IEEE ULTRASONICS, FERROELECTRICS AND FREQUENCY CONTROL SOCIETY NEWSLETTER

Gerry Farnell
UFFC-S President

Joe Heyman
Distinguished Lecturer

Frequency Control Symposium
Baltimore, MD
June 1-3

ISAF Symposium
Zurich Switzerland
Aug. 20 - Sept. 1
President’s Message

Over many years Bruce McAvoy has contributed in many ways to the development of our Society, but the leadership he has shown as President during the past two years has been especially noteworthy. When many of us were showing panic with respect to the deteriorating financial position of the UFFC, he maintained a calm purposeful approach which has led us around this corner. Several new initiatives were introduced during his tenure which are bound to improve the quality and scope of the Society and the services it offers to its members. While he will no longer be our President, Bruce will continue his active roles on key committees and especially as the Editor of the Proceedings of the Ultrasonics Symposium. It is indeed a pleasure to thank him both for his past efforts on our behalf and his willingness to continue to work for the IEEE in general and the UFFC in particular.

The semi-annual meeting of the AdComm was held in Dallas on February 9, 1988 in conjunction with the first technical program meeting of the 1988 Ultrasonics Symposium and the last technical program meeting of the 1988 Frequency Control Symposium. It appears that the general financial health of the Society is gradually improving though our reserves are still well below the level recommended by IEEE Headquarters. The improvement comes through the intensive work done by the organizing committees of our symposia which has allowed them to finish with surpluses and from the increasing number of authors who are honoring the voluntary page charges for their papers published in the Transactions.

AdComm has been worried for some time about the backlog of papers which have been accumulating for the Transactions and about the resulting publication delays. It was voted to increase the number of pages to be published in 1989 by about 50% over the limit for 1988. Because of the financing formula for publications of the IEEE it is not possible to implement this increase before next year. There was also discussion of introducing a UFFC LETTERS section to the Transactions to allow the rapid publication of short significant papers. Bill O’Brien, Editor of the Transactions is studying the modalities of operating such a new section.

The total number of members of the UFFC Society declined last year by some 7%. Part of this drop may reflect the gradually changing technical interests of the Society which has seen some of the long-time supporters move out of the fields while the newcomers have yet to recognize the importance of the Society to our discipline through its publications, its major symposia, its regional and standards activities and its liaison role with other professional societies. It is hoped that all of our current members will make an effort to ensure that any of their colleagues who are working in, or publishing in, fields under the purview of the UFFC are encouraged to join us.

I am looking forward to working with all of you during the coming year in the promotion of our discipline.

G.W. Farnell
President UFFC-S

AdCom Briefs

The second AdCom meeting for 1987 was held on October 13, 1987 at the Sheraton Denver Tech Center, Denver, CO. Twenty-nine people attended this meeting. The highlight of the meeting was the election of Gerry W. Farnell as President and Jan Brown as Vice-President. The meeting was called to order by B.R. McAvoy, who introduced the newly elected members of AdCom, Nobuo Mikoshiba, Tom Parker and Rolf Weglein. Eric Cross was also elected but was unable to attend.

H. Van de Vaart presented the UFFC-S Operating Financial Statement. The good news is that periodical loss will not be as great as anticipated so that 1987 should show a surplus. He also presented his Basic Symposium Form for summarizing the Symposium financial statements. AdCom encouraged the symposia chairman to use this form.

R.A. Moore summarized the results of the AdHoc Committee on Finance and Operation. The committee recommended the formation of a Long Range Planning Committee and a Finance and Operations Committee. AdCom approved the formation of a Long Range Planning Committee to be chaired by the Vice President. AdCom also approved the formation of the Finance and Operations Committee. B. McAvoy then appointed H. Van de Vaart the chairman of this committee.

H.L. Salvo’s membership report pointed out that UFFC-S had a net loss of 128 members. This was due to the fact that 355 members did not renew their membership. The former UFFC-S members will be contacted and asked why they dropped out of the society.

M.A. Breazeale talked about the various places he planned to present his Distinguished Lecture.

W.D. O’Brien presented his report about the UFFC-S Transaction status for 1987 and 1988. He pointed out that because of the page limitation the backlog is constantly growing.

R.H. Tancrrell reported on Jean-Pierre Monchalin receiving the 1986 "Best Paper" award, for his paper on "Optical Detection of Ultrasound". He also talked about Thrygve K. Meeker receiving the 1987 Achievement Award", for "pioneering contributions, ranging from concept to practical implementation in the fields of bulk wave resonators and dispersive delay lines; and diligently pursuing standards on piezoelectric crystals".

G.W. Farnell had various Ultrasonics Symposium Chairpersons report on their status. He said that he received a comprehensive proposal from H. L. Salvo for Baltimore in 1992. For the 1993 Ultrasonics Symposium, G.W. Farnell is soliciting an offshore site.

T.E. Parker presented the final report for the 41st Annual Frequency Control Symposium and the budget for the 42nd Annual Frequency Control Symposium which will be held in Baltimore.

A. Ballato presented a request from Peter Edmunds that UFFC-S AdCom support the IEC meeting in Philadelphia. This request was approved by AdCom.

Reynold S. Kagiwada
Secretary Treasurer

G.W. Farnell
NDE IN AEROSPACE—REQUIREMENTS FOR SCIENCE, SENSORS AND SENSE

Joseph S. Heyman
NASA—Langley Research Center
Hampton, VA 23665

ABSTRACT

Nondestructive Evaluation (NDE) is the technology of measurement, analysis and prediction of the state of material systems, for safety, reliability and mission assurance. It is an old technology yet still in its infancy. The opportunities for research and application are great and the need demands national attention. Those of us in the field are witnessing an awakening of the engineering and management awareness to the importance of NDE. This is an exciting and dynamic time.

Although conventional NDE has been quite successful, it is generally based on correlative relationships which can be complex and multifaceted. Modern NDE depends on four factors—quantitative measurement science, physical models for computational analysis, realistic interfacing with engineering decisions, and direct access to management priorities. Quantitative relationships, the direction of advanced NDE, often lead to benefits such as reliable standards, prediction capability, and enhanced reliability with smart systems.

In this talk, aspects of aerospace NDE will be reviewed and recent advances discussed. The measurement focus will be on ultrasonics with generous case examples. Problem solutions to be highlighted include critical stress in fasteners, residual stress in steel, NDE in laminated composites, and three dimensional NDE laminography. As an example, a physical ultrasonics model of the solid rocket motor (SRM) will be discussed. The propagation model revealed information that explained the difficulty in using conventional time domain pulse techniques on the SRM. The model further identified that a frequency domain approach could successfully examine the buried bondlines. Experimental verification of the model will be presented as will comparisons with other NDE techniques.

BIOGRAPHY

Joe Heyman began his studies in English at Cornell University from 1961-63. He then went into the sciences and received an Honors B.A. in Physics from Northeastern University in 1968. His education included 5 years as a cooperative student at NASA Langley Research Center. He received an M.A. and PhD. in Physics from Washington University in 1971 and 1975 respectively.

He began working at NASA Langley Research Center in 1964. His first research area, radiation interactions with solids, resulted in a low energy ion accelerator for solar wind simulation. He developed the model and analysis for the Apollo Solar Wind Experiment and performed heavy ion implants to ion calibrate material for moon rock studies.

In 1971, he started the NASA Laboratory for Ultrasonics which has grown to a major NDE research center. He has over 15 patents primarily in the field of ultrasonics NDE and over 120 papers and presentations covering a broad area of measurement science such as particle detection in flowing fluids, acoustic spectroscopy and its calibration, transducers, high resolution acoustic phase monitors, NDE in composites, residual and applied stress measurement, and thermal NDE. In 1979, he was made an Adjunct Professor of Physics with The College of William and Mary and in 1985 was appointed by Governor Robb to the Hampton Roads Sanitation District Commission.

Dr. Heyman has received numerous awards including four IR-100 awards for his technology developments, the NASA Exceptional Service Award in 1979, the Arthur S. Fleming Award for Outstanding Federal Employee In Science in 1981, NASA Inventor of the Year Award in 1982, the NASA Technology Utilization Annual Award in 1979 and 82. He has also received the Federal Laboratories Award for Technology Transfer and the Langley Award for Leadership.

Dr. Heyman is a member of the IEEE, SEM, APS, SX and AAAS. He was an ADCOM member from 1983-7, Local and general Chairman of the Ultrasonics Symposium (86,87), and has been Chairman of numerous NDE Symposia/Workshops. He may be reached at 804-865-3036.

He is currently Head of the Materials Characterization Instrumentation Section at NASA and is Program Manager of the Agency’s Research in Advanced NDE. He lives in Williamsburg, Virginia with his wife, Berna and daughter, Laura and enjoys stimulating interest in measurement science in students and faculty.
The 42nd Annual Frequency Control Symposium will be held on June 1-3, 1988 at the Stouffer Harborplace Hotel in Baltimore, MD. The Frequency Control Symposium is the leading international technical conference dealing with frequency control and precision timekeeping. Papers will be presented by some of the world's leading experts in the field. Authors for this year's program will represent 10 countries from Asia, Europe, and North America.

This is the first year since 1980 that the symposium will not be held in Philadelphia. In the future, the symposium will oscillate from the East coast to the West coast in alternate years. This year's location, the Stouffer Harborplace Hotel, is a brand new facility. It is situated in the newly rebuilt Inner Harbor area of Baltimore, with the world famous Aquarium and other activities close at hand.

The technical program will feature 82 papers, in 18 sessions (see Figure 1), on topics ranging from superconductivity to dielectric resonators to time coordination. In addition, there will be sessions on quartz crystal resonators and oscillators and rubidium and cesium frequency standards.

The symposium will begin with a plenary session at which three prestigious awards will be presented. The Cady Award is presented annually by the technical program committee to recognize outstanding contributions related to piezoelectric frequency control devices. This year the award recipient will be Dr. Baldwin Sawyer. The Rabi Award, which takes on special significance this year due to the passing of Nobel Laureate I. I. Rabi, is presented to recognize outstanding contributions related to fields such as atomic and molecular frequency standards, time transfer, and frequency and time metrology. This year's recipient is Dr. Gernot Winkler. The third award, sponsored by Sawyer Applied Research Products, is presented in honor of C. B. Sawyer for the most outstanding recent contribution to advancement in the field of quartz crystals and devices. The recipient of the C. B. Sawyer Memorial Award is selected by an independent committee and will be announced at the Symposium.

The highlight of the technical program will be a tutorial session on the evening of Thursday, June 2, 1988. The topic will be Noise. Two invited papers will be presented. The first is entitled "Noise Processes" and will be delivered by Dr. J. Barnes, a noted authority on noise processes in clocks. The second paper in the session is "Frequency Domain Characterization" by Dr. Percival. This paper will provide new insights into the subject as well as serve as a tutorial.


In addition to the technical program there will be a centralized products, equipment, and information exhibit area.

The annual banquet will be something special to remember. It will include dining and dancing on a cruise ship which will sail from the Inner Harbor. The dinner and cruise will take place on Wednesday, June 1, 1988.

Raymond L. Filler
Publicity Chairman

Acknowledgments

The editor wishes to thank all those who submitted articles and photographs for this issue of the UFFC-S Newsletter. Also a special thank you to Liz Rau for typing the manuscript. Articles of interest to UFFC-S members are welcome. For inclusion in the fall issue, please send by August 1, 1988, to Fred Hickernell, Motorola Inc., Government Electronics Group, 8201 E. McDowell Road, Scottsdale, Arizona 85232.
Nominations Committee Report

With the widened scope of the Society on Ultrasonics, Ferroelectrics, and Frequency Control, it is felt that the Ad Comm members should reflect the new mix of technical specialities encompassed in the Society. Specifically, candidates for the class of 1991 should include individuals able to represent the Frequency Control or Ferroelectrics positions.

The Nominations Committee dealt with the issue of re-balancing the Ad Comm to include more representatives from the Frequency Control and Ferroelectrics technical area, while providing representatives for the diverse technologies found in the traditional ultrasonics area.

Our solution is to run strong candidates in those areas which will not be represented during the term of office in question, and to continue to seek candidates to represent the Frequency Control and Ferroelectrics positions.

The following candidates were approved by the Ad Comm.

1. Prof. Helmut Ermert  
   University of Erlangen  
   Federal Republic of Germany  
   NDE
2. Dr. Andrea De Marchi  
   University of Ancona  
   Italy  
   Frequency Control
3. Dr. Donald B. Sullivan  
   National Bureau of Standards  
   Frequency Control
4. Dr. Alister M. Glass  
   Ferroelectrics
5. Dr. Gene Haertling  
   University of Missouri, Rolla  
   Ferroelectrics
6. Dr. Celia Yeack  
   IBM  
   NDE
7. Dr. James F. Greenleaf  
   Mayo Clinic  
   Medical
8. Prof. Donald Malocca  
   University of Florida  
   SAW

The election will be held in June with the results available at the Fall Ad Comm meeting.

John D. Larson  
Chairman

Standards Activities Report

1. Our society is currently responsible for seven items, four standards and three projects.
   Galley proofs of ANSI/IEEE Std 176-1987, IEEE Standard on Piezoelectricity have been returned to the Standards Office after review. The next step is printing, which should take place within the next month or so.
3. Ultrasonics in Medicine - F. W. Kremkau (P790)  
   The final version of the Medical Ultrasonic Field Parameter Measurement Guide was approved by official ballot, and will be submitted to the IEEE Standards Board.
4. Time and Frequency - J. R. Vig  
   This new subcommittee will interface with the newly approved IEEE Standards Coordinating Committee (SSC) on Time and Frequency. The SSC is presently comprised of members from IM, MTT, and UFFC Societies.
5. Sensors - J. Schoenwald  
   This is a newly created subcommittee, chaired by Dr. Jeff Schoenwald; it is in the formative stage. One of its tasks will be to maintain liaison with other IEEE Societies' sensor standards group.
6. Surface Acoustic Wave Devices - E. A. Mariani (P1037)  
   The draft standard "Terms and Definitions for SAW Devices" will be coordinated with TC49/WG10 of the IEC.
7. Piezomagnetic Technology - S. L. Ehrlich (319-1971)  
   The revision of Standard 319 (Magnetostrictive Materials: Piezomagnetic Nomenclature) is getting under way. A new PAR will be submitted to the IEEE Standards Office.
8. Industrial Ultrasonics - E. P. Papadakis  
   Committee E-7 on Nondestructive Testing of ASTM has responded favorably to a UFFC-S Standard Committee letter calling for joint cooperation in the review of NDE standards. The matter is up for formal discussion and approval at their next Executive Committee meeting.
   Pyroelectricity and electrostriction are two areas under consideration for possible standardization work.
10. Acousto-Optics - D. L. Hecht (P1022)  
    A draft nomenclature standard is in preparation.
11. Delay Lines - A. A. Comparini  
    Presently inactive

President’s Speaker

Dr. Simon Foner of the National Magnet Laboratory of Massachusetts Institute of Technology will be the President’s Speaker at the 1987 Ultrasonics Symposium to be held October 3rd-5th in Chicago. The title of Dr. Foner’s talk will be "The Impact of High Temperature Superconductors on Applications".
Chapter Activities

The Baltimore, Washington and Northern Virginia Chapter has a program of 5 lecturers and one seminar scheduled for the 1987 - 1988 season. Our meetings are held every two months at the Holiday Inn - Calverton which is a central location for the Baltimore Washington metropolitan areas.

Our first program was held in October. The speaker was Dr. George Gilmour of the Westinghouse Oceanic Division of Annapolis, MD. His talk was titled "High Resolution Sonars." Dr. Gilmour's presentation described high resolution imaging sonars and the technologies involved in their development. The talk included pictures of actual sonar images of underwater formations.

In December our lecturer was Dr. Williams Hanson of Piezo Crystal company of Carlisle, PA. Dr. Hanson's presentation was "Quartz Resonators and Ceramic Actuators". The current status of precision quartz resonators for use in military - aerospace and industrial applications was reviewed. Dr. Hanson discussed some of the more critical device parameters such as; phase noise, vibration sensitivity and aging and the latest results in improving these characteristics. Also discussed were Ceramic Actuators for use in advanced laser and robotic technology for precise positioning.

The UFFC Distinguished Lecturer, Dr. Mack Breazeale of the University of Tennessee visited us in February. In addition to his national lecture on "Physics and Engineering Principles of Nonlinear Acoustics," Dr. Breazeale shared some of his remembrances of his visit to mainland China which he had visited just prior to our meeting.

In April we will be having a lecture on Acoustic Charge Transport devices. Dr. Daniel Fleisch of Electronic Decisions Incorporated of Urbana, IL has agreed to address our chapter. Dr. Fleisch has indicated that he will be describing the physics of ACT operation and current device architectures and performance. The talk will also include applications of ACT technology to military and commercial signal processing systems.

For the second year the Baltimore, Washington and Northern Virginia will be hosting a mini-course. This year the topic is Acousto-optic Signal Processing. The lecturers will be Dr. D. Mergerian of the Westinghouse Advanced Technology Laboratory and Dr. John Lee of the Naval Research Laboratory. The seminar will run approximately 6 hours including a dinner break. The seminar is designed to examine AO interactions in order to develop an understanding of the basic principles, the current limitations on the parameters of available AO cells, and to establish the types of signal processing functions which best lend themselves to AO implementation.

Harry L. Salvo, Jr.
Chapter President

SOUTHERN CALIFORNIA CHAPTER

The following four technical meetings have been held since the start of the new academic year:


All meetings were well attended with an average audience of 40 persons. The audiences were well balanced, consisting of graduate students, faculty members, and industrial colleagues.

Chen Tsai, Chapter Chairman
University of California, Irvine
(714) 856-5144

ORLANDO CHAPTER

The Orlando Section is finalizing its spring program of meetings. The first meeting was held at the University of Central Florida and discussed the current research programs in acoustic devices at UCF, presented by D.C. Malocha. The second meeting will be in March with Mr. Gary Monnetti presenting "SAW Applications." Plans for Professor Collin Campbell of McMaster's University to speak in April are underway.

The Orlando Section had its annual awards banquet on February 20, 1988. Mr. Robert Smythe was nominated by the UFFC chapter as its Engineer of the Year and he also was chosen as the Section's Engineer of the Year. Congratulations are due to Bob for his many contributions in the areas of bulk wave devices, monolithic filters and frequency control.

D.C. Malocha
Chapter Chair
TOKYO CHAPTER

The Tokyo Chapter invited the UFFC National Lecturer, Professor M. A. Breazeale in December 1987. He presented several very impressive lectures on nonlinear acoustics and other topics in Tokyo, Sendai and Kyoto. Prof. and Mrs. Breazeale and several members of Tokyo Chapter enjoyed a shabu-shabu dinner.

The Tokyo Chapter sponsored USE 87 (the 8th Symposium on Ultrasonic Electronics) which was held in Tokyo December 8th - 10th. Eighty-three papers including the invited lecture by Professor Breazeale were given and more than 320 attended. Other technical meetings held during the past half a year were:

<table>
<thead>
<tr>
<th>Date</th>
<th>Papers</th>
<th>Place</th>
</tr>
</thead>
<tbody>
<tr>
<td>June 22 '87</td>
<td>8</td>
<td>Tokyo</td>
</tr>
<tr>
<td>July 23</td>
<td>6</td>
<td>Tokyo</td>
</tr>
<tr>
<td>Aug. 26</td>
<td>5</td>
<td>Tokyo</td>
</tr>
<tr>
<td>Sept. 21/22</td>
<td>12</td>
<td>Yamagata</td>
</tr>
<tr>
<td>Oct. 24</td>
<td>5</td>
<td>Tokyo</td>
</tr>
<tr>
<td>Nov. 30</td>
<td>7</td>
<td>Nagoya</td>
</tr>
<tr>
<td>Dec. 14</td>
<td>6</td>
<td>Tokyo*</td>
</tr>
<tr>
<td>Jan. 28 '88</td>
<td>10</td>
<td>Kyoto</td>
</tr>
</tbody>
</table>

*Professor Breazeale gave an invited lecture.

Our vice-chairman has changed and the officers for 1988 are:

Chairman: Prof. Noriyoshi Chubachi  
Faculty of Engineering, Tohoku University, Sendai

Vice-Chairman: Prof. Kenshiro Takagi  
Institute of Industrial Science, University of Tokyo, Tokyo

Secretary: Prof. Masatsune Yamaguchi  
Faculty of Engineering, Chiba University, Chiba

Treasurer: Prof. Tadashi Shiosaki  
Faculty of Engineering, Kyoto University, Kyoto

The Tokyo Chapter members discussed having the 1990 Ultrasonic Symposium in Hawaii and all agreed to cooperate to make it a success.

Kenshiro Takagi  
Vice Chairman, Tokyo Chapter

Membership Report

As of December 31, 1987, the Ultrasonics, Ferroelectrics, and Frequency Control Society consisted of 2,183 members. This membership is broken down as follows:

- Fellows: 88
- Senior Members: 265
- Members: 1,519
- Associates: 124
- Students: 180
- Affiliates: 7

Members who are involved in conferences which would be of interest to persons in the ultrasonics, ferroelectrics and frequency control community are urged to have UFFC membership materials on display at their conference. These materials can be obtained from Dr. Harry L. Salvo, Jr.  
333 Gordon Avenue  
Severna Park, MD 21146

In addition to conferences, this material is available to local chapters and any society members who need them.

We wish to welcome the following new members who joined the society during the second half of 1987:

- Atlar, Abdullah
- Barzi, Bita
- Biernecki, John
- Blakely, Barry A.
- Boska, Joseph M.
- Broadwin, Alan
- Brown, Stephen A.
- Bugajski, Paul R.
- Burick, Ronald J.
- Burke, Eric G.
- Cattley, David R.
- Chin, Ronny B.
- Chu, Bright H.
- Coates, Keven D.
- Coloma, Jorge
- Corsielleus, Jean L.
- Cotten, Whitworth W. (Jr.)
- Cronin-Golomb, Mark
- Farine, Pierre A.
- Fechner, Jimmy R.
- Ghavini, Ali R.
- Goeking, Kent V.
- Greenberg, Ralph D.
- Grose, Ralph H.
- Haley, Paul V.
- Hail, Maclin S.
- Hama, Leo J.
- Hoffert, W. J.
- Holland, Mark R.
- Heiung, Harry L.
- Jung, Seung H.
- Kitapci, Aysein
- Kueng, Roland
- Lowis, Gary K.
- Liaw, Jiman J.
- Mahant, Mukul C.
- Malm, J. F.
- Metze, Armin
- Mostarshed, Shahriar
- Nagahban, Shabab S.
- Powers, Edward D. (Jr.)
- Rezaei-Mo, Mohammad H.
- Robitaille, Michael A.
- Roth, Patrick J.
- Schmidt, V. Hugo
- Siegert, Joachim
- Staples, Edward J.
- Steyn, Robert L.
- Stone, Barbara A.
- Sullivan, Donald B.
- Swaminathan, K.
- Tantilwat, Yuthana
- Tehranl, Fleur T.
- Temple, R. E.
- Tseng, Ling-Yuan
- Ussery, W. Warren (Jr.)
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 James F. Greenleaf
Biomedical Research Unit
Mayo Foundation
200 First Street, S.W.
Rochester, MN 55905

For contributions to the development of advanced medical imaging.

Professor Nobuo Mikoshiba
Tohoku University
Zi-1- Katahira
Sendai 980, Japan

For contributions to the development of physical acoustics and surface acoustic-wave devices.

Mr. Robert A. Johnson
3222 Woodland Drive
Tustin, CA 92801

For contributions to mechanical filters.

Dr. Leland P. Sible
1790 Washington Avenue
Urbana, IL 61801

For contributions to the development of reflective array surface acoustic-wave filters and multistrip filter techniques.

Dr. Eric G. Lean
IBM Corporation
T. J. Watson Research Center
Post Office Box 218
Yorktown Heights, NY 10598

For contributions to the development -- and application of bulk and thin-film acousto-optic diffraction devices and to optical probing of acoustic surface wave nonlinear effects.

Dr. Herman van de Vaart
Allied-Signal, Inc.
Post Office Box 1221
Columbus Road and Park Avenue
Morrison, NJ 07960

For contributions to the field of surface acoustic-wave delay line technology.

They join the following list of Fellows for our UFFC-S Society. If you know of society members who would be qualified for this honor, consider nominating them. The fellow election forms may be obtained from IEEE headquarters by writing Dolores Wright, Staff Assistant, IEEE Fellow Committee, 345 East 47th Street, New York, N.Y. 10017-2394 or by calling (212) 705-7750. Fellow nominations are due at IEEE headquarters in April of each year. This year’s deadline is April 30th.

IEEE Fellows Roster

0197904 LF 212-391-7571
ROBERT ADLER IEG 4
ZENITH CENTER
1006 MILWAUKEE AVE
GLENVIEW IL 60025

0677319 F 415-722-0264
KEVIN J. ASHBY IEG 4
IMPERIAL COLLEGE OF SCI & TECH
LONDON SW7 2AZ ENGLAND

0567796 F 415-722-0264
Elia A. BUDELL IEG 4
STANFORD UNIV
HARRIS LABS
STANFORD CA 94305

0916401 F 201-544-2773
IEC 4
150 ATLANTIC AVE
LONG BRANCH NJ 07740

0099269 LF 718-389-1000
J W BOUDREAU IEG 4
BDI 23447
ROCHESTER NY 14692

0835047 F 1780 OLD BILLERICA RD
PAUL H. CARR IEG 4
BEDFORD MA 01730

1057317 F 02-966-1931
ZANG-HEE CHI IEG 4
CARGO-CEC, INC
50 WOLFWATER PL
HAIGHT-ASHBURY SF 94117

0214109 LF 714-481-7049
LESLIE E. CROSS IEG 4
C C CUTLER IEG 4
GIRINOT LAB
STANFORD CA 94305

1709035 F 818-885-1181
PENNSYLVANIA STATE UNIV
MAT RES LAB
UNIVERSITY PARK PA 16802

0172197 LF 415-722-0261
LOUIS J. CUTRONA IEG 4
17339 BARRABOS WAY
DEL MAR CA 92014

1349999 F 015-601901
G QUIRKEN IEG 4
CHAIRMAN EXECUTIVE BOARD
AND CHIEF EXECUTIVE OFFICER
GIBERT GROPP INSTITUTE
2800 MD DEPT NETHERLANDS

1675786 F 212-333-3135
FAYE HUNT IEG 4
UNIV OF ILLINOIS
1103 S. WRIGHT ST
URBANA IL 61801

1612175 F 801-266-6099
L E. J. JANSEN IEG 4
QUARTEX INC
1639 W.ATHERTON DR
BLOOMINGTON IN 47404

2654301 LF 317-284-4500
FRANCIS J. FRY IEG 4
LARSONSONICS INC
261 E. WASHINGTON ST
MOONSVILLE IN 46150

1317791 F 212-530-6622
E. HAPNER IEG 4
SRI SYCAMORE AVE
TINNITUS FALLS NY 10724

0843572 F 212-705-7910
FRIC HENSE IEG 4
14 MARGUETE DR
RYE NY 10573

0130656 F 714-629-7524
CHARLES P. HORNE JR IEG 4
844 MUSCROCT AVE
POMONA CA 91768

0183848 LF 02-831622
P - H INGELS IEG 4
THE TECHNICAL UNIV OF DENMARK
2800 COPENHAGEN DENMARK

0307161 LF 609-924-5537
J D JOHNSON IEG 4
THEAQUE LLC
PRINCETON NJ 08540

0594747 F 415-497-0205
GORDON S. KING IEG 4
STANFORD UNIV-GIRINOT LAB
W W HANSELY LABS
STANFORD CA 94305

0651822 F 319-352-5056
A. KOPPEL IEG 4
THE UNIVERSITY OF IOWA
DEPARTMENT OF ELECTRICAL AND COMPUTER ENGINEERING
IOWA CITY IA 52242

0295439 F 319-351-4342
B. LA ROSA IEG 4
317 SOUTHEAST HEMPSTEAD
NEW YORK NY 11550

0408890 LF 0425-91-5111
HIROSHI KIRISHI IEG 4
1-1- KOBORI
MIN SHI
TOKYO 191 JAPAN

0597458 F 074-41-1271
YUICHI KAGAMA IEG 4
NATIONAL UNIV OF IOWA
DEPARTMENT OF ELECTRICAL AND COMPUTER ENGINEERING
IOWA CITY IOWA 52242

0597458 F 074-41-1271
YUICHI KAGAMA IEG 4
NATIONAL UNIV OF IOWA
DEPARTMENT OF ELECTRICAL AND COMPUTER ENGINEERING
IOWA CITY IOWA 52242

0278266 F 602-969-3694
IRVING KAPLAN IEG 4
ATLATIC STATE UNIVERSITY
DEPARTMENT OF ELECTRICAL AND COMPUTER ENGINEERING
TEMPIC

0278266 F 602-969-3694
IRVING KAPLAN IEG 4
ATLATIC STATE UNIVERSITY
DEPARTMENT OF ELECTRICAL AND COMPUTER ENGINEERING
TEMPIC

0278266 F 602-969-3694
IRVING KAPLAN IEG 4
ATLATIC STATE UNIVERSITY
DEPARTMENT OF ELECTRICAL AND COMPUTER ENGINEERING
TEMPIC

0278266 F 602-969-3694
IRVING KAPLAN IEG 4
ATLATIC STATE UNIVERSITY
DEPARTMENT OF ELECTRICAL AND COMPUTER ENGINEERING
TEMPIC
<table>
<thead>
<tr>
<th>Name</th>
<th>Institution</th>
<th>Position</th>
<th>Phone</th>
<th>Email</th>
<th>Address</th>
</tr>
</thead>
<tbody>
<tr>
<td>C. L. Land</td>
<td>Sandia Nat Labs</td>
<td>NM</td>
<td>87105</td>
<td>PROVOST</td>
<td>Sandia Nat Labs</td>
</tr>
<tr>
<td>J. B. Lewis</td>
<td>Rensselaer Polytech Institute</td>
<td>NY</td>
<td>1112</td>
<td>PROVOST</td>
<td>Rensselaer Polytech</td>
</tr>
<tr>
<td>H. C. Lin</td>
<td>Rensselaer Polytech Institute</td>
<td>NY</td>
<td>1112</td>
<td>PROVOST</td>
<td>Rensselaer Polytech</td>
</tr>
<tr>
<td>J. A. M. Lyon</td>
<td>University of Michigan</td>
<td>MI</td>
<td>48109</td>
<td>PROVOST</td>
<td>University of Michigan</td>
</tr>
<tr>
<td>F. S. Mackett</td>
<td>University of California</td>
<td>CA</td>
<td>94110</td>
<td>PROVOST</td>
<td>University of California</td>
</tr>
<tr>
<td>T. H. Mackrodt</td>
<td>University of California</td>
<td>CA</td>
<td>94110</td>
<td>PROVOST</td>
<td>University of California</td>
</tr>
<tr>
<td>Y. Nakamura</td>
<td>University of California</td>
<td>CA</td>
<td>94110</td>
<td>PROVOST</td>
<td>University of California</td>
</tr>
<tr>
<td>T. S. Makris</td>
<td>University of California</td>
<td>CA</td>
<td>94110</td>
<td>PROVOST</td>
<td>University of California</td>
</tr>
<tr>
<td>G. A. Mekler</td>
<td>University of California</td>
<td>CA</td>
<td>94110</td>
<td>PROVOST</td>
<td>University of California</td>
</tr>
<tr>
<td>J. R. Meller</td>
<td>University of California</td>
<td>CA</td>
<td>94110</td>
<td>PROVOST</td>
<td>University of California</td>
</tr>
<tr>
<td>R. C. Miller</td>
<td>University of Pennsylvania</td>
<td>PA</td>
<td>16001</td>
<td>PROVOST</td>
<td>University of Pennsylvania</td>
</tr>
<tr>
<td>J. A. M. Lyon</td>
<td>University of Pennsylvania</td>
<td>PA</td>
<td>16001</td>
<td>PROVOST</td>
<td>University of Pennsylvania</td>
</tr>
<tr>
<td>F. S. Mackett</td>
<td>University of Pennsylvania</td>
<td>PA</td>
<td>16001</td>
<td>PROVOST</td>
<td>University of Pennsylvania</td>
</tr>
<tr>
<td>T. H. Mackrodt</td>
<td>University of Pennsylvania</td>
<td>PA</td>
<td>16001</td>
<td>PROVOST</td>
<td>University of Pennsylvania</td>
</tr>
<tr>
<td>Y. Nakamura</td>
<td>University of Pennsylvania</td>
<td>PA</td>
<td>16001</td>
<td>PROVOST</td>
<td>University of Pennsylvania</td>
</tr>
<tr>
<td>T. S. Makris</td>
<td>University of Pennsylvania</td>
<td>PA</td>
<td>16001</td>
<td>PROVOST</td>
<td>University of Pennsylvania</td>
</tr>
<tr>
<td>G. A. Mekler</td>
<td>University of Pennsylvania</td>
<td>PA</td>
<td>16001</td>
<td>PROVOST</td>
<td>University of Pennsylvania</td>
</tr>
<tr>
<td>J. R. Meller</td>
<td>University of Pennsylvania</td>
<td>PA</td>
<td>16001</td>
<td>PROVOST</td>
<td>University of Pennsylvania</td>
</tr>
<tr>
<td>R. C. Miller</td>
<td>University of Pennsylvania</td>
<td>PA</td>
<td>16001</td>
<td>PROVOST</td>
<td>University of Pennsylvania</td>
</tr>
</tbody>
</table>

IEEE Fellows Roster

IEEE 1988
ULTRASONICS SYMPOSIUM
Monday–Wednesday, October 3–5, 1988
McCormick Center Hotel, Chicago, Illinois

Sponsored by The Ultrasonics, Ferroelectrics and Frequency Control Society
The UFFC Society Distinguished Lecturer Mack A. Breazeale has had a successful tour during recent months. He was very well received not only in the United States, but also in China and Japan. Below is a list of places visited to date. In addition, he is making plans to visit Milwaukee, Kingston (Ontario), Tullahoma, Perugia, and Copenhagen. Plans for these visits, as well as visits to other places, are incomplete at the moment.

Professor Breazeale reports an exhilaration that comes from interacting with other scientists and with students at the universities visited, that the experience is valuable to the lecturer as well as the audience.

<table>
<thead>
<tr>
<th>Date</th>
<th>Place</th>
<th>Approximate Number in Attendance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nov. 9, 1987</td>
<td>Department of Physics</td>
<td>35</td>
</tr>
<tr>
<td></td>
<td>University of Mississippi</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Oxford, MS</td>
<td></td>
</tr>
<tr>
<td>Nov. 23, 1987</td>
<td>Department of Physics</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td>Tong JI University</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Shanghai, PR China</td>
<td></td>
</tr>
<tr>
<td>Nov. 27, 1987</td>
<td>Department of Physics</td>
<td>Total of 6 lectures.</td>
</tr>
<tr>
<td>Dec. 1, 2</td>
<td>Institute of Acoustics</td>
<td>~ 30 attendees each time.</td>
</tr>
<tr>
<td></td>
<td>Nanjing University</td>
<td></td>
</tr>
<tr>
<td>Dec. 5, 7</td>
<td>Acoustics Institute</td>
<td>2 lectures ~ 20 each time.</td>
</tr>
<tr>
<td></td>
<td>Academia Sinica</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Beijing, PR China</td>
<td>University and Academy of Railway Sciences in addition.</td>
</tr>
<tr>
<td>Dec. 10</td>
<td>8th Symposium on Ultrasonic Electronics</td>
<td>50</td>
</tr>
<tr>
<td></td>
<td>Tokyo, Japan (Invited lecture)</td>
<td></td>
</tr>
<tr>
<td>Dec. 11</td>
<td>Murata Company</td>
<td>15</td>
</tr>
<tr>
<td></td>
<td>Kyoto, Japan</td>
<td></td>
</tr>
<tr>
<td>Dec. 12</td>
<td>Elastic Wave Technology Committee of Japan</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td>Society for Promotion of Science</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Osaka University</td>
<td></td>
</tr>
<tr>
<td>Dec. 14</td>
<td>Technical Group on Ultrasonics of IEICE</td>
<td>30</td>
</tr>
<tr>
<td></td>
<td>Tokyo, Japan</td>
<td></td>
</tr>
<tr>
<td>Dec. 15</td>
<td>Tamagawa University</td>
<td>2 lectures. First: ~ 200 undergraduates</td>
</tr>
<tr>
<td></td>
<td>Tokyo, Japan</td>
<td>Second: ~ 12 faculty</td>
</tr>
<tr>
<td>Feb. 1, 1988</td>
<td>Long Island Chapter</td>
<td>15</td>
</tr>
<tr>
<td></td>
<td>SUNY at Stonybrook</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Islip, Long Island, NY</td>
<td></td>
</tr>
<tr>
<td>Feb. 2</td>
<td>National Bureau of Standards</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>Gaithersberg, MD</td>
<td></td>
</tr>
<tr>
<td>Feb. 2</td>
<td>Washington, Baltimore and N. Va. Chapter</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>Calverton, MD</td>
<td></td>
</tr>
<tr>
<td>Feb. 3</td>
<td>Boston Section</td>
<td>15</td>
</tr>
<tr>
<td></td>
<td>Raytheon Research Division</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Lexington, MA</td>
<td></td>
</tr>
<tr>
<td>Feb. 4</td>
<td>Department of Physics</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td>Millersville State University</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Millersville, PA</td>
<td></td>
</tr>
<tr>
<td>Feb. 17</td>
<td>Santa Clara Chapter, IEEE</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Palo Alto, CA</td>
<td></td>
</tr>
<tr>
<td>Feb. 19</td>
<td>Naval Postgraduate School</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Monterey, CA</td>
<td></td>
</tr>
</tbody>
</table>
UFFC-S Distinguished Lecturer Mack Breazeale in Japan and China

Professor and Mrs. Breazeale with hosts from the Tokyo Chapter in Japan.

Professor Breazeale ready to lecture in Nanjing.

The Breazeales with dinner guests in Japan.

Announcement of lecture series in Nanjing.
The 1987 Ultrasonics Symposium was held at the Sheraton Denver Tech Center on 10/14-16 1987. The most important part of the conference is always the technical sessions and this year was one of the best. There were over 450 attendees with roughly one third from outside the continental United States demonstrating the vitality and broad international activity in the field of ultrasonics. In addition to the technical sessions, there was an outstanding exhibitors session bringing the latest in commercial technology to the Symposium for the attendees. As usual, the social atmosphere was an excellent backdrop for continuing technical discussions and catching up on the latest news.

The Symposium opened with the plenary session, followed by 41 technical sessions during which 236 papers were given. There were 206 oral papers and 30 papers were given in the poster sessions. Twenty papers were invited highlighting new developments, bringing visibility to a critical area, or reviewing important mature technology. 107 papers were from outside the United States pointing to the significance of this Symposium in the international sphere of ultrasonics.

The plenary session was opened by Jan Brown, Technical Program Chair and Bruce McAvoy presented the Awards and Recognitions to:

- **Achievement Award** - Thrygve R. Meeker, Consultant, retired from AT&T Bell Laboratories presented by Robert L. Rosenberg (Figure 1).
- **Best Paper Award** - "Optical Detection of Ultrasound" by Jean-Pierre Monchalin from the National Research Council of Canada presented by Roger Tancrell to Jean Bussiere accepting on behalf of the author (Figure 2).
- **Fellow Award** - H.L. Bertoni from the Polytechnic Institute of New York presented by Bruce McAvoy (Figure 3).
- **UFFC-S Distinguished Lecturer** - Mack A. Breazeale from the University of Tennessee presented by Bruce McAvoy (Figure 4).

Following the awards, the Presidents Speaker, Professor Breazeale, gave a talk including demonstration on "The Ubiquitous Nonlinearity: Its Origin in Solids" (Figure 5). The presentation began with a visual demonstration of the diffraction of a laser beam by 4 MHz ultrasonic waves in water, followed by a review of where nonlinearity is today and where it may go in the future.

The first day ended with a traditional reception at the hotel to bring the diverse yet coupled attendees back together from the various technology disciplines. As an observer of human nature, I always delight at the ability of IEEE-UFFC people to both compress a years work into a short social session while also absorbing a years work from their discussion partner. As if that were not amazing enough, while that is happening they are absorbing about 2000 calories of refreshment!

Some of the visitors had the fortunate opportunity to partake of the spouses program and see the natural grandeur of the Denver site, nestled in the Rocky Mountains as it is. We all wish we could have shared those memories. We all thank all those people with the 1987 Ultrasonics Symposium who donated so much of their time and energy to making the meeting such a success. We have a great society and plan to keep it vital; successful meetings and publications are our backbone.

Joe Heyman and Jan Brown
Fig. 3 Henry Bertoni receives Fellow Award from Bruce McAvoy.

Fig. 4 Mack A Breazeale receives UFFC-S Distinguished Lecturer Award from Bruce McAvoy.

Fig. 5 The President's Speaker, Professor Mack A. Breazeale.

Fig. 6 Sheraton Denver Tech Center, site of the 1987 Ultrasonics Symposium.

Fig. 7 President Bruce McAvoy opens the 1987 Ultrasonics Symposium.

Fig. 8 Jan Brown, Chairperson of the Technical Program Committee.
Technical Program Committee Note

The members of the Technical Program Committee work very hard with little formal recognition. The 1987 Ultrasonics Symposium Committee consisted of 72 members with 15 from government laboratories, 34 from industry, and 23 from universities. Six of the members were from Europe and Japan. The Committee is divided into four working groups, each with a Vice Chair, roughly dividing the technical activities into Medical (Group 1), NDE and Sensors (Group 2), Physical Acoustics (Group 3), and SAW (Group 4). The following pictures show some of the members of the Committee hard at work during the second TPC meeting in Denver last July. Thank You to all of you for your time and dedication and for a job very well done.

Jan Brown

Art Ballato - Vice Chairman - Group 3.

Roger Tancrèll - Vice Chairman - Group 1.

Gary Montress - Vice Chairman - Group 4.

Bernie Tittman - Vice Chairman - Group 2.

Group 1 - Medical.
Technical Program Committee

Group 2 NDE and Sensors.

Group 3 Physical Acoustics.

Group 3 Physical Acoustics.

Group 4 - Surface Acoustic Waves.

Jerry Farnell 1988 UFFC-S President.

M.A. Breazeale - UFFC-S Distinguished Lecturer.
Scenes From The 1987 Ultrasonics Symposium

Bruce McAvoy and Roger Tancrrett review a schedule at start of AdCom Meeting.

John Larson, Herman Van de Vaart, Bill O'Brien and Wally Smith in discussion.

Do you think I should use this slide in my talk?

Members of AdCom enjoy a lighter moment.

Newly elected President Farnell and Vice-President Brown.

Secretary Kagiwada packs up after AdCom Meeting.
Scenes From The 1987 Ultrasonics Symposium

Registration

Refreshments

Relaxation

Repartee

Repast

Rememberance
Speakers Pool Directory

As a service to the local chapters to aid them in identifying speakers and topics for their regular meetings, the UFFCS has begun compiling a speakers pool. The list as it presently exists is printed here in the Newsletter. The information provided by these speakers in the returned questionnaires is periodically compiled and sent to all of the chapter chairman to aid them in selecting their speakers. It will also be sent to other appropriate IEEE groups and academic institutions on request. We urge anyone who is interested in being included in this list to fill out the questionnaire and return it to me. The ADCOM has not reviewed the abstracts from these speakers. All those who so desire will be included in the list. We anticipate that as this list grows it will become an increasingly useful tool to those planning IEEE technical activities as well as academic seminars.

<table>
<thead>
<tr>
<th>NAME</th>
<th>CITY</th>
<th>STATE</th>
<th>SUBJECT</th>
<th>ALTERNATE SUBJECT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kimme-Smith, Carolyn</td>
<td>Los Angeles</td>
<td>CA</td>
<td>Medical Ultrasonics</td>
<td></td>
</tr>
<tr>
<td>Schoenwald, Jeffrey S.</td>
<td>Thousand Oaks</td>
<td>CA</td>
<td>Sensors &amp; Industrial Acoustics</td>
<td></td>
</tr>
<tr>
<td>Lubaszek, Antoni</td>
<td>02-524- Warszawa</td>
<td>Poland</td>
<td>SAW Devices or Applications</td>
<td></td>
</tr>
<tr>
<td>Evans, J.A.</td>
<td>Leeds LS1 3E</td>
<td>England</td>
<td>Medical Ultrasonics</td>
<td></td>
</tr>
<tr>
<td>Sampson, Milo</td>
<td>Tampa</td>
<td>FL</td>
<td>Medical Ultrasonics</td>
<td></td>
</tr>
<tr>
<td>Malocha, Donald C.</td>
<td>Orlando</td>
<td>FL</td>
<td>SAW Devices or Applications</td>
<td></td>
</tr>
<tr>
<td>Oravec, Michael G.</td>
<td>Bansenville</td>
<td>IL</td>
<td>Nondestructive Evaluation</td>
<td></td>
</tr>
<tr>
<td>Hunt, William D.</td>
<td>Atlanta</td>
<td>GA</td>
<td>SAW Devices or Applications</td>
<td></td>
</tr>
<tr>
<td>Panwar, B.S.</td>
<td>ITT New Delhi</td>
<td>India</td>
<td>Nondestructive Evaluation</td>
<td></td>
</tr>
<tr>
<td>Naidea, Kazuo</td>
<td>Yokohama 683</td>
<td>Japan</td>
<td>SAW Devices or Applications</td>
<td></td>
</tr>
<tr>
<td>Driscoll, Michael M.</td>
<td>Baltimore</td>
<td>MD</td>
<td>Biophysics</td>
<td></td>
</tr>
<tr>
<td>Blessing, Gerald V.</td>
<td>Gaithersburg</td>
<td>MD</td>
<td>Bulk Wave Devices</td>
<td></td>
</tr>
<tr>
<td>Vale, Christopher</td>
<td>Elk Ridge</td>
<td>MD</td>
<td>Nondestructive Evaluation</td>
<td></td>
</tr>
<tr>
<td>Harrison, George H.</td>
<td>Baltimore</td>
<td>MD</td>
<td>Medical Ultrasonics</td>
<td></td>
</tr>
<tr>
<td>Flitting, Dale W.</td>
<td>Ann Arbor</td>
<td>MI</td>
<td>Nondestructive Evaluation</td>
<td></td>
</tr>
<tr>
<td>Nikoochad, Mehrdad</td>
<td>Briar Cliff Manor</td>
<td>NY</td>
<td>Acoustic Microscopy</td>
<td></td>
</tr>
<tr>
<td>Driller, Jack</td>
<td>New York City</td>
<td>NY</td>
<td>Medical Ultrasonics</td>
<td></td>
</tr>
<tr>
<td>Cheung, John Y.</td>
<td>Norman</td>
<td>OK</td>
<td>Medical Ultrasonics</td>
<td></td>
</tr>
<tr>
<td>Jen, Cheng-Ruei</td>
<td>Boucherville</td>
<td>P.Q. Canada</td>
<td>Nondestructive Evaluation</td>
<td></td>
</tr>
<tr>
<td>Yanwu, Dong</td>
<td>Xian</td>
<td>P.R. China</td>
<td>Medical Ultrasonics</td>
<td></td>
</tr>
<tr>
<td>Yongche, Sun</td>
<td>Xian</td>
<td>P.R. China</td>
<td>Medical Ultrasonics</td>
<td></td>
</tr>
<tr>
<td>Gunirja, T.R.</td>
<td>University Park</td>
<td>PA</td>
<td>Medical Ultrasonics</td>
<td>Ferroelectrics</td>
</tr>
<tr>
<td>Shung, K. Kirk</td>
<td>University Park</td>
<td>PA</td>
<td>SAW Devices or Applications</td>
<td></td>
</tr>
<tr>
<td>Danicki, Eugene</td>
<td>00-049 Warsaw</td>
<td>PL</td>
<td>Nondestructive Evaluation</td>
<td></td>
</tr>
<tr>
<td>Koymen, H.</td>
<td>Ankara</td>
<td>Turkey</td>
<td>Medical Ultrasonics</td>
<td></td>
</tr>
<tr>
<td>Owens, J.M.</td>
<td>Arlington</td>
<td>TX</td>
<td>Medical Ultrasonics</td>
<td></td>
</tr>
<tr>
<td>Yuan, Liu</td>
<td>Beijing</td>
<td>China</td>
<td>Medical Ultrasonics</td>
<td></td>
</tr>
<tr>
<td>Reeser, Lawrence</td>
<td>Bansenville</td>
<td>IL</td>
<td>Nondestructive Evaluation</td>
<td>Acoustic Microscopy</td>
</tr>
<tr>
<td>Fliegel, Fred</td>
<td>Champaign</td>
<td>IL</td>
<td>Nondestructive Evaluation</td>
<td>Acousto-Optic</td>
</tr>
</tbody>
</table>

International Symposium on Applications of Ferroelectrics

ISAF 88, The International Symposium on Applications of Ferroelectrics is being held in conjunction with The 1st European Conference on Applications of Polar Dielectrics (ECAPD-1) in Zurich Switzerland August 29 through September 1 of 1988. The conferences are devoted to all research activities dealing with polar dielectrics. In particular special sessions on the following topics will be included in the programs:

1. Materials research of organic and inorganic single crystals, thin films, ceramics, polymers, composites, high Tc superconductors and liquid crystals.

2. Basic research of device oriented physical properties.
   - Ferro-, piezo- and pyroelectric properties
   - Electro-optical and nonlinear optical effects
   - Photorefractive effects, optical phase conjugation and dynamic holography

3. Device research
   - Piezoelectric transducers, actuators, films etc.
   - Electro-optic modulators, displays
   - Associative optical memories, spatial light modulators, optical signal processors, phase conjugate resonators.
   - Thin film devices: transducers, integrated optics
   - Pyroelectric detectors, arrays, vidicons.

The Conference will be held on the Hangarberg campus of the Swiss Federal Institute of Technology. Registration and accommodation information may be obtained by writing ECAPD-1/ISAF '88, c/o H. Arend, Institute of Quantum Electronics, Swiss Federal Institue of Technology, CH-8093 Zurich, Switzerland.
CALL FOR SPEAKERS POOL DIRECTORY

for the Ultrasonic, Ferroelectrics, and Frequency Control Society

If you would be willing to have your name included on a list of available speakers for UFFC chapter meetings, please provide us with the following information and return this form to Dr. Leland Solie, EDI, 1776 E. Washington Street, Urbana, IL 61801.

| NAME: ___________________________ | CONDENSED RESUME: ___________________________ |
| ADDRESS: ________________________ | .......................................................... |
| ........................................ | .......................................................... |
| ........................................ | .......................................................... |
| ........................................ | .......................................................... |
| BUS. PHONE: _____________________ | .......................................................... |
| HOME PHONE: _____________________ | .......................................................... |
| VISUAL AIDS REQUIRED: __________ | .......................................................... |
| ........................................ | .......................................................... |
| TRAVEL LIMITATIONS: _____________ | SUBJECT CLASSIFICATION (check one) |
| ........................................ | ( ) Medical Ultrasions |
| ........................................ | ( ) SAW Devices or Applications |
| ........................................ | ( ) Nondestructive Evaluation |
| ........................................ | ( ) Acousto-Optic |
| ........................................ | ( ) Magnetoelastic |
| ........................................ | ( ) Bulk Wave Devices |
| ........................................ | ( ) Ferroelectrics |
| ........................................ | ( ) Frequency Control |
| ........................................ | ( ) Other ______________________ |

IEEE 1988
ULTRASONICS SYMPOSIUM

CHICAGO
Meetings Sponsored by the
IEEE Ultrasonics, Ferroelectrics, and Frequency Control Society

42nd Annual Frequency Control Symposium
June 1–3, 1988
Venue: Baltimore, MD

J. R. Vig, General Program Chair
US Army LABCOM
SLCET-EQ
Fort Monmouth, NJ 07703
201/444-4275; 4805

1988 IEEE International Symposium on Applications of Ferroelectrics
and First European Conference on Applications of Polar Dielectrics
August 29–September 2, 1988
Zurich, Switzerland

P. Gunter, General Program Chair
Swiss Federal Institute of Technology
Hochengerg
CH-8093 Zurich
Switzerland

1988 IEEE Ultrasonics Symposium
October 3–5, 1988
Chicago, IL

W. D. O'Brien, Jr., General Program Chair
Department of Electrical and Computer Engineering
University of Illinois
1406 W. Green St.
Urbana, IL 61801
217/333-2407

J. Brown, Technical Program Chair
Fisher Controls
1712 Centre Creek Drive
Austin, TX 78754

43rd Annual Frequency Control Symposium
May or June, 1989
Venue: To be announced

T. R. Meeker, Technical Program Chair
Bell Laboratories (Ret.)
2936 Lindberg Ave.
Allentown, PA 18103
215/437-3310

1989 IEEE Ultrasonics Symposium
October 4–6, 1989
Montreal, PQ Canada

H. van de Vaart, General Program Chair
Allied Signal Incorporated
P. O. Box 1021 R
Morristown, NJ 07960
201/455-2482

K. V. Montress, Technical Program Chair
Raytheon Research Division
131 Spring St.
Lexington, MA 02173

44th Annual Frequency Control Symposium
May or June, 1990
Venue: To be announced

1990 IEEE Ultrasonics Symposium
Date: To be announced
Honolulu, Hawaii

R. S. Kagiwada, General Program Co-Chair
TRW-ESG, MS M5/1007
One Space Park
Redondo Beach, CA 90278
213/535-5515

N. Mikoshiba, General Program Co-Chair
Research Institute Electrical Communications
Tohoku University Katahira
Sendai 980, Japan
(0222) 27-6200

1990 International Symposium on Applications of Ferroelectrics
June, 1990
Urbana, IL

D. A. Payne, General Program Chair
Department of Ceramic Engineering
University of Illinois
105 S. Goodwin Ave.
Urbana, IL 61801
217/333-1770

THE INSTITUTE OF ELECTRICAL & ELECTRONICS ENGINEERS, INC.
445 Hoes Lane
Piscataway, N.J. 08854-4150