



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



Number 29: April 2000

Editor: William D. Hunt

ISSN 1060-0264

**2000 IEEE/EIA International Frequency Control
Symposium & Exhibition**



7-9 June 2000

Kansas City Missouri

2000 IEEE/EIA International Frequency Control Symposium & Exhibition

7 – 9 June 2000

and

TUTORIALS

6 June 2000

at

**Westin Crown Center
Kansas City, Missouri, USA**

Co-Sponsored by:

*IEEE Ultrasonics, Ferroelectrics & Frequency Control Society
and*

EIA Electronic Components, Assemblies & Materials Association

General Co-Chairs:

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Jack Kay, Kay, Inc.

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Tutorial Chair:

Lute Maleki, Jet Propulsion Laboratory

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John R. Vig, US Army CECOM

Awards Chair:

Charles Adams, Agilent Technologies

Symposium Site

This year's symposium will be held at **The Westin Crown Center Hotel in Kansas City, Missouri, U.S.A.** Kansas City's style and culture delight first-time and return guests alike. It is a jazzy city brimming with surprises. Part of its charm lies in its beauty; which includes an impressive network of boulevards, parks and exquisite fountains. Fountains are everywhere, from massive and elegant to small and fairylike, for this city maintains more fountains than the city of Rome. Kansas City is known as the "Heart of America", centrally located within 250 miles of both the geographic and population centers of the United States. Though famous for steaks and barbecue, the city offers an incredible variety of cuisine. Visitors are delighted by the abundance of excellent restaurants of every ethnic origin.

The great jazz era in Kansas City has formed part of its current

identity. It remains home to scores of jazz artists and bands. You can still find a wide variety of nightclubs with live music 365 days of the year. Kansas City played a major role as a gateway for pioneers heading west along the Oregon, California and Santa Fe Trails. In the mid 1800's, settlers, missionaries and traders began their overland journeys from several local points. Today the city's colorful past is highlighted by an interesting mix of museums specializing in subjects such as Harry S. Truman, Jesse James and the history of westward expansion. Not far from downtown, you will find the Kansas City Museum, with hands-on science exhibits, including a planetarium, and the city's largest collection of regional historical artifacts, photographs and displays. Other historic stops include the Arabia Steamboat Museum in the River Market, with over 200 tons of treasure from the steamboat Arabia that sunk in 1856 and it's worth the trip to nearby Independence to see the Harry S. Truman Presidential Library, one of only 11 presidential libraries in the country.

The new center of the city is the The Hallmark's Crown Center – an 85-acre complex of over 60 unique shops, restaurants, movie theaters and live theaters including the American

Heartland Theater. In the heart of these attractions, you'll find **The Westin Crown Center**, a hotel with over 700 guestrooms. With a five-story waterfall cascading through a garden of rocks and exotic plants, the dramatic atrium lobby is the most spectacular in town.

Hotel Reservations

The Westin Crown Center Hotel is located at 1 Pershing Road in Kansas City, Missouri. For your convenience, a hotel reservation card is enclosed in the center of this booklet or you may call the hotel at 1-816-474-4400 directly to make your reservation.



Reservations must be made with the hotel directly in order to get the discounted group rate. Arrangements have been made with the hotel to offer a limited number of rooms at a reduced rate to U.S. Government employees only. Government ID and/or government travel orders must be presented at time of check-in. These rooms are being offered on a first-come first-served basis. **All reservations must be made by 5 May 2000.** Any reservations made after this cut-off date will only be honored on a space available basis. Accommodations will not be guaranteed without a check or a major credit card number for the first night's lodging.

Parking at the Hotel

Parking at the Westin Crown Center is managed by a private company. Their current parking rates are \$11 per day for self-parking and \$13.50 per day for valet parking.

Air Transportation to Kansas City International Airport

United Airlines and US Airways have been selected as the official air carriers for the symposium. To take advantage of the discounts offered call either United Airlines at 1-800-521-4041, 7:00AM – Midnight EST daily and refer to ID Code 597BE or US Airways at 1-877-874-7687 and refer to Gold File #94691375. Certain restrictions may apply and seats are limited.

Transportation from Airport to Hotel

Shuttle service from Kansas City International Airport to the Westin Crown Center is available every 30 minutes from KCI Shuttle. The hotel is approximately a 30-45 minute ride from the airport and the cost is \$20 for a roundtrip ticket. Upon arrival at the airport, tickets may be purchased from the red KCI Shuttle Ticket Counters or by dialing "5000" on any white courtesy telephone. Taxi service is also available to the hotel from the airport and return at an approximate cost of \$30-\$35 each way.

Car Rental

AVIS Rent-A-Car has been appointed the official rental car agency for the symposium. Special group rates have been negotiated with AVIS for one week before and one week after the symposium. These rates include unlimited free mileage. The following rates will apply for symposium attendees and their guests:

Registration Fees

Each symposium participant must register and receive a badge. The badge must be worn to gain admission to the technical sessions and the exhibit area. You will save time and money by registering in advance.

The advanced registration fee for IEEE Members is \$330 for registrations received NO LATER THAN 7 MAY 2000. After 7 May, the registration fee for IEEE Members is \$380. The advanced registration fee for Non-Members received prior to 7 May 2000 is \$355 and \$405 after that date. *In order for attendees to receive the reduced rate for advanced registration, payment must be submitted with the advanced registration form.* The registration fee entitles the registrant to admission to the technical sessions (but not the Tutorials), the

exhibits, the refreshment breaks, two lunches (Wednesday and Thursday), the Welcoming Reception and one copy of the Proceedings. The Proceedings will be mailed to attendees several months after the symposium. Attendees will also receive a symposium tote bag compliments of Kolinker Industrial Equipments, Ltd.

The registration fee for FULL-TIME students and FULL-TIME retirees with Proceedings is \$65 and \$50 without Proceedings. In addition, those individuals who wish to register for one day only may do so for a fee of \$200. There is also a \$50 registration fee available to all IEEE Life Members. The fee for one-day registrations and IEEE Life Members does not include Proceedings, which can be ordered at a cost of \$65 per copy. All registration fees **MUST BE PAID IN US DOLLARS.**

The advanced registration form for the symposium and tutorial is located in the center of this booklet. You may photocopy this form for use by additional registrants. You may register by phone by calling 1-703-907-7536 from 9:00AM - 5:00PM, EST, Monday through Friday. Have your credit card available when you call. Visa, MasterCard and American Express will be accepted. Registrations can also be faxed to 1-703-907-7501 or mailed to the address shown on the form. Allow 1-2 weeks for delivery. All registrations received by 26 May 2000 will be acknowledged by mail. Your badge can be picked up at the symposium registration desk.

Guest Registration

There will also be a Guest Registration this year at the symposium. The guest registration fee includes continental breakfast each morning (Wednesday, Thursday and Friday) and admittance to the Welcoming Reception (Wednesday). A representative from the Kansas City Visitor and Convention Bureau will be on hand Wednesday morning to provide highlights and sightseeing tips for the Kansas City area. The registration fee for the Guest Program is \$50 and it would be most helpful, for planning purposes, if you pre-registered using the enclosed registration form.

Truman Homestead and Museum Tour

For a fee of \$25 per person, which includes round-trip transportation and all entrance fees, a guided tour to the Truman Homestead and Library has been planned for Thursday. This tour, entitled: "The Buck Stops Here", will give you a glimpse of both the public and private lives of Harry S. Truman, the 33rd President of the USA. Nestled in the heart of town, this venerable Victorian home, built by Bess Truman's grandfather, anchors a neighborhood of homes on the historic register. The public man exists at the Harry S. Truman Presidential Library and Museum, where historical documents and exhibits bring to life the challenges of a celebrated commander-in-chief. As stated above, it would be most helpful, for planning purposes, if you pre-registered for this tour using the enclosed registration form.

Proceedings Information on Web & Disk

The abstracts of all the papers ever published in the proceedings, i.e. from 1956 to 1999, ordering information for the

proceedings, and other symposium related information are available on the World Wide Web at: www.ieee-uffc.org/fc.

Similar information is available, as ASCII files, on a 3.5" Windows format floppy disk for \$5 each. Copies will be available for sale at the symposium registration desk.

Speaker's Breakfast

Speakers and Session Chairmen for the Oral Sessions of the Symposium are requested to attend a complimentary Speaker's Breakfast on the morning of their presentation/session at 7:15AM in the Penn Valley Room.

Welcoming Reception

This year's Welcoming Reception is being sponsored by Sawyer Research Products and will be held on Wednesday evening, June 7th, from 6:00PM – 7:30PM in the Exhibit Area. All registered participants and registered guests of the symposium are cordially invited to attend.

Dinner Excursion

To sample the best of Kansas City life, we will have a barbecue dinner at the American Museum of Jazz on Thursday evening, June 8th at 6:30PM. The cost is \$50 per person and includes transportation to the museum and return to the hotel, dinner, entertainment, entry to the Jazz Museum and the Associated Negro Leagues Baseball Museum. There are a limited number of spaces available, so to avoid disappointment, please register early (see enclosed registration form). Registrations will be accepted on a first-come first-served basis.

Exhibition

The exhibit portion of the symposium will be located in Century Salons A and B of the hotel. Listed below are companies with exhibit space reserved at the time of this printing:

A.T. Wall Company
Agilent Technologies
Alfa Quartz, C.A.
Alvord Systems, Inc.
Brent America, Inc.
CCI/USA
Eagleware Corporation
EFG International, Inc.
Hoffman Materials, Inc.
IEEE/UFFC Society
K.C. Abrasive Company
Gard Corporation
Geib Refining Corporation
Great Southern Marketing
H.E.S. International, Inc.
Hoffman Materials, Inc.
Kolinker Industrial Equip.
Legacy Technologies, Inc.
Mackin Industries Corp.
Polaris Electronics Corp. Poseidon Sci. Instruments
PRA, Inc.
Saunders & Associates
Sawyer Research Products
Seiwa Corporation

Shure Manufacturing
Solid State Equipment
SPC Goodwill
Stanford Research Systems
Timing Solutions Corp.
Transat Corporation

Special Thanks

The IEEE/EIA community owes a sincere debt of gratitude to the following organizations for their generous contributions to the 2000 IEEE/EIA International Frequency Control Symposium and Exhibition.

Agilent Technologies
Frequency Electronics Inc.
Hoffman Materials, Inc. I
EEE/UFFC Society
Jet Propulsion Laboratory
Kolinker Industrial Equip.
Mackin Industries
M-tron Industries
NIST
Northrop-Grumman Corp.
Quartzdyne, Inc.
Sawyer Research Products
Transat Corporation

TUTORIALS

This year the Tutorials will be held on Tuesday, June 6th from 8:00AM until 5:00PM. Our tutorial leaders have been selected from among the best experts in the world. The tutorial presentations are designed for newcomers to the field, as well as containing state-of-the-art material for experienced practitioners desiring to keep up-to-date. We look forward to your participation.

Dr. Lute Maleki
Jet Propulsion Laboratory

A single registration fee will allow attendees to participate in the Tutorials in all of the sessions. The fee includes morning and afternoon refreshment breaks, a CD containing hundreds of pages of instructional material and admission to all of the tutorials. The advanced registration fee for IEEE members is \$160, if received no later than 7 May, and \$190 for on-site registration. The advanced registration fee for non-members is \$170, if received no later than 7 May and \$200 for on-site registration. All registration fees **MUST BE PAID IN US DOLLARS**. In order to receive the reduced rate, you must submit your payment with your registration form. The registration fee for FULL-TIME students and FULL-TIME retirees is \$50. A limited number of additional copies of the instructional material will be available at a cost of \$75 per CD at the registration desk.

TUTORIAL SCHEDULE

TUESDAY, 6 JUNE 2000

SESSION 1 – 8:30AM-10:00AM

1A. Low Noise Oscillator Design and Performance

—M.M. Driscoll, Northrop-Grumman Corporation

- 1B. Principles of Phase Locked Loops (PLL)
—V.F. Kroupa, Institute of Radio Engineering and Electronics, Academy of Sciences of the Czech Republic
- 1C. Wireless Passive SAW Identification Marks and Sensors
—L.M. Reindl, Clausthal University of Technology, Germany

10:00AM Refreshment Break

SESSION 2 – 10:30AM-12:00 Noon

- 2A. Introduction to Quartz Frequency Standards
—J.R. Vig, US Army Communications-Electronics Command
- 2B. Introduction to Time and Frequency Transfer
—T.E. Parker, National Institute of Standards and Technology
- 2C. Advanced Atomic Clocks
—L. Maleki, Jet Propulsion Laboratory

12:00 Noon LUNCH

SESSION 3 – 1:30PM-3:00PM

- 3A. An Introduction to the Wavelet Analysis of Time Series
—D.B. Percival, University of Washington, Seattle
- 3B. Fundamentals of X-Ray Orientation of Quartz Crystals
—J. Kusters, Agilent Technologies Inc.
- 3C. Frequency and Time Synthesis
—V.S. Reinhardt, Hughes Space & Communication

3:00PMBreak/Intermission

SESSION 4 – 3:30PM-5:00PM

- 4A. Clock Jitter
—R. Temple, Agilent Technologies Inc.
- 4B. Photonic Techniques in Frequency and Timing
—X.S. Yao, Jet Propulsion Laboratory
- 4C. The Fundamental Theory of Low Noise Oscillators with Special Reference to Some Detailed Designs
—J. Everard, University of York, UK

Awards and Accolades



Prof. Meirion Lewis after receiving his CBE at Buckingham Palace, Nov. 1999. He is accompanied by colleague, Rebecca Wilson

Meirion Lewis wins CBE

Meirion Lewis has been awarded a CBE (Commander of the Order of the British Empire), which was presented to him by the Queen at Buckingham Palace last November. Although he has worked mainly in optics for some time, Meirion is very well remembered by the SAW community for a wide range of important innovations resulting from his earlier SAW work. These include SSBW's (leading to leaky waves in 36° lithium tantalate and STW's in quartz), IIDT filters for low loss and the first single-layer SPUDT's.

Meirion is also a Professor of Cambridge University, though still mainly located in Malvern at DERA (formerly RSRE).

**David Morgan
Impulse Consulting**



1999 Achievement Award

Thomas E. Parker received the 1999 Achievement Award at the Awards ceremonies on October 18, 1999, at Lake Tahoe, Nevada. Tom is the 21th recipient of this Society-wide award. He received a plaque, a certificate and an honorarium of \$2000. Tom's citation reads:

"For his original contributions to high-stability SAW oscillators and his leadership of the professional community worldwide for increasingly more precise time standards and time transfer."

Gary K. Montress, of Raytheon Company, introduced Tom to the audience. Gary is a long-term professional colleague and worked closely with Tom during Tom's twenty-one years at Raytheon.

During his formal education, Tom received degrees in Physics from Allegheny College (BS in 1967), and from Purdue University (MS in 1969 and PhD in 1973). Joining Raytheon Research Division, Lexington, Massachusetts, in 1973, Tom began his career in ultrasonics. During his years at Raytheon, he made significant contributions to advancing the state-of-the-art in stable SAW oscillators and in improving materials processing for these devices. Among these advancements is the "All Quartz Package" for SAW devices, which significantly improved the stability and reproducibility of these oscillators. Concurrently, Tom established techniques to measure quantities essential to time standards: frequency stability, 1/f noise, vibration sensitivity, temperature stability, and long-term stability.

Tom joined the National Institute of Standards and Technology (NIST), Boulder, Colorado, in 1994, where he now leads the Atomic Frequency Standards Group. His responsibilities build on his earlier experience in ultrasonics, and now extend to the more exacting requirements of atomic-based devices. Tom's current interest include primary frequency standards, time scales, and time transfer technology. He has been

instrumental in incorporating hydrogen masers into the NIST time scale. He has attained world-wide leadership in this field, and serves on committees setting international time standards.

In addition to technical achievement, Tom has contributed to several areas of IEEE by generously serving in several capacities. He was elected to his first three-year term on the AdCom of UFFC Society (1988-1990), and recently has been re-elected to return for another term (2000-2003). In addition within AdCom, he served as Chair of the Frequency Control Standing Committee (1989-1997). For the Frequency Control Symposium, he was Technical Program Committee Chair (1990 and 1991), and was General Chair (1997 and 1998). For many years he has participated on the Technical Program Committees of both the International Frequency Control Symposium and the International Ultrasonics Symposium, two of the major symposia of the UFFC Society. In addition, Tom continues his service as an Associate Editor of *Transactions on UFFC* in the field of Frequency Control—Acoustics Devices.

Tom has authored more than 95 papers published in the professional literature. Many of these papers are recognized as establishing the basic background in the field. He received the Outstanding Paper Award (1988) for two papers published in the *Transactions on UFFC* on high-precision SAW resonators and oscillators. He received the W. G. Cady Award (1994) during the International Frequency Control Symposium. He also received the Thomas L. Phillips "Excellence in Technology Award" from Raytheon Company (1992). Tom served as Distinguished Lecturer for UFFC Society (1996) presenting a talk entitled "The Search for the Perfect Oscillator." He was elected a Fellow of IEEE (1994).

In his acceptance remarks, Tom expressed his appreciation to the many people with whom he has collaborated over the years. Learning from them has been and continues to be a welcome challenge.

1999 Distinguished Service Award

Bruce R. McAvoy received the 1999 Distinguished Service Award at the Awards ceremonies on October 18, 1999, at Lake Tahoe, Nevada. Bruce is the third recipient of this Society-wide award, which is granted to recognize individuals who have devoted meritorious service to the operation of the UFFC Society over an extended period of time. He received a plaque, a certificate and an honorarium of \$2000.

The citation on Bruce's plaque and certificate reads:

"In recognition of his vision and enterprise in editing the Ultrasonics Symposium Proceedings and his dedication to strengthening communications with the wider IEEE community."

Bruce was unable to attend the ceremonies in person, as he was recovering from recent surgery. Robert Weigel, University of Linz, Austria, presented the introductory remarks for Bruce's award. Harry Salvo, a colleague from Westinghouse and former President of UFFC Society, graciously accepted the award for Bruce.

Bruce received his degree in Physics from the University of Rochester (1954), and went on for further studies at Carnegie Mellon University. Bruce's industrial experience began in 1957 when he accepted a position at Westinghouse Research Center near Pittsburgh, Pennsylvania. During his 33 years at Westinghouse, his work focused mostly on devices to improve radar performance, especially by utilizing microwave and

acoustic devices for signal processing. Bruce published extensively in these fields. Many of his papers appeared in the *Transactions on Microwave Theory and Techniques*, and in the *Transactions on Ultrasonics, Ferroelectrics, and Frequency Control*. He was equally adept in the technology of both Societies. Bruce holds 14 patents in these fields. He retired from Westinghouse in 1990.

The most prominent of Bruce's contributions to the UFFC Society is his editing of the *Proceedings of the Ultrasonics Symposium*. In the early 1970's, a concerted effort was made to collect the papers presented at the Symposium in printed form to improve dissemination of information which had been presented orally. Except for the very early years of the Society in the 1950's, only abstracts of the Symposium were available as a record of the talks presented. Bruce edited the *Proceedings* for nineteen years (1975-1993), over which time the latter grew progressively larger as the Symposium increased in relevance and popularity, partially due to the availability of the *Proceedings* to the technical community. In some years, the bound *Proceedings* of a Symposium encompassed three volumes. It is worth noting that each year's *Proceedings* displayed a distinctive binding to facilitate identification on a bookshelf. Bruce's efforts to collect manuscripts from the authors over those years required perseverance, patience and persuasion.

Bruce has contributed to the Society in many other ways as well. He served as President of the UFFC Society (1986 and 1987). For the Ultrasonics Symposium, he served as General Chair (1982) and as a member of the Technical Program Committee (1977-1999). Within the larger IEEE community, Bruce served on the Awards and Recognition Committee of the Technical Activities Board (1989 and 1990) and on the Defense R&D Policy Committee (1989 through 1991). As a member of the MTT Society, he served on the Technical Program Committee of the Microwave Symposium (1985-1998), and chaired the Microwave Acoustics Technical Committee MTT-2 (1988-1998). He served on the initial Editorial Board of the *Microwave and Guided Wave Letters* and co-edited a special edition of the *Transactions on MTT* (1991).

Bruce was elected a Fellow of IEEE (1988). He received the IEEE Centennial Medal (1984). Within Westinghouse, he was the recipient of the Signature Award of Excellence (1990), and the Westinghouse Outstanding Innovation Award (1990).

In acknowledging his award, Bruce emphasized that he would not have missed this experience with the UFFC Society for the world. He declared his participation to be 'fun all the way.'

1998 Outstanding Paper Award

The Outstanding Paper Award for papers appearing in Volume 45 of the *Transactions on UFFC* was selected to be a collection of articles on a common topic by the same authors. The Award was presented during Awards ceremonies at the International Ultrasonics Symposium on October 18, 1999, at Lake Tahoe, Nevada. The winning authors are:

Takahiro Sato

and

Hidenori Abe

Japan Energy Corporation
Electronic Materials Division
Saitama, Japan

for three papers on

"Longitudinal Leaky Surface Waves on Lithium Tetraborate"

1. *Propagation Properties*
2. *Propagation under Periodic Metal Grating*
3. *SAW Device Applications*

These papers appeared in the 1998 issues in January, pp. 136-151, March, pp. 395-408, and November, pp. 1506-1516, respectively.

The papers give an excellent overview of SAW properties of the high-velocity piezoelectric material Lithium Tetraborate. The unique properties of this material make it a candidate for new types of devices. The authors' development of the basic theory, combined with experimental verification, plus the details of specific applications, a tutorial treatise on this topic. The papers exhibit originality in concept and execution of the underlying studies, including the use of graphical tools to explain the calculation approach. The demonstration of low-loss filters in the 1.5 GHz range without submicron fabrication techniques and based solidly on theoretical models makes the work of practical usefulness, as for example, in the ever increasing demands of wireless rf telecommunications.

The Awards Committee recognizes that the papers constitute an enormous amount of work. In addition, the papers are well focused and clearly written.

Takahiro Sato accepted the plaques and certificates at the Award ceremonies for Hidenori Abe and himself. Hidenori was unable to travel to the USA to receive the award in person. Both authors expressed their gratitude to the UFFC Society for this special honor.

The Society congratulates the authors on their achievement.

Congratulations

Dr. Emmanuel P. Papadakis, President of Quality Systems Concepts, Inc. of New Holland, PA, has been made a Life Member of the Institute of Electrical and Electronics Engineers (IEEE). The announcement was made by Dr. Bruce A. Eisenstein, President of IEEE, and is effective on January 1, 2000. This honor is for long dedicated service to the IEEE as a member. Papadakis has been a member since 1963 and a Fellow of the Institute since 1989, Effective the same date he was made an Emeritus Fellow of the Acoustical Society of America.

His service to the IEEE has been principally in the group on ultrasonics. This group itself has developed over time and has changed names from Group on Ultrasonic Engineering (G-UE) to Group on Sonics and Ultrasonics (G-SU) and then to its present title, the Society for Ultrasonics, Ferroelectrics, and Frequency Control (UFFC Society). Within this organization, Papadakis has been active in the

fields of physical acoustics and nondestructive testing. He has served on the Administrative Committee up to the post of Vice-Chairman, on the annual Symposium Planning Committee from 1963 until recently, and then as Editor of the Newsletter in the 1970s.

The involvement of the IEEE in ultrasonics is through the need for electronic instruments in every facet of the field of ultrasonics. Realizing this, Dr. Papadakis joined the IEEE early in his career along with his membership in the Acoustical Society of America, the American Society for Nondestructive Testing, and the American Physical Society. Dr. Papadakis holds a Ph.D. in physics from MIT and has done both research and engineering throughout his career. His most recent accomplishment is the editing of two books for Academic Press on the successful commercialization of instruments and devices arising from research in ultrasonics.

2000 Distinguished Lecturer

Quartz Crystals vs. their Environment: Time Bases or Sensors? (Keeping the World On Time and your Tanks Full of Gas)

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Quartz crystals have been used for frequency control or time bases for over half a century. The requirements of modern telecommunications applications place very stringent performance standards on quartz crystals. Performance has improved over the years through extensive research on how to reduce quartz crystal reactions to environmental influences such as acceleration, force and temperature transients, as well as to a host of manufacturing process variations. Some recent

accomplishments in the frequency control field will be presented. Applications include telecommunications and navigation aids such as the Global Positioning System.

During the research on environmental influences, it became clear that instead of minimizing the influence of certain environmental effects, it was possible to maximize the influence. The field of quartz crystal sensors emerged. Examples that will be presented range from thin film thickness and stress measurements to high precision temperature and pressure transducers. These sensor applications are used in a variety of situations ranging from benign laboratory environments to the hostile environments at the bottom of an oil well.



1999 Ultrasonics Symposium in Lake Tahoe, Nevada

Oct. 17 – Oct. 20, 1999

The 1999 Ultrasonics Symposium in Lake Tahoe enjoyed an enormous success as evidenced by the largest number of technical registrants ever (810), the total number of attendees (876), the number of short course students (414) and exhibitors (13). This is a testament of the increase in interest in our society and the research

topics that the membership is engaged in. The social program was also very successful as all the tours were full, and mother nature provided great weather for the duration of the symposium.

The accompanying pictures were taken during the plenary session showing various characters in action.



Mr. President and his wife.



Cal Quate delivers his fine Plenary Talk.



“Buckaroo Roy” teaching Bill O'Brien “how to use the whip.”(!)



Marlene & Bill Gaunaurd “The Heavenly Tram.” (Breathtaking!)



Some Awardees & Organizers: Mack Breazeale, G. Bill Gaunaurd, Calvin Quate and Butrus Khuri-Yakub.



G. Bill Gaunaurd receiving the FELLOW plaque from President John Vig.



Lake Tahoe.



Ladies' Tour.



The gavel is passed from Vig to Hickernell.



Helmut Ermert and his wife (Ultrasonics Symposium chairman for 2002 in Munich).

President's Message – Rockets

New Years Eve 1999 Thresa and I were sitting on the banks of the river in Canberra, Australia watching the fireworks as rockets zoomed skyward and burst into displays of fascinating patterns and brilliant colors. We had exited Sydney and were on our way by car to Melbourne for a world congress. A couple of days later we were at Tidbinbilla where situated near the koala and kangaroo reserve is one of the three deep space network tracking stations in the world. It was exciting to note that Voyager II, the spacecraft launched in 1977 that brought us the close up photographs of the planets, was still being tracked and now lay over eight billion kilometers from Earth in the dark regions beyond our Solar System. It was in the early 1970's when Motorola developed the transponder with its SAW devices that controlled the signals still being heard back on Earth. The rockets ushering in the new millenium were a technological gift from the Chinese a millenium ago, and Voyager was a technological gift that now spanned the new millenium time frame.

Our UFFC Society will reach its golden anniversary in 2003 with plans being made for a celebration in 2004 involving a joint symposium of all three of our major groups. We will have a lot to celebrate with the phenomenal growth in ultrasonics, ferroelectrics, and frequency control technologies. No skyrockets bursting in air, but rather some historic presentations and recognitions, hearing the newest technological developments, and envisioning the future of our technologies. Beyond sitting and watching the display, we will be active participants in questioning, sharing, learning, and celebrating with one another. That is what our society is all about. We are a diverse yet knit fellowship and the information age interconnects us when we are away from conference gatherings. Between now and then there will be plenty of conference gatherings. This year

there will be symposia in Kansas City, Honolulu, St. Petersburg, and Puerto Rico which I encourage you to attend.

In November we rocketed into prominence under scrutiny of the IEEE Audit Committee to report on the health and growth of our society over the past five years. Supporting me were Jan Brown and John Vig in answering inquiries from the audit committee. We were well received. Some of our programs are unique in the IEEE and to be recommended to other societies. This is a real tribute to the society leadership and is a motivation to continue building the area of service to our members and the associated technological community. Financially, we are very sound, and our members will soon benefit from a major initiative to digitize our technical publications of the past and make them available at low cost to our members. We solicit ideas from you, the membership, where we can serve you better. In turn, we welcome your presence on committees or as representatives to other organizations with whom we cooperate. A new UFFC Education Committee is being formed, and we welcome participation.

I just returned from New Orleans for IEEE meetings on your behalf as a member of the Technical Activities Board. In that city preparations were being made for the Mardi Gras Celebration with its parades, fireworks and rockets. In the meeting were the messages that the IEEE had a very good year, membership is up, new member services are coming on line, and we are financially sound. The Institute is launching new programs making it easier to search the web for products and articles of technical interest. The major opportunities in the future lie in the areas of on-line businesses and services, responsiveness to membership needs, to become a vital source in education, and to make volunteering fun. The last one is a

reminder that the life and breath of the IEEE and its societies is volunteers.

I am interested in membership input on ways in which the UFFC-Society can better serve you the members. Please be in touch with me (E-mail: f.hickernell@ieee.org) or other AdCom members for new ideas and participation in society committees. It is your participation that determines whether we rocket into

space, burst, and then fizzle-out like the fireworks of the new millenium, or whether we continue to signal our presence to the world that we are still alive and setting new distance records like Voyager.

Fred Hickernell
President, UFFC Society

IEEE Ultrasonics, Ferroelectrics, and Frequency Control Society Administrative Committee

SOCIETY OFFICERS

President	F. S. Hickernell Motorola (ret.)	
President-Elect	A. Safari	Rutgers University
Vice-President, Ferroelectrics	J. T. Cutchen	Sandia Labs.
Vice-President, Frequency Control	J. A. Kusters	Hewlett-Packard Company
Vice-President, Ultrasonics	J. F. Greenleaf Mayo Clinic	
Vice-President, Publications	J. Brown JB Consultants	
Secretary-Treasurer	G. V. Blessing	National Institute of Standards & Technology

ELECTED COMMITTEE MEMBERS

1998 - 2000	T. R. Gururaja	Hewlett-Packard Company
1998 - 2000	D. B. Hauden	LPMO-CNRS
1998 - 2000	A. H. Meitzler	Ford Motor Co. (ret.)
1998 - 2000	K. Uchino	The Pennsylvania State University
1999 - 2001	S. M. Pilgrim	Alfred University
1999 - 2001	H. F. Routh	Advanced Technology Laboratory
1999 - 2001	S. E. Trolier-McKinstry	Pennsylvania State University
1999 - 2001	M. Yamaguchi	Chiba University
2000 - 2002	L. F. Brown	South Dakota State University
2000 - 2002	M. M. Driscoll	Northrop Grumman
2000 - 2002	T. E. Parker	National Institute of Standards & Technology
2000 - 2002	C. C. W. Ruppel	Siemens AG

EX-OFFICIO COMMITTEE MEMBERS

Awards	R. Lerch	Friedrich-Alexander-Universitat, Erlangen
Fellows*	R. M. White	University of California, Berkeley
Finance	H. van de Vaart	VDV Associates
Historian*	F. S. Hickernell	Motorola (ret.)
Long Range Planning (Ad Hoc)	D. C. Malocha	University of Central Florida, Orlando
Membership-Chapters	D. R. Pape	Photonic Systems Inc.
Newsletter*	W. D. Hunt	Georgia Institute of Technology
Nominations	F. S. Foster	University of Toronto
Standards	A. Ballato	U. S. Army Communications-Electronics Command, Fort Monmouth
Transactions*	W. D. O'Brien, Jr.	University of Illinois, Urbana
Senior Past President (1998 - 2001)	D. C. Malocha	University of Central Florida, Orlando
Junior Past President (2000 - 2003)	J. R. Vig	U. S. Army Communications-Electronics Command, Fort Monmouth
Senior Student Member* (1999-2000)	K. E. Morgan	University of Virginia, Charlottesville
Junior Student Member* (2000-2001)	(To be appointed)	

IEEE HEADQUARTERS

Director, Division IX*	N. Khazenie
Managing Director, TAB*	M. Ward-Callan
General Manager, IEEE*	D. J. Senese

*Non-Voting Position

Roster of replacements and new additions to UFFC Society chairs and representatives.

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AdCom Briefs

The Administrative Committee (AdCom) meeting of the Ultrasonics, Ferroelectrics, and Frequency Control Society (UFFC-S) was called to order at 9:00 A.M., 17th October 1999, by J. R. Vig, UFFC-S AdCom President, at Caesar's Tahoe Hotel, Lake Tahoe, Nevada. Introductions of attending members were conducted.

J. R. Vig, UFFC-S AdCom President, introduced C. H. Frazier (University of Illinois) and K. E. Morgan (University of Virginia - Charlottesville), the UFFC-S's AdCom Student Members for 1999.

G. K. Montress, UFFC-S Secretary/Treasurer, moved to approve the minutes of the 18th June 1999, UFFC-S AdCom meeting. The motion was seconded by R. H. Tancrell. The motion passed.

G. K. Montress, UFFC-S Secretary/Treasurer, reported that there were no e-mail/FAX ballots conducted during the time period from 19th June 1999 to 16th October 1999.

The IEEE is studying new financial operating scenarios, referred to as "New Financial Models (NFM)". The UFFC-S's AdCom approved several motions instructing the UFFC-S's President (J. R. Vig) to protect the Society's financial interests at the upcoming IEEE TAB meeting in November 1999.

The UFFC-S AdCom approved a plan to put all of the UFFC-S's Conference Proceedings (US, FCS, and ISAF) and Transactions onto a set of CR-ROMs at the 18th June 1999 UFFC-S AdCom meeting. The project is underway, and the CDs should be available in early 2000, and will be available to all UFFC-S members.

H. van de Vaart, UFFC-S Finance & Operations Committee Chair, presented oral and written reports. The UFFC-S remains

in good financial shape, with reserves of approximately \$831k as of 31st August 1999.

J. Brown, UFFC-S Vice-President for Publications, presented oral and written reports. The IEEE's electronic publishing product is called EPIC - Electronic Professional Information Connection.

W. D. O'Brien, Jr., UFFC-S Transactions Editor-in-Chief, presented oral and written reports. The Federation of Animal Science Societies' (FASSs') handling of the editing and preparation operations for the UFFC-S Transactions continues to go very well in 1999. A new printer (Imperial Printing) is now handling the UFFC-S Transactions for FASS.

W. D. O'Brien, Jr., UFFC-S Transactions Editor-in-Chief, reported that the UFFC-S Transactions are available on-line now, beginning with the January 1997 issue. The 1995 and 1996 UFFC-S Transactions volumes will be available on-line soon. All UFFC-S members in good standing should be able to access the UFFC-S Transactions on-line.

W. D. O'Brien, Jr., UFFC-S Transactions Editor-in-Chief, reported that five additional Special Issues of the UFFC-S Transactions are currently in progress, specifically: a Special Issue on Applications of Ferroelectrics, a Special Issue commemorating the 30th Anniversary of Piezoelectric PVDF, a Special Issue on Frequency Control and Precision Timing, a Special Issue on the Joint Korea-United States Workshop on Nondestructive Evaluation, and a Special Issue on Modeling, Optimization, and Design of Surface and Bulk Acoustic Wave Devices.

W. D. Hunt, UFFC-S Newsletter Editor-in-Chief, presented an oral report. The deadline for submission of material for the

April 2000 (Spring) issue of the UFFC-S Newsletter is approximately 11th February 2000.

A. Safari, UFFC-S Ferroelectrics Vice-President, presented oral and written reports. The 2000 ISAF will be held in Honolulu, Hawaii with A. Kingon and D. Viehland serving as General Co-Chairs, and the 2002 ISAF will be held in Gaithersburg, Maryland with S. Freeman serving as General Chair.

D. Viehland, 2000 ISAF General Co-Chair, presented a report on arrangements for the symposium.

The UFFC-S's AdCom approved a motion providing \$8k of support to the Asian Meeting on Ferroelectricity (AMF), which will be held late in 2000 in Hong Kong, China. The UFFC-S will be a technical co-sponsor of the meeting.

J. A. Kusters, UFFC-S Frequency Control Vice-President, submitted a written report.

J. A. Kusters, UFFC-S Frequency Control Vice-President, noted that the 2000 IEEE International Frequency Control Symposium will be held in Kansas City, Missouri, on 6th - 9th June 2000. It will be the first jointly sponsored meeting with the EIA. J. D. Prestage has agreed to serve as Technical Program Chair for the meeting. Arrangements for the conference are progressing, including the formalization of responsibilities for the EIA and the IEEE, in terms of running the meeting.

J. F. Greenleaf, UFFC-S Ultrasonics Standing Committee Chair, presented an oral report. The 1999 IEEE International Ultrasonics Symposium will be held in Lake Tahoe, Nevada; the 2000 IEEE International Ultrasonics Symposium will be held in San Juan, Puerto Rico; the 2001 IEEE International Ultrasonics Symposium will be held in Atlanta, Georgia; the 2002 IEEE International Ultrasonics Symposium will be held in Munich, Germany; and the 2003 IEEE International Ultrasonics Symposium will be held in Honolulu, Hawaii, with J. F. Greenleaf and W. D. O'Brien, Jr., serving as General Co-Chairs for the meeting.

The UFFC-S's 50th anniversary year is coming up in 2004. The UFFC-S's AdCom approved a joint meeting of all three UFFC-S sponsored conferences (ISAF, FCS, and US), to be held in Montreal, Canada, in August 2004.

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

B. T. Khuri-Yakub is the current UFFC-S's 1999-2000 Distinguished Lecturer. The title of his presentation is: "Capacitive Micromachined Ultrasonic Transducers".

R. H. Tancrell, UFFC-S Awards Committee Chair, announced that T. E. Parker is the recipient of the Society's 1999

Achievement Award, while B. R. McAvoy is the recipient of the Society's 1999 Distinguished Service Award.

The UFFC-S's AdCom approved E. P. EerNisse, Quartzdyne, Inc., as the UFFC-S Distinguished Lecturer for 2000-2001. The title of his presentation is: "Quartz Crystals versus their Environment: Time Bases or Sensors?".

A. Ballato, UFFC-S Standards Committee Chair, presented written and oral reports. The UFFC-S's Standards Committee is currently responsible for nine items: eight standards and one project.

F. S. Foster, UFFC-S Nominations Committee Chair, presented an oral report. The election for new UFFC-S AdCom members with their three year terms in office starting on 1st January 2000 is currently being conducted. The slate of nominees from IEEE Regions 1 - 7 is: L. Brown, M. M. Driscoll, R. L. Filler, R. M. Garvey, T. E. Parker, and T. Sinclair. Nominees from IEEE Regions 8 - 10 are: C. C. W. Ruppel, D. P. Tsarapkin, and A. F. W. van der Steen. Three new UFFC-S AdCom members will be elected from among the Regions 1 - 7 candidates, while one new UFFC-S AdCom member will be elected from among the Regions 8 - 10 candidates. The election should be completed by early November 1999.

The UFFC-S's AdCom approved two motions making changes to the process for electing UFFC-S AdCom members. The two changes will necessitate revisions to the UFFC-S By-laws. The changes will be published in the April 2000 (Spring) issues of the UFFC-S Newsletter, and become effective in time for next year's election.

D. C. Malocha, UFFC-S Long Range Planning Committee Chair, indicated that the UFFC-S's Strategic Planning Document is operative, and he continues to coordinate efforts to achieve its major objectives.

D. C. Malocha is the UFFC-S's representative on the IEEE's New Technology Directions Committee. He requests inputs from all UFFC-S members.

A. Safari was elected UFFC-S President-Elect for a two-year term, starting on 1st January 2000.

The next UFFC-S AdCom meeting will be held at 9:00 A.M., on Sunday, 30th July 2000, in conjunction with the 2000 (12th) IEEE International Symposium on the Applications of Ferroelectrics, in Honolulu, Hawaii.

The UFFC-S AdCom meeting adjourned at 5:21 P.M.

Gary K. Montress

UFFC-S AdCom Secretary/Treasurer, 1999

Congratulations to the following newly elected UFFC-S AdCom members (2000-2002):

Lewis F. Brown
Michael M. Driscoll
Thomas E. Parker
Clemens C. W. Ruppel

As we welcome these newly elected UFFC-S AdCom members, I also would like to express our gratitude for the contributions of the four "retiring" Elected UFFC-S AdCom members whose terms in office expire at the end of this year (12/31/99):

William D. Hunt
Dennis R. Pape
Bob R. Potter
Kazuhiko Yamanouchi

Finally, as my current term serving as the UFFC-S's Secretary-Treasurer comes to a close, I would personally like to thank everyone involved with the UFFC-S during my tenure for their support and assistance. It has been a very enjoyable six years, and I look forward to further interactions with all of you in other UFFC-S activities and endeavors. Gerry Blessing has accepted the position of UFFC-S

Secretary-Treasurer beginning on 01/01/00, and the process of transferring responsibilities has already started. Gerry already is working hard to make arrangements for a UFFC-S AdCom meeting next March (2000), and will be forwarding additional information to all of you shortly. I will continue processing all reimbursement requests, etc., through the end of the year, and I will forward any requests received after 01/01/00 directly to Gerry in order that they are processed with minimal delay.

My Best Wishes for the coming Holidays, as well as for the New Millennium!!!

Sincerely,
Gary Montress

New IEEE Membership Applications Surge Ahead of 1999

Total IEEE membership for the end of February was 324,491 for an annual membership increase of 18,266 or 6.0% over February 1999. Society memberships also climbed to 361,137 for an increase of 6,789 or 1.9% over last year.

New higher-grade and Student member applications continue to surge ahead of last year's record numbers. In just the first eight weeks of the calendar year, IEEE has received 3,816 new higher-grade member applications — 2,535 of them via the Web — for a 10% increase over the first two months of 1999. Student member applications are showing a more moderate increase of 1.2% over last year. 5,726 Student applications have come in during the first eight weeks of this year, nearly 23% via the Web. Last year, only 14.3% of Student applications came in via the Web, so the rate of Web usage among prospective Student members is increasing dramatically. If this pace continues, IEEE could see nearly 26,000 Web applications in 2000.

Two categories of applications are down, however. Affiliate applications are down by 46%. Readmissions and reinstatements are down by 6%.

Half-Year Dues Rates for New Members to IEEE and Societies Are Now in Effect

1 March began the half-year dues rates for new members joining IEEE or an IEEE Society. That makes it an excellent time now for current members to add a new Society and for nonmembers to join IEEE and IEEE Societies at a substantial savings of 50% off the full year rates.

Announce it in newsletters; mention it at meetings and share it with colleagues. Now is a great time to join IEEE and IEEE Societies.

The Redesigned IEEE Spectrum Online is Another Member Benefit You Can Use to Recruit and Retain Members

IEEE Spectrum Online has just been released—redesigned and improved. The enhanced site now delivers content unavailable in print. Here are some of the features:

- Daily Science and Technology News provided by Reuters
- International News Services is updated hourly.
- Weekly Web Sites reports on new, compelling Web sites of special interest to the science and technology communities.
- Weekly Newslog identifies and summarizes key science and technology events for the prior week.

A new server makes the site faster than ever, and the new design is open, bright, and inviting.

Member surveys have always rated *IEEE Spectrum* and easy and *ready access to the latest technical information* as being two of the top member benefits that are of major interest to IEEE professionals. The new *Spectrum Online* makes these two needs readily available to our members in one place. Let your members know how to access this service by highlighting mention of *Spectrum Online* in your newsletters and communications with members. This is yet another reason for them to feel good about why they should keep their IEEE membership active. When contacting lapsed members making mention of *Spectrum Online* and *IEEEExplore*, the on-line platform to search and access technical publications are two member benefits services that may just convince them to renew IEEE dues for 2000 now.

For a short time, you can share this *Spectrum Online* information with colleagues who aren't members and show them this direct link to the information they want and need. For a six-week period (through 12 April), the full site will be open at www.spectrum.ieee.org to give all visitors free access to information usually available to IEEE members only.

UFFC Website Update

The UFFC website has received more than 56,000 "hits" since its inception in 1996. The new UFFC website, <http://www.ieee-uffc.org>, was launched at the end of 1999. This site features a brand new look-and-feel and is maintained by FASS, UFFC's professional webmaster. John Vig is responsible for the overall content as the Web Editor-in-Chief, while Richard Chiao, Ahmad Safari, and John Vig are serving as Web Editors for Ultrasonics, Ferroelectrics, and Frequency Control, respectively.

Recent additions to the website include a historical paper on the history of ceramic filters, a review paper on the acceleration sensitivity of crystal filters, an updated tutorial on quartz resonators and oscillators, and "CODA," a formerly commercial software package, including the source code, for the design and analysis of crystal oscillators. CODA was donated to UFFC-S by its author, Albert Benjaminson. The Web Editors hope that CODA is just the start of software contributions to the UFFC website. Contributed software need not be complex;

e.g., MATHCAD or MATLAB routines that perform useful calculations are welcome. Also included are updated, and greatly expanded industry website directories for ultrasonics and frequency control. Ultrasonics is experimenting with an interactive site where users can get as well as contribute information. Contributions are solicited for the Ultrasonics Gallery, Software, and other sections.

The new UFFC website has received a steady stream of hits since November 1, 1999. As of February 18, Frequency Control is leading the pack at 2589, Ultrasonics at 1294, and Ferroelectrics at 486. (The obvious conclusion from this data is that John can click his mouse twice as fast as Richard and five times faster than Ahmad). But (not so) seriously, the Editors do have a friendly wager as to which of the three technical areas will have the most hits by November 1, 2000, with the runner up buying dinner for the winner.

Comments and suggestions about the new UFFC website are welcome.

1999 Year End UFFC Financial Report

The accompanying report shows the income and expense of the UFFC Society for 1999 (all numbers are in thousands). They are Post-Close but Pre-Audit. As you can see, the actual surplus is \$236.6K versus a budgeted deficit of \$27.5K. The Post-Audit report will probably show a reduced surplus of \$200.2K since the Transactions expense of \$36.4K for the November issue has not been posted yet. Apart from that, I do not expect any material changes in the Post-Audit report which will not be out until May.

The actual income from both our short term and long term funds was much higher than expected, \$110.5K versus \$30.8K budgeted (listed as a negative expense). I am sure the healthy stock market returns for 1999 had a lot to do with that.

The Transactions continue to do very well. The number of pages published for 1999 was 1620, nearly double of what it was five years ago. The publishing cost has been kept in line by transferring the editing, composition and printing from IEEE to FASS (Federation of Animal Science Societies). Particularly gratifying is the income from voluntary and overlength page charges and reprints. As I mentioned last year, FASS is doing an efficient job in collecting these charges. Again, the expense for the November issue is not included.

There is an additional expense item under Transactions that was not in the budget, namely \$30.5K for CD-ROM. As you may know, at its last meeting AdCom voted to put all past UFFC Transactions and Proceedings on a set of CD-ROMs at a cost of \$122.0K, \$91.5K of which was expected to be

invoiced during 1999. However, only \$30.5K has been posted, the rest will be invoiced during 2000.

The Symposia income and expense for 1999 are confusing as usual. Only \$24.3K from the 1998 IUS is real income for 1999. The 1998 IFCS and 1997 IUS surpluses were already credited to our account in 1998, and the income posted to the UFFC account was reduced by that amount when the final reports for those Symposia were recorded. The 1998 ISAF just submitted its final report showing a surplus of \$2.6K. A big part of the surplus is the income from the Book Broker program (\$73.5K, again listed as a negative expense). This income is a running total of the sale of Proceedings for the past three years and is very hard to predict. Obviously our Proceedings are doing very well.

The AdCom expenses were below budget. The President did not spend any of his discretionary funds of \$25K, and his travel expenses were also below budget. In addition, UFFC received \$20.3K from the Transactions on Medical Imaging and the Journal on Lightwave Technology (again posted as a negative expense). UFFC is a co-sponsor of those publications.

With the surplus of \$236.6K, UFFC's net worth as of 12/31/99 is \$994.2K. Long term investment is \$567.0K.

Herman van de Vaart
Chair Finance and Operations Committee.
March 2, 2000

UFFC OPERATING FINANCIAL STATEMENT 12/31/99

	INCOME		EXPENSE		NET	
	BUDGET	ACTUAL	BUDGET	ACTUAL	BUDGET	ACTUAL
INTEREST/CAPITAL GAINS	0.0	0.0	-30.8	-110.5	30.8	110.5
TRANSACTIONS	342.7	390.8	289.2	284.1	53.5	106.7
NEWSLETTER	0.0	0.0	13.0	13.1	-13.0	-13.1
NON-PERIODICALS	1.3	0.1	1.4	1.3	-0.1	-1.2
SYMPOSIA	759.4	938.0	738.3	845.9	21.1	92.1
HQ ADMINISTRATION	0.0	0.0	33.5	17.7	-33.5	-17.7
ADCOM / OTHER	0.0	0.0	86.3	40.7	-86.3	-40.7
TOTAL	1103.4	1328.9	1130.9	1092.3	-27.5	236.6

	INCOME		EXPENSE		NET	
	BUDGET	ACTUAL	BUDGET	ACTUAL	BUDGET	ACTUAL
MEMBERSHIP FEES	29.7	28.6	0.0	0.0	29.7	28.6
INDIVIDUAL NM SUBS.	88.1	75.3	0.0	0.0	88.1	75.3
ALL TRANS. PACKAGE	149.6	179.5	0.0	0.0	149.6	179.5
VOLUNTARY PAGE CHARGES	35.0	49.0	0.0	0.0	35.0	49.0
OVERLENGTH PAGE CHARGES	35.0	30.5	0.0	0.0	35.0	30.5
REPRINTS	0.0	23.0	0.0	0.0	0.0	23.0
PUB. ADMINISTRATION	0.0	0.0	7.3	7.3	-7.3	-7.3
UFFC EDITOR'S OFFICE	0.0	0.0	40.0	36.4	-40.0	-36.4
COMPOSITION/EDIT/PRINTING	0.0	0.0	214.0	181.9	-214.0	-181.9
CD ROM	0.0	0.0	0.0	30.5	0.0	-30.5
INDEXING	0.0	0.0	3.2	3.3	-3.2	-3.3
EXIT FEE	0.0	0.0	11.0	11.0	-11.0	-11.0
SUBSCRIBER HANDLING	0.0	0.0	6.3	6.0	-6.3	-6.0
MISCELLANEOUS	5.3	4.9	7.4	7.7	-2.1	-2.8
TOTAL	342.7	390.8	289.2	284.1	53.5	106.7

	INCOME		EXPENSE		NET	
	BUDGET	ACTUAL	BUDGET	ACTUAL	BUDGET	ACTUAL
1998 ULTRASONICS	397.7	462.4	375.2	438.1	22.5	24.3
1998 FERROELECTRICS *	149.0	0.0	143.6	0.0	5.4	0.0
1998 FREQUENCY CONTROL **	212.7	191.4	179.6	191.4	33.1	0.0
1997 ULTRASONICS ***	0.0	284.2	0.0	284.2	0.0	0.0
BOOKBROKER	0.0	0.0	-0.1	-73.5	0.1	73.5
CONFERENCE RELATED	0.0	0.0	40.0	5.7	-40.0	-5.7
TOTAL	759.4	938.0	738.3	845.9	21.1	92.1

	ADCOM		OUTSTANDING LOANS	
	BUDGET	ACTUAL		
PRESIDENT'S OFFICE	33.0	2.2	1999 ULTRASONICS	50.0
TOTAL ADCOM EXPENSES	30.0	31.9	1999 FREQ. CONTROL	20.0
CHAPTERS / DIST. LECTURER	16.0	14.0	2000 ULTRASONICS	15.0
TECHN/MEMBERSHIP/AWARDS	2.2	2.3	2000 FREQ. CONTROL	15.0
IEEE HQ EXPENSE	6.5	7.8	2000 FERROELECTRICS	25.0
TMI, JLT	0.0	-20.3	TOTAL	125.0
OTHER	-1.4	2.8		
TOTAL	86.3	40.7	NET WORTH 1/1/99	757.6
			SURPLUS/DEFICIT	236.6
LONG TERM INVESTMENT	567.0		NET WORTH 12/31/99	994.2

* Actual income \$99.3K, expense \$96.7K, surplus \$2.6K

** Actual income \$202.5K, \$11.1K surplus already credited in 1998

*** Actual income \$331.6K, \$47.4K surplus already credited in 1998

Five UFFC Members Elected IEEE Fellow

Name/Address	Society List	Eval Soc.
<p>Helmut Ermert Ruhr University Building IC 6/132 Bochum D-44780, Germany</p> <p><i>For contributions to coherent wave imaging and its application to medical diagnostics and nondestructive testing, and to engineering education.</i></p>	<p>AP, Ed, EMB, GRS, IM, MTT, UFFC</p>	<p>UFFC</p>
<p>Lute Malecki Jet Propulsion Laboratory 4800 Oak Grove Drive MS 298/100 Pasadena, CA 91109</p> <p><i>For contributions to the science and technology of frequency standards.</i></p>	<p>LEO, UFFC</p>	<p>UFFC</p>
<p>Shin-ichiro Umemura Hitachi Ltd. Hitachi Central Research Lab. 1-280, Higashi-Koigakubo, Kokubunji Tokyo 185-8601, Japan</p> <p><i>For contributions to biomedical ultrasonics.</i></p>	<p>UFFC</p>	<p>UFFC</p>
<p>Soo-Chang Pei National Taiwan University Department of Electrical Engineering Taipei 106, Taiwan</p> <p><i>For contributions to the development of digital eigenfilter design, color image coding and signal compression, and to electrical education in Taiwan.</i></p>	<p>AES, AP, C, CAS, CE, COMM, CS, Ed, EMB, GRS, IT, RA, SMC, SP, UFFC, VT</p>	<p>CAS</p>
<p>Linden W. Pierce Self Employed P.O. Box 2367 Rome, GA 30164-2367</p> <p><i>For contributions to the understanding of heat transfer and loading of liquid-immersed and dry type power and distribution transformers.</i></p>	<p>CPMT, DEI, IA, MAG, Pen, UFFC</p>	<p>Pen</p>

ISAF 2000—Hawaii

12th IEEE International Symposium On the Applications of Ferroelectrics

ISAF 2000

A New Millennium Celebration of the Past and Future of Ferroelectrics

July 30 - August 2, 2000

Hilton Hawaiian Village
Honolulu, Hawaii

Sponsored by the Ultrasonics, Ferroelectrics and Frequency
Control Society of the IEEE

Website address: http://www2.ncsu.edu/unity/lockers/project/isaf_2000/



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We cordially invite all members of the UFFC to attend ISAF-2000 meeting in Honolulu, Hawaii. Our guidance committee, AdCom, will be meeting there in conjunction with the meeting. We look forward to a productive meeting personally and professionally and we hope to see you there. This biennial meeting focuses on the topical areas pertaining to the applications of ferroelectric, piezoelectric, dielectric, and electro-optic materials in single crystalline and polycrystalline forms of both bulk and thin-layer bodies. The substance of the meeting will consist of papers including (but not limited to) properties, structure-property-chemical relationships, materials processing, materials and device design, materials and device fabrication, and device testing. Poster and oral presentation formats will both be used at the symposium.

Primary Technical Topics:

- Piezoelectric Materials for Transducers, Actuators, Ultrasonic Imaging, SAW, BAW, High-power Devices, and Smart Systems
- Capacitors for Discrete Components, Embedded Devices, and On-chip Applications
- Pyroelectrics Materials, Infrared Imaging, and Infrared Detection
- Single Crystal Ferroelectrics and Their Applications
- Ferroelectric and Dielectric Thin Films for Memory Applications
- Novel Characterization Methods
- Polymeric and Liquid Crystal Ferroelectrics: Displays and Soft Actuation Applications
- Tunable Materials for RF and Microwave Applications
- Modeling and Theory
- New Materials
- Optical Materials and Optical Interactions
- Energy Storage Devices and Materials
- Thermistor Materials
- Ferroelectrics for Electron Field Emission Devices

If you are interested in **being included** on the meeting mailing list, *please send email to:*

Ms. Tina Confer (tmc9@psu.edu)
187 Materials Research Laboratory
The Penn State University, University Park, PA 16802, USA
Phone: +814-865-1154; FAX: +814-863-7846

Website address: http://www2.ncsu.edu/unity/lockers/project/isaf_2000/

Standards Activities Committee

Standards Activities Report

1. Our society is currently responsible for nine items, eight standards and one project.

2. *Piezoelectric Crystals* – W. P. Hanson (176-1987 and 177-1966)

Bill Hanson (Piezo Crystal Company, Carlisle, PA) has been appointed as new chairman of this subcommittee. Trig Meeker will serve as his deputy. Revision of Standard 176 [Piezoelectricity] is the main item of future work.

3. *Ultrasonics in Medicine* - (790-1989)

Currently inactive.

4. *Time and Frequency* - J. R. Vig (1139-1988 and 1193-1994; SCC-27 liaison)

Revision of IEEE Standard 1139-1988, "IEEE Standard Definitions of Physical Quantities for Fundamental Frequency and Time Metrology - Random Instabilities," was published in June. Dr. Eva Frerre-Pikal is the new chairman of SCC-27, which has begun revision of 1139-1988.

5. *Sensors, Actuators, & Transducers* - R. M. Lec and S. J. Martin (P1182)

This subcommittee is responsible for: "IEEE Guide to Terms and Definitions of Ferroelectric, Frequency Control, and Ultrasonic Sensors." Work is beginning on a first draft; it is planned to be posted on the UFFC website, so as to be

available for comments and input. The Sensor Council, which represents most of the IEEE Societies, will meet on 11/6 in Newark. The UFFC representatives are S. Martin and R. Lerch.

6. *Ferroelectrics* - A. H. Meitzler (180-1986)

The Ferroelectric Standards subcommittee met twice at MRL/PSU. Good progress has been made on the document "IEEE Standard Definitions of Terms Associated with Ferroelectric and Related Materials," which will ultimately be a much more complete standard to replace Standard 180-1986. The latest draft is expected to be transferred to the UFFC website before the end of the year, for review and comments.

7. *Surface Acoustic Wave Devices* - (1037-1992)

Currently inactive.

8. *Piezomagnetic Technology* - S. L. Ehrlich (319-1990)

Standard 319 has been withdrawn. Plans are being made to post the proposed revisions on the UFFC website. Until the revised version is virtually complete, the work will proceed informally.

**ARTHUR BALLATO
Chairman, Standards Activities
Ultrasonics, Ferroelectrics, and
Frequency Control Society**

A Proposed New Standard on Ferroelectricity Available on IEEE-UFFC Web Site

The draft version of a proposed new standard on ferroelectricity is accessible on the IEEE-UFFC web site <http://www.ieee-uffc.org/>. Since 1996, the Ferroelectric Standards Committee of the IEEE Ferroelectrics Committee has been working on a standard to replace the old ferroelectrics standard that went under the title "ANSI/IEEE Std 180-1986, IEEE Standard Definitions of Primary Ferroelectric Terms". This earlier standard lapsed and several years ago was withdrawn from the list of active IEEE standards. The proposed new standard is entitled "IEEE Standard Definitions of Terms Associated with

Ferroelectric and Related Materials." The Chair of the Ferroelectric Standards Committee is Allen Meitzler; the Vice-Chair and Secretary is Susan Trolier-McKinstry.

Since the Standard is still in the draft stage, there is an opportunity for people with a strong interest in Ferroelectrics to influence the preparation of this standard. Comments from anyone interested in the standard would be welcomed by the committee. These comments can be sent to Dr. Trolier-McKinstry through the message forwarding provision included in the web site or to STMcKinstry@psu.edu.

Chapter Activities

Japan Chapter

Seven new Sections were founded in Japan and the Japan Council was established in June 1999 aiming at promotion of country wide IEEE activities and coordination of the inter-sectional activities in Japan. Due to this change, the

former Tokyo Chapter of the UFFC Society was renamed as the Japan Chapter which belongs to the Japan Council.

The Japan Chapter held 11 technical meetings in 1999, in conjunction with the Technical Group on Ultrasonics of the Institute of Electronics, Information and Communication Engineers of Japan:

Date	Papers	Venue
1) January 21-22, 1999	18	Osaka
2) February 12, 1999	10	Kanagawa
3) April 27, 1999	7	Tokyo
4) May 24, 1999	7	Yokohama
5) June 21, 1999	6	Tokyo
6) July 9, 1999	10	Tokyo
7) August 27, 1999	7	Yokohama
8) September 20-21, 1999	15	Akita
9) October 12, 1999	7	Tokyo
10) November 11, 1999	8	Hamamatsu
11) December 21, 1999	7	Tokyo

20th Symposium on Ultrasonic Electronics

The Japan Chapter cosponsored the 20th Symposium on Ultrasonic Electronics (USE '99) on November 17-19, 1999 at the Japan Women's University in Tokyo, attended by 386 participants. Two invited talks and 156 contributed papers were presented and the 20th anniversary special session was held. Most of the papers will be published in the May 2000 issue (Vol.39, No.5B) of the Japanese Journal of Applied Physics. Titles and abstracts of the articles in J.J.A.P. including back issues will be browsed by accessing the J.J.A.P. Home Page at <http://www.jjap.or.jp/online/>.

28th Symposium on Electromechanical Functional Devices

The 28th Symposium on Electromechanical Functional Devices (EM Symposium) was held at the Tokyo Metropolitan University in Hachioji on May 27-28, 1998, cosponsored by the Japan Chapter. The number of participants was over 160. There were one special memorial lecture, two tutorial lectures and 20 oral presentations. Dr. F. S. Hickernell was invited to this

Symposium and he presented on the attractive topic, "Thin-Films on SAW Substrate: Where are we Headed Dreams Anticipated, Promises Fulfilled, and Opportunities Awaiting."

UFFC-S 1999-2000 Distinguished Lecturer Program

Professor B. T. Khuri-Yakub, E. L. Ginzton Laboratory, the Stanford University, the UFFC-S 1999-2000 Distinguished Lecturer, was invited to Japan and he stayed from November 14 to November 20. He favored us with impressive and instructive talks on the topic, "Capacitive Micromachined Ultrasonic Transducers" at the USE '99 in Tokyo, at the Tohoku University in Sendai and at the Shizuoka University in Hamamatsu.

2000 Officers

The officers of the Japan Chapter for 2000 are:

Chair: Professor Kiyoshi Nakamura, Graduate School of Engineering, Tohoku University, Aramaki 05, Aoba-ku, Sendai 980-8579

Vice Chair: Dr. Sadayuki Takahashi, NEC Corporation, 4-1-1, Miyazaki, Miyamae-ku, Kawasaki 216-8555

Secretary: Associate Professor Ken-ya Hashimoto, Faculty of Engineering, Chiba University, Yayoi-cho 33, Inage-ku, Chiba 263-8522

Treasurer: Associate Professor Ken Yamada, Graduate School of Engineering, Tohoku University, Aramaki 05, Aoba-ku, Sendai 980-8579

(IEEE Japan Chapter Home Page: <http://homepage1.nifty.com/ieetokyo/>)

Sadayuki Takahashi
Vice Chair
UFFC-S Japan Chapter



Prof. B. T. Khuri-Yakub with members of the IEEE UFFC Japan Chapter at the welcome party held in Sendai. Front row (left to right): Kiyoshi Nakamura (Chair), Kazuhiko Yamanouchi, B. T. Khuri-Yakub (Distinguished Lecturer), Noriyoshi Chubachi. Back row (left to right) Ken Yamada, Kazushi Yamanaka, Tsutomu Hoshimiya, Jun-ichi Kushibiki.



Prof. B.T. Khuri-Yakub giving his lecture at Tohoku University.

Future UFFC-S Symposia

ULTRASONICS SYMPOSIA

2000 IEEE International Ultrasonics Symposium

San Juan, Puerto Rico — 22 - 25 October 2000

For information contact:

Rodolfo Almar, *General Chair*

USA

(407) 290-9552 (Phone)

(407) 290-5181 (FAX)

rcalmar@bellsouth.net (e-mail)

Peter V. Wright, *Technical Program Chair*

Thomson Microsonics

399 Route des Cretes, BP 232

Sophia-Antipolis, Cedex 06904

FRANCE

+33 (0) 4 92 96 35 07 (Phone)

+33 (0) 4 92 96 31 90 (FAX)

peter.wright@tmx.thomson-csf.com (e-mail)

2001 IEEE International Ultrasonics Symposium

Atlanta, Georgia

For information contact:

Mack A. Breazeale, *General Co-Chair*

University of Mississippi

National Center for Physical Acoustics

University, Mississippi 38677

USA

(662) 915-7490 (Phone)

(662) 915-7494 (FAX)

breazeal@olemiss.edu (e-mail)

or

William D. O'Brien, Jr., *General Co-Chair*

University of Illinois

Department of Electrical

& Computer Engineering

Bioacoustics Research Laboratory

405 North Mathews Avenue

Urbana, Illinois 61801-2991, USA

(217) 333-2407 (Phone)

(217) 244-0105 (FAX)

wdo@uiuc.edu (e-mail)

2002 IEEE International Ultrasonics Symposium

Munich, Germany

For information contact:

Helmut Ermert, *General Chair*

Ruhr-Universitaet Bochum

Lehrstuhl fuer Hochfrequenztechnik

Department of Electrical Engineering

Geb. IC 6.132

Bochum D-44780

GERMANY

+49 234-322-2842 (Phone)

+49 234-321-4167 (FAX)

helmut.ermert@ruhr-uni-bochum.de (e-mail)

2003 IEEE International Ultrasonics Symposium

Honolulu, Hawaii

For information contact:

William D. O'Brien, Jr., *General Co-Chair*

University of Illinois

Department of Electrical

& Computer Engineering

Bioacoustics Research Laboratory

405 North Mathews Avenue

Urbana, Illinois 61801-2991, USA

(217) 333-2407 (Phone)

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wdo@uiuc.edu (e-mail)

or

James F. Greenleaf, *General Co-Chair*

Mayo Clinic

Ultrasound Research

200 First Street SW

Rochester, Minnesota 55905, USA

(507) 284-8496 (Phone)

(507) 266-0631 (FAX)

jfg@mayo.edu (e-mail)

FREQUENCY CONTROL SYMPOSIA

2000 IEEE International Frequency Control Symposium

Kansas City, Missouri — 6 - 9 June 2000

For information contact:

Donald B. Sullivan, *General Co-Chair*

National Institute of Standards & Technology

Time & Frequency Division

Division 847

325 Broadway

Boulder, Colorado 80303, USA

(303) 497-3772 (Phone)

(303) 497-6461 (FAX)

donald.sullivan@boulder.nist.gov (e-mail)

or

Jack Kay, *General Co-Chair*

Kay, Inc.

9419 West 122nd Street

Overland Park, Kansas 66213, USA

(913) 685-3685 (Phone)

(913) 685-4786 (FAX)

kayinc@gvi.net (e-mail)

John Prestage, *Technical Program Chair*

Jet Propulsion Laboratory

MS: 298-105B

4800 Oak Grove Drive

Pasadena, California 91109, USA

(818) 354-3515 (Phone)

(818) 393-6773 (FAX)

prestage@horology.jpl.nasa.gov (e-mail)

2001 IEEE International Frequency Control Symposium

Seattle, Washington

For information contact:

Errol P. EerNisse, *General Chair*

Quartzdyne, Inc.

1020 West Atherton Drive

Building C

Salt Lake City, Utah 84123, USA

(801) 266-6958 (Phone)

(801) 266-7985 (FAX)

errol@quartzdyne.com (e-mail)

1176 Howell Street

Newport, Rhode Island 02841

(401) 832-5107 (Phone)

(401) 832-6461 (FAX)

viehlandd@npt.nuwc.navy.mil (e-mail)

2002 IEEE International Frequency Control Symposium

Venue To Be Determined

For information contact:

Errol P. EerNisse, *General Chair*

Quartzdyne, Inc.

1020 West Atherton Drive

Building C

Salt Lake City, Utah 84123, USA

(801) 266-6958 (Phone)

(801) 266-7985 (FAX)

errol@quartzdyne.com (e-mail)

FERROELECTRICS SYMPOSIA

2000 IEEE International Symposium on Applications of Ferroelectrics

Honolulu, Hawaii

For information contact:

Dwight Viehland, *General Co-Chair*

Naval Sea Command

Code 2132; Building 1170

IEEE Sensors Journal

The inaugural issue of the IEEE Sensors Journal is scheduled for June 2001. This issue is to consist of a collection of review papers covering a wide range of sensor technologies. The deadline for submissions is 1 September 2000. The call-for-papers, and other relevant information can be found on the Sensors Council website, <http://www.ieee.org/sensors>.

The IEEE established the Sensors Council in 1999 for the purpose of creating a focus for the sensor activities of IEEE societies, and for starting a high quality, affordable journal. (The major competing journal costs \$5,200 per year.) The Council has 26 member societies, with a combined membership of 260,000. The UFFC-S is one of the member societies.

Sensor researchers and users are invited to submit papers and help make the Sensors Journal the leading sensor publication in the world. Papers on sensor applications are of special interest to the Journal.

The subscription price will be \$19- per year for IEEE members. The non-member (institutional) price will be \$495- per year.

Postdoctoral Position at Mayo Clinic

The Ultrasound Research Laboratory at Mayo Clinic in Rochester, Minnesota, has immediate openings for two post-doctoral research fellows or research associates. The first position requires someone with a Ph.D. in Mechanical Engineering or Materials with a solid knowledge of acoustics and vibration. The person should have a strong theoretical background along with experimental skills. The project involves investigating new imaging methods called vibro-acoustography and vibrography.

The second position requires someone with a Ph.D. in Electrical Engineering or Optics with knowledge of interferometry and signal processing along with some acquaintance with tomography if possible. This person should be able to conduct schlieren-like experiments and analyze resulting data. The project involves investigating new quantitative optical methods for measuring ultrasound signals in water with high spatial and temporal resolution.

Both positions are supported by R01 grants from the National Institutes of Medicine.

Rochester is a small city of 70,000 in the southeastern region of Minnesota. The Mayo Clinic is the largest private medical institution in the world with annual income of over \$2.5 billion.

James F. Greenleaf, Ph.D.

Basic Ultrasound Research Laboratory

Department of Physiology and Biophysics

Mayo Clinic and Foundation

Rochester MN 55905

Phone: 507 284-8496

Fax: 507 266-0361

E-mail: jfg@mayo.edu

<http://www.mayo.edu/ultrasound/ultrasound.html>

Mayo Foundation is an equal opportunity employer.

First Announcement and Call for Papers

International Forum on Wave Electronics and Its Applications



14 - 18 September, 2000

St. Petersburg - Valaam- Mandroga - St. Petersburg
(on a board of a ship)



Sponsored by:

Center "Integration" (Ministry of Education of Russia, Russian Academy of Sciences) Ministry of Education (Russia) Russian Foundation for Basic Research (Russia) Ministry of Science and Technology (Russia) IEEE UFFC - Society (USA) Societe Francaise des Microtechniques et de Chronometrie Committee for Science and Higher Education of St. Petersburg Administration External Affairs Committee of St. Petersburg Administration

ABSTRACT DEADLINE: 3 MAY, 2000

International Forum is consisting of:

5th INTERNATIONAL SYMPOSIUM ON SURFACE WAVES IN
SOLID AND LAYERED STRUCTURES

and

NATIONAL CONFERENCE ON ACOUSTOELECTRONICS
(WITH
INTERNATIONAL PARTICIPATION)

and

3rd INTERNATIONAL CONFERENCE FOR YOUNG RE-
SEARCHERS ON ACOUSTOELECTRONIC AND
ACOUSTOOPTIC INFORMATION PROCESSING

and

INTERNATIONAL SYMPOSIUM ON SPIN-WAVE ELEC-
TRONICS AND OPTOELECTRONICS

and

2000 INTERNATIONAL SYMPOSIUM ON FREQUENCY CON-
TROL AND SIGNAL GENERATION

14-18 September, 2000

St. Petersburg - Valaam - Mandroga - St. Petersburg
(on a board of a ship)

Forum Committees

General Chairman:

Academician Yuri V. Gulyaev (Russia)

Co-Chairmen:

Dr. Fred Hickernell (USA) - 5th International Symposium on
Surface Waves in Solid and Layered Structures

Prof. Yu. Mansfeld (Russia) - National Conference on
Acoustoelectronics (with international participation)

Prof. A. Bugaev (Russia) and **Prof. S. Kulakov** (Russia) - 3rd Interna-
tional Conference for Young Researchers on Acoustoelectronic and
Acousto-Optic Information Processing

Prof. S. Nikitov - International Symposium on Spin-wave Electronics
and Optoelectronics

Prof. V. Kuleshov - 2000 International Symposium on Frequency Con-
trol and Signal Generation

Forum Technical Program Committee

Chairmen

Dr. Dennis Pape (USA)

Prof. V. Proklov (Russia)

Organizing Committee

Chairman

Prof. S. Kulakov (Russia)

Forum Organizers

- State University of Aerospace Instrumentation (St. Petersburg, Russia)
- Institute of Radio Engineering and Electronics Russian Academy of Sciences (Moscow, Russia)
- Moscow Power Engineering Institute (Russia)
- Photonic Systems Incorporated (USA)

Preparation Of Abstract

Due 3 MAY 2000

A one page abstract (in English) containing sufficient details of the proposed paper should be submitted by E-mail to

Professor Sergei V. Kulakov

State University of Aerospace Instrumentation

67 Bolshaya Morskaya Street

St. Petersburg, 190000, Russia

Tel/ FAX: +7 (812) 108-4204

Tel. +7 (812) 443-4216

E-MAIL: bck@telebot.net or svk25@mail.ru

Also the abstracts should contain the authors' telephone and FAX as well as E-mail address. Authors will be notified of acceptance of papers by 1 June 2000.

Topics

Topics to be considered include, but are not to be limited to the following areas:

- **Acoustic Waves**
Acoustic wave propagation in crystals, glasses, spurious media, and periodic structures.
- **Acoustic Materials**
New acoustic and acousto-optic materials and their properties.
- **Acoustic Methods**
Acoustic methods for studying solid media.
- **Acoustoelectronic Signal Processing**
Acoustoelectronic signal processing system design and simulation, methods of parameter measurement and control. Bulk acoustic wave devices (filters, resonators, sensors etc.) and their applications, new principles. Surface acoustic wave devices (new principal results and applications for resonators, filters, sensors etc.).
- **Acousto-Optic Signal Processing**
Acousto-optic signal processing methods and systems, acousto-optic processors, theory, algorithms.
- **Spin-wave Electronics and its applications**
Magnetostatic spin waves in thin films and layered structures. Non-linear phenomena, magneto-optics, and magnetoacoustics. Magnetic domain wall dynamics. Spin-wave devices.
- **Frequency Synthesizers and Signal Generation**
Crystal and SAW oscillators. Microwave oscillators. Atomic frequency standards and measurement. Phase and amplitude noise. Frequency synthesis. GPS/GLONASS systems.

Both invited lectures (30 minutes) and contributed papers (20 minutes) will be given. In addition there will be a poster session and roundtable discussion. Conference language will be English.

The organizers would especially encourage young (under 35 years old) scientists to submit their papers.

Forum Fees

	For participants
Registration Fee	\$250.00
Lodging and Meals	\$400.00

Total Fees	\$650.00
	For accompanying Persons
Total Fees	\$400.00
	For young scientists (under 35 years old)
Registration Fee	\$150.00
Lodging and Meals	\$400.00
Total Fees	\$550.00

International Advisory Board

Chairmen

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Mario Armenise (Italy)	Sergei Ivanov (Russia)
John Vig (USA)	Yuri Zelenka (Czech Rep.) Antoni
Sliwinski (Poland)	Jun Yamada (Japan)

Arrangements The Opening Ceremony of the Meeting, First Plenary Session and First Poster Session will take place on 14 September, 2000 at 10 a.m. in one of the Historical Russian Buildings located in downtown St. Petersburg. Then the Forum departs by ship from the landing stage "Rechnoi Vokzal" on the 14 September 2000 in the evening and sails from St. Petersburg to the Archipelago of Valaam and the landing stage of Mandroga on the Svir River returning to St. Petersburg in the early morning on 18 September 2000.

The ship will sail along the Neva River to the Lake of Ladoga and then to its Northern Part with a stop at the picturesque archipelago of Valaam.

The attendees will have there the sightseeing tour visiting the magnificent wooden churches and chapels and the famous monastery.

The ship will then cruise along the Svir River to the mooring place of Mandroga. This place of wooden architecture is a new attempt at reconstructing an old rich Russian village with a quarter of trades - and craftsmen, carved decorations on the houses etc.

Departing from Mandroga the Forum arrives to St. Petersburg.

All Forum attendees will be housed in cabins from 14 September till 18 September on board the ship and served breakfast, lunch and dinner meals in the ship's dining hall. A lounge offers evening entertainment.

Please check boxes below

- I plan to attend
- I plan to submit a paper
- I plan to exhibit products or services
- I will be accompanied by ___ companions.

Name _____
(last name) (first name)

Organization _____

Address _____

City _____

State _____ Country _____

Phone _____ Fax _____

E-mail _____

Editor's Note:

Welcome to this, the first UFFC Society Newsletter of the new millennium. To those of you who would argue that the new millennium does not start till next year: good luck finding anyone to come to your Millennium New Year's Eve bash on December 31st of this year. What better president to guide us through this new era than Fred Hickernell? Fred has been affiliated with the society for almost half a century and knows our history well. As we look forward, it will be an interesting time to look back as well. The issue of someone writing a history of the technology that the society canvases has been broached at the last two AdCom meetings. I, and others, hope that we can enlist the services of a historian to take up this formidable task. Perhaps you are personally interested in putting together a history of our society and wish to work with a historian. Please feel free to contact me () for information on potential funding sources for such an endeavor which include the National Endowment for the Humanities and the Sloan Foundation.

Many accolades should be handed out this time around. Five individuals associated with the society received the commendation of IEEE Fellow recently and Meirion Lewis was awarded the BE by Queen Elizabeth II.

Things are moving ahead with the Digital Archive project and much new information is appearing on the UFFC website (). Be sure to visit it if you have not done so lately.

We wish to thank Dennis Pape for taking over as Membership Chair and to Gerry Blessing for taking over as Secretary-Treasurer. Gerry replaces Gary Montress who has served in this capacity for any years with professionalism and good humor. If you know Gary, you are aware that, among his many accomplishments, he is the world's foremost authority on Theoretical and Applied Dilbert memes. If there is anything in that comic strip which you do not fully understand or resonate with, Gary is the man to enlighten you. Gary, we all wish to thank for the fine job you have done as Secretary-Treasurer. It would not have been the same without you.

William Hunt



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