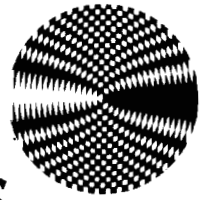




IEEE




SONICS AND ULTRASONICS GROUP NEWSLETTER

NUMBER 45 - SEPTEMBER 1978

EDITOR: FRED S. HICKERNELL

Program

1962 ULTRASONICS SYMPOSIUM
NOVEMBER 28, 29




1964 Symposium on Sonics and Ultrasonics
OCTOBER 14, 15

HOST
SCHOOL OF APPLIED SCIENCE
COLUMBIA UNIVERSITY
NEW YORK CITY


Program

1963 ULTRASONICS SYMPOSIUM
DECEMBER 4, 5, 6, 1963

1967 SYMPOSIUM ON SONICS AND ULTRASONICS
STATLER HILTON HOTEL
CLEVELAND, OHIO
OCTOBER 12-14



1973 IEEE ULTRASONICS SYMPOSIUM
TITLES AND ABSTRACTS
NOVEMBER 5-7
NAVAL POSTGRADUATE SCHOOL



HAPPY 25TH ANNIVERSARY G-SU

1968 IEEE ULTRASONICS SYMPOSIUM
FINAL PROGRAM



1969 IEEE ULTRASONICS SYMPOSIUM
FINAL PROGRAM



Chase Park Plaza
St. Louis, Miss
Sept. 24-26, 1969

STATLER HILTON
NEW YORK
SEPT. 25-27

Sponsored by the Group on Sonics and Ultrasonics of the Institute of Electrical and Electronics Engineers

1975 ULTRASONIC SYMPOSIUM

IEEE GROUP ON SONICS AND ULTRASONICS



Los Angeles Hilt
SEPTEMBER 22-24

1977 ULTRASONICS SYMPOSIUM

IEEE GROUP ON SONICS AND ULTRASONICS

OCTOBER 26 - 28, 1977



The TowneHouse
Phoenix, Arizona

1974 IEEE ULTRASONICS SYMPOSIUM
NOVEMBER 1974



1978 ULTRASONICS SYMPOSIUM

The 1978 Ultrasonics Symposium will present an international program of invited and contributed papers describing recent R and D work in physical acoustics, acoustic imaging for medical and industrial applications, technology for device fabrication and high speed signal processing using bulk and surface acoustic wave devices, and related ultrasonic phenomena. This year's symposium will be held on 25-27 September at the Cherry Hill Hyatt House near Philadelphia, PA. where approximately 170 contributed papers will be presented by authors from England, France, Germany, Italy, Japan, USA, and other countries. A series of papers have been invited by the technical program committee to highlight specific areas of ultrasonic work. A summary of invited papers and speakers are given below. Attendance at recent symposia has been over 400. The technical program committee cordially invites scientists and engineers, who have an interest in the latest developments in ultrasonics technology, to join us at this year's Ultrasonics Symposium. For additional information, contact the Conference Chairman, Frederic S. Welsh, at Bell Laboratories, Allentown PA. (215) 439-7978.

SUMMARY OF INVITED SPEAKERS

Opening Plenary Speaker

E. L. Titlebaum	Univ. of Rochester	Echo Location Systems in Nature: Bats, Dolphins, and Humans
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Medical and Imaging

D. W. Baker	Univ. of Wash.	New Developments in Pulsed Echo-Doppler Flow Detection and Their Clinical Application
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M. deBilly G. Quentin	Univ. of Paris	Ultrasonic Signal Analysis Methods Applied to Biological Tissues
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A. C. Kak	Purdue Univ.	Computerized Ultrasonic Tomography: Algorithms and Signal Processing
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Non-Destructive Evaluation

S. Braun	Ford Motor Co.	Acoustic Signature Analysis and Time Domain Technique for De- tecting Flaws in Rotating Machinery
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B. P. Hildebrand T. P. Harrington	Battelle Laboratories	Residual Stress Mapping by Ultrasonic Tomography
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S. J. Vahaviolos	Western Electric	Real Time Evaluation of Welding By Means of Acoustic Emission
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Physical Acoustics

R. L. Melcher N. S. Shiren	IBM Research	Application of Nonlinear Acous- tic Phenomenon to Signal Processing and Spectroscopy
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Bulk Acoustic Devices

J. Murphy	Westinghouse Research Labs	A Versatile Program For Computing and Displaying the Bulk Acoustic Wave Properties of Anisotropic Crystals
E. H. Young	Harris Corp.	Recent Developments in Bulk Acousto-Optic Devices and Applications

Surface Acoustic Waves

L. A. Coldren	Bell Labs	SAW Resonator-Filter Overview: Design and Performance Trade-Offs
R. D. Haggerty	Mitre Corp.	SAW Processors vs. Competing Technologies for Spread Spectrum Data Link Applications
C. S. Hartmann	Texas Instruments	SAW Devices and High Performance TV Receiver
N. Mikoshiba	Tohoku Univ.	New Developments in SAW/Semiconductor Devices
T. Shiosaki	Kyoto Univ.	Fabrication of High Quality Sputtered ZnO Thin-Films for Bulk and Surface Wave Applications
N. R. Shreve J. A. Kusters C. A. Adams	Hewlett Packard	Fabrication of SAW Resonators for Improved Long Term Aging
H. Gautier C. Maerfeld P. Tournois	Thomson - CSF	Diode Acoustic Devices Applied to Optical Imaging
J. H. Cafarella	Lincoln Labs.	Acoustoelectric Signal Processing Devices with Charge Storage

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SYMPOSIUM ECHOES

The first Ultrasonics Symposium was a one-day meeting held at Stanford University, August 17, 1959. Dr. Vincent Salmon of Stanford Research Institute was the General Chairman of this "National Ultrasonics Symposium" held the day before WESCON in San Francisco. Papers were presented covering the areas of delay lines, transducers, filters, acousto-optics and ultrasonic doppler. The meeting was attended by approximately fifty persons. It almost faltered when only one paper was received by the deadline time for abstracts. By extending the deadline for one month and with some scrambling from the committee, fifteen high quality technical papers were presented. The registration fee was \$3.00.

It wasn't until 1962 that the Second National Ultrasonics Symposium was held at Columbia University, New York City, November 28, 29 and 30th. The Columbia University School of Applied Science and Engineering served as the host. John May of BTL was the General Chairman. There were 292 registrants, with 121 from the local area, 166 from more distant points in the U. S. and 5 from outside the U. S. The program consisted of six technical sessions with 17 invited papers and 21 contributed papers. An early season blizzard did not seem to dampen the spirits of the attendees.

Ultrasonic Symposia have been held every year since 1962. This year is our 18th. The number of papers and participants has grown over the years to where the conference now attracts well over 400 people with a substantial representation from countries outside the United States.



FRED WELSH

Frederic S. Welsh received the BSEE degree from Princeton University in 1964, and then went on to receive his Ph.D. in Applied Physics from Cornell University. Since completing his work at Cornell in 1968 he has been a member of the Piezoelectric Devices Department at Bell Laboratories in Allentown, Pennsylvania. There he has worked on the characterization of materials, especially lithium tantalate and quartz, for piezoelectric resonators, and on electro-mechanical filters. He has more recently been studying the design and applications of piezoelectric transducer devices. Currently he is Supervisor of the Exploratory Piezoelectric Devices Group.

Fred has been a member of the Group on Sonics and Ultrasonics for several years. He is a former Associate Editor of the Transactions on Sonics and Ultrasonics and has served on the program committee for the Ultrasonics Symposium several times. He is also a member of the Subcommittee for Piezoelectric Crystals which has recently completed a new IEEE Standard.

Fred and his wife, Wendy, live in an old Pennsylvania farmhouse in Coopersburg with their two boys, Jason and Charlie. Fred is a member of Trinity Episcopal Church, Bethlehem, where he is a member of the Vestry, Chairman of the Finance Committee, and sings in the Choir. He is also a member of the Personnel Committee of the Diocese of Bethlehem.



TIM PEARMAN

G. Timothy (Tim) Pearman is a native of Missouri having been transplanted to Pennsylvania when he began work for Bell Laboratories in Allentown in 1967. Tim received his Ph.D. in Physics from the University of Missouri and has worked in the Piezoelectric Device department of Bell Labs since that time. His work has involved both resonant and non-resonant piezoelectric devices with, however, a primary emphasis on the development of monolithic crystal filters for communications systems.

Tim is a member of Sigma Xi, the American Physical Society and the IEEE. He is presently an Associate Editor (Filters and Resonators) of the Transactions on Sonics and Ultrasonics. He has served on the Technical Program Committee for the Ultrasonics Symposium for the last several years.

Tim and his wife, Pat, have one son, Timmie, who is eight years old. Away from Bell Labs, Tim enjoys gardening (vegetable and fruit), canoeing, fishing and (according to Tim) just "relaxing around the home" with the family.

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Fred is an over-enthusiastic gardener in May and spends much of his spare time tending his resulting production during the latter part of the summer. Nevertheless, he will almost never refuse an invitation to go sailing.

TECHNICAL PROGRAM

PUBLICATIONS



TOM REEDER

Tom Reeder was born near Chicago, Ill. and grew up in the central Illinois corn-belt. After graduating from the University of Illinois with a BSEE in 1960, he attended graduate school at Stanford University, winning an MSEE in 1961 and PhD in 1965. During 1965-68, Tom was a research engineer at Standard Telecommunications Laboratories, Harlow, England and later at Teledyne MEC where he worked on the development of octave bandwidth microwave delay lines. A chance to take part in a new research area, surface acoustic wave (SAW) devices, brought him back to Stanford University's Microwave Laboratory in 1968 as a research associate. There, he was a member of the team that developed many of the engineering device models that are used today in SAW device design. In 1971, Tom joined United Technologies in Hartford, CT to establish a research group on SAW device applications. This group gradually grew to include work on GaAs FETs, thin-film devices, and signal processing sub-systems. A longing to return to the west coast brought Tom to Tektronix in Beaverton, OR. in 1978 where he is presently manager of the Solid State Research Department within Tektronix Laboratories.

Tom met his wife, Karen, while attending Stanford. They have two grade school age children, and they share a strong interest in choral music, square dancing, and hiking over the scenic countryside of Oregon.



TOM GRUDKOWSKI

Tom is a native of Drexel Hill, PA which is a suburb of Philadelphia. During undergraduate days at the University of Pennsylvania he was an active member of the campus radio station, WXPB, and an avid Phillies fan. After graduating with a BSEE, he moved to Los Angeles and joined the Hughes Aircraft Company's Master's Work-Study Program. While at Hughes, he worked at Culver City and Malibu Research Labs in the areas of microelectronics and infrared laser modulation. Time off was spent either thinking snow or making the short 5 hour trip to Mammoth Mt. Ski Area. Other activities included water skiing and motorcycling on back roads. After earning his Master's Degree at UCLA in 1970, he moved to Palo Alto to work on SAW devices at Stanford. There he met his wife, Sonya, earned his Ph.D. in E.E. sold his motorcycle and re-located back East.

Since 1974, he has been at the United Technologies Research Center in East Hartford, Connecticut. His activities at UTRC have included SAW and integrated circuit device development particularly in the areas of programmable SAW signal processors, SAW sensors, filters, and oscillators. His family has grown to include two boys, Dennis and Michael, ages 2 and 4. Present hobbies include fishing, swimming, golf and ever present work around the house.

1978 G-SU AD COM

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CHAPTER NEWS

WASHINGTON/NORTHERN
VIRGINIA/BALTIMORE CHAPTER

BOSTON CHAPTER

The following were recently elected as officers to serve the Boston Chapter:
Lee Solie, Sperry Research Center, Chairman;
John Melngailis, MIT Lincoln Labs. Vice-Chairman;
Alan Budreau, RADC/EEA, Secretary-Treasurer. There are approximately 50 members in the Boston Chapter with a good attendance of 20 to 30 at the regular monthly meetings. The schedule for the coming year has been finalized. Anyone in the Boston area wishing to join this active group or attend the technical presentations should contact Lee Solie at Sperry Research Center, Sudbury, MA, 617/269-4000

M. B. Shulz

Official status for our chapter was approved by IEEE on December 19, 1977, after a petition containing signatures of twenty-eight (28) Sonics and Ultrasonics Group members was sent to IEEE Headquarters. Our first meeting was held March 29. The speaker was Professor R. M. White of the University of California, Berkeley, who described techniques for performing physical measurements using surface acoustic waves. At our second meeting, which was held June 27, Dr. Peter Wells of the Department of Medical Physics, Bristol General Hospital, Bristol, U.K., was the speaker. He discussed current medical ultrasonics research at Bristol.

Chapter officers for the first year are:
R. A. Moore, Westinghouse, Chairman; D. C. Webb, Naval Research Laboratory, Vice Chairman; K. L. Davis, Naval Research Laboratory, Secretary/Treasurer.

Ken L. Davis

AD COM BRIEFS

The winter/spring Group on Sonics and Ultrasonics (G-SU) Administration Committee (Ad Com) meeting was held February 28, 1978 in Chicago. J. deKlerk (Westinghouse Res. Labs), President, introduced the three new Ad Com members who were recently elected for a three year term, L. W. Kessler (Sonoscan), R. Adler (Extel Corp.) and J. G. Miller (Washington University). Also welcomed and introduced was R. Damon (Sperry Res. Center), Director of Division IV, who discussed many of the IEEE and TAB activities which may affect the G-SU and its members including professional registration of engineers, The IEEE presidential election and the new electioneering policy, ethical conduct committee and its activities, USAB and its reorganization, TAB staff operations and financial matters relating to group subsidy to and support from IEEE HQ.

W. D. O'Brien, Jr. (University of Ill.), Secretary-Treasurer, reported that G-SU's financial condition was quite good.

Increasing the frequency of the IEEE Transactions on Sonics and Ultrasonics from quarterly to bimonthly, along with the increase in total annual pages has been very successful, S. Wanuga (General Electric), Transactions Editor reported. F. S. Hickernell (Motorola Government Electronics Div.) was elected the new Newsletter Editor replacing E. P. Papadakis (Ford Motor Co.) who will be taking on other group activities.

There was some concern expressed that papers are being "crammed" into the symposia, thus cutting down on valuable discussion time. B. R. McAvoy (Westinghouse Res. Lab.), Meetings committee Chairman, will draft, with his committee, a set of guidelines regarding the symposia in order to provide guidance to the general chairmen. Also, future meeting sites will be: 1979 - New Orleans, 1980 - Boston, 1981 - Chicago, 1982 - San Diego, 1983 - Atlanta, 1984 - Dallas - Ft Worth. The 1978 Ultrasonics Symposium (Cherry Hill, New Jersey - September 25-27) budget was approved with F. S. Welsh (Bell Labs.), General Chairman and T. M. Reeder (Tektronix), Technical Program Chairman.

The Ad Com unanimously established a "President's Speaker" whereby the group's president annually will solicit and select a speaker of his choice to present a plenary talk at the annual symposia. Travel expenses and an honorarium will be provided to the speaker.

The cash award for the Best Paper of the Year (in the G-SU Transactions) was increased to \$300 per author and not to exceed a total of \$900. The award is selected by H. van de Vaart's (Sperry Res. Center) Awards Committee and is presented at the opening of the symposium.

The Ferroelectrics Committee, chaired by S. K. Kurtz (Philips Labs), had its tentative budget approved for the 1979 Symposium on Applications of Ferroelectrics to be held in Minneapolis. S. T. Liu (Honeywell) is Conference Chairman.

The next Ad Com meeting is scheduled for September 24, 1978 at the 1978 Ultrasonics Symposium in Cherry Hill, New Jersey.

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MEMBERSHIP REPORT

At last count, active membership of the Sonics and Ultrasonics Group stood at 1,771, an all time high for the month of May. The peak annually occurs in February before the computer starts to drop delinquent members. This year the level of 2,030 was again a high, three percent above last year. At the present time, IEEE headquarters shows 443 in-arrears members who have neglected to pay their 1978 dues. If you are one of these, don't put off renewing another moment. Besides the many technical benefits highlighted by a dynamic, constantly improving Transactions, Newsletter, and Symposium, membership can be nearly completely justified on purely financial grounds. In the present period of inflation and resulting higher tax brackets, the real (non-deductible) costs of professional societies are constantly decreasing. Membership is clearly one of the best deals around.

At the 1977 Ultrasonics Symposium in Phoenix, twenty people took the opportunity to join the IEEE and/or Sonics and Ultrasonics Group. The 50%-off offer on new S-U Group members will again be offered in Cherry Hill. Don't be distracted by hallway discussions before taking advantage of it.

* * * * *

IN MEMORIAM

JOE BURNSWEIG 1919-1978

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