

IEEE ULTRASONICS, FERROELECTRICS AND FREQUENCY CONTROL SOCIETY NEWSLETTER

Number 9, April 1990

Editor: Fred S. Hickernell



**Jan Brown
UFFC-S President**



**James Greenleaf
Distinguished Lecturer**

**Frequency Control Symposium
Baltimore, Maryland
May 23 - 25**

**ISAF '90
University of Illinois
June 6 - 8**

Jan Brown UFFC-S President

Jan Brown was born in Wyoming and grew up in the Rocky Mountains of Utah, Montana, and Washington. She received the A.B., A.M., and Ph.D. degrees in Physics from Washington University in St. Louis in 1972, 1974, and 1978, respectively.

From 1978-1984 she was a Member of the Professional Staff at Schlumberger-Doll Research in Ridgefield, CT, where she was primarily involved in investigations of materials, devices, and techniques for pressure and temperature measurements under arduous conditions. Since joining Fisher Controls in Austin, TX in 1984, Jan has continued materials and sensor research and applications including resonant and non-resonant sensors for temperature, pressure, mass flow, liquid level, and pH measurement.

Jan has been an elected member of the UFFC Administrative Committee (1984-1986), a member of the Ultrasonics Symposium Technical Program Committee (1980-Present), a member of the Frequency Control Symposium Technical Program Committee (1984-Present), Technical Chair of the 1987 and 1988 Ultrasonics Symposia, and Vice President of the UFFC (1988 and 1989). Currently, she is President of the UFFC and serves as an Associate Editor for the IEEE UFFC Transactions.

Jan enjoys the Hill Country of Central Texas, outdoor recreation, woodworking, and the University of Texas, Women's volleyball and basketball teams. In May she will receive an MBA from the University of Texas, where she is currently enrolled in the Executive MBA Program.

Editor's Notes

Usually your editor is satisfied with putting one short paragraph at some appropriate "filler" spot in the newsletter, thanking the contributors and telling when articles are needed for the next edition. This time I found that there was a big empty space between our new president, Jan Brown, and vice president, Jim Greenleaf, that we had a larger than usual page and picture count and that this was the start of a new decade which was being launched with some remarkable events in Eastern Europe and the Soviet Union. How all of this prompted the following remarks may or may not become clear.

First, we welcome a new president and vice president who will need the support of the membership. Call up Jan, tell her what you like and dislike about our UFFC Society and then let her know how you are going to help. Support our Distinguished Lecturer by inviting him to your chapter meetings. Maybe you can entice the Microwave or Electron Device Societies in your area to consider having Jim Greenleaf for one of their meetings.

Editor's Notes continued

This issue has lots of pictures. In fact, your editor had a lot more pictures sent for the newsletter than he could possibly include. I have always encouraged the photographic visuals because it gets us better acquainted. Of course, the best "getting acquainted" takes place at the Symposia. Maybe the pictures and biographies will start you on the road. I am always fascinated by the diversity in interests of our members and encourage them to share some items of personal interest in their biographies. (Note: I was a bit ruthless this edition in cutting down the bios to fit on one column below the pictures).

There are three terrific Symposia coming up this year. First, the Frequency Control Symposium in Maryland in May featuring Nobel prizewinners, tutorials, and the main menu of recent advances in the frequency business. In June, it is the International Ferroelectrics Symposium with its wide ranging papers on materials that respond in interesting ways to fields. In December, as the first heavy snows move into the midwest and east, you'll find the ultrasonic devotees on the beaches of Hawaii basking in the sun after the days technical sessions. The Ultrasonics Symposium will be a real Far East meets West affair.

I also took the liberty of putting in photographs and a short write up on a conference held in Varna, Bulgaria, this past September. Your editor has had the privilege of participating in conferences in Eastern Europe and the USSR in recent years. We (my wife doesn't want to miss any of these trips) made many special friends in these countries. A few have been able to come to our various UFFC Symposia, and I hope that more will be able to come in the future. We need to encourage our fellow scientists and engineers in these countries because they sense an uncertain future as governments are changing. It is an interesting aspect of life that as we reach out in friendship to others that we are the ones that are most blessed. I hope you enjoy seeing some faces of some very intelligent, capable, and loving people from across the Atlantic.

Finally, your editor appreciates the many contributions that were made in putting this newsletter together. First a thank you to those who supplied the various articles contained in the newsletter. Herman van de Vaart supplied some excellent photos of the Ultrasonics Symposium. Jan Brown, with her roving camera, captured more action at committee meetings. Harry Salvo (who doesn't want his name mentioned) also took some of the candid shots. Kathy Nolan who gave the word processor a good workout. I did the cutting and pasting. You can start thinking about articles for the next newsletter; the deadline will be the middle of August 1990.

UFFC-S 1990-91 Distinguished Lecturer Program

Multidimensional Ultrasonic Imaging and Tissue Characterization

James F. Greenleaf, Fellow, IEEE

1990 Distinguished Lecturer

Throughout the history of medicine it has been implicit that function follows form. Thus, an intimate understanding of biological structure through some means of visualization has been required to deduce function in health or disease. Even medieval medical science understood the importance of visual depictions of the body. However, most visual depictions are two-dimensional forcing the viewer to construct in his mind the three-dimensional relationships within the organ or body. The emergence of the digital computer provides new methods for acquisition and for display of biomedical images. Ultrasonic imaging with the B-scan is a naturally tomographic modality. By combining many two-dimensional images, taken through different planes within the three-dimensional object, three-dimensional depictions of the object can be obtained. Several geometries are possible using available equipment. For example, the scan plane can be translated through the object obtaining a "breadloaf" sequence of slices or it can be rotated obtaining a set of slices in a cylinder. After acquisition of the three-dimensional data set, the data must be classified into tissues, e.g., heart wall, heart chamber, vessels, etc., using some measurable characteristic of the signal. After classification comes segmentation in which structurally defined classes are divided into functional or anatomic groups for subsequent evaluation. The heart tissue classes might be segmented into the left ventricular chamber for study of its volume through the heart cycle, for example. The final step is to evaluate or visualize the image using some form of display such as a true three-dimensional display, stereo views or two-dimensional projections.

Three-dimensional images of the beating heart have been obtained using specific cylindrical scan geometries as shown in Figure 1.

Another form of multidimensional data is multidimensional textures or features. Tissues can be classified into groups according to certain measured features such as texture, attenuation, speed, etc. The features can represent coordinates in a multidimensional domain and classes of tissues can be represented by regions in the multidimensional space. Just as an object within a scattering image can be segmented, tissues can be separated or classified by their position in multidimensional feature space. The imaging and classification problems are essentially the same, each requiring multidimensional analysis.

In this lecture, we will describe methods of acquisition, analysis, and display of multidimensional ultrasound images and multidimensional classification systems using various ultrasonic signal features.

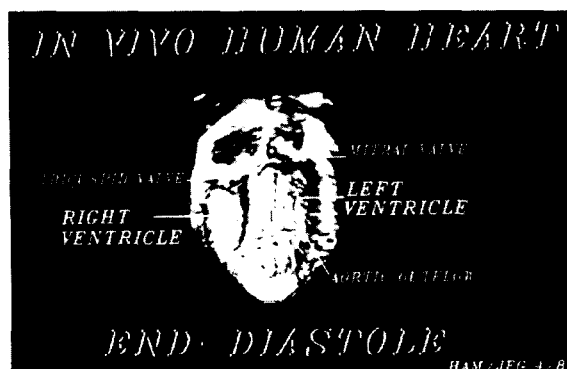


Figure 1 Ultrasonic image of human heart derived from data obtained by rotating the transducer about its central axis at the apical region of the heart.

James F. Greenleaf (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, Biodynamics Research Unit, 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-UFFCS Subcommittee on Ultrasonics in Medicine/IEEE Measurement Guide Editors, and on the IEEE Medical Ultrasound Committee. Dr. Greenleaf is Vice President of the UFFCS Society. Dr. Greenleaf has four 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. His special field of interest is in ultrasonic biomedical imaging science and has published more than 146 articles and edited four books in the field.

Doctor Greenleaf can be reached at the Biodynamics Research Unit, Department of Physiology and Biophysics, Mayo Clinic, Rochester, MN 55905. Phone: (507) 284-8496.

President's Message

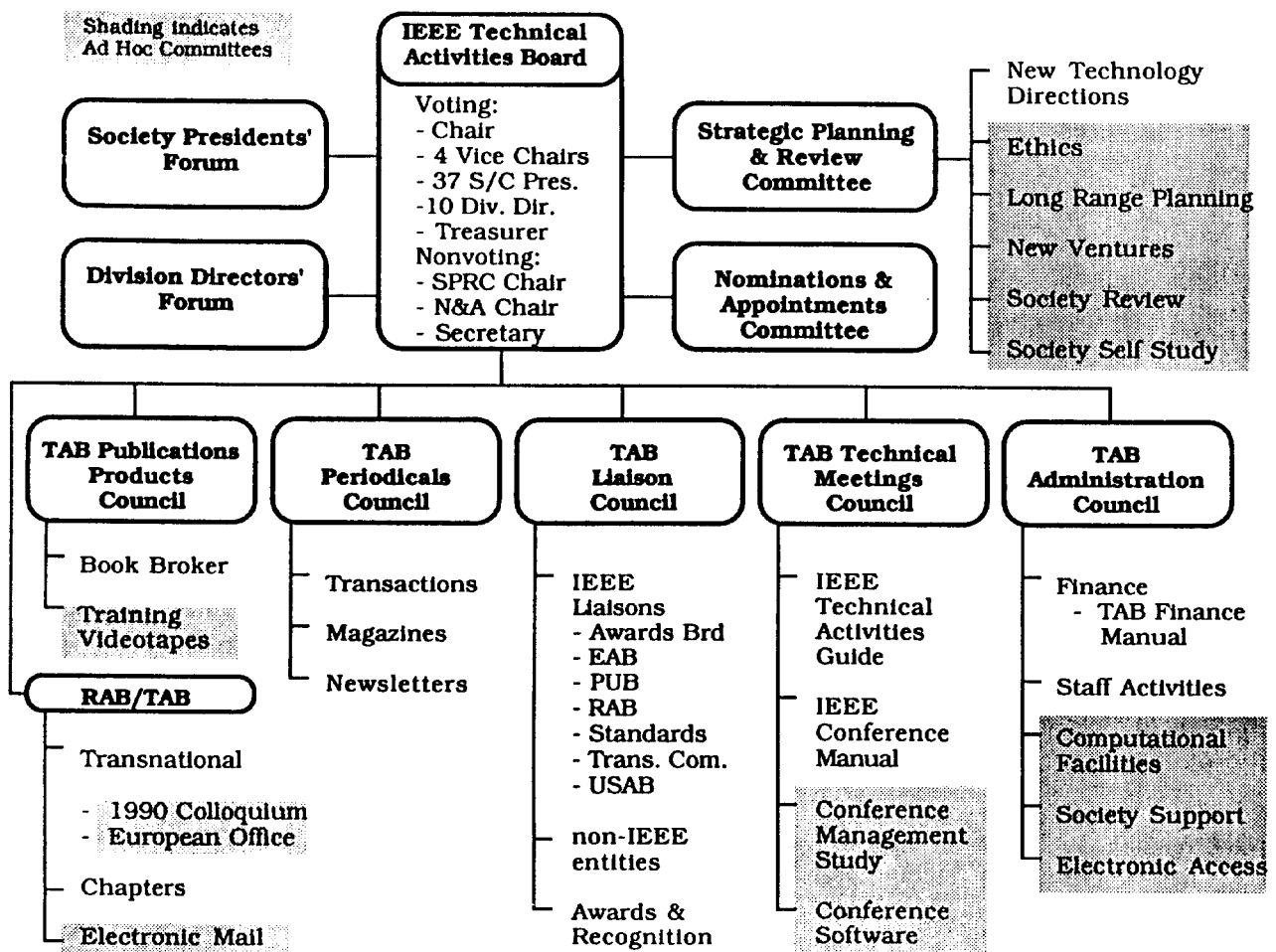
A NOTE FROM THE PRESIDENT...

This year is off to a busy start. Your Executive Committee of the ADCOM (Jim Greenleaf, VP, Harry Salvo, Secretary-Treasurer, Bill O'Brien, Transactions, Editor, Herm van de Vaart, Chair of Finance Committee, and myself) ADCOM met in Dallas in February. Aside from some administrative details, we spent some time discussing the three technical areas of our society (ultrasonics, ferroelectrics, and frequency control) and how, as an administrative committee, we might better serve the different needs of the groups, how we might achieve some parity of representation of the groups on the ADCOM and standing committees, and how the groups might function in a more parallel fashion. Our goal is to make necessary changes to truly reflect the interests of the constituencies in the Society.

The IEEE Technical Activities Board has undergone a major restructuring. I have included the structure here for you to see. I believe this restructuring has the potential for making the Institute more responsive to our needs. At the least, it clearly shows where the various concerns we have may be addressed.

I would like to extend the invitation to all of you to become more involved in the Society. If there is anything you would like to volunteer for, please let me or your other Society officers know. If there is anything we can do for you or any comments or suggestions you have for us, please let us know.

Jan Brown
President, UFFC-S



Frequency Control Symposium

FREQUENCY CONTROL SYMPOSIUM

The 44th Annual Symposium on Frequency Control will be held May 22 to May 25 at the Stouffer Harborplace Hotel in Baltimore, Maryland. This years symposium will be unique in several ways. First, there will be a special plenary session on Friday, May 25th at which two of the 1989 Nobel Prize winners in physics will speak. Ray Filler gives the details of this extraordinary session. The second unique feature of this years symposium is that there will be five tutorials given on Tuesday, May 22nd. These five tutorials are:

Bulk Wave Resonators and Transducers by Arthur Ballato

The Instabilities of Quartz Crystal Resonators and Oscillators by John R. Vig

Design of Experiments and Analysis of Data - Statistical by Thrygve R. Meeker

Low Noise Oscillator Design Using Acoustic and Other High Q Resonators by Michael M. Driscoll

How to Make Meaningful Phase Noise Measurements (Is it an Art of a Science?) by T.E. Parker, G.K. Montress and F.L. Walls

A registration fee of \$150 (separate from the symposium registration tee) will be charged and any of the five tutorials can be attended. There will be two parallel sessions so it will not be possible to attend all five. More details on these tutorials will be given in the Advanced program which will be mailed in April.

On the first regular day of the symposium (Wednesday, May 23rd) there is another plenary session scheduled during which there will be a panel discussion on the Measurement of Environmental Sensitivities of Precision Oscillators, chaired by Helmut Hellwig. In addition to the tutorials, the panel discussion, and the Nobel Prize Session, there will be eight invited and approximately seventy contributed papers presented at the 44th Annual Symposium on Frequency Control.

Thomas E. Parker
Technical Program Chairman

NOBEL PRIZE WINNERS TO SPEAK AT THE 44TH ANNUAL SYMPOSIUM ON FREQUENCY CONTROL

The 1989 Nobel Prize in Physics was awarded to Norman Ramsey, Hans Dehmelt, and Wolfgang Paul for advancements in atomic clock technology. Professor Ramsey of Harvard University and Professor Dehmelt of the University of Washington have accepted invitations to present their Nobel lectures at the 44th Annual Symposium on Frequency Control. The symposium is scheduled for May 23-25, 1990 at the Stouffer Harborplace Hotel, Baltimore, MD. There will be a special reduced registration fee for the Nobel lectures. The lectures will be presented Friday morning, May 25.

Professor Ramsey's talk is titled "Experiments with Separated Oscillatory Fields and Atomic Hydrogen Masers." Professor Dehmelt's talk is titled "Experiments with an Isolated Subatomic Particle at Rest."

44TH Annual Frequency Control Symposium May 23 - 25, 1990 Stouffer Harborplace Hotel, Baltimore, MD

For more information contact Dr. Raymond L. Filler, US Army Electronics Technology and Devices Laboratory, ATTN: SLCET-EQ, Fort Monmouth, NJ 07703-5000; (201) 544-2467.

FORTHCOMING FREQUENCY CONTROL SYMPOSIA as of February 1990

Year	Dates	Location	Hotel	General Chairman	Technical Program Chairman	Local Arrangements Chairman
1990	May 23 - 25	Baltimore	Stouffer Harborplace Hotel	D. Allan	T. Parker	M. Driscoll
1991	May 29 - 31	Los Angeles	Airport Marriott	R. Filler	T. Parker	V. Reinhardt
1992	May 27 - 29	Hershey, PA	Hershey Lodge & Convention Center	R. Filler	J. Kusters	C. Jensik
1993	June 2 - 4	Salt Lake City	Salt Lake City Marriott	J. Vig	J. Kusters	E. EerNisse

Frequency Control Symposium



DAVID ALLAN
GENERAL CHAIRMAN

David W. Allan was born in Mapleton, Utah on September 25, 1936. He received the B.S. degree in physics from Brigham Young University, Provo, Utah, in 1960, and the M.S. degree in physics from the University of Colorado in 1965,

In 1960 he joined the Atomic Frequency and Time Standards Section of the National Bureau of Standards, Boulder, Colorado, where he worked with ammonia beam masers and related quantum electronic devices. He is currently a senior scientist in the Time and Frequency Division in the National Institute of Standards and Technology, and leader of the group who generates the NIST atomic time scales and who coordinate international time and frequency comparisons.

He received the Department of Commerce Silver Medal award, 29 October 1968, "for contributions to the NBS atomic time scales and the understanding of the statistics of atomic frequency standards." In May 1984 he was the second to receive the I.I. Rabi award "for his contribution to the measurement and characterization of precision time and frequency sources."

Mr. Allan is a member of the Scientific Research Society of America, Sigma Xi, the International Radio Consultative Committee (CCIR), the International Radio Scientific Union (URSI) and the International Astronomical Union (IAU)- His first loves are his family and his religious activities. He is also involved in community affairs. He loves the mountains, and keeps himself fit by biking, jogging and hiking. When he can he tries to beat his oldest son at racquet ball! Over the years he has been an avid white-water river guide, a hunter and photographer.



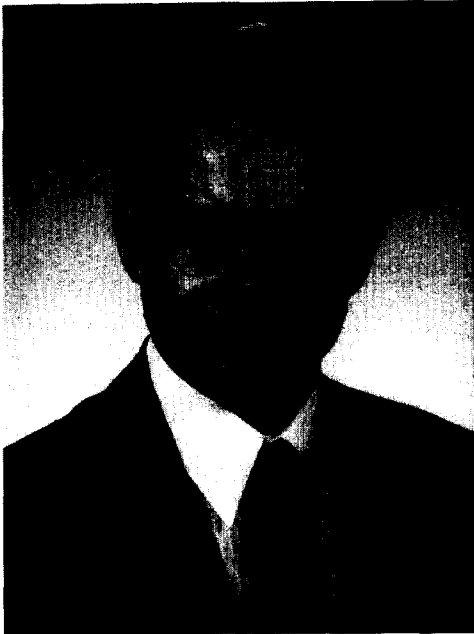
THOMAS E. PARKER
TECHNICAL PROGRAM CHAIRMAN

Thomas E. Parker was born in Natrona Heights, PA on September 17, 1945. He received the B.S. degree in Physics from Allegheny College in 1967. He received the M.S. degree in 1969 and the Ph.D degree in 1973, both in Physics, from Purdue University. His doctoral thesis was a Brillouin scattering study of acoustoelectric domains in GaAs.

In 1973 in joined the staff of the Raytheon Research Division, working with the Generalized Filters and Microwave Acoustics (now Stable Sources) group. His initial areas of interest involved temperature stable surface acoustic wave (SAW) materials and laser probing techniques. Since 1976, he has concentrated on stable frequency sources, in particular, SAW stabilized oscillators. He has made fundamental contributions to the understanding, and reduction of flicker noise in stable oscillators, and has conducted an extensive investigation of the long-term frequency stability of SAW oscillators. He played a major role in the development of the "all quartz package" for SAW devices and has worked on the reduction of the vibration sensitivity of SAW devices and oscillators. In 1989, Dr. Parker was promoted to Consulting Scientist, the highest technical level in Raytheon.

Dr. Parker is a member of Sigma Pi, Sigma Xi and a Senior Member of IEEE. He has been an officer of the Boston Chapter of UFFC, served on the Technical Program Committees of both the Ultrasonics and Frequency Control Symposia, and also served as Finance Chairman for both Symposia. Dr. Parker is an elected member of the UFFC Adcom and is the UFFC Administrator for Frequency Control.

Frequency Control Symposium



JOHN R. VIG
EDITORIAL CHAIRMAN

John R. Vig was born in Hungary in 1942. He immigrated to the United States in 1957, received the B.S. degree in Physics from CCNY in 1964, and the Ph.D from Rutgers in 1969.

Since 1969 he has worked primarily on the experimental aspects of quartz crystal devices. The results of his research have been published in more than 60 professional papers. He has received 37 patents. As Chief of the Frequency Control and Timing Branch in the US Army Electronics Technology and Devices Laboratory he leads a research program aimed at the development of high-stability frequency control devices and clocks for future Army systems.

He served as General Chairman of the Annual Frequency Control Symposium from 1982 to 1988, and as a member of the Technical Program Committee since 1972. He has been serving on the Technical Program Committee of the IEEE UFFC-Society Administrative Committee for the 1986-1989 term.

In 1988, he was elected a Fellow of the IEEE. He has been selected to receive the 1990 Cady Award "for outstanding contributions to the development of improved quartz crystals and processing techniques..."

John serves on his town's Environmental Commission (since 1972). In his spare time, he enjoys: "playing" with his Amiga computer, gardening, and ballroom dancing.



RAYMOND L. FILLER
PUBLICITY CHAIRMAN

Ray Filler was born in Brooklyn, NY in 1948. He received the B.S. degree in Physics from Rensselaer Polytechnic Institute, Troy, NY in 1969 and the Ph.D degree from Rutgers, New Brunswick, NJ in 1975.

He is currently the leader of the Crystal Resonator Team of the Frequency Control and Timing Branch of the U.S. Army Electronics Technology and Devices Laboratory (LABCOM), Fort Monmouth, NJ. His research interests include techniques to improve the long and short term stability, and shock and acceleration sensitivity of quartz crystal resonators. His professional credits include 5 patents and over 30 publications.

Dr. Filler has served as Publicity Chairman of the Annual Symposium on Frequency Control since 1986. He will be General Chairman for two years starting in 1991. He is a member of the IEEE and the APS.

He is married and spends virtually all of his non-working hours caring for, training, and competing with his and his wife's 4 horses. The rest of the family consists of 3 dogs and 9 cats.

International Symposium on Applications of Ferroelectrics

ISAF '90

The Seventh International Symposium on Applications of Ferroelectrics (ISAF) will be held June 6-8, 1990 on the campus of the University of Illinois at Urbana. The meeting will provide a forum for update on recent progress and future trends in the applications of ferroelectric materials and devices in the following areas:

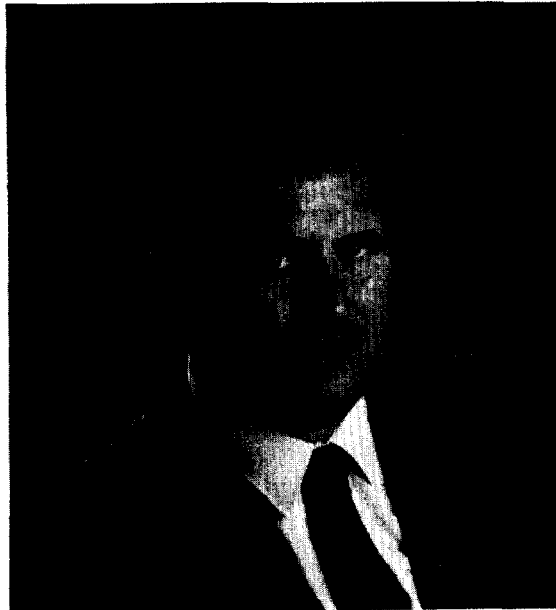
(1) Ferroelectric Thin Films: processing, devices, properties, fatigue, interfaces, integration with semiconductors. (2) Optical Applications: Photorefractive, electrooptic, bistability, ir detectors, pyroelectrics, PVDF devices. (3) Liquid Crystals: Ferroelectricity, displays, composers. (4) Piezo Devices: Motors, actuators, strictors, transducers, composites, biomedical, smart devices. (5) Dielectric: Capacitors, reliability, aging, degradation, relaxors, integrated packages. (6) Materials: Novel materials, predictions, crystal growth, biopolymers, ferroelectric-superconductors.

The Symposium will be held in the Krannert Center for the Performing Arts on the Urbana Campus of the University of Illinois. There will be invited and contributed talks, and poster sessions. Each day the Symposium will start with plenary and invited talks, followed by concurrent sessions and invited and contributed papers. Extensive use will be made of poster sessions as at previous meetings. Posters will be on display all the time in the central foyer of the Krannert Center. Authors will be available at prearranged times as indicated in the Program and Abstracts Volume. There will be a reception and a dinner.

Housing will be available in University Residence Halls and commercial hotels. Blocks of rooms have been set aside for the Symposium. Registrants who choose a housing and meals package will be lodged in modern air conditioned dormitory rooms. The housing and meals package will include breakfast and lunch options, which will be served in the Busey/Evans Residence Halls close to the Krannert Center.

For additional information and registration materials contact

General Chairman
Professor D.A. Payne
Department of Materials Science and Engineering
University of Illinois at Urbana-Champaign
Urbana, IL 61801 USA
Tel: (217) 333-2937
Fax: (217) 333-5877

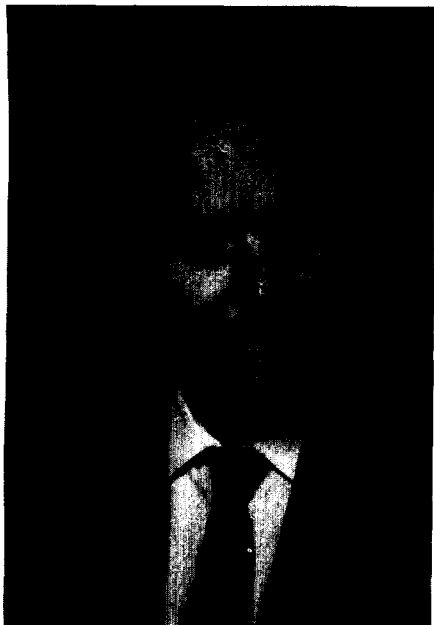


DAVID A. PAYNE
GENERAL CHAIRMAN

David A. Payne was born in Manchester, England in 1941. He studied Ceramic Science at the University of Leeds where he received a B.Sc. degree with Honors in 1963. He later received a M.S. in Physics from Williams College in 1967, and a Ph.D. in Solid State Science from the Pennsylvania State University in 1973. Industrial experience was with Northern Electric Company, Montreal (1963-65); Sprague Electric Company, N. Adams, Massachusetts (1965-67); and Erie Technological Products, State College, Pennsylvania (1967-73). In 1974 he joined the University of Illinois and became Professor of Ceramic Engineering in 1981. He served as Head of the Department of Ceramic Engineering from 1986-88, and Acting Head of the Department of Materials Science and Engineering from 1987-88. He has authored or co-authored over 90 papers on electrical ceramics, dielectrical materials, chemical methods of processing, crystal growth, superconductors and structure-property relations in ferroelectric materials. Six patents have issued from this research. He is a member of the Materials Research Society, the IEEE, and the Japanese Ceramic Society; and is a member and Fellow of the American Ceramic Society and the British Institute of Ceramics. He was recently elected to the International Academy of Ceramics in 1989. At the University of Illinois he is a faculty member in the Department of Materials Science and Engineering, and is also affiliated with the Materials Research Laboratory, the Beckman Institute of Advanced Science and Technology, and the Compound Semiconductor Microelectronics Center.

David and his wife, Anne, enjoy breeding and showing purebred Mastiff dogs. He is an avid tennis player, and with his son Greg, has spent many hours in attempting to maintain an English garden in the Midwest!

International Symposium on Applications of Ferroelectrics

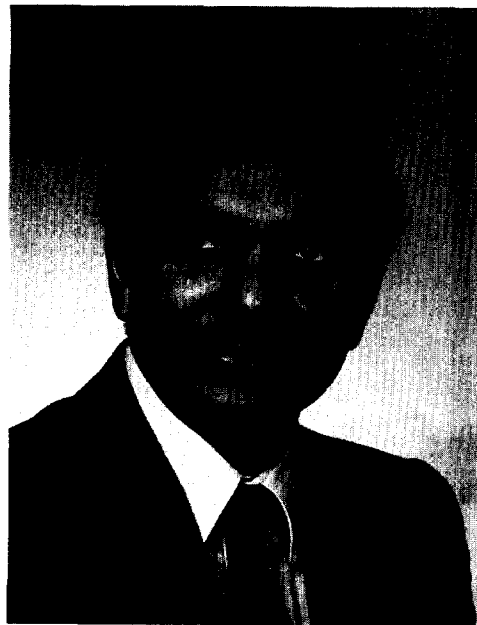


STEWART KURTZ
TECHNICAL PROGRAM

Stewart K. Kurtz, a Senior Member of IEEE, is Director of the Materials Research Laboratory at The Pennsylvania State University, where he concurrently holds two additional titles: Murata Professor of Materials Research and Professor of Electrical Engineering. Dr. Kurtz credentials for this trio of posts include a Ph.D. in Physics from Ohio State University and a long and productive career in research for three corporations of international repute: Bell Laboratories, Philips, and Bristol Meyers. Before joining Penn State in 1987, Stewart held two top research management positions at Bristol-Meyers: Vice President for Engineering, and then for Technology, both in the Clairol Appliance Division.

Stewart, born in 1931, is listed in American Men of Science and is a member of Phi Beta Kappa. He is a recognized authority on the nonlinear optical and electro-optical properties of the perovskite ferroelectrics and his current research interests include high temperature superconductivity in perovskite ceramics. Despite a densely packed research and administrative schedule, Stewart is active in professional societies. He serves on the editorial boards of several journals and is often a guest editor as well as a guest lecturer at conferences and seminars.

Stewart and his wife Dora are the parents of four children--Philip, David, Timothy, and John--and one grandchild. Mrs. Kurtz worked as a physician's assistant in gynecology and internal medicine before her husband joined Penn State. The couple enjoys hiking and traveling with the latter likely to increase in view of worldwide activity in Stewart Kurtz's specialty: materials.



S.B. KRUPANIDHI
TECHNICAL PROGRAM

S.B. Krupanidhi was born in Andhra Pradesh, India in 1954. He earned his Ph.D. degree in Solid State Physics at Delhi University, India where he was a UGC scholar. Until 1981, he was a post-doctoral fellow at the Department of Physics, Delhi University, researching on ferroelectric field effect memory transistors.

In 1982, Dr. Krupanidhi joined the Department of Physics, Queen's University, Canada, as a Research Associate where he worked on developing crystalline ferroelectric thin films for piezoelectric based applications. He joined Motorola, Albuquerque, USA in 1984 as a group leader and directed the activity of developing epitaxial ferroelectric thin films for electrooptic based devices. Later, Dr. Krupanidhi joined Penn State University in 1988, as an Associate Professor of Engineering Science & Mechanics, while he conducts his research at the Materials Research Laboratory.

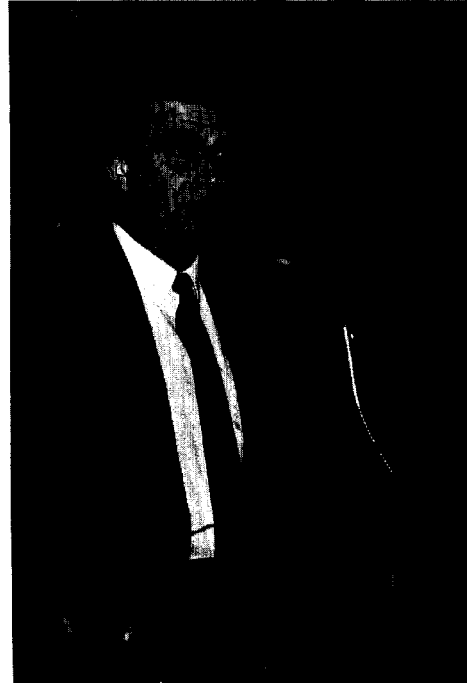
Krupa's areas of research interest include development of multi-component oxide thin films of ferroelectrics, dielectrics, studies of device physics, and ion-surface & photo-surface interactions. Presently, he is developing a unique thin film growth laboratory at MRL/PSU to conduct research in ferroelectric, piezoelectric, electrooptic and dielectric thin films for a variety of device applications.

Krupa likes classical music (Indian & Western), tennis and fishing. His wife, Bharathi holds a degree in humanities and currently keeps herself busy with their 2 year old son Deepu. She like painting and gardening in her spare time.

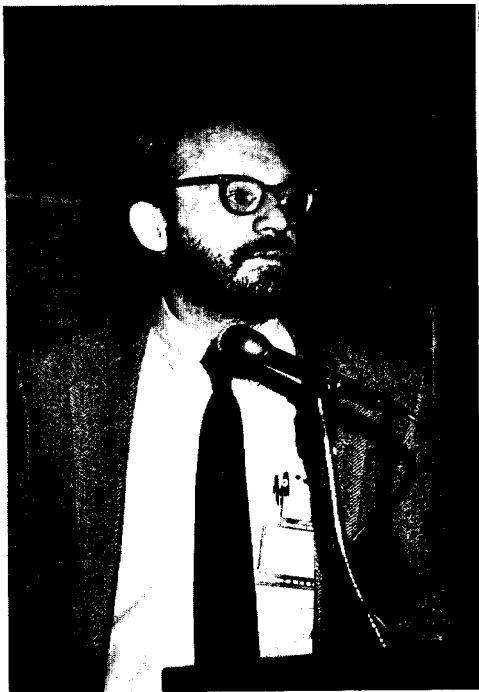
Opening Session 1989 Ultrasonics Symposium



UFFC-S President G.W. Farnell presided at the Opening Session of the 1989 Ultrasonics Symposium in Montreal.



Herman van de Vaart, General Chairman of the 1989 Ultrasonics Symposium.



Gary Montress, Technical Program Chairman for the 1989 Ultrasonics Symposium.



Ron Hays paid tribute to Ron Rosenfeld.

Opening Session 1989 Ultrasonics Symposium

ACHIEVEMENT AWARD

Presented to:

Prof. Eric A. Ash
Rector, Imperial College
of Science, Technology and Medicine
London, England

Citation:

"for his devotion to education, and his innovation and leadership in surface acoustic waves, integrated optics and scanning acoustic microscopy."

The award was presented at the 1989 Ultrasonics Symposium, in Montreal. Prof. Ash was unable to attend personally because of duties at the University, and Prof. Eugene Dieulesaint (a long time friend of Eric's) graciously accepted the awards for him. The Achievement Award consists of a cash award, plaque and certificate.

The presentation was made by Kumar Wickramasinghe, a former student of Eric's. Kumar recounted Eric's many (and wideranging) contributions to the field of Ultrasonics, leading to the creation of new fields, particularly in microscopy. Eric has broad-ranging interests in both science and technology. Kumar recalled poignant (yet humorous) episodes working in Prof. Ash's laboratory several years ago, when crucial experiments were performed which demonstrated feasibility of Eric's ideas. Kumar described attributes Eric encouraged in his students (characteristics which Eric possesses himself): hard working, academically strong, tremendous dedication, and a degree of impatience.

Eric transmitted a warm and appreciative letter to the Society, which was read to the large audience gathered at the Opening Ceremonies by Roger Tancrell, chairman of the Awards Committee. Eric commented that he looks forward to the day when he retires from his current job (in four years) as rector and restarts some work he has in mind. He concluded his letter by noting that this award greatly encouraged him in his ambition to return to active work in Ultrasonics.



Professor E. Dieulesaint accepting the 1989 UFFC-S Achievement award for Professor Eric Ash from K. Wickramasinghe.



Dick White receiving the Distinguished Lecturer Certificate from UFFC-S President Farnell.



Presidential Speaker Dr. David W. Tank of AT&T Bell Laboratories lectured on "Computing with Neural Networks".

Awards

OUTSTANDING PAPER AWARD FOR 1988 UFFC-S TRANSACTIONS

Presented for the combined papers:

"Precision SAW oscillators"
by
Thomas E. Parker and Gary K. Montress
May 1988 issue

and

"Extremely Low-Phase-Noise
SAW Resonators and Oscillators:
Design and Performance"
by
Gary K. Montress, Thomas E. Parker,
Mark J. Loboda and James A. Greer
November 1988 issue

The awards were presented by President Gerry Farnell at the Opening Ceremonies of the Ultrasonics Symposium in Montreal.

The selection is based upon, originality, interest to membership, contribution to field, clarity of writing, and timeliness. The first of these papers is an excellent tutorial on the technology of high performance oscillators, giving a historical development of the field and describing the present state of the art. It brings together several aspects of low-noise oscillators. The other paper demonstrates improved device performance through resourceful (ingenious) noise lowering techniques. The papers have something for every reader; for those not specialists in the field a comprehensive tutorial is presented; for those experienced in the field, the latest innovations are described which eke out precious dB's in improved noise performance. The combined papers make a significant contribution to our Society.

The objectives of giving an award every year are to encourage excellence in research and development, and to recognize the extra work involved in writing a good technical paper. The ADCOM wishes to demonstrate to all authors that their efforts are appreciated.



Outstanding Paper Awardee Tom Parker with UFFC-S President Gerry Farnell.



Outstanding Paper Awardee Gary Montress



Outstanding Paper Awardee James Greer



Outstanding Paper Awardee Mark Loboda

Committee Meetings



Gerry Farnell and Harry Salvo, Secretary-Treasurer of UFFC-S, compare notes at the AdCom meeting in Montreal.



Tom Parker, Technical Chair and David Allan, General Chair for the 1990 Frequency Control Symposium.



H. Emert, R. Tancrell and N. Mikoshiba at the AdCom meeting in Montreal.



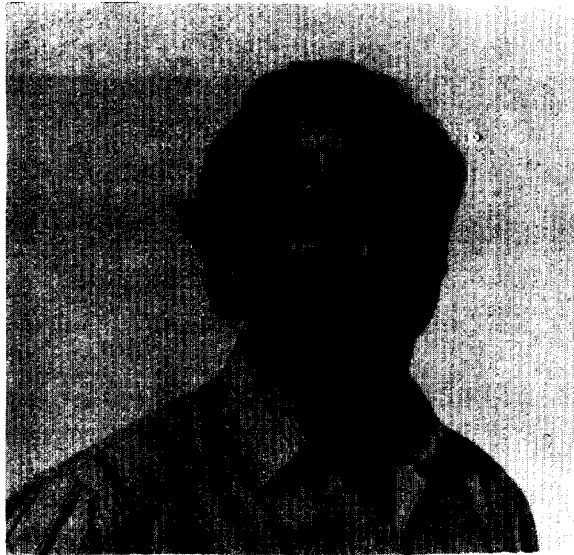
Technical Program Committee members for the 1990 Frequency Control Symposium.



Jim Greenleaf, 1990 Vice President of UFFC-S and Jan Brown, President for 1990 of UFFC-S, confer at the AdCom Meeting.



"It must be getting late", Errol Eer Nisse checks his watch and Art Ballato checks the agenda at the Frequency Control program meeting.



RON ROSENFELD

IN MEMORY...

On September 22, 1989, we lost a respected colleague and good friend. Dr. Ronald C. Rosenfeld, a member of the Ultrasonics community for nearly 20 years, died at his home after a long illness. Ron's wife Shirley, who frequently joined us at our Symposia, his daughter Emily, and his son Eric will continue to make their home in Orlando, Florida, where they've lived the past 10 years.

Ron had been active in surface acoustic wave technology since receiving his doctorate from Iowa State University in 1971. In recent years he served our industry as Vice President of Research and Development at Sawtek.

Ron was a founder of Sawtek and counted that chief among his career accomplishments. He did not just dream of his own company or talk about it as so many of us do; he did it. He showed his enthusiasm, commitment, courage and leadership as he became the first among those at Sawtek to take the risk to make his dream a reality. He left his job at Motorola in 1978 and moved his family to Dallas from Chicago... with no assurance of success... to work full time on starting a SAW company. His technical knowledge, creativity and intensity established Sawtek's niche in the marketplace and have been driving forces in its success and growth in the years since.

Prior to roles at Sawtek as Founder, Director, and Officer, Ron had worked at both Texas Instruments' Central Research Laboratory in Dallas and in Schaumburg, Illinois, at Motorola where he helped establish a surface wave laboratory. Throughout the last two decades he has contributed significantly to SAW technology in many areas including the research, development and application of resonator filters, transversal filters (especially low-loss filters) and, most recently, state-of-the-art dispersive delay lines.

Although he could count numerous papers, presentations and patents to his credit over the years, many of Ron's greatest professional contributions are less tangible. His encouragement and support of new engineers and scientists has been tireless, unselfish, and exemplary.

Ron's life was noteworthy in many other ways as well. An accomplished, highly regarded athlete in his youth, Ron was a cyclist, ran marathons (including that in San Francisco), and competed as a triathlete in recent years. Playing both classical and rock music, he was skilled on clarinet and piano.

Ron reached out for all life had to offer. He loved the adventure; he took up skydiving (one jump...one broken leg) and scuba diving, his most recent passion with nearly 40 dives in the last year. He was blessed with a love of nature and a sense of wonder that excited and enriched the lives he shared. No one exulted in life more or had a greater capacity for joy. Whatever opportunity arose or whatever challenge or hardship he faced, Ron always gave it his best.

Truly a great competitor, Ron lived with energy, enthusiasm, and daring. His vitality, good heart and enormous spirit are sorely missed.

(Editor's note: This tribute to Ron Rosenfeld was written by Ron Hays of Sawtek)

Chapter Activities

TOYKO CHAPTER

The Tokyo Chapter sponsored the USE 89 (The Symposium on Ultrasonic Electronics), which was held in Tokyo on November 7-9, 1989. This was the tenth anniversary of the symposium. More than 100 papers including four invited lectures were presented and a panel discussion on "The Scope of Ultrasonic Research, Present and Future" was held as a tenth memorial event.

Professor Richard M. White of UC Berkley, the UFFC-S 1989-90 Distinguished Lecturer, was an invited speaker of the Tokyo Chapter and presented lectures at the USE 89 and some other meetings during November 8-14. After the lecture, he enjoyed the "FUGU dinner" at a traditional Japanese restaurant in Kyoto.

The following six technical meetings on ultrasonics were held during the past half year.

1)	Sept. 25-26, 1989	13 papers	Sendai
2)	Oct. 23	10 papers	Nagoya
3)	Nov. 14	6 papers	Tokyo
4)	Dec. 19	5 papers	Tokyo
5)	Jan. 30-31, 1990	17 papers	Kyoto
6)	Feb. 20	5 papers	Tokyo

Kenshiro Takagi
Vice Chairman



Professor White's weekend in Kyoto.



Professor White fully tasted "Fugu", the most delicious and most dangerous fish of Japan.



Dr. Fujishima of Murata Co, The Tokyo Chapter Chairman, presented a souvenir to Professor White at the reception.

ORLANDO CHAPTER

AWARDS

Benjamin P. Abbott was selected as the Orlando Chapter Outstanding Engineer for 1990. Ben completed his Doctoral Work in Electrical Engineering at the University of Central Florida in December, 1989. While at UCF, Ben worked on research in the area of Surface Acoustic Wave devices, concentrating on Coupling of Modes Theory (COM) and Single-Phase Unidirectional Transducers (SPUDT's). From 1985 through 1989, much of this work was in cooperation with Hartmann Research, in Dallas Texas. Currently, Ben is doing Post-Doctoral work on the Quasi-Static Analysis of SAW Filters, working jointly with UCF and ETH (the Swiss Federal Institute of Technology Institute for Field Theory).

Chapter Activities

New AdCom Member

MEETINGS

The Orlando Chapter held four meetings between October 1989 and March 1990. All were well attended, and included interesting technical presentations by various members of the Ultrasonics community and related fields. Our speaker for February was Richard White, Director of the Berkeley Sensor and Actuator Center, IEEE Fellow, and the IEEE UFFC-S Distinguished Lecturer. Professor White spoke on the topic of "Micro-Mechanics of Sensors and Actuators", and the presentation was videotaped for future use. The Orlando Chapter plans to hold several more meetings this spring. Details of these meetings can be obtained through the Orlando Section Newsletter, or from any Chapter Officer.

Jackie Hines
Chapter Chair



BOSTON

The Boston chapter of UFFC has averaged 25 people per meeting so far this year. The following is a summary of the technical programs.

- November:** Bill Tanski of United Technology talked about progress in acoustic charge transport (ACT) devices, specifically a hybrid ACT (HACT). This was an update of the work reported at the 1988 UFFC Symposium.
- January:** Gary Brandenburger of Osteoporosis Technology reported on the technical aspects of his company's device for detecting osteoporosis by measuring the velocity of sound in bone. Gary also discussed the process of a Pre-Market Approval (PMA) required by the FDA for any new device.
- February:** Karl Thiele and Tom Shoup of Hewlett-Packard's Imaging Systems Division presented a talk on the signal processing requirements of ultrasonics imaging. In this talk they discussed methods of increasing the amount of digital signal processing in the front end of an imaging system and also compared the performance of several solid-state signal processing devices with imaging and Doppler requirements.
- April:** Professor Dick White, the UFFC Distinguished Lecturer, is scheduled to present his talk on micro-sale mechanics for sensors and actuators.
- May:** Steve Wilkus of AT&T is scheduled to present a talk on the use of a SAW filter in a local area network (LAN).

Tom Shoup
Chapter Chairman

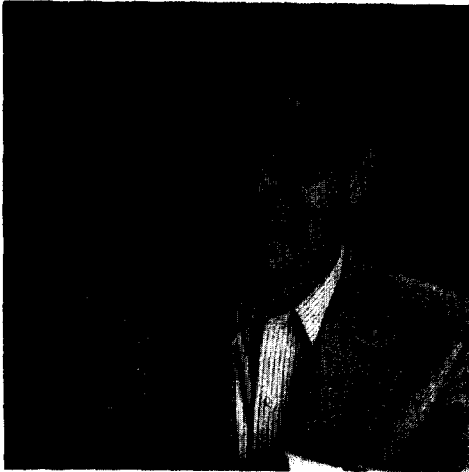
MOISES LEVY

Moises Levy was born in Concepcion, Chiriqui, Rep, of Panama on April 8, 1930. He received a B.S. in Chemistry and an M.S. in Chemical Engineering from Cal Tech in 1952 and 1955, and a Ph.D. in Physics from UCLA in 1963. He went to the Physics Department, University of Pennsylvania, as an Assistant Professor in 1964-1965 and then returned to UCLA as an Assistant Professor in 1965-1970. He then joined the Physics Department at the University of Wisconsin Milwaukee as an Associate Professor in 1971 and became a Professor in 1973. He was elected Chairman of the Physics Department from 1975 to 1978. Moises has engaged in the ultrasonic investigation of superconducting materials, most recently the newly discovered high T_c superconductors using both bulk and surface acoustic waves.

Moises has been associated with the UFFC and its progenitor the Sonics and Ultrasonics Group since 1969. He was the General Chairman of the IEEE Ultrasonics Symposia in Milwaukee in 1974 and in Atlanta in 1983. He will be the General Co-Chairman for the IEEE 1990 Ultrasonics Symposium. He has served on the technical program committee of the IEEE Ultrasonics Symposium and as chairman of the nominations committee of IEEE Group of Sonics and Ultrasonics. He is presently serving as Associate Editor of the IEEE UFFC Transactions.

Much to his surprise, Moises was recently informed that he has already spent 20 years in Milwaukee on the shores of Lake Michigan, but, it was only this past summer that friends induced him and his wife, Nina, to sail on their 40 foot sloop. So now they can truly say that as well as enjoying the panoramic views afforded by Lake Michigan they also enjoy sailing on it.

New AdCom Members



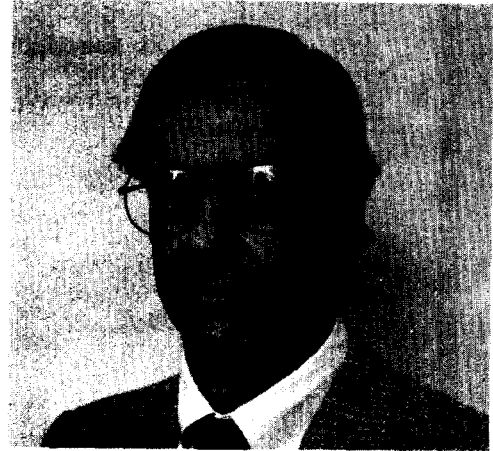
CHEN S. TSAI

Chen S. Tsai is a naturalized citizen of the U.S. He did his Ph.D. research at the Microwave Laboratories of Stanford University and received his Ph.D. degree in Electrical Engineering in 1965. He was with the Lockheed Palo Alto Research Laboratories as a Research scientist for three and a half years before joining Carnegie-Mellon University as an Assistant Professor in 1969. In 1974 he was promoted to Professor of Electrical Engineering and was awarded an Endowed Chair Professorship in 1979. In the Fall of 1980 he joined UCI as a Professor of Electrical Engineering and served as Acting Department Chair from 1985-1986. The areas of his current research interest include integrated optics, guided-wave acoustooptics, electrooptics, magneto-optics, and acoustic microscopy.

He currently serves as an Associate Editor of the IEEE UFFC Transactions in the topical areas of optical interactions and on the editorial board of the International Journal of Highspeed Electronics and of the Microwaves and Optics Letters.

Dr. Tsai is a Fellow of the IEEE, a Fellow of the Society for Photo Instrumentation Engineers, a Fellow of the Institute for the Advancement of Engineering, and a Fellow of the OSA. Included among his honors are the 1985 U.C. Irvine Engineering Instructor of the Year Award, and the 1986 IEEE Distinguished Lecturer Award of the UFFC-Society.

Chen's wife Shirley has been Professor of Chemical Engineering at California State University at Long Beach since 1983. Both of their children, Jeannie and Larry, are currently attending Stanford University as Junior and Freshman. Tennis and traveling are the main family activities of the Tsai's.



HENRY L. BERTONI

Henry L. Bertoni was born in Chicago, Illinois in 1938. He obtained the B.S. (E.E.) Degree in 1960 from Northwestern University, where a transplanted New Yorker got him interested in wave propagation, and steered him to Brooklyn Polytechnic Institute (now Polytechnic University) for graduate study. He received the M.S. (E.E.) Degree in 1962 and the Ph.D. (Electrophysics) Degree in 1967. After graduating he joined the faculty of Brooklyn Poly, and now holds the rank of Professor.

His interest in ultrasonics started in the late 60's. During 1982-83 he spent a sabbatical at University College London working on acoustic microscopy under the sponsorship of the Royal Society of London. A paper that grew out of this work was given the 1984 Best Paper Award by the IEEE Sonics and Ultrasonics Group. Besides his ongoing work on the acoustic microscope, he is currently developing a theoretical model of UHF propagation in urban environments for mobile telephone communications and wireless LAN.

Henry has authored or co-authored over 70 articles dealing with ultrasonic, acoustic, electromagnetic and optical wave propagation, and heat transfer. He is a Fellow of the IEEE, and Book Review Editor for the IEEE UFFC Transactions.

Henry enjoys the energy and excitement of a large city, and resides in a brownstone neighborhood in Brooklyn. He has devoted many hours to the pleasures of New York's restaurants, theaters and arts, and to watching other people. Away from the city he enjoys hiking. His remaining free time is spent in an intensely personal crusade against the gentle forces of decay at work in a hundred year old row house.

IEEE UFFC-S Members Elected to Fellow Grade

Congratulations to the following members of the Ultrasonics, Ferroelectrics and Frequency Control Society who were recently elected to the grade of IEEE Fellow.

Professor Mack A. Breazeale
Department of Physics
National Center for Physical
Acoustics
Post Office Box 847
University, MS 38677

For theoretical and experimental contributions to nonlinear phenomena in ultrasonic wave propagation.

Dr. Youssef A. El-Mansy
18820 SW Gassner Road
Aloha, OR 97007

For contributions to modeling insulated gate field-effect devices.

Dr. Bill J. Hunsinger, President
Electronic Decisions Inc.
1776 East Washington
Urbana, IL 61801

For contributions to surface-acoustic-wave device research and the development of acoustic charge transport technology.

Dr. John M. Owens
112 Euclid Avenue
Los Gatos, CA 95030

For contributions to the understanding and application of magnetostatic waves in the microwave frequency bands.

Dr. Josef Raviv
IBM Israel
Science and Technology
Nuclear Engineering Building
Technion City
32000 Haifa, Israel

For contributions to data compaction, pattern recognition, and information theory.

Dr. Roger H. Tancrell
Raytheon Research Division
131 Spring Street
Lexington, MA 02173

For contributions to the analysis and design of surface-acoustic-wave filters for signal processing.

Dr. Bernhard R. Tittmann
2466 Sassafras Court
State College, PA 16803

For contributions to the development of instrumentation and measurement techniques for material characterization and nondestructive testing.

Dr. Robert C. Waag
Six Babcock Drive
Rochester, NY 14610

For contributions to biomedical ultrasound in the areas of tissue characterization, wave propagation effects, and two-dimensional imaging.

Dr. Kiyotaka Wasa
Central Research Laboratories
Matsushita Electric
Industrial Co., Ltd.
3-15 Yagumonakamachi, Moriguchi
Osaka 570, Japan

For contribution to the development and application of a cathodic sputtering technology to material processing.

New Members

The current membership of the IEEE UFFC-S is over 2100. Membership has remained relatively stable over the past two years, with a slight increase this year. The expanded charter of the society to include frequency control and ferroelectrics technology should increase membership in the future and it would be beneficial to your colleagues to encourage their participation and membership.

The society welcomes our newest members listed. The list is compiled from IEEE membership information for October 1989-February 1990. We look forward to our new members participation and contributions to the society.

Members are urged to help recruit persons interested in joining the UFFC-S. Membership materials may be obtained from:

Dr. Donald C. Malocha
University of Central Florida
Electrical Engineering Department
Orlando, FL 32816-0450

Abraham, Joseph O.	Fujishima, Satoru	MacDonald, Thomas L.	Sinclair, Anthony N.
Adwan, Ezzeldeen A.	Fukunaga, Hirotooshi	Manuelian, George H.	Sirkin, Eric R.
Aghdaei, Mohammad, H.	Gemar, Jeff R.	Matikas, Theodore E.	Skanadore, William R.
Alcoz, Jorge	Gold, Randy	Mattos, Paul J.	Skurnik, David
Alejandro-F, Ignacio	Goto, Nobuo	Maxwell, Jerry A.	Slhyton, Michael H.
Anderson, Jon A.	Grant, Rohn R.	McDonnell, M.J.	Smith, Niel P.
Ando, Ei'ichi	Gray, Harry J.	McLean, James S.	Smith, W.L.
Andriamanalimanan, B.R.	Green III, Charles A.	Meyer, Randall J.	Soderkvist, Jan M. O.
Ataiyan, Younes J.	Greene, Robert I.	Miner, Donald W.	Sohler, Wolfgang
Atriss, Ahmad H.	Greenstein, Michael	Moazzami, Reza	Sparks, Anita
Aussel, Jean D.	Grigioni, Mauro	Mohan, William L.	Spiett, Dale H.
Balram, Sangeeta N.	Guenette, Rejean	Moldt, Nina H.	Sridhar, Champa G.
Baltschun, Waldemar F.	Hakata, Hannu	Moon, Kwang S.	Stepinski, Tadeusz
Banaja, Salem A.	Han, Kyung J.	Mori, Shizuo	Stewart, William L.
Bardus, Emilio	Haskins III, Henry D.	Moroney, Richard M.	Stocker, Rudolf J.
Bart, Stephen F.	Hata, Hiroshi	Musha, Takaaki	Strupat, John P.
Basler, Samuel	Haydell III, Irvin B.	Natarajan, Marappan	Suhr, James T.
Berg, Lawrence J.	Heierli, Jakob	Neundorfer, Beth A.	Swain, Howard L.
Berger, Josef	Higginbottom, Mark H.	Nogami, Hiroshi	Taber, Bradley M.
Bernstein, Jonathan	Hsu, Nelson N.	Ohm, Dirk	Tabocchini, Dorian
Blumenfeld, Howard D.	Hsueh, Ching T.	Olszewski, Ronald E.	Taft, Victor
Boesch, Hans	Hu, Peir Jy	Orman, Daniel R.	Takeuchi, Hiroshi
Bougher, Stephen G.	Iltis, Gregory J.	Orofino, Donald P.	Teasdale, Steven D.
Bryant, Michael D.	Janes, Stephen D.	Parisi, Thomas M.	Tenholzen, Neal L.
Buchanan, Jeffrey A.	Jurgensen, Russell P.	Paul, David A.	Tesko, Donald E.
Buddi, Naveen	Karaman, Mustafa	Petersen, C.M.	Toland, Stephanie
Bukhari, Mohammad N.	Kelly, Trent E.	Peterson, Chris L.	Uchino, Kenji
Burckhardt, C.B.	Kepley, Kevin P.	Peterson, Robert B.	Vago, Robert E.
Candelaria, Nathaniel	Kim, Jong K.	Philpy, Steven C.	Vanier, Jacques
Capozza, Paul T.	Kim, Sun I.	Pietrowicz, Joseph W.	VanWeereld, Jeff J.
Castore, Glen M.	Klaassen, Richard E.	Prokop, Mark S.	Vellekoop, Michael J.
Chayat, Naftali	Klesenski, Kevin L.	Prytz, Snorre	Wagner, James W.
Cole, Patrick	Klibo, Rolf K.	Pues, Hugo F.	Walker, Wililam F.
Colles, Joseph H.	Klimker, Harry	Pugh, Robert D.	Wang, John S.
Comer, David M.	Knowles, Terence J.	Quinn Jr., Thomas J.	Wang, Nai Hsien
Cox, Michael T.	Kontos, Thonre K.	Rabson, T.A.	Werner III, Valentine G.
Cunningham Jr., Charles	Korn, David S.	Reiser, D.	White, Russell A.
Daneshrad, Babak	Krahn, Donald R.	Rendla, Wayne L.	Wiesbeck, Werner
Diederich, Chris J.	Krumins, Andrew	Robinson, Harold C.	Yang, Xuan Min
Dixon, Toby D.	Kuczynski, Victor	Robinson, Herbert L.	Yemisciler, Oguz
Drogin, Barry J.	Lacoste, Francois P.	Rocha, Joao A.	Yin, Liu Wai
Duff, David R.	Larnard, Donald J.	Roning, Darin O.	Yoon, Suk W.
Duncan, William A.	Layton, Michael R.	Ryan, Thomas P.	Yoshikawa, Shokichiro
Dwyer, John P.	Lee, Young Won	Sabetfakhri, Kazem	You, Zhongqing
Dyckman, Warren D.	Leijon, Mats A.	Salamina, Nicolas	Young, George P.
Egan, William F.	Levens, Joseph R.	Sanghvi, Narendra T.	Young, Shuenn T.
Einicke, Hans W.	Lewin, Peter A.	Sauer, Ken D.	Yuan, Yi
Everhart, Charles A.	Liebman, Vadim	Schaffer, Gregory L.	Zagzebshi, James A.
Falkner, Robert F.	Lin, Yujin	Schiffler, Richard A.	Zahedi, Edmond
Fennell, Robert D.	Lindstrom, Kjell O.	Schweitzer, Jeff A.	Zelmer, Wayne M.
Folkestad, Trond	Lucas, Richard K.	Seet, Tiong E.	Zetlmaier, Kenneth T.
Frankston, Michael J.	Ma, Peter W.	Shieh, Jyun Li S.	Zhang, Daoxian H.
Franz, Gerhard, A.	Ma, Qinglin	Shigeta, yasutsugu	

ISSWAS '89 and AE '89

ISWASS '89 AND AE '89

The Ultrasonics, Ferroelectrics and Frequency Control Society was represented by Don Malocha, Tom Parker, and Fred Hickernell at the Second International Symposium on Surface Waves in Solids and Layered Structures (ISWASS '89) and the Acoustoelectronics Conference (AE '89) held near Varna, Bulgaria. Each gave an invited talk and participated in the technical sessions and associated activities of the conference program. There were over 200 participants at the symposium representing some 14 countries of Eastern and Western Europe and the Soviet Union. The first ISSWAS conference was held in Novosibirsk, USSR, in 1986, and the Acoustoelectronics Conferences in Bulgaria are held every two years.

There were over 20 invited talks, many contributed talks, plus three large poster sessions containing more than 30 papers each. The Symposia were held in the House of Scientists in Druzhba, just north of Varna, along the Black Sea Coast. The official languages were Russian and English with simultaneous translations. The presentation material (view cells and posters) were all in English.

The Organizing Committee Chairman of the joint conferences was M. Borissov of the Institute of Solid State Physics of the Bulgarian Academy of Sciences in Sophia, Bulgaria. The Vice Chairman representing ISWASS '89 and AE '89 respectively were I. Yakovkin of the Institute of Semiconductor Physics, Siberian Division of the USSR Academy of Sciences in Novosibirsk, USSR, and L. Spassov of the Institute of Solid State Physics in Sophia, Bulgaria. The Bulgarian organizing committee did a marvelous job of registering, accommodating, and assisting the conferees.

There was ample time for swimming in the Black Sea, eating Bulgarian cuisine at local restaurants (lunch on patio cafes overlooking the Black Sea) and sight seeing. There were two special treats for attendees. One was the conference banquet at the Bulgarska Svatba Restaurant featuring colorful dancers and singers portraying the events surrounding a Bulgarian wedding. The second was a trip to the old post city of Nessebur, south of Varna, noted for its rich cultural heritage starting in Grecian times, and extending through Roman, Byzantine, Bulgarian and Turkish cultures.

The photographs on the following pages give you a glimpse into the conference activities. There are plans for an Acoustoelectronics conference in Bulgaria in 1991 and an ISSWAS conference in Poland in 1992.



The International Committee at the opening session of ISSWAS '89 and AE '90.



Opening technical session of ISSWAS '89 and AE '89 with speaker and session chairs, L. Spassov (Bulgaria) and I. Yakovkin (USSR).



Attendees at the opening technical session of ISSWAS '89 and AE '89.

ISSWAS '89 and AE '89



Session Chairs V. Plessky (USSR) and J. Henaff (France).



I. Yakovkin (USSR) Chairman of the International Committee is greeted at the symposium banquet.



Technical Program Secretary Zh. Bunzarov (Bulgaria) in sweater, with Moscow State University Materials Group at right.



Dancers at the Bulgarian Wedding Feast.



V. Proklov (USSR) and T. Hickernell (U.S.A.) exchange greetings at the House of Scientists.



An international gathering down at the beach on the Black Sea.

UFFC FINANCE

During 1989 the UFFC Society continued its return to financial health. As can be seen from the operating statement shown below (this statement is pre-closing and pre-audit and thus subject to changes) we had a \$109.8K surplus against a budgeted surplus of \$49.3K. While this puts UFFC financially in a good position, the reason for the unexpectedly large surplus is somewhat disturbing. Basically the Transactions had a \$74.5K surplus against a budgeted surplus of only \$19.5K due to the fact that the actual number of pages published was only 650 against a budget of 1100 pages. Because there was a large backlog of papers in 1988 when the page budget was 800, the page budget was increased to 1100 for 1989. For reasons that are discussed elsewhere in this issue, the backlog of papers vanished in 1989. The financial result of this is the exact opposite of what happened four years ago. At that time we published more pages than we had budgeted for causing a large deficit that practically wiped out our reserves; this time we published fewer pages than we had budgeted for causing a large surplus. This of course results from the fact that to a large extent the Transactions income is based on the budgeted number of pages, while the expenses are based on the actual number of pages published.

Apart from this, there are no great surprises. As is to be expected, the interest income is up from \$2.9K in 1988 to \$9.4K in 1989. The Symposia showed a surplus of \$35.2K of which \$21.3K was contributed by the 1988 Ultrasonics Symposium and \$8.3K and \$5.9K by the 1988 and 1989 Frequency Control Symposia, respectively (the \$0.3K difference is an insurance expense for the 1989 Ultrasonics Symposium). Membership income was practically the same as last year and Newsletter, Non-periodical, Administration (IEEE) and Other (Awards, AdCom, etc.) expenses were all close to budget.

With the \$109.8K surplus, The UFFC net worth as of 12/31/89 was \$203.6K consisting of \$184.4K cash, \$13.0K outstanding loans, \$51.9 accounts receivables and prepaid expenses, minus \$45.7K of deferred income.

	I N C O M E		E X P E N S E		N E T	
	BUDGET	ACTUAL	BUDGET	ACTUAL	BUDGET	ACTUAL
MEMBERSHIP FEES	30.1	28.1	0.0	0.0	30.1	28.1
INTEREST	4.7	9.4	0.0	0.0	4.7	9.4
TRANSACTIONS	240.7	217.3	221.2	142.8	19.5	74.5
NEWSLETTER	0.0	0.0	6.0	4.9	-6.0	-4.9
NON-PERIODICALS	3.4	6.0	5.0	4.8	-1.6	1.2
SYMPOSIA	255.1	292.8	216.1	257.6	39.0	35.2
ADMINISTRATION	0.0	0.0	9.3	10.3	-9.3	-10.3
OTHER	-0.3	-0.2	26.8	23.2	-27.1	-23.4
TOTAL	533.7	553.4	484.4	443.6	49.3	109.8

H. van de Vaart
 Chairman, UFFC-S Finance
 March 9, 1990

Ad Com Briefs

The Administrative Committee (ADCOM) Meeting of the Ultrasonics, Ferroelectrics and Frequency Control Society (UFFC-S) was called to order at 1:20 p.m., October 3, 1989, by G. W. Farnell.

President Farnell introduced the new ADCOM members who will begin their terms on January 1, 1990:

Henry Bertoni	Chen Tsai
Moises Levy	Charles Maerfeld

J. E. May, a member of the IEEE Standards Board and currently Chairman of the IEEE New Opportunities in Standards Committee, reported that IEEE is forming a Standards Audit Committee. Each standards writing Society will be asked to write a set of rules that they will be operating under. These rules will be reviewed by the Standards Audit Committee. The Standards Committee has also recommended that IEEE hire an outside organization to audit the standards activities.

H. van de Vaart presented the UFFC-S Operating Statement as of August 31, 1989. He reported that membership fees were down but interest was up because our net worth is up. The Society's net worth is now \$206.5K.

H. van de Vaart presented the UFFC-S budget for 1990, ADCOM approved this budget for 1990.

W. D. O'Brien reported that there is no backlog of papers for the Transactions. There is one special issue on "Thin Film Ferroelectrics" planned tentatively for May or June 1990.

W. D. O'Brien expressed his concern that if he is successful in soliciting papers, he is afraid that he will not be able to publish them due to a fixed page budget and, we would get back into a backlog situation.

ADCOM passed a motion that ADCOM encourages the Transaction's Editor to solicit papers even if there is a page budget overrun.

ADCOM approved the term of office for an Associate Editor of the IEEE Transactions on Ultrasonics, Ferroelectrics and Frequency Control to be 5 years with the possibility of reappointment for only one additional term. This policy will be implemented by the Editor-in-Chief and be effective January 1, 1990.

In a related area, ADCOM recommended that the normal term of office of the Editor-in-Chief of the Transactions be 5 annual appointments with the opportunity for reappointment.

President G. W. Farnell reappointed W. D. O'Brien as Editor-in-Chief of the Transactions beginning January 1, 1990, and ADCOM approved.

R. A. Moore reported that a new chapter was formed in Dallas, TX, and there are possibilities of chapters in Boulder, CO, and New Dehli, India.

D. C. Malocha introduced the new UFFC-S Membership Information and Application brochure.

R. H. Tancrell reported that Prof. Eric A. Ash will receive the 1989 Achievement Award. The 1988 Outstanding Paper Award was given for the combined papers "Precision SAW Oscillators" and "Extremely Low-Phase-Noise SAW Resonators and Oscillators: Design and Performance," by T. E. Parker, G. K. Montress, M. J. Loboda and J. A. Greer. He also indicated that the Distinguished Lecturer Award will be presented to Prof. Richard M. White.

The Frequency Control Awards were as follows: The Cady Award was presented to Darrell E. Newell and the Rabi Award was presented to Leonard S. Culter. Both of these awards were presented at the 1989 Frequency Control Symposium in Denver, CO.

W. D. O'Brien presented that final financial report on the 1988 Ultrasonics Symposium held in Chicago. He reported that both the income and the expenses were close to budget with the exception of the social program expense. The short courses were a great success both financially and technically. The net surplus is expected to be \$36,000.

H. van de Vaart reported that as of this date there were 240 advanced and 40 onsite registrations for the 1989 Ultrasonics Symposium. He expects the onsite registration to go up to 100 to 150 based on hotel bookings. The short courses are again a success with registration at 175. He reported that advance registration was ahead of last year.

M. Levy reported on plans for the 1990 Ultrasonics Symposium. He described plans for the social functions which include a luau, cocktail party, and the trip to the Polynesian Cultural Center.

T. Lukaszek presented the budget for the 1990 Ultrasonics Symposium. He is budgeting \$178,465 in income and \$151,210 in expenses for a net surplus of \$27,255. The proposed conference registration fees will be \$240 IEEE member in advance and \$270 nonmember in advance, \$300 member onsite and \$330 nonmember on site. He is budgeting for 15 exhibit booths and 4 short courses. ADCOM approved the budget.

H. L. Salvo reported that the conference hotel for the 1993 Ultrasonics Symposium will be the Hyatt Regency Inner Harbor in Baltimore. The conference will be held November 8-10, 1993.

ADCOM BRIEFS CONTINUED

T. E. Parker gave that report on the 1989 Frequency Control Symposium. He reported that 102 papers were given and 16 exhibitors were in attendance. Attendance was down slightly from the year before. He believes that attendance is leveling off at 350 for this conference.

T. E. Parker reported that the site for the 1990 Frequency control Symposium will be the Stouffer Harbor Place Hotel in Baltimore.

ADCOM approved the site for the 1992 Frequency Control Symposium to be Hershey, PA.

W. Smith reported that Dr. G. H. Haertling has agreed to be General Chairman of the 1992 I.S.A.F. and has obtained permission from Clemson University to hold the Symposium there. He pointed out a potential conflict with the 2nd European Conference on Polar Dielectrics to be held in April 1992.

Because of the reorganization of IEEE, the ADCOM passed a motion stating that the UFFC-S ADCOM favors the retention and expansion of the Transnational nature of the Standards Board and strongly urges that the Standards Board be retained as part of the Transnational part of IEEE, not as part of IEEE-USA.

R. M. White reported that 11 members were nominated for fellow in 1988 and 7 were elected. He also stated that there are 8 nominations for 1989.

J. Brown was elected President of the UFFC-S ADCOM for 1990 and J. Greenleaf was elected Vice President.

The ADCOM adjourned at 9:40 p.m.

Harry Salvo
Secretary-Treasurer

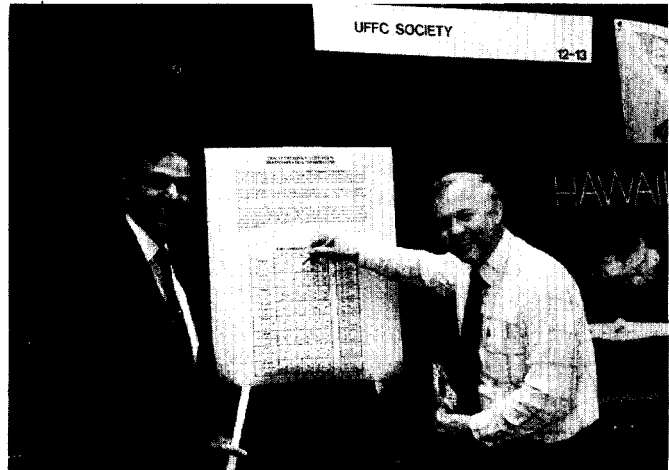
Outstanding Branch Counselor

DR. WILLIAM D. O'BRIEN, JR.

Congratulations to Bill O'Brien Jr who was named one of three 1988-1989 Outstanding Branch Counselor/Advisor Award winners. Selection of the winners was based on essays written by Student Branch members nominating their Counselors and Advisors. Supporting documentation such as petitions, letters of recommendation, and brief biographies of the nominees were also taken into consideration.

Each winner was presented with a \$500 check and a certificate donated jointly by the Regional Activities Board and the Technical Activities Board of the IEEE.

Professor O'Brien's dedication to Student Branch programs is surpassed by no one. His involvement as an advisor for the past nine years has helped enable the IEEE Student Branch at the University of Illinois at Urbana to become the largest student organization on campus.



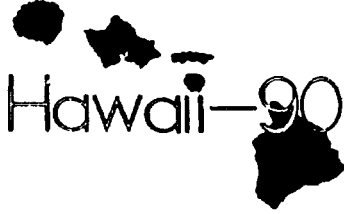
"See, you can get to Hawaii even from Penn State".



"I sure could use a new telephone"



"And the winner is....."



IEEE 1990 ULTRASONICS SYMPOSIUM

Aloha

As you already know, the IEEE 1990 Ultrasonics Symposium will be held in Hawaii, December 4 - 7, 1990. We are planning an exciting technical program with the active participation of scientists and exhibitors from Japan. We expect to have a truly international conference by attracting participants and papers from each of the five continents.

Since last year's symposium in Montreal, the Hawaii-90 committee has been busy, and we'd like to keep you posted on our progress to help you plan your trip to the Symposium as soon as possible. Full information about the conference will be provided in the Advance Program Booklet that will be mailed by September, 1990.

The IEEE 1990 Ultrasonics Symposium will be held Wednesday, December 5, 1990, through Friday, December 7, 1990. If you haven't already received the final call for papers, you should be receiving it soon. As a reminder, the deadline for abstracts for the 1990 Symposium is **May 31, 1990**. The talks will be divided into four parallel sessions and a poster session. Advance registration deadline is November 1, 1990. We urge everyone to register early as on-site registration fees will be higher.

The headquarters hotel for the 1990 Ultrasonics Symposium is the Sheraton Waikiki, in Honolulu. The Sheraton Hotel is located directly on Waikiki Beach near Honolulu, with Diamond Head in full view. Besides the amenities of the hotel proper, there is shopping in Honolulu within walking distance and, of course, full use of the beach. This hotel was carefully selected well in advance to allow optimal use of the Hawaiian setting. In addition, overflow rooms will be available at the Princess Kaiulani Hotel. The Princess Kaiulani Hotel is about a 10 minute walk from the Sheraton Waikiki.

The short course program will be held on Tuesday, December 4. Registration for the short courses is on a first-come, first-serve basis. Short courses may be cancelled if there is insufficient pre-registration. The short course program will be run as two parallel sessions and the course titles and instructors are as follows:

Course 1: 8:00 a.m. - 12:00 noon
Fundamentals of Elastic Waves in Crystals
Instructor: Bert A. Auld, Department of Applied Physics, Stanford University

Course 2: 1:00 p.m. - 5:00 p.m.
Bulk Wave Resonators and Transducers
Instructor: Arthur Ballato, ET&D Laboratory, Fort Monmouth, NJ

Course 3: 6:00 p.m. - 10:00 p.m.
Fundamentals of the Finite Element Method for Piezoelectric Resonators
Instructor: Yook-Kong Yong, Rutgers University, NJ

Course 4: 8:00 a.m. -12:00 noon
Piezocomposites for Acoustic Transducers
Instructor: Wallace Arden Smith, Office of Naval Research

Course 5: 1:00 p.m. - 5:00 p.m.
Fundamentals of Applied Ultrasonics for Nondestructive Evaluation
Instructor: Joseph S. Heyman, NASA, Langley Research Center, Hampton, VA

Course 6: 6:00 p.m. - 10:00 p.m.
Medical Ultrasound Fundamentals: Imaging, Therapeutics and Flow
Instructor: William D. O'Brien, Bioacoustics Research Laboratory, Department of Electrical and Computer Engineering, University of Illinois, Urbana, IL.

In addition to the exciting technical program and the short courses, several social events have been planned for those who attend the 1990 Ultrasonics Symposium. A Reception/Cocktail party on the first night (Wednesday, December 5) is included with your registration for the symposium. The event will start around 6:30 p.m. with a cocktail hour while our beef and pig are being roasted. When these are ready, we will have an open-air reception area to ourselves for food and conversation in the twilight. Reserve this time to meet, greet, and socialize with your symposium colleagues.

When you travel to Hawaii, attendance at a festive event known as the luau is bound to be high on your must-do list. On Thursday, December 6, we have arranged for a Traditional Hawaiian Luau. The Sheraton Waikiki, as a highly rated purveyor, is offering us an opportunity to enjoy a luau on premises. Traditional foods, appropriately served, will be accompanied by equally traditional hula and fire dancers. Music and narrations will be included to both edify and satisfy. Space at the luau is limited, so be sure to register for the luau when you register in advance for the symposium.

For those who will stay over after the conference, we hope you will come with us to visit the famous Polynesian Cultural Center on the north end of Oahu. We will share a rich eight hours together on Saturday, December 8, in the afternoon and evening. Seven Pacific Island societies are authentically represented in the mini-villages at the center. Our stay with the "natives" will include the "Pageant of the Long Canoes", a hibiscus buffet dinner and the "Invitation to Paradise" show. It will be a cultural experience to be long remembered. Transportation will be provided for our group. Plan on joining us.

Spouses/guests will have their own continental breakfast area each morning, included in their registration. These morning "get-togethers" will allow ample opportunities to make plans on how best to avail themselves of the beautiful island offerings available, including any of the optional tours that have been arranged for us. Several activities have been selected which capture some of Oahu's main features for your enjoyment with a trained guide available to point out the interesting subtleties. Safaris, Inc., with an office across the street from our Sheraton hotel, will conduct our tours for us. These optional "doings" can be reserved as late as the day before each of them. We will plan on seeing you there!

Optional Tours:

- * We will poke around on Oahu by bus on Wednesday afternoon, to get to know this corner of Hawaii. This first look at the island will include Diamond Head, Mount Tantalus, the Nuuanu Valley and the famous tropical rainforest area.
- * The next day we focus on some particulars which all visitors expect to see around Honolulu. We will have a bus and walking tour of the USS Arizona Memorial at Pearl Harbor, then Iolani Palace and Punchbowl Crater, and other historical sites.
- * On Friday, having sampled Hawaiian culture and history, we will change our pace with a snorkeling/swimming excursion to beautiful Hanauma Bay. This is a safe, protected area where both the waters and the fish are friendly; it promises to be a delightful experience. Bus transportation will be provided.

Now that we've told you about what's in store when you're in Hawaii, it's time to tell you how to get to Hawaii. The key to keeping costs down when attending the 1990 Ultrasonic Symposium is to book your airlines reservations WELL in advance to take advantage of every discount the airlines offer. Airlines generally allocate 5 - 10% of their seats for discount fares.

United Airlines has been selected as the official airline for the 1990 Ultrasonics Symposium. The official carrier agreement gives a 5% discount off any United or United Express published fare in effect when the tickets are purchased, subject to all applicable restrictions; or a 40% discount off unrestricted coach fares (Y/YN) in effect when tickets are purchased. These discounts will apply only if travel is commenced and completed during the Meeting Travel Period of December 2, 1990 to December 11, 1990. When making reservations, call the US toll-free number 1-800-521-4041 and state the meeting I.D. number 445HD.

Because of international airline agreements, the Meeting Travel Discount is not applicable for fares to or from Japan, Europe and other international destinations. United will offer published Meeting fares in select Canadian markets that will be available to attendees of the symposium. Also, United will offer all symposium attendees who make their flight reservations through the United Meeting Desk, a special Hertz Rent-a-Car rental rate. Past experience with car rentals on site indicates that car rental arrangements should be made BEFORE coming to Hawaii.

The table below gives a sampling of restricted (14-day) Advance Purchase fares to Honolulu quoted in January, 1990 for both United and TWA. Similar fares apply for American, Northwest, Delta, PanAm and Continental. The 14-Day Advance Purchase Fares quoted are based on a Tuesday departure and a Sunday return, which is a "low fare" departure day and a "high fare" return day. Fares adjust approximately \$20 up or down depending on the day of travel category. The 14-Day Advance Purchase Fares generally have a no cancellation-no change policy. Penalties should be checked when you make your reservations. Prices shown below are in US dollars.

**Air Fares to Honolulu
(as of January, 1990)**

From	United	TWA
Frankfurt	1250	1283
Paris	950	975
Mexico City	650	NA
Tokyo	1169	NA
Boston	617	617
Atlanta	690	690
Chicago	659	659
Dallas	680	680
St. Louis	659	659
San Francisco	399	399

We hope to see you at the 1990 Ultrasonics Symposium, December 4 - 7, 1990, in Hawaii. If you have any questions about the symposium, please contact either of the general co-chairmen for the conference,

Moisés Levy
University of Wisconsin-Milwaukee
Department of Physics
Milwaukee, WI 53201, USA
(414) 229-4168

Nobuo Mikoshiba
Research Inst. of Elect. Commun.
Tohoku University
Katahira, Sendai 980, JAPAN
022-227-6200 ext. 2720.

Any questions about the technical program can be addressed to the technical program chairman,

Harry L. Salvo, Jr.
Westinghouse Electric Corporation
Electronic Systems Group
333 Severna Park, MD 21146, USA
(301) 765-4290.

On behalf of the Hawaii-90 symposium committee, Aloha till Hawaii.

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