



**The Boston gang after Bill O'Brien's DL talk.**



**Jan and Pauline Somer at the Old Dutch in Rotterdam with Bill O'Brien (center).**



**Astra and Helmut Ermert in Bochum, Germany after Bill O'Brien's DL talk.**



**Visiting Rochester, NY as part of the DL program. Left to right: Steve Levinson, Bill O'Brien, and Bob Waag.**



**The research group in Halle, Germany after Bill O'Brien's DL talk.**



**Toasting a short conference with featured Bill O'Brien's DL talk in Rotterdam, The Netherlands. Left to right: Ton van der Steen, Rob Hekkenberg, and Bill O'Brien.**

## CONGRATULATIONS

**Meirion Lewis** has won the Duddell Medal and Prize for "his fundamental contributions to the understanding of surface acoustic waves and surface-skimming bulk waves, and to the subsequent development of devices relying on these phenomena". Lewis is a visiting professor at the University of Cambridge.

\*Ref: Physics Today, April 1998, page 86

Submitted by Herman van de Vaart

**James G. Miller** has been honored for his scientific contributions by receiving MERIT grant status from the International Institutes of Health.

**Bernhard H. Tittmann** was the recipient of a 1998 Outstanding Research Award given by The Penn State Engineering Society. He was also honored by the society as the recipient of a Senior Fullbright Scholarship for 1998/1999, and as the IEEE-UFFC Society Distinguished International Lecturer. (April 30, 1998)

Submitted by Art Ballato.

**Kenji Uchino** was named Fellow of the American Ceramic Society.

## EXPRESS YOUR VIEWS. Your ideas are valuable!

### Nominations for UFFC-S ACHIEVEMENT AWARD

The Achievement Award is the highest Society-wide award presented to a member in special recognition of outstanding technical achievements. Take a moment to identify members whom you think deserve to be honored. The award is granted for significant technical publications in the field of ultrasonics, ferroelectrics, or frequency control; for presentation of lectures; and/or for service to the Society.

The award embraces all technical fields in the society, and includes both technical and organizational achievements. Each nomination receives serious consideration by the Officers and the Awards Committee. Nominations may be submitted at any time during the year.

Photocopy this section and send via FAX or mail:  
(You may submit more than one if you wish.)

Here is my nomination for **Achievement Award**:

Nominee's Name & Main Contributions: \_\_\_\_\_

\_\_\_\_\_

Your Name/Address: \_\_\_\_\_

\_\_\_\_\_

Send at anytime to:

Roger H. Tancrell  
Chair, UFFC-S Awards Committee  
7 Valyn Lane  
Wilmington, MA 01887-1147  
Tel/FAX: (978) 657-9748  
e-mail: r. tancrell@ieee.org

## Nominations for UFFC-S DISTINGUISHED SERVICE AWARD

The Distinguished Service Award is a new award created by AdCom to recognize long-term support of the Society's activities. The first Award was presented in 1997. Recognition is given to those who innovate new Society programs, administer major Committees, manage Society functions, or promote the Society's areas of technical interest to the larger community. The recipient usually has served for many years with sustained participation in the Society's management. Selection is made by the Officers and the Awards Committee. Nominations may be submitted at any time. Who is the person you would like to honor in this way?

Photocopy this section and send via FAX or mail:  
(You may submit more than one if you wish.)

Suggestions for the next **Distinguished Service Award**:

\_\_\_\_\_

Your Name/Address: \_\_\_\_\_

\_\_\_\_\_

Send at anytime to:            Roger H. Tancrell  
   Chair, UFFC-S Awards Committee  
   7 Valyn Lane  
   Wilmington, MA 01887-1147  
   Tel/FAX: (978) 657-9748  
   e-mail: r. tancrell@ieee.org

---

## Nominations for DISTINGUISHED LECTURER AND/OR TOPIC

The UFFC-S Distinguished Lecturer is welcomed by organizations around the world to present an up-to-date review of new developments in ultrasonics, ferro-electrics, or frequency control. The Distinguished Lecturer represents the Society to the larger technical community, and stimulates interest in the Society's professional areas. Recent lecturers have spoken to local chapters, universities and companies throughout North America, Japan, Europe, China, and South America.

Which topics would you like to hear? Which member would give a stimulating lecture? Fresh ideas are always welcome. Nominations may be submitted at any time. Be heard by filling out the attached form.

Photocopy this section and send via FAX or mail:  
(You may submit more than one if you wish.)

Suggestions for the next **Distinguished Lecturer and/or Topic**:

\_\_\_\_\_

Your Name/Address: \_\_\_\_\_

\_\_\_\_\_

Send at anytime to:            Prof. Mack A. Breazeale  
   Chair, UFFC-S Distinguished Lecturer  
   Subcommittee  
   The National Center for Physical Acoustics  
   University of Mississippi  
   University, MS 38677  
   Tel: (601) 232-7490  
   FAX: (601) 232-7494

## INVITATION TO SENDAI — 1998 IEEE International Ultrasonics Symposium

It is a great pleasure and privilege to welcome you to the 1998 IEEE International Ultrasonics Symposium to be held from October 5 to 8 in Sendai, Japan. In our society of UFFC, this is the second time the symposium is held outside the North American continent after 1994 Cannes, France and it is the first time in Asia. We are grateful to the members of AdCom, who always give their kind suggestions and advice to our local committee.

Our local committee is making special efforts in the preparation for the Sendai symposium and hope that the planned program will satisfy all participants. In order to attract as many participants as possible from abroad, our local committee is preparing many pleasant events.

Here we should like to inform you of two special events. The first is a new program of "Presentations and Tours" which was kindly arranged by three research teams of Tohoku University where ultrasound investigations in Japan originated. We hope you will find and feel the active research atmosphere of Tohoku University, directly. Details will be described in this newsletter.

The second is a special noble and elegant "Noh" performance that will be given by Mr. Rejiro Tsumura, the famous "Noh" actor and his musical team. "Noh" is a classical Japanese stage art or play which combines elements of dance, drama, music and poetry into one highly aesthetic stage art (see photos below). Before their performance Mr. Tsumura will make a presentation on "Noh" in English. You will be able to look at gorgeous "Noh" costumes and classical Japanese instruments, such as the bamboo flute and special drums - very closely. We are also planning a pleasant Japanese style dinner and joyful guest tours during the symposium week.

We hope and wish that this Sendai symposium will promote mutual understanding of Asian and Western cultures, so that our society may contribute to the peace of the world as well as human welfare worldwide through science and technology.

**Noriyoshi Chubachi and Bernhard Tittmann**  
General Co-Chairs



## INVITED SPEAKERS

### **MEDICAL ULTRASONICS (Vice Chair: Lewis Brown)**

**James G. Miller**

Washington University

*"Backscatter imaging and myocardial tissue characterization"*

**Ton van der Steen**

Thorax Center, Rotterdam

*"Novel developments in intravascular imaging"*

**Jean-Michel Correas**

Hopital Necker, Paris

*"Ultrasound contrast agents: clinical applications"*

**Jonathan Ophir**

The University of Texas Medical School

*"Elastography Imaging"*

**Kenneth R. Erickson**

Lockheed Martin IR Imaging Systems  
"Performance of a 128 X 128 ultrasonic hybrid array"

**Motonao Tanaka**

Tohoku Welfare Pension Hospital, Sendai, Japan  
"Historical perspective of the development of echocardiography and myocardial ultrasound"

**POSTERS**

**Juin Jet Hwang**

SonoSight, Inc.  
"Portable ultrasound device for battlefield trauma"

**Richard J. Littlefield**

Battelle, Pacific Northwest National Laboratory  
"MUSTPAC: An operational 3-D ultrasound telemedicine/telepresence system"

**NDE & INDUSTRIAL APPLICATIONS  
(Vice Chair: Donald E. Yuhas)**

**Pierre Brodeur**

Institute of Paper Science and Technology, Atlanta, GA  
"Overview of applications of ultrasonics in the pulp and paper industry"

**Pierre Calmon**

Commissariat L'Energie Atomique/CEREM, Saclay, France  
"Modeling of acoustic fields in solids and their interaction with defects"

**Heiichi Fukada**

Kobayashi Institute of Physical Research, Tsukuba, Japan  
"History and recent progress of piezoelectric polymer research"

**Pier Paolo Delsanto**

Director, INFN-DIP FISICA, Torino, Italy  
"Parallel processing simulations of the propagation of ultrasonic waves through material interfaces"

**Cheng-Kuei Jen**

Industrial Materials Institute, Boucherville, Quebec, Canada  
"On-line ultrasonic monitoring of industrial materials processes"

**P. Kielczynski**

Research and Productivity Council, Fredericton, NB, Canada  
"Recent developments in ultrasonic devices for monitoring critical parameters in Canadian nuclear reactors"

**Kazushi Yamanaka**

Tohoku University  
"Ultrasound atomic force microscopy with higher order mode vibration of cantilever"

**PHYSICAL ACOUSTICS  
(Vice Chair: Bikash K. Sinha)**

**Sadayuki Ueha**

Tokyo Institute of Technology  
"Ultrasonic actuators using near-field acoustic levitation"

**B. T. (Pierre) Khuri-Yakub**

E. L. Ginzton Laboratory, Stanford University  
"Silicon micromachined ultrasonic transducers"



**Godaido Temple, Matsushima Bay**

**Stewart Sherrit**

Department of Physics, Royal Military College of Canada  
"The use of complex material constants to model the AC dynamic response of piezoelectric materials"

**Kazuhiko Yamanouchi**

Tohoku University  
"Generation, propagation and attenuation of 10 GHz-range SAW in LiNbO3"

**Qiming Zhang**

The Pennsylvania State University  
"Relaxor ferroelectric polymers for actuators and transducers"

**SURFACE ACOUSTIC WAVES (Vice Chair:  
Gary K. Montress)**

**Darrell L. Ash**

RF Monolithics Inc., Dallas, TX  
"SAW-based hybrid transceivers in SLAM packaging with frequency range from 200 to 1000 MHz"

**Pascal Ventura**

Thomson Microsonics, Sophia-Antipolis, France  
"Numerical methods for SAW propagation"

**Yoshio Satoh**

Fujitsu Laboratories Ltd., Akashi, Japan  
"SAW duplexer metalizations for high power durability"

**Leland P. Solie**

SAWTEK Inc., Orlando, FL  
"Design of low-loss tapered SAW filters"

**Presentations and Tours**

This is a new program especially arranged for Sendai Symposium.

**Background of this special program:**

It can be said that ultrasound investigations in Japan originated at Tohoku University in Sendai. In the history of the Department of Electrical Engineering, Tohoku University, Professor Heiichi Nukiyama studied on electroacoustic transducers with Professor A. E. Kennelly at Harvard University in Boston from 1917 to 1919. After he returned to Tohoku (then



Imperial University in Sendai, he raised many active researchers and engineers of acoustics to spread them to all parts of Japan. In 1936, Professor Nukiyama was awarded the highest prize on science and technology in Japan, which is known as the "Asahi Prize", on the development of underwater telephony and magnetostriction ultrasonic transducers. Professors Y. Kikuchi and K. Shibayama of Tohoku University, and Professor J. Saneyoshi of Tokyo Institute of Technology - all students of Professor Nukiyama - cultivated ultrasonics in such fields as under-water ultrasonics, non-destructive testing, ultrasonics in medicine and biology, SAW devices, etc., so that many engineers working in ultrasonics industries today have continued their good relationships with Tohoku University. To visit Tohoku University is a must for ultrasonics engineers.

On this occasion of the Ultrasonics Symposium held in Sendai, the local committee members have arranged the following program to return our sincere thanks to all friends in the world who for a long time have been encouraging the ultrasonics groups of Tohoku University.

## Tours

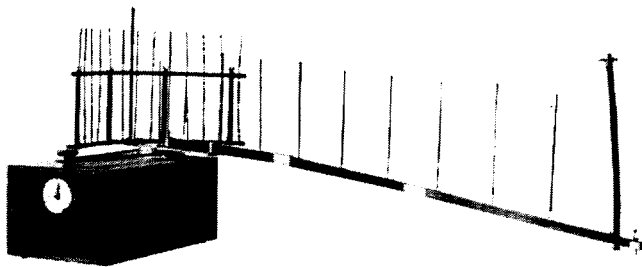
The following three tours are planned on Monday, October 5, 1998. Please join us in this program and discussion.

### Tour 1. "SAW Devices and Fabrication"- Katahira Campus

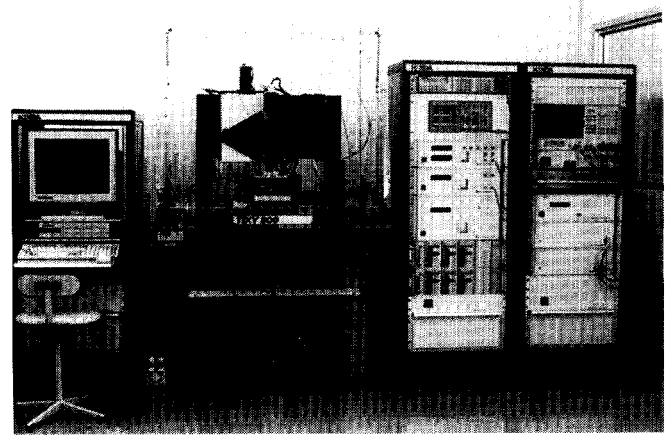
Presenters: Professors K. Yamanouchi and K. Tsubouchi

Research activities on novel SAW materials, SAW devices, and their applications to GHz wireless multimedia communication in Research Institute of Electrical Communication are presented.

- (1) KNbO<sub>3</sub> single crystals and thin films with extremely high electromechanical coupling coefficients for SAW devices.
- (2) New type of SAW convolvers using InSb semiconductor thin film fabricated by MBE method.
- (3) Submicron fabrication technology and its application to GHz-Range SAW-filters
- (4) Scanning nonlinear dielectric microscopy for evaluation of ferroelectric domains and its application to ferroelectric memory.



SAW structure reminds us of Yagi-Uda antenna invented at Tohoku University.



Ultrasonic spectroscopy (UMS) system.

- (5) ZnO/Si SAW convolver and highly reliable 2.4 GHz spread spectrum (SS) wireless modem utilizing the convolver as a corrector. This modem is the first authorized one for 2.4 GHz SS band in Japan. .
- (6) 2.4 GHz front-end AlN/Al<sub>2</sub>O<sub>3</sub> SAW matched filter with the zero-temperature-coefficient-of-delay characteristics and the ultra low-power (28mW) card-size SS wireless modem.
- (7) Indoor SS/CDMA system utilizing the approximately synchronous CDMA code. Facilities of Yamanouchi Laboratory and Tsubouchi Laboratory as well as the Superclean Room of the Laboratory for Electronic Intelligent Systems will be opened and guided.

### Tour 2. "Ultrasonic Micro-Spectroscopy"- Aoba-yama Campus.

Presenters: Professors J. Kushibiki and K. Yamanaka

"Ultrasonic-Microspectroscopy (UMS)" as a new technology for material analysis has been intensively studied at Tohoku University. The UMS technology consists of the following new ultrasonic systems and methods:

- (1) acoustic microscopy with imaging and quantitative measurements,
- (2) bulk-wave ultrasonic spectroscopy, operating in the VHF and UHF ranges,
- (3) laser ultrasound system including the phase velocity scanning of interference fringes, and
- (4) ultrasonic atomic force microscopy with super high resolution at the nanometer scale.

UMS has been applied to a wide variety of scientific and industrial materials problems, including various mechanical solid materials. After presentation, the UMS Research Center of Kushibiki Laboratory and Yamanaka Laboratory will be opened and guided.



**New ultrasonic diagnostic equipment invented at Tohoku University.**

### **Tour 3. "Medical Ultrasonics" - Seiry Campus.**

Presenters: Professors S.Nitta (MD), Y. Koiwa(MD), Y. Saijo(MD), and H. Kanai.

At Tohoku University, medical doctors and engineers have collaborated to cultivate medical ultrasonics since the late

Professor Y. Kikuchi initiated it in the 1950's. In the presentation, two quantitative evaluation systems are demonstrated, which have been recently developed for medical diagnosis and tissue characterization.

- (1) A novel Doppler system for clinical cardiovascular diseases has been developed at the Electrical Engineering Department. A small displacement on the heart wall or arterial wall is measured in the frequency range up to 200 MHz for each of multiple layers preset across the ventricular wall. From the displacement, the changing view in myocardial thickening during the cardiac cycle at each layer is graphically described. We also present the usefulness of this system in evaluating the instability of the atheromatous lesion of carotid artery, which is one of the main clinical targets today.
- (2) A mechanically scanning acoustic microscope (SAM) system, operating in the frequency range 100-200 MHz, has been specially developed for medicine and biology at the Research Institute of Cancer and Chest Diseases. The system has been applied to various kinds of diseased tissues, and the research of tissue characterization using two-dimensional images and quantitative data of velocity and attenuation has been conducted.

---

## **EDITORS NOTE**

Summer temperatures have climbed to above 115 degrees Fahrenheit here in Arizona and your editor is already longing for a place to cool off. By the time this newsletter arrives, some of our members will have already experienced the cooler climes and beauty of Montreux, Switzerland at ISAF XI and its associated conferences. Last word was that the advanced program book was published and was sent to over 1000 people. Overall the committee had received over 720 abstracts for oral and poster presentations. We will have a report on the conference in the next newsletter.

Your editor is looking forward to the 1998 IEEE Ultrasonics Symposium in Sendai, Japan where the air should be crisp and cool, the tours and presentations interesting, the scenic sights beautiful, and the hospitality wonderful. This newsletter begins with an invitation to come to Sendai. The web-site is full of information on the symposium so be sure and check it out. A very distinguished committee in Japan, introduced in this newsletter, has been working very hard to assure the success of the Sendai Symposium. Be sure and express your appreciation to them.

The 1998 International Frequency Control Symposium in Pasadena, California was a great success. Tom Parker, the General Chairman has made note of this. The accommodations were luxurious and the surroundings beautiful. Our congratulations to the Cady, Rabi, and Sawyer award winners.

While the UFFC-S Administrative committee were meeting in Chicago, Dennis Pape and I were enjoying the fresh air and scenic beauty of northern Russia as we cruised the lakes and rivers at the UFFC-S co-sponsored Russian Conference in St. Petersburg. Dennis has written up information on the con-

ference and pictures have been supplied by Dennis, Raymond Besson, and Thresa Hickernell. Our Russian hosts were most gracious and the IEEE and UFFC-S logos were prominent on the name badges and abstract books. Maybe the AdCom meeting next summer can cruise Lake Michigan?

Thresa and I had such a wonderful time in Poland that we had to share information about the IEEE co-sponsored MIKON-98. Jozef Modelski sent the article and pictures. We were saddened by the death of a very dear friend of ours and the society member who was Polish born, Chris Fortunko.

Gary Montress, our secretary extraordinaire, has put together minutes of the AdCom meeting in Chicago. Jan Brown has captured the faces of those at the meeting. Ahmad Safari is the new Vice-president of Ferroelectrics and we welcome him and Jack Custers, the new VP for Frequency Control, to the AdCom. Congratulations to members and friends receiving honors. Please keep your newsletter editor informed about honors and awards to our members.

Future symposia are noted together with some advanced information on the joint meeting of the European Frequency and Time Forum and the 1999 IEEE Frequency Control Symposium. Raymond Besson and Don Sullivan want you to experience Besancon, France in April 1999 for a spectacular conference.

Bill O'Brien has been all over the world as our Distinguished Lecturer. Don't forget to schedule Bernie Tittmann, who is the new Distinguished Lecturer. Information was contained in the last newsletter.

We welcome our new UFFC Society members and note that the number of new international members exceeds those

in the United States. It is not too soon to be thinking about nominations for Fellows. A list of senior members of our society is given as a guide to possible candidates. Also it is important to note that this is the year of the senior member and the society will receive ten dollars for everyone of their members elevated to senior member. You can use this same list to determine who needs to be on it. The list of Fellows of our society is on the web site. Finally please take the time to give your input for any of the three awards our society gives. This is an opportunity for our membership to honor other members.

I trust you will enjoy this issue of the newsletter. Special thanks go to Andrea Watson and her coworkers at IEEE Maga-

zines/Newsletters for final assembly of this newsletter edition. The invitation is always there to any of our members to submit articles, photographs, and information which will be of interest to our readership. The next deadline falls around January 15, 1999, for the spring newsletter. The easiest way to communicate is e-mail if you have it available. My address is f.hickernell@ieee.org. I have a fax- (602) 441-7714, a phone-(602) 441-2923, and an address - Motorola SSTG, MS-H1330, 8201 E. McDowell, Scottsdale, AZ 85252. I look forward to hearing from you.

**Fred Hickernell**  
Newsletter Editor

## WELCOME NEW UFFC-S MEMBERS

We welcome the following new members to the IEEE UFFC Society, January 1, 1998 to July 4, 1998.

Rittberg, Howard R.	AE	Braou, Azeddine	Algeria
McIntosh, John C.	AL	Ferreya, Romualdo A.	Argentina
Alessi, William N.	AR	Figueroa, Jose L.	Argentina
Armijo, Paul David	AZ	McNeillage, Cameron	Australia
Lanz, Darren C.	AZ	Mountford, Graham C.	Australia
Wu, Qiu	AZ	Suchcicki, Eugene	Australia
Bautista, Danny C.	CA	Jungwirth, Mario P.	Austria
Briggs, Keith	CA	Demeur, Bram	Belgium
Chungpaiboonpatana, Surasit	CA	Mantovani, Suely	Brazil
Day, Robert A.	CA	Balachov, Serguei	Brazil
Kong, Alvin M.	CA	Hristov, Alexander I.	Bulgaria
Schluchter, Caly	CA	Kalchev, Chavdar D.	Bulgaria
Wang, Yunlong	CA	Spasov, Aleksander Y.	Bulgaria
Wu, Shih-Jeh J.	CA	Terziev, Kiril O.	Bulgaria
Holsing, Droy L.	CO	Cloutier, Mark M.	Canada
Stasiak, James W.	CO	Joiner, Glenn A.	Canada
Galipeau, Jeffrey. D	CT	Kuehner, Nathanael P.	Canada
Gaudreault, Eugene	CT	Mainguy, Francois	Canada
Barnett, Kenneth C.	FL	Simpson, David H.	Canada
Dobrilla, Dave	FL	Ting, Michele	Canada
Jensen, Finn W.	FL	Wilson, Robin L.	Canada
Lear, Kelly M.	FL	Racine, Yves	Canada
McKnight, Marty	FL	Gui, Zhilun	China
Rhodes II, Richard A.	FL	Hareb, Fathi O.	China
Sheets, Judd O.	FL	Ke, Xiheng	China
Stallings, Justin Paul	FL	Lu, Shengguo	China
Van-Dyke-Lewis, Michele D.	FL	Luo, Wei-Gen	China
Vetelino, Kevin A.	FL	Ma, Yiwu	China
Lou, Kuokchun	HI	Ren, Wei	China
Schmerr, Lester	IA	Wang, Yu	China
Telschow, Kenneth L.	ID	Zhu, Shouhong	China
De Ball, Leonard M.	IL	Carranza, William	Colombia
Klonsdorf, Armin W.	IL	Rodriguez, Luis G.	Colombia
Pedersen, Michael	IL	Aguinte, Bryan	Costa Rica
Rooney, Paul K.	IL	Stimac, Alan	Croatia
Whitty, Henrietta A.	IL	Mosek, Jaroslav	Czech Republic
Rice, Joseph M.	KS	Rushdi, Muhammad Ali	Egypt

Huang, Lidu	MA	Sallam, Aly A.	Egypt
Jie, Sun	MA	Baily, Greg F.	England
Katzin, Peter John	MA	Eckersley, Robert J.	England
Miccioli, William F.	MA	Forde, Michael C.	England
Pappas, Seth H.	MA	Jaffer, Asger	England
Rothman, Michael A.	MA	Schlaberg, H. Inaki	England
Thompson, Charles	MA	Tiitinen, Pasi S.	Finland
Cavey, William W.	MD	Tjukahoff, Esa J.	Finland
Corey, Jr., Francis S.	MD	Andre, Carrere G.	France
Buma, Takashi	MI	Brusseau, Elisabeth	France
Dixon, John W.	MI	Leger, C. P.	France
Linn III, Thomas L.	MI	Elfgarb, Kuehnicke	Germany
Nielsen, Charles A.	MI	Fischer, Wolf J.	Germany
Oweiss, Karin G.	MI	Friedrich, Stefan	Germany
Reimus, David	MI	Haas, Christine	Germany
Rochat, Harold E.	MN	Knaak, Mirko	Germany
Elbert, Troy A.	MO	Marklein, Rene	Germany
Neal, Steven P.	MO	Pesavento, Andreas	Germany
Zhang, Weiming	MO	Schmitz, Georg	Germany
Causey, Jr., Wayne H.	MS	Schuller, Axel	Germany
Douglas, Stephen J.	NC	Tacke, Maurus	Germany
Fernandez, Anna T.	NC	Thielemann, Christiane	Germany
Nightingale, Kathryn R.	NC	Balabanov, Iavor G.	Greece
Babcock, David	NJ	Dadoros, Avraam	Greece
Cooper, Jr., Michael H.	NJ	Wong, Kin Hung	Hong Kong
Didenko, Nikolai V.	NJ	Goyal, Piyush	India
Emanetoglu, Muri W.	NJ	Pannu, Raj	India
Kands, Rizk L.	NJ	Rajnarayanan, S. B.	India
Koscica, Thomas E.	NJ	Rangarajan, Radhika	India
Tuttle, Bruce A.	NM	Tiwary, H. V.	India
Heffron, Christopher, J.	NY	Ezzati, Neamat O.	Iran
McAleavey, Sephen A.	NY	Kashani, Amir U.	Iran
Myer, Daniel P.	NY	Wright, William M.	Ireland
Szekely, Csaba	NY	Chorev, Motti	Israel
Hadick, Robert	OH	Kartoun, David	Israel
Hazard, Christopher R.	OH	Lamberti, Nicola A.	Italy
Herrera, Elizabeth M.	OH	Marlin, Riccardo	Italy
Karaus, Jr., William M.	OH	Araki, Yoshikazu	Japan
Kohr, Eric A.	OH	Froelich, Benoit G.	Japan
Makin, Inder	OH	Goto, Hiroyuki	Japan
Brehm, Darell F.	OK	Hashimoto, Hiroshi	Japan
Bailey, Kirk A.	OR	Hattori, Takeshi	Japan
Ansel, Lukas Brian	PA	Hirala, Yoshihiro	Japan
Augenstein, Don R.	PA	Imano, Kazuhiko	Japan
Bickhart, Sheri A.	PA	Ishihara, Mitsuhiro	Japan
Chaiyasena, Isra A.	PA	Kawarai, Shigeyoshi	Japan
Forrester, Martin G.	PA	Matsumoto, Noriyuki	Japan
Guo, Ruyan	PA	Minamide, Akiyuki	Japan
Hunsdorf, Jon	PA	Murayama, Riichi	Japan
Keitzer, Scott A.	PA	Sato, Masahiro	Japan
Mast, T. Douglas	PA	Shida, Katsunori	Japan
Miyasaka, Chiaki	PA	Suzuki, Shinji	Japan
Patterson, Richard D.	PA	Tanidokoro, Hiroaki	Japan
Shi, William T.	PA	Tsuchiya, Masamichi	Japan

Siao, Warren	PA	Abu-Hantash, Laith A.	Jordan
Tavossi, Hasson M.	PA	Al-Arid, Shadi M.	Jordan
Toner, Eugene M.	PA	Al-Atrash, Nidal I.	Jordan
Yang, Gin L.	PA	Kozan, Yaser Y.	Jordan
Yanulis, George E.	PA	Wasike, Aquinas	Kenya
Yuan, Ying-Wei	PA	Jung, Yi Hong	Korea
Zheng, Jiehui	PA	Kang, Seong-Woo	Korea
Bobkowski, Romuald	TX	Park Sin-Chong	Korea
Campanini, Robert H.	TX	Ryoo, Tae-Ha	Korea
Kallel, Faouzi	TX	Sohn, Hak-Yeol	Korea
Kondfagou, Elisa E.	TX	Sung, Dai Y.	Korea
Mohammedali, Razak	TX	Cardona, Felix J.	Mexico
Nayeemuddin, Mohammed	TX	Cardona, Felix Javier Reyes	Mexico
Norvell, Bill R.	TX	Casillas, Fernando Lepe	Mexico
Righetti, Raffaella	TX	Corona-Sanchez, J. Jesus	Mexico
Standley, Thomas E.	TX	Gonzalez, Vincente J. Nunez	Mexico
Vogrinec, Gary G.	UT	Hennings, Pablo	Mexico
Butler, John C.	VA	Martinez, Hector Daniel	Mexico
Lee, Seok-Won	VA	Tlapale, Ignacio Aguilar	Mexico
Price, Douglas R.	VA	Dirk, Kamminga S.	Netherlands
Borup, David T.	VT	Andersen, Kenneth	Norway
Anderson, Kevin D.	WA	Olivares, Roy	Panama
Anderson, Thomas L.	WA	Fabijanski, Pawel R.	Poland
Averkou, Michael A.	WA	Filus, Zdzislaw	Poland
Bloch, Susannah H.	WA	Pardelinha, Carlos	Portugal
Hg, Gary C.	WA	Santos, Mario J.	Portugal
Howley, C. J.	WA	Homentcouschi, Dorel T.	Romania
Perozek, David M.	WA	Balaz, Igor J.	Russia
Peterson, Roy B.	WA	Barihou, Dmitry A.	Russia
Ramachandran, Dinendra	WA	Frolova, Galina	Russia
Becker, David	WI	Al-Aklubi, Ayid T.	Saudi Arabia
Jacoby, James L.	WI	Balghunem, Adil S.	Saudi Arabia
Wilson, Thaddeus	WI	Abeyratne, Udantha R.	Singapore
Yetka, Robert	WI	Qureshi, Jamil A.	Singapore
		Sanusi, Hendy	Singapore
		Martinez, Francisco G.	Spain
		Carlson, Johan	Sweden
		Grbic, Nedelko	Sweden
		Rydell, Bo H.	Sweden
		Dubois, Marc-Alexandre	Switzerland
		Kuo, Yue Yuan	Taiwan
		Lin, Jiun-Hwa	Taiwan
		Kumwachara, Kiattisak	Thailand
		Artan, E. Tolga	Turkey
		Birgul, Ozlen	Turkey
		Sencor, Taha Husrev	Turkey
		Tavli, Bulent	Turkey
		Shams, Eyad K.	UA Emirates
		Al-Askar, Yousef M.	UA Emirates
		Machusky, Eugene A.	Ukraine
		Andrickson, Jose A.	Venezuela
		Nino, Julian F.	Venezuela



## IEEE FELLOW NOMINATIONS

It is not too early to be thinking about Senior Members of the UFFC-Society that you would like to nominate for the Fellow grade. Nominations will be due in March of 1999 and forms will be ready by November, 1998. To refresh your memory on the process it is described in the paragraphs that follow which focuses on the IEEE Fellow Committee and how it operates.

The IEEE Bylaws define the Fellow grade as one of unusual distinction in the profession, to be conferred only by initiation of the Board of Directors upon a person of outstanding and extraordinary qualifications and experience in the IEEE designated fields, who has made important individual contributions to one or more of those fields. A nominee must be a Senior Member of the Institute and have been a member in any grade for at least five years prior to January 1 of the year of election.

The Fellow Committee, appointed by the Board of Directors, has the responsibility of making recommendations to the Board of Directors for nominees to be conferred the grade of Fellow.

The Fellow Committee acts as a guardian of IEEE Fellow grade standards and works carefully and faithfully to maintain these standards uniformly throughout the IEEE. The committee is concerned with determining whether the applicants meet the requirements of the IEEE Bylaws, and it seeks assistance from many sources in adjudicating the nominations.

The Fellow Committee depends upon the nominator of a candidate to furnish all of the basic necessary information requested on the nomination form and to point out the unique contributions of the candidate in a concise and succinct statement.

The Fellow Committee depends upon the society evaluations of, the technical contributions of the candidates and their ranking of the candidates.

The Fellow Committee depends upon the Fellow grade references to comment on the candidate's specific achievements which they are qualified to judge.

The Fellow Committee will consider brief letters of endorsement from IEEE sections, chapters and committees.

In the processing by the Fellow Committee, the candidates' dossiers are evaluated on a basis of eight criteria:

1. Individual contributions as engineer, scientist, originator, technical leaders, or educator.
2. Evaluation by an IEEE society. Note that only one IEEE society evaluation is to be submitted for each candidate. The nominator is responsible for selecting the IEEE society that best reflects the candidate's field of technical accomplishments.
3. Tangible and verifiable evidence of technical accomplishments, such as technical publications, patents, reports, or published descriptions of products, facilities, and/or service.
4. Opinions of confidential Fellow references who are qualified to judge the work of the candidate (where possible, these should be associated with other than the candidate's own organization).
5. Service to IEEE and its predecessors, the AIEE or IRE.
6. Professional engineering service other than the IEEE.
7. Opinions of endorsers.
8. Total years in the profession.

Having considered all of the valuable information supplied from these many sources, a consensus of committee judgements is reached on the nominees to be recommended to the Board of Directors for evaluation to the IEEE Fellow grade, taking into account the maximum number of recommendations permitted by the IEEE Bylaws which can be submitted annually.

If you are interested in nominating one of our UFFC Society members you may obtain the necessary forms from Sandy Schumacher, IEEE Corporate Communications & Awards Activities, P.O. Box 1331 - 445 Hoes Lane, Piscataway, NJ 08855-1331, (732) 562-3843 or from the IEEE website, [www.ieee.org/awards](http://www.ieee.org/awards).

The following is a list of members of the UFFC-S who are Senior Members of the IEEE. A list of Fellows is on the UFFC website.

### UFFC-S IEEE Senior Members

Adams, Charles A.	Broschat, Shira L.	Farison, J. B.	Hinedi, Sami
Asfar, Omar R.	Brown, Jan	Filler, Raymond L.	Hruska, Carl K.
Ash, Darrell L.	Budreau, Alan J.	Fish, Peter J.	Hsu, S. T.
Atalar, Abdullah	Buff, Werner	Fliegel, Frederick M.	Inoue, Takeshi
Audet, Sarah	Bylander, Ernest G.	Foster, F Stuart	Jain, Faquir C.
Baghai-Wadji, Alireza	Chang, Shu-Kong	Frizzell, Leon A.	Jen, Cheng-Kuei
Barzilai, Uzi	Chang, I. C.	Fukumoto, Akira	Jones, Joie P.
Batra, Narendra K.	Cheeke, David	Furgason, Eric S.	Joshi, S. G.
Baudrand, Henri	Chubachi, Noriyoshi	Gao, Shangkai	Josse, Fabien
Becker, Richard A.	Clemen, David M.	Gaunard, Guillermo C.	Kawashima, Hirofumi
Belkerdid, Madjid A.	Cook, R. L.	Ghorayeb, Solomon R.	Keller, Bruce D.
Benkeser, Paul J.	Craig, S. E.	Goldstein, Albert	Kelly, Kenneth R.
Besson, Raymond J.	De Reggi, Aime S.	Goss, Stephen A.	Kessler, Lawrence W.
Bhat, Prabhakar N.	Doctor, Steven R.	Gualtieri, John G.	Kielczynski, Pawel
Biebl, Erwin M.	Durand, Louis G.	Guy, Ian L.	Kinoshita, Yasuaki
Bilgutay, Nihat	Edmonds, Peter D.	Hanafy, Amin M.	Koide, Frank K.
Blalock, Theron V.	Etzold, Karl F.	Hartley, Craig J.	Kojima, Toshihiro
Bosso, Frank C.	Evans, David H.	Hayward, Gordon	Koshiba, Masanori

Kosinski, John A.  
Koymen, Hayrettin  
Kozaki, Shogo  
Kremkau, Frederick W.  
Kucar, Andrew D.  
Kusters, J. A.  
Lakin, Kenneth M.  
Larson, John D.  
Leach, William M.  
Lee, John N.  
Leopold, Hans A.  
Leung, Wing P.  
Li, Longtu  
Lie, Liu W.  
Lim, Teong C.  
Liu, Qing-Huo  
Luo, Wei-Gen  
Ludwig, Reinhold  
Maleki, Lute  
Malette, Leo A.  
Matthiesen, Duane J.  
Melton, Hewlett E.  
Miller, Robert L.  
Monteith, C. R.  
Mylvaganam, K Saba  
Nakazawa, Mitsuo

Naldi, Carlo N.  
Nandi, Asoke K.  
Nikoonahad, Mehrdad  
Odyniec, Michal  
Owings, Bryan  
Panasik, Carl M.  
Pandey, R. K.  
Pedersen, Peder C.  
Pei, Soo-Chang  
Penunuri, David  
Polla, Dennis L.  
Powers, John P.  
Queen, Daniel  
Quentin, Gerard J.  
Reible, Stanley A.  
Riley, William J.  
Riza, Nabeel A.  
Roberts, Gerald E.  
Rodrigues Filho, Arlindo  
Roman, Maev  
Rothermich, E. Wayne  
Roy, Manas K.  
Ruppel, Clemens C.  
Russell, Steve F.  
Salvo, Harry L.  
Samy, Ram P.

Saniie, Jafar  
Schmidt, V Hugo  
Sehgal, Chandra M.  
Seifert, Franz J.  
Seim, Tom A.  
Serbest, A Hamit  
Shankar, P. M.  
Shiosaki, Tadashi  
Smith, John I.  
Smith, Wallace A.  
Smith, Thane  
Smith, Peter M.  
Soetanto, Kawan  
Soluch, Waldemar  
Sostrand, K. A.  
Takeuchi, Hiroshi  
Takeuchi, Yasuhito  
Tam, Andrew C.  
Taylor, George W.  
Teo, Tat-Jin  
Thijssen, Johan M.  
Toda, Kohji  
Tortoli, Piero  
Tsarapkin, Dmitry P.  
Turner, C. W.  
Udpa, Satish S.

Umemura, Shin-Ichiro  
Van Biesen, Leo P.  
Vetelino, John  
Vojak, Bruce A.  
Wadaka, Shusou  
Walls, Fred L.  
Ward, Roger W.  
Wasilik, John H.  
Waters, D. D.  
Weigel, Robert  
Wiggins, Robert B.  
Withers, Richard S.  
Woon-Siong, Gan  
Wright, J. Nelson  
Yamaguchi, Masatsune  
Yamani, Ahmed M.  
Yang, Daben  
Yao, Xi  
Ying, Hao  
Yoon, Suk Wang  
Yuan, Weng Wen  
Zagar, Bernhard G.  
Zakarevicius, Ramutis A.  
Zhang, Shu-Yi



**The INSTITUTE OF ELECTRICAL & ELECTRONICS ENGINEERS, Inc.**  
445 Hoes Lane, P.O. Box 1331 • Piscataway, NJ 08855-1331, USA

**Non Profit Org.**  
**U.S. Postage**  
**PAID**  
**IEEE**  
**Permit #52**