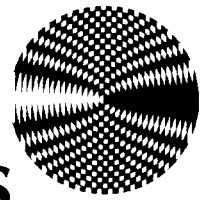




IEEE



SONICS AND ULTRASONICS GROUP NEWSLETTER

NUMBER 52, APRIL 1982

EDITOR: FRED S. HICKERNELL

G-SU SELECTS



WILLIAM D. O'BRIEN, JR.

G-SU PRESIDENT

Dr. William D. O'Brien, Jr. has been elected to lead the Group on Sonics and Ultrasonics in 1982. Dr. O'Brien is an Associate Professor of electrical engineering and bio-engineering at the University of Illinois at Urbana-Champaign.



FRANK E. BARBER

G-SU NATIONAL LECTURER

Dr. Frank E. Barber, Assistant Professor of Radiology at Harvard Medical School, has been selected as the G-SU National Lecturer for 1982-85. Dr. Barber will speak on the topic, "Ultrasonics in Medical Diagnosis and Biomedical Research."

PRESIDENT'S MESSAGE

Would you read this and then pass it onto one of your colleagues who may not be a member of the Group on Sonics and Ultrasonics (G-SU). The theme is the benefits one derives by belonging to G-SU. There are so many.

G-SU is one of thirty-three groups, societies and councils (G/S/C) of IEEE. A profile of IEEE members shows that 57% of the IEEE members belong to one or more G/S/C. As of December, 1981 the institute membership totalled 213,536 members with G/S/C membership of 239,023.

Surveys strongly suggest that one joins IEEE to take advantage of its Technical Activities through the 50 Transactions, Journals and Magazines (48,000 pages published annually) and 150 conferences with 60,000 pages of conference publication annually.

The IEEE Group on Sonics and Ultrasonics annually published over 500 pages in the bi-monthly IEEE Transactions on Sonics and Ultrasonics and over 1000 pages in the Ultrasonics Symposium Proceedings. The publications deal exclusively with the theory, design and applications relating to the generation, transmission and detection of bulk and surface mechanical waves. The areas of interest range from fundamental studies in physical acoustics to the design of sonic and ultrasonic devices and their applications in industry, biomedicine and signal processing.

Other publications available through membership in G-SU include the Journal of Ocean Engineering, Journal of Solid-State Circuits, Transactions on Pattern Analysis and Machine Intelligence and the brand new Transactions on Medical Imaging.

The G-SU annually awards a cash prize of \$300.00 per author for the "Best Paper of the Year" published in the IEEE Transactions on Sonics and Ultrasonics. Over the past few years, the quality of the Transactions' papers has been so high that the Awards Committee has also awarded an Honorable Mention each year.

The G-SU National Lecturer Program was established two years ago. A national lecturer is selected on the basis of having demonstrated competence in sonics and ultrasonics. A stipend is provided to cover travel expenses to present the lecture to SU Chapters, groups that are considering chapter formation, university groups and other interested IEEE groups. Consult the July, 1981 issue of the SU Transactions, pp. 235-236, for further details.

The G-SU Ad Com believes that the future is invested in our graduate students. To promote their participation in SU technical activities, a Student Travel Support program has been established. This program provides financial support for graduate students active in sonics and ultrasonics to travel

to the Ultrasonics Symposium. Watch for details in the Call for Papers for the 1982 Ultrasonics Symposium, to be held October 27-29 in San Diego.

If you are an IEEE member but not a member of G-SU, a special first time membership promotion will be available to you at the 1982 Ultrasonic Symposium. You cannot afford to pass it up.

Welcome to 1982. It should be a good year.

William D. O'Brien, Jr.

New AdCom Officers

W. D. O'BRIEN, JR.
President

The new president of the GSU is W. D. O'Brien, Jr. He served several years as secretary-treasurer of the Group and was the vice-president for 1981.

Bill is an Associate Professor at the University of Illinois. He received the B.S., M.S. and Ph.D. degrees from Illinois in 1966, 1968 and 1970, respectively. He teaches graduate and undergraduate courses in electrical engineering, bioengineering, and biophysics. He is currently involved in research projects concerning the understanding and application of acoustic microscopy to biological materials and their associated problems.

Outside the University Bill is involved in various community activities. He stays physically active with bowling, jogging, and racquetball. He and his family also enjoy camping and skiing.

G. W. FARNELL
Vice President

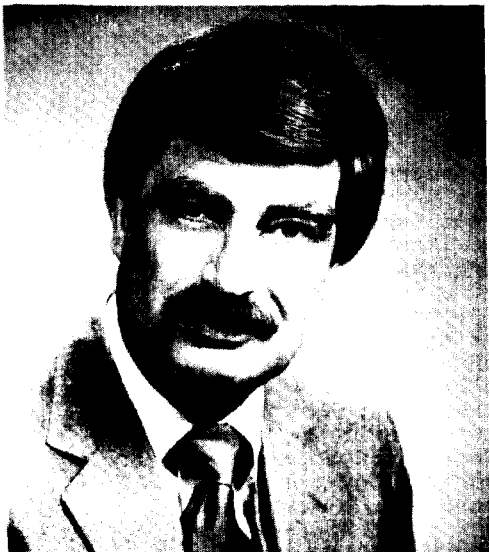
Dr. Gerald W. Farnell (F 70) the new vice-president of the Group got into ultrasonics work by a rather circuitous route from the diffraction of electromagnetic waves through relaxation interactions in maser materials to electroacoustic amplification. For some time he has been concerned with the propagation characteristics of acoustic surface waves and their effects in SAW devices and more recently he has been involved with the properties of a planar acoustic microscope lens.

Born in Toronto, Canada, Jerry Farnell was educated at the University of Toronto (B.A.Sc.), M.I.T. (S.M.) and McGill University (Ph.D.). He has been a professor in the Department of Electrical Engineering at McGill University in Montreal for many years. From 1967 to 1974 he was chairman of the Electrical Engineering Department and since that time he has been Dean of the Faculty of Engineering. His main hobbies are sailing and teaching.

NOMINATIONS INVITED FOR
IEEE 1983 AWARDS



G.W. FARNELL



HERMAN VAN DE VAART
Secretary-Treasurer

Dr. van de Vaart is serving his second term as Secretary-Treasurer of the IEEE Group on Sonics and Ultrasonics. He has served on the Technical Program Committee of the Ultrasonics Symposium since 1976 and was chairman in 1980. He has served as Secretary-Treasurer and Chairman of the Boston Section of the GSU.

Dr. van de Vaart is Director of the Applied Physics Laboratory of the Sperry Research Center where he has engaged in advanced solid state device work since 1962. Hermann has contributed to the areas of linear and nonlinear phenomena involving spin wave and magneto-elastic waves at microwave frequencies in ferrites and more recently to magnetic and acoustic surface-wave device studies.

All members of the IEEE are urged to participate in the annual quest for the best-qualified candidates, who will be recognized by the IEEE for their outstanding contributions to the field of electrical and electronics engineering.

The deadline dates for the receipt of nominations and supporting letters for the IEEE Medal of Honor, Major Annual Medals, and Service Award are June 1, 1982; for the Field Awards, April, 1982; and for the Prizes, July 1, 1982.

Forms and a descriptive brochure may be obtained by writing to the Staff Secretary of the Awards Board, the IEEE, 345 East 47th St., New York, NY 10017.

IEEE HONORS 130 MEMBERS
WITH ELECTION TO FELLOW GRADE

The Institute of Electrical and Electronics Engineers (IEEE) has elevated 130 of its members to its most distinguished membership grade, IEEE Fellow. Fellows are named annually by the Board of Directors after election by a committee of peers. A mark of unusual distinction, Fellow grade is conferred only upon persons of outstanding qualifications and experience in their particular fields. Of the more than 220,000 members of the IEEE, less than 2 percent are Fellows.

Of this year's Fellows receiving special recognition were the following members of the IEEE Group on Sonics and Ultrasonics. We congratulate them on this achievement.

Larry A. Coldren, Bell Laboratories, for contributions to surface-acoustic-wave resonator filters, long delay lines, and monolithic acoustoelectric signal-processing devices.

Francis J. Fry, Fortune-Fry Research Laboratory, for pioneering contributions to the applications of ultrasonics in biology and medicine.

Horst W.A. Gerlach, U.S. Army Eradcom Harry Diamond Laboratories, for design and development of microwave tubes and solid-state sources for missile fuze systems.

Richard La Rosa, Hazeltine Corp., for contributions to the development of electro-acoustic signal-processing devices.

Ferdy P.M. Mayer, Laboratoire d'Electro-technique et d'Automatique Dauphinois (France), for contributions to the theory of ferro-magnetics and to the development of materials for the suppression of electromagnetic interference.

Richard C. Williamson, Massachusetts Institute of Technology, Lincoln Laboratory, for contributing reflective grating devices to the field of surface-acoustic-wave filters.

New AdCom Members



BRUCE CHICK

Bruce B. Chick received the Sc.B. degree in Engineering in 1950 and the Sc.M. degree in Engineering in 1953 from Brown University.

In 1953, he became a Research Associate in the Metals Research Laboratory at Brown University. In 1964, he was appointed Associate Director of that laboratory and also received the position of Senior Research Engineer. He has been responsible for the development of specialized instrumentation for the measurement of Ultrasonic Attenuation particularly in the area of amplitude dependence and ultrasonic bias stress. In 1964, he formed Matec, Inc., with associates to specialize in the development, production, and sales of pulsed ultrasonic test equipment while continuing his affiliation with Brown University on a part time basis.

Present development interests are in the use of quadrature phase detection of pulsed ultrasonic information to be interfaced to a computer for simultaneous measurements of attenuation and velocity on a completely automated basis. He is also actively participating in the development of a computer controlled, pulsed nuclear quadrupole resonance spectrometer. Techniques for advanced NDE measurements for evaluating materials are also being devised.

Mr. Chick is a member of Sigma Xi and is President of the commercial FM radio station WBRU which is operated by students of Brown University.



LARRY COLDREN

Larry A. Coldren was born in Mifflintown, PA, on January 1, 1946. He received the B.A. degree in physics and the B.S. degree in electrical engineering from Bucknell University, Lewisburg, PA in 1968, and the M.S. and Ph.D. degrees in electrical engineering from Stanford University, Stanford, CA, in 1969 and 1972, respectively. Upon completion of his work at Bucknell, he joined the technical staff of Bell Telephone Laboratories. From 1968 to 1972 he worked in the Microwave Laboratory at Stanford under the support of Bell Laboratories. During the seventies he worked on various ultrasonic device projects at Bell Laboratories, Holmdel, NJ. Notable among these were clad fiber long delay lines, ZnO/Si signal processing devices, and coupled SAW resonator filters. In 1979, he shared the SU Transactions best paper award for an article on resonator scattering theory and design. Recently, Dr. Coldren has worked in the area of III-V Semiconductor integrated optics, using new fabrication techniques, such as reactive ion etching, to create improved structures. He has filed 15 patents and has published about 60 technical papers. He served on the program committee of the IEEE Ultrasonics Symposium from 1975 to 1980, and he was elected to the SU group Ad Com in 1981. Dr. Coldren is a member of Phi Beta Kappa, Tau Beta Pi, Pi Mu Epsilon, and Sigma Pi Sigma.

His nontechnical activities include membership in his township's energy committee, chairmanship of his church's building committee, and management of his own corporation. He enjoys his airplane for nonbusiness purposes, renovating his home, and leading his Webelos den on outings.

Ad Com Briefs



JOHN D. LARSON III

John Larson is a native Oregonian, educated in Boston (M.I.T. SBEE, 1962), and transplanted to California where he studied at Stanford University, culminating in a doctorate in microwave acoustics (Ph.D. 1971). A post-doctoral year at the Technical University of Denmark followed this, then he joined the central research laboratories at Hewlett-Packard Co., Palto Alto, California.

His professional interests have centered on acoustic transduction, with applications in delay lines, amplifiers, acousto-optical filters, acoustical imaging, Rayleigh waves, etc.

In 1980, he helped found the Santa Clara Valley section of Sonics and Ultrasonics, and has continued to serve as Secretary-Treasurer of that group, as well as program chairman.

In his spare time, he has participated in a number of civic activities including school playground construction, church leadership, and an active role in a Cub Scout Pack. Jogging, hiking, and outdoor sports are his favorite pastimes.

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EDITORS THANK YOU

The editor appreciates the articles from various members which make-up this issue of the G-SU newsletter. Newsworthy articles from any G-SU member are welcomed. Deadline for the Fall issue is August 15th.

The editor also gratefully acknowledges the work of Bob Mills who patiently typed this newsletter.

The G-SU Ad Com met on October 13, 1981 at the McCormick Inn, Chicago, IL, presided over by T.W. Bristol. B.B. Chick, L.A. Coldren and J.D. Larson were introduced as newly elected members to serve from 1/1/82 to 12/31/84. Also introduced were R.W. Damon, IEEE President for 1981, and A.R. Schell, Director Division IV for 1981-1982.

H. van de Vaart (Secr. Treas. G-SU) reported that the income and expenses for the period 1/1/81 to 8/31/81 were \$128.5K and \$107.0K, respectively, for an operating surplus of \$21.5K. The net worth as of 8/31/81 was \$109.1K.

S. Wanuga (Transactions Editor) reported that all the Transactions issues for 1981 were completed. The six issues had a total of 522 pages, against a page budget of 528. The average voluntary page charge return for the first five issues was 45%, with a high of 77% for the January issue, and a low of 18% for the May issue. It was noted that the voluntary page charges will increase from \$70 to \$85 per page, starting January 1982. The editing and publication charges will also be increased for 1982. A letter has been drafted that will be sent to all G-SU members. The letter outlines suggestions for publishing in the Transactions on Sonics and Ultrasonics, recommendations for complete manuscripts to speed publication dates and topics for special issues and review papers.

D.E. Yuhas, as G-SU representative on the Transactions on Medical Imaging (TMI) Steering Committee, attended two meetings of the committee. He reported that the TMI will appear quarterly with approximately 400 pages. The first issue is planned for May-June 1982. The subscription cost will be \$8 for IEEE members. Guest editors have been chosen for the first issue. Jack Reid will represent the Ultrasonics interest.

The publication of Ultrasonics Symposium Proceedings continues to be highly successful, creating a net income to the Group through the IEEE Book Broker program. A question was raised about the large difference in price of the Proceedings ordered at the Symposium, or afterward through the IEEE. B.R. McAvoy (Proceedings Editor) promises to look into this and to find out whether the Proceedings could be made available up to a month after the Symposium at the Symposium rate, without being in conflict with the IEEE Book Broker program.

G.W. Farnell reported that 17 students received travel assistance to the 1981 Ultrasonics Symposium. All recipients were authors or co-authors of papers. The general consensus was that the program is very worthwhile and should be continued. The budgeted assistance for the 1982 Symposium was increased to \$6000.

A preliminary report on the 1981 Ultrasonics Symposium was presented by W.D. O'Brien and L.W. Kessler, co-chairmen of the

Symposium. A total of 248 contributed and 13 invited abstracts were received. For the seven years that records are available, this represents the second highest number of contributed abstracts, topped only by the 1980 Symposium in Boston. Of the total of 248 contributed abstracts received, 164 (66.1%) were from the U.S., while 84 (33.9%) were from outside the U.S. In the Program Committee meetings, there was continued effort to assure that poster papers were judged equally with oral papers. A total of 47 poster papers were planned, divided into seven topical sessions. No other sessions were scheduled during the poster sessions and for the first time an invited paper was scheduled as a poster paper. Future Symposia are planned for San Diego, CA in 1982 (B.R. McAvoy, R.S. Wagers); Atlanta, GA in 1983 (M. Levy, R.S. Kagiwada); Dallas, TX in 1984 (L.T. Claiborne); San Francisco, CA in 1985; Williamsburg, VA in 1986. R.C. Williamson mentioned that a Workshop is being planned on Signal Processing, similar to the meetings held in the past in Aviemore and Peebles, Scotland. The plan is to ask for participation from such IEEE groups/societies as SU, MTT, AES, ASSP and Optical Societies.

R. Adler (Chairman, Awards Committee) presented the results of the Best Paper Selection for 1980. Donald L. Lee's paper, "Excitation and Detection of Surface Skimming Bulk Waves on Rotated Y-Cut Quartz" in the January issue of the SU-Transactions was selected as the Best Paper, while the paper by R.W. Martin and D.W. Watkins "An Ultrasonic Catheter for Intravascular Measurement of Blood Flow: Technical Details" in the November issue received an Honorable Mention. Larry Kessler was chosen as the second SU National Lecturer. The subject for his talk will be "Acoustic Microscopy: Methods, Applications, Outlook."

As of August 31, 1981, Group membership stood at 2011, as compared to 2104 a year ago, a decrease of 93, or 4.4%. W.J. Tanski (Membership Chairman) reported to have received a preliminary copy of the new IEEE Society Membership Development Manual. He is planning to implement several items from this manual to increase membership in the Group.

The new Long Island, NY Chapter of G-SU, organized by H. Carleton, was approved by IEEE and is now active. There are now five G-SU chapters. The other four are: Boston (R.W. Ralston), Pittsburgh (B.R. McAvoy), Baltimore/Washington/Northern Virginia (C. Vale) and Santa Clara Valley (W.R. Shreve).

A.D. Ballato, as new chairman of the Technical Activities Committee, is reviewing the efforts of the various subcommittees. A new subcommittee on Surface Acoustic Wave Devices was created, which is chaired by E. Mariani. The other subcommittees are: Delay Lines and Acousto-Optic Devices - A. Comparini, Piezoelectric Crystals - T. Meeker, Industrial Ultrasonics - R. Woollett, and Ultrasonics in Medicine - F. Kremkau.

T.W. Bristol announced that the G-SU Constitution and Bylaws are outdated and are in need of review. An effort will be made to update them, starting from ground zero, so that they are in line with current practice.

G. Alers (past President) expressed his strong feelings that the G-SU should make available funding to allow the President or his designee to attend IEEE Technical Activities Board meetings and the Spring Ad Com meeting, which are deemed important to the operation of the Group, provided he has exhausted all possibilities that his employer could pay all or part of his travel expenses. Even though the absence of G-SU funds for these purposes has not been a problem in the past, it was felt that it was important to eliminate a possible bias against electing G-SU officers whose organizations would not pay for expenses incurred in the professional activities of their staff members. A motion to that effect was introduced, which passed with 16 in favor, 2 against.

Since this was the last Ad Com meeting of the year, elections were held for officers for 1982. T.W. Bristol announced that he would not be able to stand for re-election as President for a second term. The Ad Com then unanimously elected W.D. O'Brien, Jr. as President for 1982, while G.W. Farnell was elected Vice President. H. van de Vaart was reappointed Secretary-Treasurer.

The next Ad Com Meeting is scheduled for Tuesday, March 16, 1982 at the Holiday-Inn, O'Hare/Kennedy, Chicago, IL.

H. van de Vaart
G-SU Secretary-Treasurer

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G-SU NATIONAL LECTURER

The Administrative Committee of the Group on Sonics and Ultrasonics has announced the selection of Dr. Frank E. Barber as the G-SU National Lecturer for 1982-83. As the National Lecturer Dr. Barber will be available to speak before SU Chapters, graduate and undergraduate student university seminars and other appropriate local interested groups. Dr. Barber's topic for these talks will be:

ULTRASONICS IN MEDICAL DIAGNOSIS
AND BIOMEDICAL RESEARCH

The establishing of the National Lecturer program and providing a stipend to cover travel expense by SU is indication of the interest of the AD COM in supporting the activities of groups interested in sonics and ultrasonics. In addition to present SU Chapters, groups which are considering chapter formation, university groups and other IEEE groups which have an SU interest are encouraged to schedule the national lecturer. It is urged that interested groups should contact the national lecturer as early a date as practical so that he can organize his talks and schedules to best fit the groups' needs. Please feel free to xerox or extract from the full page announcement of the national lecturer shown on the opposite page.

IEEE - SONICS AND ULTRASONICS GROUP

NATIONAL LECTURER PROGRAM

presents

ULTRASONICS IN MEDICAL DIAGNOSIS AND BIOMEDICAL RESEARCH

by

FRANK E. BARBER, Ph.D.

ASSISTANT PROFESSOR OF RADIOLOGY, HARVARD MEDICAL SCHOOL

25 SHATTUCK STREET, BOSTON, MA 02115

ABSTRACT

Physicians in radiology and other medical specialties have adopted ultrasonic imaging as a primary means of diagnosis, sometimes in place of more hazardous X-ray and nuclear scans, but more often because of the unique information that can be seen through the scattering of acoustic radiation. The lecturer will introduce some of the more interesting examples of ultrasonic imaging along with a review of the current utilization of ultrasonics in medicine and medical research.

In the past, from SONAR to B-Scan to Real-Time, developments in this field have followed the lead of technological advances in other fields. Today, however, ultrasound physicists and engineers are leading the way to new technologies with requirements, and opportunities, for innovation in transducer design, signal processing, image synthesis, and image processing and pattern recognition. While the opportunities exist, the inherent limitations are not well understood. New information is obtained by opening up both the temporal and spatial bandwidth of any system, but only up to certain limits imposed by Mother Nature. With today's systems, ultrasound frequency and transducer aperture are limited by the innovation of the designer. Large area arrays and multi-frequency arrays will create the waves of the future. Currently phase information is discarded, except in Doppler systems, and it is felt by some that a major opportunity lies there. On the other hand, severe limitations result from distortions in the ultrasonic beams as they travel from transducer, through the body to the site being imaged, and back again. These distortions, and noise, severely strain the imagination of any designer.

The opportunities and inherent sources of uncertainty will be the major subject of this presentation.

AUTOBIOGRAPHICAL SKETCH

Frank E. Barber (S/67-M'69-S'71-M'74) was born in Brattleboro, VT, on November 16, 1940. He graduated from Dartmouth College in 1966 with an A.B. and earned the M.S. from Northeastern University in 1969. He completed his formal training at the University of Washington, Seattle, WA, with a Ph.D. in 1976.

During his years at Northeastern he was on the Staff of the Forsyth Institute for Research and Advanced Study in Dentistry, Boston, MA, investigating, under Dr. Sidney Lees, potential uses of very high frequency ultrasound in dental research. From 1970 to 1975 he was employed by the Center for Bioengineering at the University of Washington and was involved in the development of real-time high resolution imaging and the duplex echo-Doppler technique for vascular diagnosis. He is currently Assistant Professor of Radiology at Harvard Medical School and a scientist on the staffs of the Brigham and Women's Hospital and the Sidney Farber Cancer Institute. His current research interest is in the development of a probe for investigating those structural features of biological tissues that are responsible for medical ultrasound images.

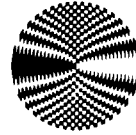
Dr. Barber is also a member of the American Institute of Ultrasound in Medicine, the Acoustical Society of America and the American Association of Physicists in Medicine. In the IEEE he has served as Boston Chapter Chairman of the Engineering in Medicine and Biology Society, and currently serves on the Administrative Committee of the Sonics and Ultrasonics Group. He has authored or coauthored about 40 publications mostly in the field of medical ultrasonics.



IEEE 1982 ULTRASONICS SYMPOSIUM

AN INTERNATIONAL SYMPOSIUM

SAN DIEGO, CA OCTOBER 27, 28, 29



General Chairman

B. R. McAvoy
Westinghouse R&D Center
1310 Beulah Road
Pittsburgh, PA 15235
(412) 256-7267 or 3595

Technical Chairman

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R. C. Badewitz
Cubic Defense Systems
9333 Balboa Ave.
San Diego, CA 92123
(714) 277-6780

This year's Symposium will be held in San Diego, California on October 27, 28 and 29, 1982. Our meeting place is the Convention Center of the Town and Country Hotel, 500 Hotel Circle North. In October the average high is 74°F and the average low temperature is 59°F with zero rain days.

On Tuesday, October 28, a cocktail party has been planned. We will all meet at poolside in the evening for horsd'oeuvre and libations. Joining us to play serenades will be a five member Mexican Band. If you are planning to bring the family there is fun for everyone at attractions such as Sea World and the San Diego Zoo and Wild Animal Park which is likely the best in the world. Our local arrangements committee will be available to assist you

of spot checks. Each U.S. citizen may bring back up to \$300 worth of merchandise free of duty. Certain items, such as fruits and vegetables, are prohibited so check before purchasing something that will be confiscated.

Our Technical Program chairman, Bob Wagers, is now at work assembling his committee -- watch for announcements in the next few months. We look forward, with everyone's participation, to an outstanding meeting.

B.R. McAvoy
General Chairman
1982 Ultrasonics Symposium

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FORTHCOMING ULTRASONIC SYMPOSIA

- 1983 Atlanta
Mariott Hotel
October 31 - November 2
M. Levy and R.S. Kagiwada
- 1984 Dallas
Dallas Hilton
October (second week)
L.T. Claiborne
- 1985 San Francisco
Jack Tar Hotel (?)
October 20-24
C.S. Tsai
- 1986 Williamsburg
Conference Center
November 17-19
J.S. Heyman and R. Moore

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10TH ANNIVERSARY ISSUE OF
ULTRASONICS SYMPOSIUM PROCEEDINGS

The 1981 Ultrasonics Symposium Proceedings is the tenth consecutive conference record published by the Group on Sonics and Ultrasonics. The 1981 Proceedings is about four times the size of the 1972 edition.

To obtain the two volume set of the 1981 Ultrasonics Symposium Proceedings ask for IEEE Catalogue Number 81CH1689-9. Send check or money order to:

IEEE Service Center
445 Hoes Lane
Piscataway, NJ 08854

List Price \$70 IEEE Member price: \$52.50

with the details including transportation.

Going into Mexico

If you are staying longer than the Symposium for a trip into Mexico here are some tips:

U.S. and Canadian Nationals do not need passports, visas or Tourist cards for visits of less than 72 hours to Mexican border cities. However, if you're planning a longer stay or traveling south of Ensenada, Tourist cards are necessary for all members in your party. These cards are available at border crossings and require proof of citizenship.

Valid driving licenses and automobile registration are required for those using a car in Mexico. No special permits are required BUT you need auto insurance that is valid in Mexico -- U.S. policies are not recognized.

Americans returning from Mexico must clear through U.S. border controls and long delays are common, particularly on weekends, because

NATIONAL LECTURER SCHEDULE

Larry Kessler, our National Lecturer on Acoustic Microscopy: Methods, Applications, Outlook, has been very busy filling speaking engagements. If you want to know why he yearns for a six week month, note the following:

Date	Location	Sponsor	Contact
September 30, 1981	Milwaukee, WI	IEEE/MTT/ED/EMB Chapter of the IEEE Milwaukee Section	Shrinivas G. Joshi Marquette University
October 27, 1981	Phoenix, AZ	Phoenix Waves & Devices Chapter	Albert Way Motorola
October 29, 1981	Santa Barbara, CA	UCSB	Prof. Glenn Wade UCSB
October 30, 1981	Thousand Oaks, CA	Rockwell	Dr. Art Muir Rockwell
November 10, 1981	State College, PA	Central Penn. Section of IEEE & PSU Graduate Program in Acoustics	Dr. Geoffrey Wilson Penn State University
November 11, 1981	Schenectady, NY	General Electric	Dr. Eric Lifshin General Electric
November 12, 1981	Stony Brook, NY	SUNY-Stony Brook	Herb Carlton SUNY-Stony Brook
December 3, 1981	Dearborn, MI	Ford Motor Co.	Al Metzler
December 8, 1981	Bethlehem, PA	Bethlehem Steel	Vince Horvath
December 9, 1981	Yorktown Hts., NY	IBM	Ralph Hollis
December 11, 1981	Rochester, NY	Lab for Laser Energetics	James F. Mason University of Rochester
January 18, 1982	W. Lafayette, IN	Purdue Univ.	Prof. Hiroshi Sato
February 8, 1982	Addison, IL	Antennas Propaga- tion/Microwave Theory & Tech- niques Soc. and Eng. in Med. & Bio. Soc.	Ernie Eckelman
February 10, 1982	Cambridge, MA	Boston Chapter SU	Richard Ralston MIT
February 10, 1982	Boston, MA	Raytheon	Roger Tancrell Raytheon
February 11, 1982	Pittsburgh, PA	Westinghouse R&D, Interde- partmental Physics Colloquium	Richard Smith
February 17, 1982	Livermore, CA	Lawrence- Livermore Lab	Bruce Maxfield
February 18, 1982	Albuquerque, NM	Local IEEE Section	George Alers
February 19, 1982	Albuquerque, NM	Sandia	Cliff Ballard
March 4, 1982	Urbana, IL	EE Dept. Univ. of IL	Gene Slottow
March 9, 1982	Baltimore, MD	IEEE S & US ASA, Un. of MD	Jerry Blessing

Contact Larry at (312) 766-7088 if you want to hear him before his tour of duty ends on June 30th.

Chapter Activities Reports

LONG ISLAND CHAPTER

The newly formed L.I. chapter of the IEEE Professional Group on Sonics and Ultrasonics received its charter on October 23 and had two meetings in 1981. In September, in a joint meeting with the Long Island Section, 1980 PGSU National Lecturer Dick Williamson (M.I.T. Lincoln Labs) spoke on "Surface-Acoustic Wave Signal Processing in a Digital Age."

In a November meeting of the chapter, Larry Kessler of Sonoscan, Inc., spoke on "Acoustic Microscopy: Methods, Applications, Outlook." Dr. Kessler is the 1981 PGSU National Lecturer.

The section is anxious to grow, and welcomes the participation of everyone with interest in ultrasonics. Please contact Herb Carleton at (516) 246-5980, who is acting section chairman, for program information.

Herbert R. Carleton
Acting Chapter Chairman

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BALTIMORE, WASHINGTON & NORTHERN VIRGINIA CHAPTER

The Baltimore, Washington and Northern Virginia Chapter convened its first meeting at the Adult Education Center of the University of Maryland. This is a new meeting place for the group. It is centrally located for our active membership and offers the convenience of providing dinner and presentation facilities in one location. Dr. Robert Green of Johns Hopkins University addressed our first meeting on novel methods of non-destructive evaluation of materials. His interesting talk was very well attended despite the miserable weather. Larry Kessler of Sonoscan, the national lecturer, spoke at the same location in March. His well-known subject was acoustic microscopy (also the subject of a recent cover of the Spectrum). In April Dr. Dick Mergerian and Tom Lisle of Westinghouse presented their views of the Acousto-optic Spectrum Analyzer. Dr. Mergerian spoke as the designer of the device and Mr. Lisle spoke as the user. Attendance this year has been the best in the Chapter's short history.

Christopher Vale
Chapter Chairman

SANTA CLARA VALLEY

The Santa Clara Valley Chapter is continuing its active technical program with seminar presentations each month. Meetings are held in the Applied Physics Lecture Hall (Room 200) at Stanford University at 8:00 p.m. On March 17, Dr. Richard L. Popp of Stanford Medical school will discuss acoustic imaging from the user's point of view and on April 21, Dr. Jon Taenzer of SRI International will present a talk on "Medical Doppler Ultrasound." Guided acoustic waves will be the subject of a presentation by Dr. Bertram Auld of Stanford University on May 12. At the final meeting of the year, May 26, Dr. William Shreve of Hewlett-Packard Co. will speak on SAW devices and applications. Officer elections will be held at this meeting.

David L. Hecht
Chapter Chairman

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BOSTON CHAPTER

During the 81-82 season, the Boston Chapter will have held eight meetings, of which six were joint affairs with other local IEEE groups. Judging by attendance, the topic of ultrasonic imaging is the subject of highest current interest. The two meetings, both jointly sponsored with Engineering in Medicine and Biology, which treated imaging drew audiences about double the size of other meetings. Imaging was discussed recently by Larry Kessler of Sonoscan in his SU National Lecture on laser-scanned acoustic microscopy. Earlier, Jim Fearnside, Bill Koppes and Hugh Larsen of Hewlett Packard had described their phased-array ultrasound medical imaging system. A variety of signal-processing topics were addressed during the year: Richard Williamson of M.I.T. Lincoln Laboratory compared SAW analog techniques with more conventional digital processing methods. Peter Wright of M.I.T. Lincoln Laboratory considered acoustooptic spectrum analysis. Tom Szabo of Hewlett Packard described his work on acoustic imaging of faults in wall seams which he did during a year at Oxford University, U.K. Donald Boroson of M.I.T. Lincoln Laboratory addressed new chirp-Fourier transform techniques which add considerable flexibility to a frequency-shift-keyed demodulator for satellite applications. On April 14, James Sethares of Rome Air Development Center will describe magnetostatic-wave time delays for phased-array antennas. The final meeting is scheduled for May 12, and will feature Robert Spindell of the Woods Hole Oceanographic Institute who will discuss undersea thermal profiling with ultrasound. A new slate of officers will also be elected at that time.

Richard W. Ralston
Chapter Chairman

A MESSAGE FROM THE
CHAPTERS COORDINATOR

MEMBERSHIP

It is a pleasure to welcome our two newest chapters - Stonybrook, Long Island, NY and Irvine, CA. The Stonybrook chapter was organized by Dr. Herbert R. Carleton, Department of Material Sciences, SUNY at Stonybrook. The Irvine chapter was organized by Dr. Chen S. Tsai, School of Engineering, U.C. Irvine. Best of luck to both chapters.

SU now has a total of six chapters all organized over the past six years. Anyone who would like to organize a chapter in a new area is invited to contact the undersigned. The chapter's coordinator can provide many helpful suggestions, having organized one chapter and observed the organizing of several others. At least three of our chapters centered on an academic institution when initially organized.

Letters have been sent to several technical leaders outside the U.S. inviting consideration of establishing one or more foreign chapters. As of this writing, the letters have been sent recently for the possibility of reply. Recognizing there are several areas of strong ultrasonic activity throughout the world, it is hoped several chapters will develop outside the U.S. Again, anyone interested should contact the undersigned.

All chapters and other appropriate groups should have made arrangements for a program by Dr. Larry Kessler, this year's SU National Lecturer. Anyone who has not and still wishes to arrange a program this year, should call him directly at 312-766-7088. The new National Lecturer for the program year beginning July 1 is announced elsewhere in this issue. Again, all chapters and other appropriate groups are urged to contact him as soon as they begin making up this program series for next year.

I recently received a letter from Dick Ralston and Dick Williamson of the Boston chapter. Dick Ralston is its current chairman. The letter discussed the almost universal problem of identifying speakers for local chapters who are both highly qualified and who will be coming to the local area so they can be tapped. The suggestion was organizing a speaker's committee which would identify and invite a number of potential speakers to notify the speaker coordinator or a local chapter when their travel plans are established far enough in advance that a program can be set up and properly publicized. How do you feel about the idea? The undersigned would be interested in the feelings of our readers on this question. Anyone who would like to help form a speaker's committee should contact the undersigned.

Robert A. Moore
Chapters Coordinator
(301) 765-4027

In order to encourage interested persons to join the Sonics and Ultrasonics Group we offered a one year membership, free of charge, at our symposium held last October in Chicago. Twenty-two people took advantage of this offer. We also had a display at the Chicago meeting and a large number of brochures and application forms were distributed. The display and brochures will again be available at our next symposium in San Diego this fall.

The most effective method of inducing qualified persons to join the IEEE and the Sonics and Ultrasonics Group is through personal contact. Current members can help promote the professional development of non-member associates by pointing out to non-members the many advantages of membership. There are various grades of membership, Student, Associate (for persons with less than a B.S.), Member, and Senior Member which can be attained by application, and a grade is available for all trained persons working in the field. More information on membership and application forms are available directly from the IEEE or from the GSU Membership Chairman (Bill Tanski (617) 369-4000).

Bill Tanski
GSU Membership Chairman

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TRANSACTIONS ON SONICS AND ULTRASONICS

The six issues of the 1981 Transactions had a total of 522 pages with six rejected papers for the year. Our current backlog of papers is low and we are attempting to emphasize the importance of publishing in our Transactions. Review papers for the Transactions are being sought in all of our Sonics and Ultrasonics Technological areas. Suggested topics and authors for these Review Papers are solicited by all G-SU members. Since government and industrial organizations are increasing emphasis on Applications, papers of this type are also being solicited. An "Editors' Lunch Meeting" is planned for Wednesday, October 27, 1982 at 12 o'clock noon at this year's Ultrasonics Symposium. Any member desiring to submit inputs or suggestions regarding our Publications please contact the Editor or any of the Associate Editors prior to the October 27th meeting. We acknowledge and offer our sincere thanks to retired Associate Editors Frank Fry "Biological and Medical Applications" and Ralph Woollett "Underwater Sound" who have diligently served as Associate Editors for a number of years.

Stephen Wanuga
Editor, Transactions on
Sonics and Ultrasonics

Division IV Report

First, a few year-end statistics on membership - for the Institute as a whole, membership was up 3.7% in 1981, to over 221,000. Society membership increased by 6% to 250,000. However, most of this growth was in the Computer Society, which gained 15% in members. Division IV increased by 1.7%, and of its seven Societies, three suffered declines.

There are valid reasons for trying to increase membership apart from a simple "more is better" kind of statistic. Our goals are to advance the theory and practice of electrical engineering, and to advance the standing of the members of the profession. The primary mechanisms for these are our meetings and publications. The advancement of our field requires more than depositing journals in archives; it is an active process of timely exchange among contributors and interested coworkers. The health of our meetings and transactions requires that we reach a sizable portion of those who are currently in the field. We need to bring them in as participants and partners in our activity.

Glenn Thoren, who is the Division IV representative to the IEEE Membership Development Committee, has a host of ideas for increasing membership, and he is working with Society officers and Chapter chairmen to revitalize our membership campaigns.

A few more statistics - Division IV is fourth in membership size of the seven Divisions, with 13% of the total. In assets, Division IV ended 1981 above where it was the previous year, with 25% of all Society funds. However, four of the seven Societies are contemplating deficits in their 1982 budgets. Division IV publishes about 35% of the total Society journal pages, and in 1982 will increase this number to over 13,000 pages.

The position paper on human exposure to microwaves and other radiofrequency electromagnetic fields, developed by the Committee on Man and Radiation (COMAR) has now been approved by the IEEE Executive Committee. It therefore expresses a formal opinion of the Institute. The paper gives a brief summary of the issues, and takes the position that there is no cause for concern over the levels of em fields at which the general population is exposed. More specifically, it states there is no scientific consensus supporting the proposition that biological damage occurs at levels below 1 mw/cm², but prolonged exposure at intensities above 100 mw/cm² is harmful. This position paper is a first step by the IEEE at communicating to the public the present state of knowledge of the biological effects of microwaves, and as might be expected it calls for continued research on effects and surveillance of levels of exposure.

A new Transactions on Computer-Aided Design of Integrated Circuits and Systems is now being published by the Circuits and Systems Society. Topics covered are hardware descriptive languages, modeling and process simulation, CAD systems, layout and routing, testing and simulation. Members of all Societies may subscribe to this Transactions, without becoming a member of the Circuits and Systems Society, for a charge of \$6.00 in 1982.

Allan C. Schell
Division IV Director

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