

# **UFFC Newsletter**

**Ultrasonics, Ferroelectrics, and Frequency Control**

Port d'escale du Vieux-Port  
Marina at the Old Port

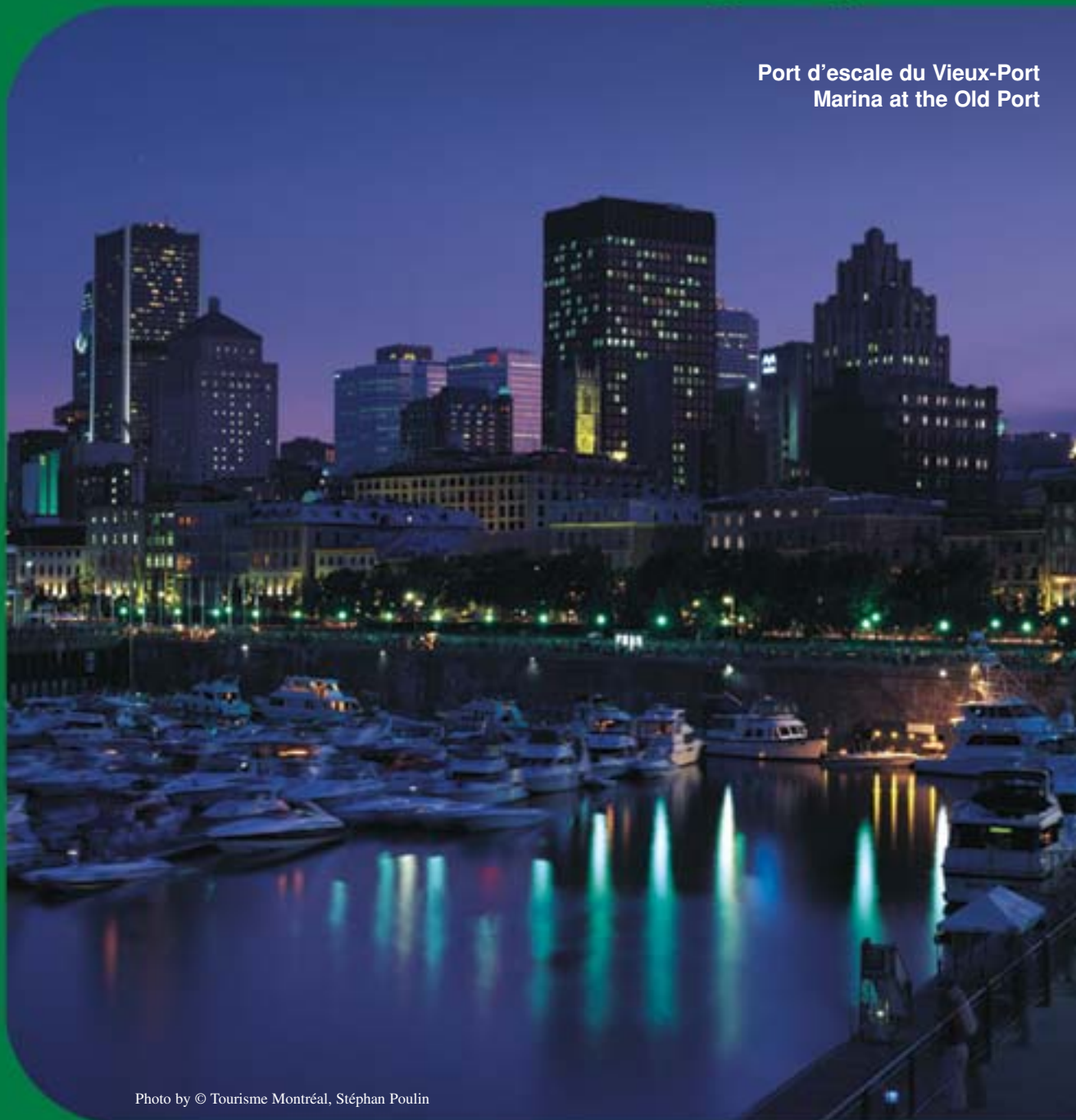


Photo by © Tourisme Montréal, Stéphan Poulin

Dear Society Colleagues:

Greetings! I would ask that you please take a couple minutes to read this message – first about myself as your new president and then about a couple items important to our Society.

In telling you who I am, I would introduce myself as an IEEE volunteer who has been asked to lead. As with many of you, my volunteer work has been directly related to my career. That career began as a college professor, continued as a scientist with the U.S. Dept. of the Navy, and concluded as an ultrasonic researcher with the National Institute of Standards and Technology for the past 23 years.

I became involved with the IEEE after graduate school when I attended my first (UFFC) Symposium in 1976. I found the symposium beneficial to my work, instigating my continued involvement with the IEEE. Briefly, my IEEE career has taken me from participation in my local Society chapter, to serving on Technical Program and Symposium Organizing Committees, to being an Associate Editor, and then two years ago to being made President-elect.

Let us focus briefly on two items that are important for our present and for our future. First, I ask - why be involved with the IEEE? And second, I salute our UFFC Society's 50th Anniversary Celebration.

I really ask you: why spend your time, energy and money with the IEEE? Some may say for the symposia, others for the publications, others for the association with respected colleagues. They are good reasons. But I would suggest that you make the commitment in order to lead – by working with like-minded peers, by helping others through your



ideas, by mentoring. That is, to share by what you have.

Many have spent careers simultaneously volunteering with the IEEE and with our Society. These people are why many of us are involved. I wish to thank them for their (continuing) example, for their mentoring, for their professional leadership. They have made a very good Society from which we benefit. I ask that you step into the shoes of those who are completing their contributions, to continue the work for a productive IEEE. Where the shoes appear big, consider expanding yourself to fill them. For possible steps, contact myself or any person

you may know in the organization.

This year, 24-27 August, we celebrate our 50th Anniversary in Montreal, Canada, with a combined Conference of the three major technical groups that make up our Society: Ultrasonics, Ferroelectrics, and Frequency Control. Our present-day UFFC Society originated in 1953 when a group of foresighted engineers was motivated to form a professional organization to service a growing population of workers in the field of ultrasound. That focus has spread over the years to include the fields of ferroelectrics and frequency control.

Do plan to participate in this conference which will be preceded by a series of Short Courses and Tutorials on 23 August, and observe how we may serve each other.

I thank you for your time and attention.

Sincerely,  
Gerry Blessing  
UFFC President, '04-'05  
[g.blessing@ieee.org](mailto:g.blessing@ieee.org)

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## 50th Anniversary Joint Conference

### 2004 IEEE International Ultrasonics, Ferroelectrics and Frequency Control 50th Anniversary Joint Conference 24 – 27 August 2004 Montréal, Canada



As we approach the Joint Conference of the UFFC in Montréal in August of this year, I look forward to the opportunity available to us for this 50th anniversary celebration. I hope to give you here an advanced view of what to expect.

The organization of the 2004 UFFC Joint Conference began in June 2000 at the Queen Elizabeth Hotel in Montréal. Eight members of the UFFC met to discuss ground rules, strategies and to experience the city of Montréal. A key decision was that our meeting would be a joint conference rather than a co-located conference. We met recently as a larger group in Chicago to further define the details of the meeting.

One of the things that we, as conference organizers, frequently discuss is: what is the same and what is different? In reality, the Joint Conference will derive its format from elements of all three Symposia.

The Conference will begin, on Monday August 23, 2004 with short courses and tutorials. Plenary, technical and poster sessions are planned for Tuesday through Friday (August 24-27).

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#### Venue

We will meet in the Palais des Congrès, Montréal's convention center located in the heart of Montréal and a short walk to the Old Port of Montréal or to Old Montréal section of the city. The sheer size of the Conference with more than 1200 attendees and 11 parallel technical sessions, necessitated that we think beyond large hotels for our Conference. Nearby Montréal hotels, all within walking distance, will be available for sleeping rooms.

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#### Conference Web Site

We are trying to provide as much information as possible on the Conference web site ([www.ieee.org/UFFC-2004](http://www.ieee.org/UFFC-2004)). It's a "work in progress" effort with updates as information becomes available. When abstracts and the program organization are available, we will post them on the Conference web site.

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#### Short Courses and Tutorials

Our focus is to provide a broad selection of topics for the short courses and tutorials and to encourage cross-fertilization amongst the three UFFC groups. Participants may select from more than thirty short courses provided at one fixed price for the entire day. Lunch is included with the tutorial registration.

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#### Technical Sessions

With the three UFFC groups in attendance, we have the unique opportunity to "sample" the technology from our sibling groups. The abstracts of the entire Conference will be available so that attendees can pick and choose the presentations they wish to attend. Invited talks will be 30 minutes in duration; standard presentations will be 15 minutes in duration.

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#### Posters

We have a large space for posters and plan to have them available for viewing for most of the duration of the Conference. There will be specific times designated for author's representation at the poster.



## Social and networking

We plan a lunch on Tuesday, the opening day of the Conference. There will be a reception Tuesday evening and a banquet on Wednesday evening.

## Montréal

Montréal is for me, a city with a vibrant personality. My favorite aspect of Montréal is its broad selection of fine restaurants, many specializing in a specific ethnic cuisine. No matter what your taste, you will find something interesting in Montréal.

## Hotels

We have reserved blocks of rooms at two nearby hotels. Hotel reservations will be handled by the Montréal Tourism

Bureau. An automated form is available on the Conference Web Site.

## Guest Program

I hear that many attendees prefer to separate family and work; family trips and conferences are not a good combination, they say. While I sympathize with this perspective, I encourage you to think about the opportunities for a “working vacation” in Montréal. While we do not plan an elaborate Guest Program, that will be an opportunity for attendee guests to gather at breakfast to plan the days’ activities.

I’m looking forward to an exciting Conference. I hope that you will make your plans to attend and to participate.

**Michael Garvey**  
General Chair

## In Memorium

It is with great sadness that we report the loss of four esteemed members of the UFFC community. We wish to extend our condolences to the family, friends and colleagues of Ivan Vladimirovich Anisimkin, John Elliot May, Jr., Edward G. S. Paige, and Patrick René Pesqué.

### Ivan Vladimirovich Anisimkin

**Ivan Vladimirovich Anisimkin**  
**1976 - 2003**



On the 9th of December 2003 an outstanding young scientist, a research assistant of the Institute of Radioengineering and Electronics of Russian Academy of Sciences Ivan Anisimkin was killed in the terrorist attack near the “National” hotel in Moscow.

I.V.Anisimkin was born on 16 of July 1976 in Ramenskoe, Moscow region. In 1999 he graduated from Moscow Institute of Physics and Technology and joined the Institute of Radioengineering and Electronics of the

Russian Academy of Sciences. In 2002 he received the Candidate of Sciences (PhD) Degree for his brilliant work “Influence of Sorption and Thermal Processes on Acoustic Wave Propagation in Solid State Structures”.

Ivan Vladimirovich was a promising scientist. When he was still a student he published 3 scientific articles on the investigation of thermal exchange in subsonic gas fluxes. His three-year scientific work in IRE RAS was successful and the findings were summed up in his PhD thesis. During the years in the IRE RAS, I.V.Anisimkin published 26 scientific articles valuable for physics of condensed matter, physical acoustics, monitoring of the environment, analytical chemistry, biology and a number of interdisciplinary sciences. He was the first to apply in these research areas all the variety of acoustic oscillations that enabled him to obtain multiparametric information about environment and processes accruing on the surface of solids. He developed new experimental techniques for the investigation of absorption and desorption in gas media, created high-sensitive detectors and sensor grids for the systems for identification of gaseous and liquid substances. Ivan was the first to study the sensitivity of normal plate modes to external influence and reveal far greater differences in the reaction of these waves than it had been known before.

His wish to achieve his aim and thoroughness of his work were striking. Though acoustic oscillations in piezoelectric crystals had been investigated for many years I.V.Anisimkin opened up quasilongitudinal normal modes anew, the tenth type of acoustic oscillations which can exist in solids as an eigen-solution of the boundary problem. This last result obtained by I.V.Anisimkin is of great importance for physical acoustic and it certainly should be included into special courses of physics.

I.V.Anisimkin was a young scientist but his research activities and reports at conferences made him well known

to Russian and foreign scientists. His report at the International Acoustic Congress in Rome in 2001 was voted as one of the best ones.

I.V.Anisimkin was awarded a number of Russian and international scientific grants and he was a laureate of the National Science Support Foundation "Outstanding Scientists, Doctors, and Candidates of Science". The news that I.V.Anisimkin had become the prize-winner of the tender of President of the Russian Federation grants on the state support of young Russian scientists came after his death.

I.V.Anisimkin was a person of manifold gifts: he spoke four languages, was fond of music, was interested in history and culture of Russia, Italy, Greece, India, China and the Middle East. Everybody knew Ivan as a modest, glamorous, even-tempered, valid and tactful person; he was an intellectual in one word. Namely these distinguishing features have always been natural of the best representatives of Russian science. His people and friends were glad of his success, his love for life, his youth and future.

I.V.Anisimkin was killed in a terrorist attack in his 27th year. He belonged to those few in number gifted and active people who are the best representatives of the nation. His most important and interesting discoveries were ahead but the valuable contribution to science he had already made during his short and bright life will provide the basis for new scientific findings. He had not become a father; he had not experienced love and many other feelings that make life so marvelous. We will remember this wonderful person forever.

**Friends and Colleagues of I.V.Anisimkin**

## **John Elliot May, Jr.**

**John Elliot May, Jr.,  
1921 - 2003**



(Photo ca. 1958)

John E. May, Jr., IEEE Life Senior Member (SM'55-Life SM'89) a device physicist who was retired from the Lucent Corp. and who was well known to the IEEE UFFC-S community passed away on October 6, 2003 in Dayton, OH. John was both an early founder of the IRE Professional

Group on Ultrasonics Engineering, the predecessor organization to the IEEE UFFC-S, and a contributor to the IEEE through a number of different positions that he held in the organizational structure.

John May was born June 4, 1921 in Yalesville, CT. He received a B.A. in Physics from Wesleyan University in 1943 and then spent three years serving in the U.S. Navy. During this period he was engaged in the development of radio-controlled aircraft and airborne radar, followed by two years at the Naval Research Laboratory, Boston Field Station, in the development of ultrasonic delay lines.

He received an M.A. in Physics from Tufts College in 1949 and in 1952 received his Ph.D in Physics from Yale University. He joined Bell Telephone Laboratories (BTL was the predecessor corporation to Lucent) in October 1952, at the Whippany, NJ location. At BTL, John joined a department headed by Roger Sykes that had a supervisory group under Morton Fagen working on ultrasonic delay lines for military systems. In the course of his career, he stayed in the field of ultrasonic devices working at various times, successively, at the Murray Hill, NJ location, the Allentown PA location, and the Merrimack Valley, CT location, until his retirement from Lucent in 1985. When he moved to Allentown, he became the Head of the Ultrasonic Device Department located there.

In spite of the fact that John May's doctoral dissertation at Yale University was in the field of experimental nuclear physics, his choice of a career path in Ultrasonics was undoubtedly the result of two strong influences in his early life. First, while he was at Wesleyan, John May had Walter G. Cady as his Physics Professor. (Walter G. Cady was internationally famous as an expert on piezoelectricity, as a former President of the IRE, and as the author of the book *Piezoelectricity*, published by McGraw-Hill.) The second strong influence on John was that during his service in the Navy at the Boston Field Station he worked with David L. Arenberg, the famous pioneer in the development of ultrasonic delay lines. In 1956, John May won the PGUE Best Paper Award for his paper entitled "Low-Loss 1,000 Microsecond Ultrasonic Delay Lines."

John May played a critical role in the formation and early growth of the IRE PGUE. He was present at the Administrative Committee (AdCom) meetings almost from the beginning, becoming an elected member of the AdCom in '56. He was the 4th Chairman of the PGUE AdCom, serving from July '58 to June 30, '59.

In the early days of the IRE PGUE, the group organized technical sessions on Ultrasonics that were included into the technical program of the IRE International Convention held in March in New York City. John was one of those who recognized the need for a separate National Ultrasonics Symposium. He along with other AdCom members organized The First National Ultrasonics Symposium, which was held at Stanford University in CA in 1959. John served as the Chairman of The Second National Ultrasonics Symposium held at Columbia University in New York City in 1962.

After his term as Chairman of the AdCom, John con-

tinued to serve as an ex-officio member of the AdCom through the '60s and '70s. He was the Editor of the PGUE Newsletter for several years and served in a number of other capacities related to Ultrasonics Symposiums over the years. In 1984, on the occasion of the 50th anniversary of the founding of the IRE and the 30th anniversary of the founding of the PGUE-UFFCS, he co-authored a paper with Stephen Wanuga and Thrygve R. Meeker, entitled "A Brief History of the Group on Sonics and Ultrasonics"<sup>1</sup>.

In regard to his personal life, John May married Marilyn Hoar in 1945 in Middletown, CT, and was married to her for 53 years until she died in 1998. He was married a second time to Jean Briggs in Ocean Point, ME, and Jean was with him at the time of his death. There are two surviving children who were adopted by John and his wife Marilyn, Marcy adopted in 1955 and Greg adopted in 1958. John loved the ocean, he loved to sail, to travel, and to tinker around the house. He also had a strong affection for the boxer breed of dogs, owning a number of them during his lifetime; and at the end, he was survived by his 13-year old boxer named Mallory.

In the course of his career, John May was a member of a number of professional societies, including the American Physical Society, Sigma Xi, and the Acoustical Society of America in which he was a Fellow. During most of his professional career John was most active in and a strong contributor to various IRE-IEEE organizations. In the course of his service to the IEEE, he made many friends. He will be remembered with affection by all who knew him.

**Allen H.  
Meitzler**

## **Edward G.S. Paige**

**Edward G.S. "Ted" Paige  
1930 - 2004**



It is with regret that we record the death on 20th February 2004 of Edward G.S. Paige, universally known as Ted, who

was a leading light in the initiation, development and exploitation of Surface Acoustic Wave technology. Ted was born on 18 July 1930 in Hastings, England. He received his B.Sc. and Ph.D. degrees in physics from Reading University, England, in 1952 and 1955 respectively.

In 1955, Ted went to work in the Royal Signals and Radar Establishment (RSRE, now known as QinetiQ) at Malvern, Worcestershire, England. RSRE was the principal electronics research facility for the UK Ministry of Defence (MoD), and so concerned itself with a wide range of technologies and their applications. At RSRE he worked on transport and optical properties of semiconductors. From about 1965 to 1977, Ted was the leader of the SAW group in RSRE. In the 1960s, Ted was one of a small group of people who were inspired to imagine that a strange new technology based on Rayleigh waves might have an important practical future.

In RSRE the SAW group under Ted studied a wide range of topics, initiating many of them, including materials, diffraction, pulse compression, multi-strip couplers (and various derived components), oscillators, resonators, convolvers and Surface Skimming Bulk Waves (SSBW's). SSBW's on quartz later became Surface Transverse Wave devices, while the SSBW on rotated Y-cut lithium tantalate was later recognized as a leaky wave which is now universally used in mobile phone RF filters. An early and important practical success was the development of the SAW pulse compression filters used in a UK high-resolution airborne search radar. This and other achievements were recognized as early as 1973, when Ted and others received the prestigious UK MoD Wolfe award, and subsequently led to a Queen's Award for technology jointly with Racal/MESL.

In addition to internal work, Ted was also a prime mover in the sponsorship of MoD-funded projects in UK industry and universities. In this role he was very effective in encouraging and supporting the SAW work throughout the UK. Thus the substantial achievements in UK SAW, both inside and outside RSRE, owe much to Ted's efforts. Many SAW workers throughout the country had professional interactions with him, and he was widely regarded with both respect and affection.

In 1977 he moved to take a chair in Electrical Engineering at Oxford University, where he continued to undertake SAW research on pulse compression, SSBW's and dot-array devices, in parallel with new ventures into optics. Ted was a Fellow of the Royal Society in London and a co-recipient of the Hewlett-Packard award for his initiatives in SAW development. He was also a Fellow of the Institute of Physics and a Fellow of the Institute of Electrical Engineers.

He will be remembered by many people world wide for his keen intellect and personal kindness. He was an inspiration to all in his group and to many outside it.

**Meirion Lewis  
David Morgan**

## Patrick René Pesqué

**Patrick René Pesqué**  
**1955 - 2003**



Dr. Pesqué (Patrick) began his career in Ultrasound in 1981 at the Philips research labs in France (Laboratoires d'Electronique Philips). He joined Philips after completing his Ph.D. in Physics and Signal Processing at Ecole Nationale Supérieure de Physique. He then held engineering leadership positions at Philips Ultrasound in California, at ATL in Seattle, and at GE Medical Systems, most recently serving as the Global Probes Engineering Manager in Scottsdale. Patrick made many significant contributions to Ultrasound. He invented new techniques for Color Flow imaging and quantification. He did fundamental work on matrix array transducers, in 3D ultrasound, compounding and almost every other aspect of ultrasound imaging.

As an innovator and great technical leader, Patrick loved his work. He was always hands-on, creative, and a mentor to others. He has at least 38 published articles; and including foreign counterparts. He has 61 patents. His patents have been referenced by over 200 other patents in the field.

His articles have been referenced at least that many times. He had patents related to Harmonics as far back as 1985, long before it became common in our industry. Patrick's contribution to Ultrasound is immense.

Patrick was born to Roland and Antoinette Pesque in Nancy, France and grew up in Le Grau du Roy with two younger brothers, Dominique and Alain, and a younger sister Danielle. His hobbies were guitar and math. While attending college he played in a rock band. He met his wife Brigitte in 1974 while playing for a town festival while on break from College.

Patrick loved good food, good wine, and a house full of people; he was a fantastic host. He learned cooking and hospitality from his father Roland, who managed food logistics for resorts in the South of France, and also loved to cook. Many of us have had the pleasure of being his guest. Patrick and Brigitte opened up their home to many, and he sometimes spent days preparing the food. Patrick also loved spending time outdoors with his daughter Julie and son Adrian. He always owned a full-size van that they could use for camping trips to see the brilliant stars from Death Valley, the beaches in Mexico, the peaks of the Sierras, and even the Saguaro cactus in Arizona. His love for the outdoors and cooking came together when he would prepare fish that he caught deep-sea fishing.

Patrick loved life: he loved family, friends, work, food, wine, music, laughing, adventure and nature. Although his life has ended too soon by our counting, he experienced more of life than most people do in twice the time. He leaves behind a legacy in this industry, and in his family. The world will benefit from his life and work for years to come, and we continue to benefit from his memory.

**Steve Miller (GE Medical Systems)**

**Jacques Souquet (Philips Medical Systems)**

<sup>1</sup> *IEEE Transactions on Sonics and Ultrasonics*, Vol. SU-31, No. 6, November 1984, p. 536.

## Ultrasonics

### 2003 IEEE International Ultrasonics Symposium 5 – 8 October 2003 Honolulu, Hawaii

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#### Message from the Chair

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Thank you all for a very successful Ultrasonics Symposium last October. We had a near record attendance with many families attending for a good time in the sun. Many people helped put together an outstanding meeting in the Hawaiian sun. Special thanks to Helen Routh the Technical Program Chair who, with the committee of about 60 people, put the

technical program together. The Ultrasonics Symposium remains one of the premier high-quality ultrasound symposiums because of the large number of high quality abstracts submitted to the meeting. Also, special thanks to Bill O'Brien for keeping all of us on track with his huge background experience in running meetings. Kirk Shung put together an outstanding set of courses. Herman van de Vaart kept us on track for a comfortable surplus with his account-



ing and check paying. Don Yuhas got the Proceedings CD finished in record time. David Cheeke organized the outstanding exhibits. Thanks again to all involved.

**James F. Greenleaf**  
**General Co-Chair**

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### Attendance

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The attendance figures for 2003 IUS in Hawaii:

Full registrants:	442
Students/Retirees	177
One day registrants:	17
Complimentary:	14
Guests:	70

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Total:	720
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121 full registrants and 77 students signed up for the Short Courses for a total of 198.

Attendees represented 35 countries, 54 percent of which were from outside the United States. Fourteen percent of the attendees were from Japan, seven percent from Germany, six percent from France, three percent each from Korea and Canada, and two percent each from The Netherlands, Norway, Italy and the United Kingdom.

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### The Plenary Session

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The plenary session opened the conference on Monday morning. Here, General Co-Chairs Jim Greenleaf and Bill O'Brien officially declared the symposium open. Technical program chair, Helen Routh, introduced the technical program. Clemens Ruppel, Vice-President for Ultrasonics welcomed all the attendees and invited them to become more involved. UFFC Society President, Ahmad Safari, and Awards Committee Chair, Reinhard Lerch, presented the 2003 society awards. (See UFFC Awards in this newsletter.) The presentation of the Rayleigh Award, the highest honor in the Ultrasonics community, was made at this time. (See Rayleigh Award following this article.)



**Bill O'Brien, General Co-Chair**



**Helen Routh, Technical Program Chair**



**Clemens Ruppel, Vice-President for Ultrasonics**



**Jim Greenleaf, General Co-Chair**



**President, Ahmad Safari**





**Reinhard Lerch, Awards Chair**



**Audience**



**Jim Greenleaf**



**Larry Crum asking a question**



**Michel Versluis**



**Michel answering questions**



**Audience**



**Gerry Blessing**





**Jim Greenleaf**



**Reinhard Lerch and Ahmad Safari presenting certificates to the TPC**

To close the plenary session Jim Greenleaf introduced Michel Versluis, the plenary speaker. Michel presented a very engaging talk on the sound of snapping shrimp which “originates solely from the collapse of a cavitation bubble that is generated by the fast water jet resulting from the rapid claw closure.” More on Michel’s work can be found at his website: <http://stilton.tnw.utwente.nl/people/michel/index.htm>

### Technical Program

The technical program took place from Monday morning through Wednesday afternoon. The program was arranged by our five Technical Program Committee (TPC) groups: (1) Medical Ultrasound; (2) Sensors, NDE & Industrial Applications; (3) Physical Acoustics, (4) Surface Acoustic Waves, and (5) Transducers & Transducer Materials, during its summer TPC meeting in Chicago. Thanks for their great job are due to all 2003 TPC members and in particular to the five TPC Vice-Chairs representing each TPC area **John Hossack, David Cheeke, Bikash Sinha, Donald Malocha, and Scott Smith**. President Ahmad Safari officially congratulated these and the other members of the organising committee and the entire Technical Program committee at the President’s reception on Monday evening.



**John Hossack, Group 1 Chair, and Ahmad Safari**



**David Cheeke, Group 2 and Exhibits Chair, and Ahmad Safari**



**Helen Routh conducting the Technical Program**



**Herman van de Vaart, Symposium Finance Chair, and Ahmad Safari**



**Kirk Shung, Short Courses Chair, with Ahmad Safari**



**Ahmad Safari and Don Yuhas, Proceedings Editor – They went shopping together**



**Don Malocha, Group 4 Chair, and Ahmad Safari**

## Student Paper Competition

This is the third year the Ultrasonics Technical Program has integrated a student paper competition. The Technical Program Committee (TPC) selected student paper finalists in each of the major technical groups. The student paper finalists presented their papers in a special poster session on Monday 6 October. The posters remained up for the duration of the conference. Review committees from each of the technical groups evaluated the papers and selected the winners. Many of the papers were also given in an oral session.

This year there were 24 finalists, eight from Group 1 – Medical Ultrasonics - and 4 from each of the other technical groups. Paper P1A-13 by R. Nayak, V. Gupta, and K. Sreenivas from the University of Delhi was a finalist in Group 3 but was withdrawn for lack of attendance. Congratulations to all!

## Finalists Group 1 – Medical Ultrasonics



**Dustin E. Kruse,  
University of California  
at Davis (P1A-1)**



**Michaelann  
Shortencarrier,  
University of California  
at Davis (P1A-2)**



**Zhen Xu, University of  
Michigan (P1A-3)**



**Stephen Hsu, Duke  
University (P1A-4)**



**Jeremy Dahl, Duke  
University (P1A-5)**



**Kenneth Gentry, Duke  
University (P1A-6)**



**Marwa J. Zohdy,  
University of Michigan  
(P1A-7)**



**Richard T. Rhee,  
University of Michigan  
Medical Center (P1A-8)**

P1A-1 New Imaging Strategy Utilizing Wideband Transient Response of Ultrasound Contrast Agents. D. E. Kruse\*<sup>1</sup>, C. K. Yeh<sup>2</sup>, and K. W. Ferrara<sup>1</sup>, <sup>1</sup>University of California, Davis, CA, <sup>2</sup>National Taiwan University, Taipei, Taiwan

P1A-2 Ultrasound Radiation Force on Acoustically-Active Lipospheres for Drug Delivery. M. Shortencarrier\*<sup>1</sup>, P.



Dayton<sup>1</sup>, D. Pearson<sup>1</sup>, P. Schumann<sup>2</sup>, R. Zutshi<sup>2</sup>, T. Matsunaga<sup>2</sup>, and K. Ferrara<sup>1</sup>, <sup>1</sup>University of California at Davis, <sup>2</sup>ImaRx Therapeutics, Inc

P1A-3 Controlled Ultrasound Tissue Erosion. Z. Xu<sup>\*1</sup>, A. Ludomirsky<sup>2</sup>, L. Eun<sup>2</sup>, T. L. Hall<sup>1</sup>, B. C. Tran<sup>1</sup>, J. B. Fowlkes<sup>1</sup>, and C. A. Cain<sup>1</sup>, <sup>1</sup>Department of Biomedical Engineering, University of Michigan, <sup>2</sup>Division of Pediatric Cardiology, University of Michigan

P1A-4 Shear Wave Anisotropy Imaging. S. Hsu<sup>\*</sup>, M. Palmeri, K. Nightingale, S. McAleavey, J. Dahl<sup>1</sup>, and G. Trahey, Duke University

P1A-5 Off-Axis Scatterer Filters for Improved Aberration Measurements. J. J. Dahl<sup>\*</sup> and G. E. Trahey, Duke University, Durham, NC

P1A-6 Integrated 3D Intracardiac Echo and Ultrasound Ablation. K. L. Gentry<sup>\*</sup> and S. W. Smith, Duke University Department of Biomedical Engineering

P1A-7 An Ultrasonic Method to Measure Effective Temperature in the Vicinity of Laser-Induced Optical Breakdown. M. J. Zohdy<sup>\*</sup>, C. Tse, M. O'Donnell, and J. Y. Ye, University of Michigan, Ann Arbor, MI

P1A-8 Acoustic Modulation of Contrast Agents for Hepatic Flow Differentiation. R. T. Rhee<sup>\*</sup>, J. M. Rubin, P. L. Carson, and J. B. Fowlkes, University of Michigan Medical Center

## Finalists Group 2 – Sensors, NDE, and Industrial Applications



**Muhammet Kursad Araz, Cornell University (P1A-9)**



**Kouki Nagamune, Himeji Institute of Technology (P1A-10)**



**Makiko Kobayashi, McGill University (P1A-11)**



**Thomas B. Pollard, University of Maine (P1A-12)**

P1A-9 Ultrasonic Separation in Microfluidic Capillaries. M. K. Araz<sup>\*</sup>, C. H. Lee, and A. Lal, SonicMEMS Laboratory, Cornell University, Ithaca, NY

P1A-10 An Ultrasonic Evaluation for Degradation of Insulating Oil Using Fuzzy Inference. K. Nagamune<sup>\*1</sup>, K. Taniguchi<sup>2</sup>, S. Kobashi<sup>1</sup>, K. Kondo<sup>1</sup>, and Y. Hatai<sup>1</sup>, <sup>1</sup>Graduate School of Engineering, Himeji Institute of Technology, <sup>2</sup>Kinden Corporation

P1A-11 High Temperature Ultrasonic Transducers for Monitoring of Micro-molding. M. Kobayashi<sup>\*1</sup>, C.-K. Jen<sup>2</sup>, C. Corbeil<sup>2</sup>, Y. Ono<sup>2</sup>, H. Hebert<sup>2</sup>, and A. Derdouri<sup>2</sup>, <sup>1</sup>McGill University, <sup>2</sup>IMI, National Research Council of Canada

P1A-12 Pure SH SAW on Single Crystal  $\text{KnbO}_3$  for Liquid Sensor Applications. T. B. Pollard<sup>\*</sup>, M. Pereira da Cunha, and J. F. Vetelino, University of Maine

## Finalists Group 3 – Physical Acoustics



**Philipus Feenstra, University of Twente (P1A-14)**



**Tatsuya Koyama, Keio University (P1A-16)**



**Alexandre Reinhardt, Université de France-Comte (P1A-15)**

P1A-13 Optical Interactions in  $\text{ZnO-TeO}_2$  Bi-layer for AO Device Applications. R. Nayak<sup>\*</sup>, V. Gupta, and K. Sreenivas, Department of Physics and Astrophysics, University of Delhi, Delhi - 110008, India

P1A-14 Analysis of a Surface Acoustic Wave Motor. P. J. Feenstra<sup>\*</sup> and P. C. Breedveld, University of Twente, Enschede, Netherlands

P1A-15 Dyadic Green's Function of a Laminar Plate. A. Reinhardt, V. Laude, and S. Ballandras, LPMO/CNRS

IMFC, Universite de France-Comte, 32 Av. de l'Observatoire, 25044 Besancon Cedex, France

P1A-16 Development of an Ultrasonic Clutch. T. Koyama<sup>\*1</sup>, K. Takemura<sup>2</sup>, and T. Maeno<sup>1</sup>, <sup>1</sup>Keio University, Yokohama, Japan, <sup>2</sup>Tokyo Institute of Technology, Yokohama, Japan

### Finalists Group 4 – Surface Acoustic Waves



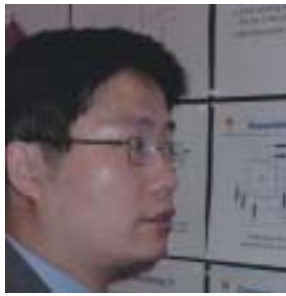
**Kimmo Kokkonen,**  
Helsinki University of  
Technology (P1A-17)



**Franz Kubat,** Clausthal  
University of  
Technology (P1A-18)



**Huaiying Wu,**  
Rutgers  
(P1A-19)



**Hao Dong,** University of  
Central Florida  
(P1A-20)

P1A-17 Phase-Sensitive Absolute-Amplitude Measurements of Surface Waves Using Heterodyne Interferometry. K. Kokkonen<sup>\*1</sup>, J. V. Knuuttila<sup>1</sup>, V. P. Plessky<sup>2</sup>, and M. M. Salomaa<sup>1</sup>, <sup>1</sup>Materials Physics Laboratory, Helsinki University of Technology, Espoo, Finland, <sup>2</sup>GVR Trade SA, Neuchatel, Switzerland

P1A-18 Distribution of the Dynamic Strain and Stress Components within a Layered-Film of a SAW Resonator on  $LiTaO_3$ . F. Kubat<sup>\*1</sup>, W. Ruile<sup>2</sup>, T. Hesjedal<sup>3</sup>, and L. Reindl<sup>1</sup>, <sup>1</sup>Institute of Electrical Information Technology, Clausthal University of Technology, Germany, <sup>2</sup>EPCOS AG, Munich, Germany, <sup>3</sup>Paul Drude Institute for Solid State Electronics, Berlin Germany

P1A-19 SAW Analysis of the  $Mg_{x-1}Zn_1-xO/SiO_2/Si$  System. H. Wu<sup>\*</sup>, N. W. Emanetoglu, P. Wu, Y. Chen, and Y. Lu, Rutgers, the State University of New Jersey, New Brunswick, NJ

P1A-20 Design of Miniaturized RF SAW Duplexer Package. H. Dong<sup>\*1</sup>, T. X. Wu<sup>1</sup>, C. A. Finch<sup>2</sup>, B. P. Abbott<sup>2</sup>, and K. S. Cheema<sup>2</sup>, <sup>1</sup>University of Central Florida, Orlando, FL, <sup>2</sup>SAWTEK Inc., Apopka, FL

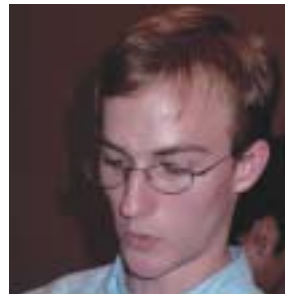
### Finalists Group 5 – Transducers and Transducer Materials



**Yong Li Huang,**  
Stanford University  
(P1A-21)



**Jesse T. Yen,**  
Duke University  
(P1A-22)



**Jeff McLean,** Georgia  
Institute of Technology  
(P1A-23)



**Joshua Knight,** Georgia  
Institute of Technology  
(P1A-24)

P1A-21 Collapsed Region Operation of Capacitive Micromachined Ultrasonic Transducers based on Wafer-Bonding Technique. Y. Huang<sup>\*</sup>, B. Bayram, A. S. Ergun, E. Haeggström, C. H. Cheng, and B. T. Khuri-Yakub, Edward L. Ginzton Laboratory, Stanford University, Stanford, CA 94305

P1A-22 Real-Time Rectilinear 3-D Ultrasound Using Receive Mode Multiplexing. J. T. Yen<sup>\*</sup> and S. W. Smith, Duke University

P1A-23 Interdigital Capacitive Micromachined Ultrasonic Transducers for Microfluidic Applications. J. McLean<sup>\*</sup> and F. L. Degertekin, Georgia Institute of Technology, Atlanta, GA

P1A-24 Fabrication and Characterization of cMUTs for Forward Looking Intravascular Ultrasound Imaging. J. G. Knight<sup>\*</sup> and F. L. Degertekin, Georgia Institute of Technology

### The Winning Student Papers

The six winners of the Student Paper Competition each received a certificate and a cash award. President Ahmad Safari and Technical Program Chair Helen Routh presented the awards during the Social Gathering October 6th on the Lagoon Green at the Hilton Hawaiian Village during the 2003 IEEE Ultrasonics Symposium.

## Student Paper Winners



**Helen Routh announcing the Student Paper winners**



**President Ahmad Safari**



**Kimmo Kokkonen, Helsinki University of Technology, for paper P1A-17**



**Dustin E. Kruse, University of California at Davis, for paper 1A-1**



**Muhammet Kursad Araz, Cornell University, for paper P1A-9**



**Jeff McLean, Georgia Institute of Technology, receives the award from Ahmad Safari for paper P1A-23**



**Richard Rhee, University of Michigan Medical Center, receives the award from Ahmad Safari for paper P1A-8**



**Alexandre Reinhardt, Universite de France-Comte, accepts the award from Ahmad Safari for paper P1A-15**

## Student - AdCom Breakfast

On the second day of the Symposium the UFFC AdCom sponsored a Student Breakfast that started at 7:00 am. Yes, the students actually got up early for Breakfast. In fact, Hui Yao from the University of Minnesota showed up 30 minutes early. Prizes were awarded to the first few students to arrive and UFFC pens were raffled.

[The editor apologizes for missing names or misidentification. I tried my best to identify everyone from their nametags – digital photography is wondrous.]



**Tom Shrout, Sorah Rhee, Kevin Snook, and Emanuel Gottlieb**





**Marj Yuhas, Hui Yao, and Huaiying Wu**



**Bob Potter, Jeremy Thiele, Mauricio da Cunha, and Eric Berkenpas**



**Mauricio da Cunha, Eric Berkenpas, Thomas Pollard, and Seshardi Srinivasan**



**Jackie Hines, Makiko Kobayashi, and Jaleh Safari**



**Ahmad Safari, John Kosinski, Koray Akdogan, and Kullervo Hynenen**



**Rick Puccio**



**unidentified and Gerry Blessing**



**unidentified and Yosuke Nakagawa**



**unidentified and Richard Rhee**



**Cyril Thybaut, Mike Garvey, and Jeremy Dahl**



**Manfred Hofer and Alexander Streicher**



**Gianmarco Pinton and Bernie Tittmann**



**Reinhard Lerch licked his plate clean!**



**Hui Yao and Huaiying Wu**



**Hu Changhong**





**Marj Yuhas**



**Eric Berkenpas**



**Jeremy Thiele**



**Seshadri Srinivasan**



**Gianmarco Pinton**



**Thomas B. Pollard**



**Jeremy Dahl**





Mike Garvey



Cyril Thybaut



unidentified and Sabine ??



Hui Yao



The whole group part 1



The whole group part 2



The whole group part 3



The whole group part 4

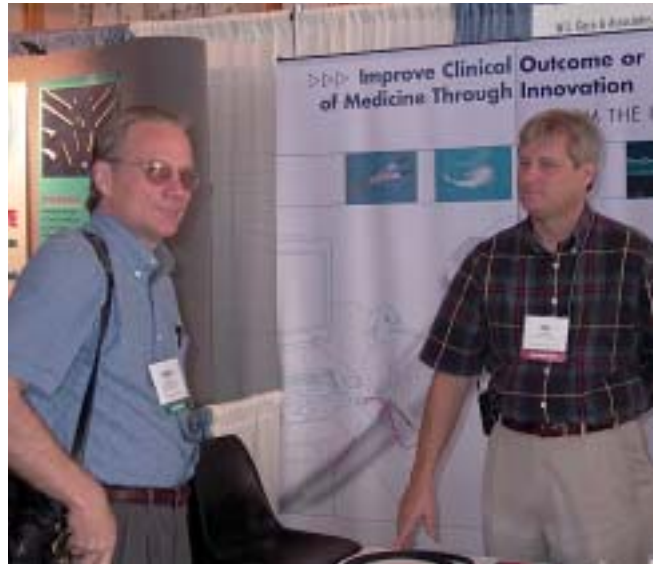
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### At the Exhibits

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## Around the Symposium



Jeff Powers and Michel Versluis enjoy coffee



Where do we go now? – Don Yuhas, Helen Routh and David Cheeke



Gerry Blessing and Roger Tancrell pause to catch up



Chatting during break



Baris Barum and Levent Degertegin – We're just resting!



Dick White (far right) at registration





**Larry Lynnworth (middle) waiting to register**



**At the message board**



**David Cheeke and Ahmad Safari**



**Manfred Hofer making a point with Alexander Streicher looking on**



**Thresa Hickernell and Ahmad Safari**



**Helmut Ermert with colleagues**



**Bernie Tittmann, David Cheeke, John Larson and Clemens Ruppel sharing a laugh**



**Enjoying the break**



**Javier De Ana and Timothy Hall at break**



**At the sessions**



**Thresa and Fred Hickernell at the Plenary session**



**At the sessions**



**At the sessions**



**Roger Tancrell listening intently**



**At the sessions**



**At the sessions**





**At the sessions**



**At the sessions**



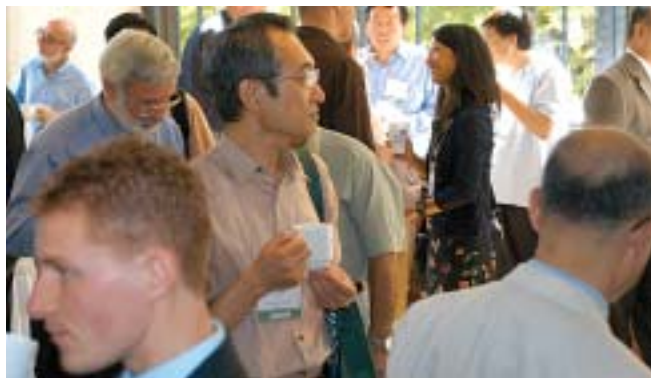
**Guenter Martin with colleagues**



**David Mills**



**John Fraser**



**Enjoying the coffee break**



**Philipus Feenstra and Rachel Chow chat during a break**



## At the Luau

The Luau photos are courtesy of Bob Potter.



Mary Lou and Gerry Blessing with David Hecht



Clemens Ruppel and Christine



Having a good time!



Having a Better time!



The Ultrasonic Dancers



Time to eat



At the luau



More Ultrasonic Dancers





**Victor Plessy and Lew Claiborne**



**Hawaiian Dancers**



**Jackie Hines and friends**



**Asger and Salma Jaffers**



**Where's Dinner?**



**Jim Greenleaf and Bill O'Brien**



**Marj Yuhas, Loretta Spiedel and Janice Dodd**



**Bob and Cheryl Potter**



**Reinhard and Elke Lerch**



## Rayleigh Award

The Rayleigh Award is presented by the IEEE UFFC Ultrasonics Committee recognizing meritorious service to the UFFC Society in the field of Ultrasonics. The achievement may be in technical innovations, research, education, publications and related professional endeavors. Typically, the recipient will have demonstrated these accomplishments over a sustained period of time. An Awards Committee consisting of the Rayleigh Award Chair, the Technical Program Chair and the Technical Program Vice-Chairs will make selection in the spring of each year.

The award consists of an honorarium of \$1,000, a plaque and a certificate.

### 2002 Rayleigh Award Recipient

The UFFC Society offers its congratulations to the recipient of the 2003 Rayleigh Award, Dr. Richard M. White "For pioneering contributions in ultrasonics to the development of SAW interdigital transducers, laser ultrasonics, and Lamb wave acoustic sensors and for continuing contributions to



David Cheeke Introducing the Rayleigh Award



Fred Hickernell congratulating Dick White



Dick White accepting the Ultrasonics Rayleigh Award



(l-r) Fred Hickernell, David Cheeke, Dick White, and Ahmad Safari  
the field of education."



Fred Hickernell presenting Laudatory remarks for  
Dick White

The 2003 Rayleigh Award was presented in October 2003 during the opening ceremony of the International Ultrasonics Symposium in Honolulu, Hawaii. The following laudation was presented by Dr. Fred S. Hickernell.



## Dick White – Rayleigh Award

What common connection is there between cross country skiing, a harpsichord, a banjo, and a panda? They all represent interests of this year's recipient of the Rayleigh Award, Professor Richard M. White of the University of California, Berkeley, hereafter known in this introduction as Dick White. Dick, a Harvard graduate, started his career with General Electric in 1956 and in 1962 moved to the University of California, Berkeley, where he has remained for the past forty years. In 1963, 40 years ago, Dick published a paper in the *Journal of Applied Physics* dealing with what are now termed thermoelastic waves which has been cited over 350 times. In 1968-1969 under University and Guggenheim Foundation support, he studied high frequency effects in solids at the Technische Hochschule in Munich, Germany. He has authored numerous publications and a major book publication on acoustic wave sensors by Dick and six other collaborators was published in 1997. Dick has been a member of IEEE since 1963 and became a Fellow in 1972. In 1988 he received the UFFC Society Achievement award and in 2000 the Cady Award from the Frequency Control group. Dick has been honored with the IEEE Cleo Brunetti Award, is a member of the National Academy of Engineering, an AAAS Fellow, and presently a Director of the Berkeley Sensor and Actuator Center which he co-founded in 1986.

Our paths have converged several times over the years, at Berkeley, in Russia, but primarily at the annual Ultrasonics Symposium. Dick has been a familiar, but modestly unassuming figure at our Ultrasonic Symposia over the past 38 years. Dick and his students have made major contributions in the areas of bulk and surface wave ultrasonic phenomenon and devices, and acoustic sensors with some 35 papers recorded in Ultrasonic Symposia. In 1965 at the 5th Ultrasonics Symposia I listened to a paper entitled "Observations of Surface-Wave Amplification and Attenuation." The first sentence of the abstract read, "Surface elastic waves have been generated and detected by transducers consisting of interleaved conducting combs vacuum-deposited on one surface of single crystal CdS and quartz." The paper appeared in the *Applied Physics Letters* shortly thereafter. The buzz however was about the interdigital transducer. It was just a month earlier that Dick White and Fred Voltmer published an article in *Applied Physics Letters* on the excitation of Rayleigh Waves on quartz using the interdigital transducer. That was eighty years after Lord Rayleigh put forth in 1885 his mathematical treatise on the existence of surface acoustic waves. The article, which has been referenced well over 200 times, initiated the SAW era and fortunately for us, was not discovered and patented by some industrial laboratory or business entity. We all have enjoyed that benefit. His early work with surface elastic waves was followed by a 39 page review article in the *Proceedings of the IEEE* in August of 1970, which awakened the world to the possibilities of signal processing with Rayleigh Waves. It has an extensive list of references.

Dick is a person who sees "around the corner." It was his

ability to see what was already out there, what was already known, what everyone took for granted and then to let us know the possibilities of what was just around the corner. It opened up new vistas when we turned that corner. Dick shared with me at one of our Ultrasonic Symposia that he felt very blessed to have had so many opportunities to be in areas of science, engineering, and education that were new and growing and where contributions could be made. I have



Dick White

been blessed by Dick's work. May I say, on behalf of the engineering community to Dick that many here in this audience and hundreds of others have been greatly blessed by your contributions.

It is always interesting to know what others think of you, but I want to share how Dick looks at himself. If you go to the University of California website you will find this picture. Dick is on your right. To me this picture is worth more than the many words that could be said about how Dick has enjoyed his life as a scientist. Please note that both of those pictured represent endangered species. You'll need to ask Dick about the cross-country skiing, the harpsichord, and the banjo.

It gives me great pleasure on behalf of the IEEE UFFC Society to introduce Dick White as the 2003 Rayleigh Award winner. The citation reads; "For pioneering contributions in ultrasonics to the development of SAW interdigital transducers, laser ultrasonics, and Lamb wave acoustic sensors and for continuing contributions to the field of education."

### Addendum:

Dick White was born April 25th 1930 in Denver, Colorado. He received the A.B., A.M., and Ph.D. Degrees in Applied Physics from Harvard University, Cambridge, Massachusetts in 1951, 1952, and 1956 respectively.

Dick White's publications and patented inventions concern sensors, ultrasonic phenomena and devices, thermo-

elastic effects and microwave electronics. He has co-authored three books: *Electrical Engineering Uncovered*, Prentice-Hall, 1997 (an introductory text); *Acoustic Wave Sensors*, Academic Press, 1997 (a reference book); and *Solar Cells: From Basics to Advanced Systems*, McGraw-Hill, 1984 (a reference and text). He is an IEEE Fellow, recipient of the IEEE Cleo Brunetti award and the Cady award, a Guggenheim fellowship, and the IEEE Society's Achievement Award for contributions to the field of ultrasonics in photoacoustics, surface acoustic wave devices, and sensors. In 1994 White was elected to the National Academy of Engineering and made a Fellow of the American Association for the Advancement of Science, and in 1996 he was made a Chancellor's Professor at Berkeley.

**Fred Hickernell  
Lauder**

## Rayleigh Award Nominations

Nominations may be submitted at any time. A member may submit a nomination by sending the nominees name, affiliation and that person's main contributions, along with the submitter's own name and affiliation to:

Prof. J. David N. Cheeke  
Chair, Rayleigh Award Committee  
Physics Department  
Concordia University  
1455 de Maisonneuve Blvd West  
Montreal, Qc  
Canada H3G 1M8

FAX: 514-848-2828  
e-Mail: [cheeke@alcor.concordia.ca](mailto:cheeke@alcor.concordia.ca)

## Past Recipients of the Rayleigh Award

The first presentation of the Rayleigh Award was in 2001.

**Gerald W. Farnell**, 2001: "for his devoted service and contributions to the IEEE UFFC Society in the field of Ultrasonics and for his original work in the areas of surface wave propagation in anisotropic materials"

**Calvin F. Quate**, 2002: "for pioneering contributions to the development of the scanning acoustic microscope and the atomic force microscope"

## Minutes of the Ultrasonics Standing Committee Meeting 4 October 2003

The Ultrasonics Committee met on 4 October 2003 in Honolulu, Hawaii. The committee meeting followed immediately after the AdCom review of the Ultrasonics Committee. Sixteen members of the UFFC Society partici-

NAME	ROLE
Clemens Ruppel	VP, Ultrasonics and Chair of the Ultrasonics Committee
John Kosinski	Vice-Chair of the Ultrasonics Standing Committee
Bill O'Brien	2003 Symposium General Co-Chair
Jim Greenleaf	2003 Symposium General Co-Chair
Helen Routh	2003 Symposium Technical Program Chair
Michael Garvey	2004 Symposium General Chair
Nico de Jong	2005 Symposium Committee
Stuart Foster	2006 Symposium General Chair
Fred Hickernell	UFFC Junior Past President
Ahmad Safari	UFFC President
Gerry Blessing	UFFC President-Elect
Jackie Hines	UFFC Secretary-Treasurer
Herman Van De Vaart	UFFC Finance Committee Chair
Jan Brown	VP, Publications
Jian-yu Lu	UFFC Transactions Editor-in-Chief
Mauricio Pereira da Cunha	Elected AdCom member

pated in the committee meeting:

The committee received brief reports from the Chairs or Committee Members of the upcoming Symposia for 2004, 2005, and 2006. The status of planning, finances, and contractual issues were discussed. No significant issues were



**Clemens Ruppel**



**Helen Routh**

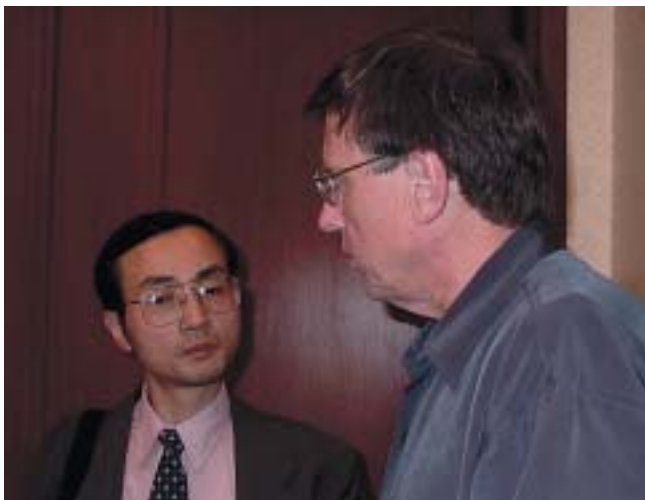




(l-r) Stuart Foster, Mike Garvey, and Nico de Jong



Helen Routh and John Kosinski



Jian-yu Lu and Gerry Blessing

identified.

Nico de Jong gave an update on the Ultrasonics Symposium 2005 to be held in Rotterdam. The 2005 IEEE Ultrasonics Symposium will be held in Rotterdam, the Netherlands,

Sunday September 18th (short courses). Monday 19th through Wednesday 21nd (conference program). The Venue is at the conference centre De Doelen, 1 minute from Rotterdam railway station, 45 minutes by train from the Amsterdam Schiphol international airport (European NWA/KLM hub).

The committee considered proposals for the 2007 Ultrasonics Symposium. John Kosinski presented information and options for having the 2007 Ultrasonics Symposium in New York City. Five different hotels and dates ranging from early September through mid-December were considered. All of the hotels considered are within easy walking distance of Times Square and all of the well-known attractions of mid-town Manhattan. The New York Hilton and Towers, quoting a single room rate of \$159 (in 2003 dollars) for the week of October 28-31, 2007 made the most favorable proposal. It was noted that this rate is \$50 less than the current U.S. government per diem rate, and represents a very aggressive discount. The Symposium would be the primary activity in the Hilton's conference space during that period. The conference space includes five adjoining rooms that are nearly optimal for the five parallel sessions of the Symposium. Substantial space would be available for posters, exhibitions, and receptions. Additional aspects relating to transportation, meal costs and options, entertainment, and the guest program were discussed. Following the discussions, the Committee voted to accept New York City as the site for 2007.

The committee also considered proposals for the 2008 Ultrasonics Symposium. Jian-yu Lu presented information on the suitability of Beijing, China. Aspects and attractions of Beijing were discussed. It was noted that the 2008 Ultrasonics Symposium would follow shortly after the 2008 Beijing Olympics, and it was felt that the Symposium attendees would benefit from the many infrastructure improvements that will be put in place to accommodate the Olympic Games. Descriptions of several hotels were considered, and it was stated that a number of hotels would be appropriate sites for the Symposium. Unfortunately, specific financial information was not included in the presentation, so a final decision was not taken. Rather, a preliminary decision was taken that Beijing is the leading candidate city, and the committee requested that Jian-yu Lu should obtain the necessary financial details to enable a final decision at the next committee meeting.

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## Volunteer

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The meeting concluded with a small discussion regarding the size and membership of the Ultrasonics Committee. The committee currently consists of the Chair and Vice-Chair, the General and Technical Program Chairs of current and future Symposia, and a small number of other UFFC members. It was agreed to aggressively solicit a wider set of volunteers to join the committee, through such means as an announcement in the Newsletter.

**If you would like to join the Ultrasonics Standing Committee please contact us**

John A. Kosinski ([j.a.kosinski@ieee.org](mailto:j.a.kosinski@ieee.org)) and Clemens C.W. Ruppel ([c.c.ruppel@ieee.org](mailto:c.c.ruppel@ieee.org))

**John Kosinski**

## Ferroelectrics

# IEEE UFFC-S Ferroelectrics Committee Meeting Minutes

## November 30, 2003

## Boston, MA

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### FERROELECTRICSCall to Order and Past Minutes

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Eleven members of the Ferroelectrics Committee were present for the Ferroelectrics Committee meeting held in Boston in conjunction with the Fall 2003 Materials Research Society conference. Committee members who attended the meeting included: Susan Trolier-McKinstry, Angus Kingon, Jon-Paul Maria, Eric Cross, Walter Schulze, Andrei Kholkin, Nava Setter, Paul Clem, Eunki Hong, and Mike Garvey. The meeting was called to order by Chair Susan Trolier-McKinstry. Paul Clem, sitting in for secretary Bruce Tuttle, noted that the minutes for the May Nashville meeting were distributed by Bruce and approved electronically by the FE committee members.

Susan noted the primary goal is to have the upcoming ISAF meetings in good order, principally ISAF 2004 (Montreal), but also ISAF 2006 and ISAF 2008.

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### International Symposium on Applications for Ferroelectrics (ISAF) Reports

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#### ISAF 2004:

Walter Schulze, one of the chief organizers of the ISAF 2004 Meeting, presented a progress report prepared by Mike Garvey. ISAF 2004 will be held in Montreal, Canada on August 24-28, 2004. The website is up, and a preliminary call for papers and electronic abstract submission system is in place. Web links to ISAF 2004 are at:

<http://ewh.ieee.org/soc/uffc/> and

<http://ewh.ieee.org/soc/uffc/firstcall.pdf>

A call for papers announcement will be sent out before Christmas, with a follow-up reminder roughly a week before the abstract deadline. The abstract deadline will be February 24, in advance of an AdCom April 15 sorting meeting at the joint Technical Program Committee (TPC) meeting.

The conference will be administered by the professional management company FASS (Federation of Animal Science Societies), which is used by Ultrasonics to run their meetings. FASS's electronic abstract submission works by text cut and paste, and lookup tables for special characters. Susan noted the importance of accepting special characters, and preference for a non-LaTeX submission process, if possible. The FASS submission process enables abstract re-editing, checks on submission status, and generation of IEEE-compatible publications. Its capability for accepting special symbols in the future by an alternative method to LaTeX will be investigated by Mike Garvey.

The conference will begin Monday, August 24 with parallel, concurrent short courses by the U, F, and FC divisions. Each division's course consists of nine 1-hour courses, followed by a 50 minute broad interest/future vision speaker. The ferroelectrics division also will select one morning plenary session speaker. A list of names were suggested for each, including Robert Newnham and Vitaly Ginzberg, the 2003 Nobel laureate in Physics. Andrei Kholkin agreed to contact Prof. Ginzberg's staff about the possibility of his presentation of a plenary talk. For context, the likely ultrasonics plenary talk will be on the technology of stethoscopes, and the frequency control plenary talk is to be on the acoustophysics of violins. Committee members agreed to make final selections of the Monday short course and the plenary speaker in January.

Mike Garvey agreed to send a preliminary call for papers before Christmas, and is assembling a broad email list. Angus agreed to help attain a broad email list from the organizers of ISAF 2002, who had worked on consolidation of ferroelectric researcher addresses. Mike suggested sending a second call for papers with a link to the site a week before the February 24 abstract deadline.

To the list of short course speakers in the attached ISAF 2004 update, Susan and other suggested adding more international speakers potentially including Enrico Colla, Y. Yamashita (single crystals), Karen Rabe & Simon Phillpot (atomic modeling), Paul Muralt (devices), and others. A final list of short course speakers is targeted for February 28, with an absolute deadline of April 17.

#### ISAF 2006:

Jon-Paul Maria discussed the prospects of a joint meeting with ISIF 2006 in Raleigh, NC, and it was noted the joint meeting was natural scientifically if the two organizations could come to terms on meeting organization details. Jon-Paul presented a draft memorandum of understanding (MOU) to enable the joint meeting. With minor modifications, the MOU was approved for submission to AdCom for approval, to enable a joint 2006 ISAF/ISIF meeting.

Jon-Paul noted that if ISAF 2006 is held jointly with ISIF, it would likely be held in the May/June timeframe, instead of the usual ISAF meeting time of August. Nava Setter noted that the location for ISIF 2006 had not yet been chosen, but that Bordeaux had been among the candidates for the ISIF 2006 meeting.

#### ISAF 2008:

Proposals will be submitted by two groups, from New Mexico and Bordeaux, at the next IEEE UFFC –



Ferroelectrics Committee meeting, to be held at the Annual Meeting of the American Ceramic Society in May. The New Mexico proposal will be developed by Paul Clem and Bruce Tuttle, Sandia National Labs, and the Bordeaux proposal will be developed by Mario Maglione, CNRS Université Bordeaux. Nava Setter noted that holding the 2008 meeting in Bordeaux may enable a joint meeting with the European Conference on Polar Dielectrics, which covers similar topics.

### Award Committee Chair:

Susan announced that Ahmad Safari will serve as the new awards committee chair.

### Ferroelectrics recognition awards

The 2003 award will be awarded to Eagle Park at the ISAF meeting, and accepted by his family. Travel assistance will be available from ISAF. Mike Garvey noted that the existing travel budget from IEEE UFFC may be augmented by corporate contributions, which would be matched by IEEE UFFC. Angus agreed to provide contact information to Mike regarding potential corporate donors.

A preliminary list of nominees was developed as a starting list of candidates for the 2004 Ferroelectrics Recognition Award.

### Standards activities

Susan noted that the 16th draft of the standard has been submitted to IEEE, and that a draft will appear in the December IEEE Transactions on Ultrasonics, Ferroelectrics, and Frequency Control. Feedback on the standards draft was requested. The committee acknowledged the yeoman efforts of Al Meitzler, who led the standards development.

### Other business

Mike Garvey noted that ISAF 2004 will be organized April 16-17 in Chicago. The final paper selection will be conducted April 16, and paper organization will be April 17. Walter Schulze stated that a spreadsheet of submitted abstracts would be provided, and that individual abstracts will be printed from the ISAF 2004 database for sorting. Mike Garvey requested a list of the sorting committee email addresses.

The next IEEE/UFFC FE committee meeting will be held at the American Ceramic Society Meeting in Indianapolis.

The meeting was adjourned at 5pm.

**Paul Clem for Bruce Tuttle**  
Secretary of the Ferroelectrics Committee

## Are You Using the Official IEEE Credit Card?



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## 50th Anniversary Joint Conference

**Update Summary:** The structure of the 2004 Conference is beginning to solidify. We had a very productive meeting of the Conference Steering Committee in Chicago on June 13. Work on the conference web site has begun (though it is not active yet). The Editorial Chair has a first draft of the Abstract to Proceedings process. A budget is ready for AdCom review and approval. The structure of the Short Courses/Tutorials has been defined.

### Conference Location: Montreal, Canada

Dates: 24-27 August, 2004 with Short Courses/Tutorials on 23 August (Monday), 2004

### Future Meetings and Dates

Feb 24 is the deadline for submission of abstracts. The joint TPC meeting will be on Friday April 16, 2004 in Chicago. The organization of the sessions will take place on the following day (Saturday). AdCom will meet in conjunction with this meeting in Chicago, tentatively on April 15 (Thursday).

**Plenary and technical sessions:** to be held at the Palais des Congres, Montreal's Convention Center.

**Meeting format:** There will be plenary sessions during the morning of three of the four days (8:30-12 on Tuesday, 8:30-9:30 other days). Technical sessions will be much like they are now. Attendees can attend any of the sessions. Paper proceedings will be published separately by the groups in three distinct volumes and will be available at additional cost. Attendees will receive CD proceedings (containing all Conference material) as part of the meeting registration fee. We envision a Conference Luncheon on the first day. We plan a Welcoming Reception on Tuesday evening and a Banquet on Wednesday evening. David Cheeke (Local Arrangements Chair) has investigated several venues for the banquet.

**Attendance:** Our plans anticipate 1350 attendees as reflected in the budget (revised downward from 1800 and then downward again from 1500)

**Short courses/tutorials:** these will be held at the Convention Center on Monday. The format is 9 parallel sessions in two hour slots; lunch is included in the registration. One price allows a choice of attendance in any of the sessions. A single evening synthesis program is planned as well.

**Meeting management:** FASS (Federation of Animal Science Societies) has been selected to manage the Conference; the contract with FASS was approved by IEEE in December of 2000. Details of the FASS responsibilities is under review.

**Hotel Status:** We have recently revised the room blocks downward by 20%. Presently we have room blocks of 240 and 200 (peak night) rooms at two Montreal hotels. The prices are \$150 USD and (approximately) \$140 per night at the two hotels. The two hotels will support approximately

one third of the expected attendees. Reservations will be through the (free) Montreal Housing Bureau.

**Convention Center Status:** We have a signed contract with the Palais des Congres for the meeting space; the total cost is \$50KUS; this will likely be reduced to \$35KUS through discounts for using the in house audio visual vendor and caterer. We will occupy approximately half of the Montreal Convention Center. The parallel meeting occupying the other half of the Palais is a conference on art history.

A Conference organizing committee web site has been set up to make available (to Conference Officers and AdCom) relevant (eg budget, minutes of meetings, etc) information about the conference. It is <http://www.ieee-uffc.org/board>. (Sorah Rhee has details of access).

### Conference Officers:

General Chair	R. Michael Garvey
Ultrasonics, Technical Program Chair	Ton van der Steen
Ferroelectrics, Technical Program Chair	Steve Pilgrim & Walter Schulze
Frequency Control, Technical Program Chair	Chris Ekstrom
Ultrasonics, Tutorial/Short Course Chair	David Cheeke
Ferroelectrics, Tutorial/Short Course Chair	Walter Schulze
Frequency Control, Tutorial/Short Course Chair	John Prestage
Finance Chair	Herman van de Vaart
Publicity Chair	Sorah Rhee
Exhibits Chair	Jack Kusters
Local Arrangements Chair	David Cheeke
Editorial Chair	Marj Yuhas
Awards Chair	Reinhard Lerch

### Past organizational events:

Conference Steering Committee: The 2004 UFFC Conference Steering Committee met in Chicago on June 13, 2003; 17 people attended. Minutes of this meeting are available.

### Web Sites: Three Internet interfaces are envisioned:

- An information web site which just provides information about the Conference <http://www.ieee.org/UFFC-2004>.
- An abstract submittal and manuscript submittal web site
- A conference registration (shorts courses and technical sessions) web site

**Abstract Submittal:** We will likely use electronic abstract submittal through FASS (as Ultrasonics presently does). The format of the abstract submittal process is under review with the Editorial Chair.

### Joint Meeting of the Technical Program Committees:

There will be two meetings of the Technical Program Committees. The three subgroups of the Society will first meet individually to organize and agree on the overall technical thrust of the meeting, including technical areas where we wish to encourage contributions. This should occur before or during early January 2004. The second TPC meeting to select the papers and organize the Conference program will be April 16-17 in Chicago. Marj Yuhas is organizing the hotel for this meeting.



## Frequency Control

### Quartz Industry Association of Taiwan

#### News from Taiwan

The Quartz Crystal Industries Association of Taiwan (QIAT) was established in 2002. Its goal is to promote the crystal and oscillator technology in Taiwan by bringing together participants from the industries, academics and government agencies. The Taiwan quartz crystal and oscillator market began to see modest growth in April this year and QIAT was glad to host a meeting on October 13th at the Institute of Applied Mechanics of National Taiwan University in Taipei. Mr. Hideo Kumagai, Chairman of the Quartz Crystal Industries Association of Japan (QIAJ) and President of Tokyo Denpa Co. Ltd., was the honor guest. During the meeting, four technical seminars were also held with strong participation. The seminars and the invited speakers were-

- "The Dawn of Crystal Resonators to Present," by Dr. Koichi Hirama, University of Yamanashi, Japan,
- "Quartz Crystal Oscillator- From the IC Perspective," Prof. Y.H. Kao, National Chiao Tung University, Taiwan,
- "RF MEMS Applications and Development," Dr. Tai-Kang Shing, Industrial Technology and Research Institute, Taiwan, and
- "Study on FBAR and Filter," Dr. Pei-Yen Chen, Chung-Shan Institute of Science and Technology, Taiwan.

QIAT also co-sponsored two seminars during the past twelve months. They were "3G Wireless Protocol and RF



(L to R) Mr. Louis S. Chou, Secretary General-QIAT, Mr. Hideo Kumagai, Chairman-QIAJ; Dr. Koichi Hirama, Yamanasji University; and Mr. Paul Lin, Chairman-QIAT

FBAR Technology" and "Applications and Development Trend of Analog Solid State Electronic Components in Future Telecommunication and Control Systems."

QIAT will co-sponsor a seminar entitled "FBAR Design and Analysis Technology" in November this year. The invited speaker will be Prof. Ken-ya Hashimoto of the Chiba University in Japan.

C.S. Lam  
TXC Corp., Taiwan  
10/16/03

## UFFC Awards

Honoring our UFFC Society members is a privilege.

The UFFC Society has a number of awards, which are given at symposia sponsored by our three groups. Each member can get involved in the process by submitting nominations for awards through the respective Award Chairs and committees. Information can be found on the UFFC Society website ([www.ieee-uffc.org](http://www.ieee-uffc.org)). Also the names of past awardees appear on the website.

### UFFC Achievement Award

The Achievement Award is the highest Society-wide award presented to a member in special recognition of outstanding contributions. Selection criteria include significant technical publications in the field of ultrasonics, ferroelectrics, or frequency control, as well as contributions to these technical fields, and service to the Society. The winner is selected by the UFFC Officers and the Awards Committee from nominations submitted by the general membership. The award

consists of an honorarium of \$2,000, a plaque, and a certificate. Presentation is usually at one of the Society's major symposia. The first award was presented in 1980.

#### 2003 UFFC Achievement Award Recipient

**Dr. James F. Greenleaf**, was awarded the 2003 UFFC Achievement Award at the 2003 IEEE International Ultrasonics Symposium in Honolulu, Hawaii, on 6 October 2003. The citation on the certificate and plaque reads:

*"For leadership in establishing a broad knowledge of medical-ly significant acoustic and ultrasound imaging technologies."*

Reinhard Lerch, UFFC Awards chair, introduced the award. Bill O'Brien lauded Dr. Greenleaf's excellent scientific work within the medical ultrasonic community as well as his service to the society as a former President, Vice-President for Ultrasonics, conference organizer, associate editor of the Transactions, author, and reviewer.



**Reinhard Lerch**



**Bill O'Brien**



**Jim Greenleaf (l) accepting the Achievement Award from Reinhard Lerch (r) and Ahmad Safari**



**Jim Greenleaf**

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### **Achievement Award Nominations**

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Nominations may be submitted at any time. Any member may submit a nomination by sending the nominee's name and a description of that person's main contributions, along with the submitter's own name and address to:

Prof. Dr. -Ing. Reinhard Lerch  
Chair, UFFC-S Awards Committee  
Friedrich-Alexander-University Erlangen-Nuremberg  
Department of Sensor Technology  
Paul-Gordan-Str. 3/5  
91052 Erlangen  
Germany  
Fon: +49 9131 85 23131  
Fax: +49 9131 85 23133  
e-Mail: [reinhard.lerch@lse.e-technik.uni-erlangen.de](mailto:reinhard.lerch@lse.e-technik.uni-erlangen.de)

## **UFFC Distinguished Service Award**

The Distinguished Service Award recognizes long-term support of the Society's activities. Recognition is given to those who innovate new Society programs, administer major Committees, manage Society functions, or promote the Society's areas of technical interest to the larger community.

The recipient usually has served for many years with sustained participation in the Society's management. Selection is made by the Officers and the Awards Committee from nominations submitted by the general membership. The award consists of an honorarium of \$2,000, a plaque and a certificate. Presentation is usually at one of the Society's major symposia. The first award was presented in 1997.

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### **2003 Distinguished Service Award Recipient**

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**Dr. William D. O'Brien, Jr.** was awarded the 2003 UFFC Distinguished Service Award at the 2003 IEEE International Ultrasonics Symposium in Honolulu, Hawaii, on 6 October 2003. The citation on the certificate and plaque reads:  
*"For continuous and outstanding support and service to the offices and principles of the UFFC Society as Transactions Editor in Chief, President, and Outstanding Lecturer, among many other roles in the Society."*

Reinhard Lerch introduced the Award. The laudation was given by Jim Greenleaf praising Bill's active and continuous volunteer service to the Society beginning with his appointment as Secretary-Treasurer in 1972 through his present day leadership as Co-Chair of the conference.

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### **UFFC Distinguished Service Award Nominations**

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Nominations may be submitted at any time. Any member may submit a nomination by sending the nominee's name





**Reinhard Lerch**



**Jim Greenleaf**



**Ahmad Safari(l) and Reinhard Lerch (r) presenting the Distinguished Service plaque to Bill O'Brien**



**William D. O'Brien, Jr.**

and a description of that person's main contributions, along with the submitter's own name and address to:

Prof. Dr. -Ing. Reinhard Lerch  
Chair, UFFC-S Awards Committee  
Friedrich-Alexander-University Erlangen-Nuremberg  
Department of Sensor Technology  
Paul-Gordan-Str. 3/5  
91052 Erlangen  
Germany  
Fon: +49 9131 85 23131  
Fax: +49 9131 85 23133  
e-Mail: reinhard.lerch@lse.e-technik.uni-erlangen.de

## UFFC Outstanding Paper Award

### 2002 Outstanding Paper Award Recipients

The UFFC is proud to announce the winners of the 2002 Outstanding Paper Award: Ömer Oralkan, A. Sanli Ergun, Jeremy A. Johnson, Mustafa Karaman, Utkan Demirci, Kambiz Kaviani, Thomas H. Lee, Butrus T. Khuri-Yakub for their paper:

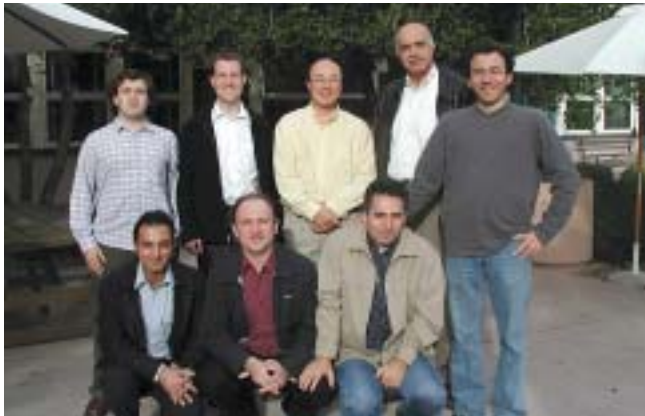
*“Capacitive Micromachined Ultrasonic Transducers: Next-Generation Arrays for Acoustic Imaging?” Transactions on UFFC, Vol. 49, No 11, pp. 1596 – 1610*



**A. Sanli Ergun and Ömer Oralkan accept the plaque from Ahmad Safari on behalf of themselves and the other authors**



**(l-r) Ahmad Safari, A. Sanli Ergun, Ömer Oralkan, Pierre Khuri-Yakub, and Reinhard Lerch**



**Sitting down from left to right: Kambiz Kaviani, Ömer Oralkan, Mustafa Karaman Standing up from left to right: Utkan Demirci, Jeremy Johnson, Tom Lee, Pierre Khuri-Yakub, Sanli Ergun Pierre**

The Awards Committee Members selected this paper from among all others that appeared in Vol. 49 of the Transactions on UFFC.

Here some further comments of Award Committee Members about this paper:

This paper represents the culmination of three others of this group that were jointly nominated for the Best Paper Award (pp. 573-584, pp. 585-595 and pp. 756-766), all of which describe capacitive ultrasonic transducers and their applications. This paper clearly shows the potential performance advantage of such transducers and will likely have a major impact on medical ultrasonic equipment.

This paper describes results from a first pulse-echo phased-array B-scan sector imaging system using the recently introduced CMUT technology. These results demonstrate that the CMUT technology would substantially advance the capability of future ultrasonic imaging systems.

The paper gives an excellent theoretical basis for this type of micromachined ultrasound transducers. Excellent physical insight. Very clearly written.

**Reinhard Lerch  
Chair UFFC Awards Committee**

## UFFC Distinguished Lecturer Award

The Distinguished Lecturer represents the UFFC Society by giving lectures worldwide to the larger technical community. The subject of the lecture must be of current interest and the lecturer must be a prominent contributor in the field of the lecture. The speaker is selected for speaking style, prominence in the topic, and willingness to commit significant time and energy to preparation, travel and lectures. The Lecturer is selected by the AdCom from a list of nominees presented by the Distinguished Lecturer Subcommittee of the UFFC-S Awards Committee from nominations received

from the general membership. Presentation of the award is usually at one of the Society's major symposia.

The award consists of a certificate, and reimbursement for an international lecture tour, which consists of roughly 30 or more lectures during an 18-month period.

You are encouraged to invite the Distinguished Lecturer to your Chapter or institution.

### 2002 - 2003 Distinguished Lecturer



**Dr. K. Kirk Shung**  
Department of Biomedical  
Engineering  
500 Olin Hall  
University of Southern California  
Los Angeles, CA 90089-1451  
e-mail: [kkshung@usc.edu](mailto:kkshung@usc.edu)

**Dr. K. Kirk Shung  
2002-2003 UFFC  
Distinguished  
Lecturer**

Dr. Shung completed his term as Distinguished Lecturer in 2003. He received a certificate of service at the 2003 IEEE International Ultrasonics Symposium in Honolulu, Hawaii.



**Bernie Tittmann Introducing the Distinguished  
Lecture Award**



**Kirk Shung(c) with Ahmad Safari(l) and Bernie  
Tittmann(r)**



## Dr. Shung Reports

My term of IEEE UFFC society distinguished lecturer was completed at the end of 2003. I visited Austria and Germany in September, 2003 and gave a total of 7 lectures. The trip was arranged by Dr. Klaus Jenderka who served as my host at Bregenz, Austria and Halle, Germany. Bregenz was the site of Ultrasound 2003 Conference and Halle is the site of the 7th Conference Of the European Society for Engineering and Medicine. At these meetings 4 lectures were given. I also visited and gave a lecture at University of Vienna hosted by Dr. Christian Kollmann. At the end of the trip I was hosted by Dr. Helmut Ermert and Dr. Michael Vogt of Rhur University - Bochum. There I gave two lectures. A memorable evening was spent at a restaurant which was remodelled from a castle with Dr and Mrs. Ermert.

My final trip was to Washington, D.C. in November to deliver the sigma xi lecture at NIST. The trip was hosted by Drs. G. Blessing and Alan Cookson. Dr. and Mrs. Blessing treated me with a delicious dinner at an Italian restaurant following the lecture.

I am grateful to have this opportunity to represent the society. It is indeed a great honor.

## 2003 – 2004 Distinguished Lecturer



**Dr. Steven R. Jefferts**

National Institute of Standards & Technology  
NIST - Time and Frequency  
Division  
325 Broadway  
Boulder, CO 80305  
[jefferts@boulder.nist.gov](mailto:jefferts@boulder.nist.gov)

**Dr. Steve Jefferts**  
**2003-2004 UFFC**  
**Distinguished**  
**Lecturer**

## Atomic Clocks: Past, Present and Future

Atomic Clocks have become ubiquitous in modern electronic systems. Modern navigation systems, such as the global positioning system (GPS), and wide-bandwidth communication systems are examples of two systems which cannot exist without the long-term frequency-stability offered by atomic clocks. Commercially available atomic clocks range from Rubidium based oscillators, which cost around \$1000 with thousands of units per year produced, to Hydrogen masers costing \$250,000 with a yearly production of a handful. Finally laboratory based atomic clocks using sophisticated laser-cooling techniques have been built in a few laboratories around the world. These premier atomic clocks offer fractional frequency accuracy at the 10<sup>-15</sup> level, equivalent to one second in 31 million years.

Laser-cooled atomic clocks are also being developed for flight aboard the International Space Station (eg. the NIST/NASA/JPL PARCS and the ESA/ACES projects)

where they promise to deliver frequency accuracy of  $\delta f/f = 5 \times 10^{-17}$ . Even more exotic atomic clocks are being developed in laboratories with potential accuracies at the 10<sup>-18</sup> level.

The underlying physical principles which govern all of these clocks will be illustrated. The basic structure of many of these atomic oscillators will be presented along with some discussion of the trade-offs inherent in all of these designs.

In particular, the laser-cooled primary frequency standards such as NIST-F1 and PTB CS-F1 will be the subject of detailed examination. An examination of this type of frequency standard will require a short discussion of laser-cooling. The laser-cooling process used in NIST-F1 allows the temperature of the cesium (caesium) atoms used in the clock to be lowered from room temperature (300K) to 1 mK: a reduction of the thermal energy of almost 9 orders of magnitude! These very low energy cesium atoms obtained through laser-cooling are crucial to the operation of a frequency standard with an accuracy equal to or better than the 10<sup>-15</sup> level. The relatively detailed description of NIST-F1, along with the previous presentation of the more traditional atomic clocks, will allow a discussion of the PARCS and ACES atomic clocks scheduled to be flown aboard the ISS in 2005.

Finally, the current state of the art of new standards based on optical transitions will be presented. These optical standards based on transitions with frequencies on the order of 10<sup>15</sup> Hz as opposed to the 10<sup>10</sup> Hz hyperfine transition frequencies typical of existing atomic clocks, are being actively developed in many standards laboratories around the world. They are quickly approaching the accuracy of the very best hyperfine transition atomic clocks and the future promise of the optical clocks is bright.

**Steve Jefferts**, a native of Seattle, WA, received his BS. in Physics from the University of Washington and his PhD in Atomic Physics/Precision Metrology from JILA/University of Colorado in 1992. He then moved to NIST as an NRC postdoctoral fellow in the Time and Frequency division working on trapped ions for quantum computation devices. In 1994 he joined the Time and Frequency division as a staff scientist where he has worked on primary frequency standards and time transfer. Dr Jefferts' group designed and operates NIST-F1 (the U.S. Primary Frequency Standard) and is currently designing the next generation of terrestrial laser-cooled primary frequency standards for NIST. Dr Jefferts is also a member of the PARCS (Primary Reference Clock in Space) cesium clock project to be flown aboard the International Space Station in 2005. PARCS is a joint NIST, University of Colorado, Jet Propulsion Labs and NASA project.

Please contact Steve Jefferts to schedule a visit to your area during the period from July 2003 – December 2004.

## Dr. Jefferts Reports

During the month of November I visited China, Japan and Korea as part of the IEEE UFFC distinguished lecturer series. In Beijing, China, I gave the talk entitled "Atomics

Clocks: Past, Present and Future” in the School of Electronics Engineering and Computer Science at Peking University as well as at the National Institute of Metrology (NIM). While in China I was hosted by Pingwei Lin and his colleagues at NIM who very kindly took me to see many beautiful sights around Beijing, including the Great Wall, the Ming Tombs and the Forbidden City.



**Dr Pingwei Lin and Steve Jefferts on the Great Wall in China**



**Steve giving a lecture at the National Institute of Metrology in Beijing**

After a very productive and enjoyable week in Beijing, I traveled to Japan at the invitation of Professor Jun-ichi Kushibiki who is the Chair of the Japan Chapter of the IEEE UFFC-S. In Tokyo I gave a presentation of the Past, Present and Future talk at the 24th Symposium on Ultrasonic Electronics and also gave a presentation at the Communications Research Laboratory. Moving on to Sendai, Japan I visited the laboratories of Professor Kushibiki at Tohoku University and was able to give a presentation on Atomic clocks to an attentive audience there as well.

Having had a wonderful time in Japan and having made many new friends it was time to move on to the last stop in this tour, Korea. In Korea I visited the Korea Research Institute of Standards and Science (KRISS) in Daejeon where I was hosted most ably by Dr. Taeg Yong Kwon. At KRISS I toured the very impressive laboratories concerned with many aspects of metrology. While there I gave the general talk on atomic frequency standards mentioned above as well as a more specialized talk to a much smaller audience.

After having spent several days at KRISS and having many interesting and useful interactions with the scientific staff there, my colleagues at KRISS were very kind to take me sightseeing in Korea, especially to a traditional folk village which showed many aspects of traditional Korean life.

At this point, having been away from my “day” job at NIST for three weeks I returned to the United States with somewhat mixed feelings and many wonderful memories. I will be giving this lecture about Atomic Clocks until the end of 2004. Please feel free to contact me about giving a lecture at your institution! I can be reached at [jefferts@boulder.nist.gov](mailto:jefferts@boulder.nist.gov).

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## 2004 – 2005 Distinguished Lecturer

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**Dr. Nava Setter**  
Ceramics Laboratory  
Materials Institute  
EPFL Swiss Federal Institute of Technology  
Lausanne, 1015 Switzerland  
[nava.setter@epfl.ch](mailto:nava.setter@epfl.ch)

### **Down Scaling in Piezoelectrics and Pyroelectrics: Microdevices, Nanofabrication, Nanoscale Features and Size Effects**

Piezo- and pyroelectrics materials in the form of thin and thick films are finding new applications in various fast growing fields such as mobile communications and MEMS. The number of applications that could benefit from availability and implementation of these films is likely to grow.

Size reduction of ferroelectric-based micro-components, both in thickness and lateral dimensions, is required for future applications. This can be achieved by a reductive approach of etching of the sintered continuous layers, or by an additive approach in which a treatment of the substrate results in the creation of patterned structures prior to the annealing step. Novel local techniques, e.g., piezoelectric force microscopy, allow the analysis of properties in such small components.

Various microdevices will be described, issues in fabrication technology will be discussed, and data and interpretation of local measurements will be reviewed. In light of these results, size effects in ferroelectrics and their significance in emerging applications will be discussed.

**Nava Setter** received B.Sc. and M.Sc. degrees in Civil Engineering from the Technion – Israel Institute of Technology and Ph.D. degree in Solid State Science from the Pennsylvania State University in 1980. She has worked in the area of ferroelectric ceramics and single crystals, microwave dielectric and ferrites at the Pennsylvania State University, USA, at the University of Geneva, Switzerland, and R&D laboratories, Israel. Since 1989 she is heading the Ceramics Laboratory of the Swiss Federal Institute of Technology at Lausanne (EPFL), a professor in Materials Science and Engineering, and an affiliated professor in



Microtechnology Engineering at the EPFL. She was nominated a member of the Swiss Academy of Technical Sciences in 1995. Her scientific interests are in piezoelectric and related bulk ceramics/crystals and ceramic thin and thick films for sensors, actuators, and capacitors. She has authored and co-authored over 200 scientific papers in this area. She was the General Chair for the 1998 ISAF meeting in Montreux.

Please contact Nava Setter to schedule a visit to your area during the period from July 2004 – December 2005.

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## 2005 – 2006 Distinguished Lecturer

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**Dr. Ken-ya Hashimoto**  
Department of Electronic and  
Mechanical Engineering  
Faculty of Engineering  
Chiba University  
1-33 Yayoi-cho, Inage-ku  
Chiba-shi 263-8522 Japan  
[k.hashimoto@ieee.org](mailto:k.hashimoto@ieee.org)

### Simulation of Surface Acoustic Wave Devices

Presently, surface acoustic wave (SAW) filters are mass produced and widely used in various consumer products and communication equipment. For their research and development, use of fast and precise simulation and design tools is essential, and much effort has been paid for their enhancement for many years.

Fortunately, recent rapid progress of computer technologies has made it possible to deal with large-scale problems using small personal computers. So as for computers, anyone can set up the latest research environment with small investment. The remaining task is to establish simulation and design software tools.

This lecture reviews simulation technologies used in the research and development of modern SAW devices. Firstly, a simple discussion is presented on the role of the numerical simulation to clarify its applicability and necessity. Although a number of simulation techniques have been developed, none of them are perfect. So we must select appropriate ones for each purpose with the trade-off between computation speed and precision.

The simulation techniques are categorized into two types. The first type is based on the full-wave analysis, and is used for parameter extraction, design verification, theoretical examination, etc. where precision is more important than the calculation speed. In this category, the finite element method (FEM), boundary element method (BEM), spectral domain analysis (SDA) and their combinations are representative. In the second part of the lecture, these techniques are practically applied in the SAW device design.

The second type is based upon phenomenological models, and is used in the optimization process. In this case, the calcu-

lation speed is also very crucial because the simulation will be executed for a huge number of iterations to search for the optimal solution. Presently, the coupling-of-modes, p-matrix and equivalent circuit models are widely used. In the third part of the lecture, they are compared and their use in practical device design is detailed. It is demonstrated how precise and speedy this type of simulation can be performed provided that all necessary parameters were determined correctly in advance.

Once simulation tools are ready, it is a starting point of a trial road. This is because minor effects in former days become obvious after evolution, and further improvement is always necessary. In the final part of the lecture, various hot topics in this direction are presented and hidden problems in current simulation tools are revealed.

**Ken-ya Hashimoto** was born in Fukushima, Japan, on March 2, 1956. He received his B.S. and M.S. degrees in electrical engineering in 1978 and 1980, respectively, from Chiba University, Japan, and Dr. Eng. degree from Tokyo Institute of Technology, Japan, in 1989.

In 1980, he joined Chiba University as a Research Associate, and is now Associate Professor of the University. In 1998, he was a Visiting Professor at Helsinki University of Technology, Finland. In the winter of 1998/1999, he was a Visiting Scientist of the Laboratoire de Physique et Metrologie des Oscillateurs (LPMO), CNRS, France. In 1999 and 2001, he was a Visiting Professor at the Johannes Kepler University of Linz, Austria.

Dr. Hashimoto has authored or co-authored more than 130 papers in refereed journals and conference proceedings. He has contributed to 6 books including a textbook "Surface Acoustic Wave Devices in Telecommunications" published by Springer Verlag in 2000. His current research interests include various types of surface and bulk acoustic wave devices, acoustic wave sensors, piezoelectric thin films, and application of thin-film micro-machining technologies to the acoustic wave devices.

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## Nominations for Distinguished Lecturer Award

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Nominations may be submitted at any time. Any member may submit a nomination by sending the nominee's name and a description of that person's main contributions, along with the submitter's own name and address. Members are also encouraged to suggest topics, which they feel, would be of interest. Send nominations and topics to:

**Bernhard R. Tittmann** – Awards Vice-Chair  
Chair, UFFC-S Distinguished Lecturer Subcommittee  
Schell Professor  
Engineering Science & Engineering  
212 Earth & Engineering Science Bldg.  
The Pennsylvania State University  
University Park PA 16802 USA  
[brt4@psu.edu](mailto:brt4@psu.edu)  
[Bernhard.tittmann@ieee.org](mailto:Bernhard.tittmann@ieee.org)

## UFFC Fellows

### Brief History of IEEE Fellow Program

The grade of Fellow first appeared in the AIEE constitution of 1912. In that year, the AIEE revised its membership structure and established the grade of Fellow for those engineers who had demonstrated outstanding proficiency and had achieved distinction in their profession. Potential Fellows had to be at least thirty-two years of age, with a minimum of ten years experience. When the IRE established its Fellow grade in 1914, the requirements were clearly modeled on those of the AIEE. Much of the wording in the relevant sections of the IRE constitution is identical to the corresponding wording in the AIEE constitution.

For the first several years after the establishment of the Fellow grade, both the AIEE and the IRE allowed Members to make direct application for transfer to Fellow. In both cases, applications had to be accompanied by references from five existing Fellows, and required the approval of the Board of Directors. In 1939, the IRE modified its procedure to make admission or transfer to the Fellow grade possible only by direct invitation of the Board of Directors, a policy it maintained until the merger in 1963. In 1938, the AIEE modified its constitution to provide that 'Applications to the grade of Fellow shall result only from a proposal of five Members or Fellows.' In 1951, the AIEE prohibited applications for Fellow grade altogether, and adopted a policy of direct invitation similar to that of the IRE.

As noted above, numerous electrical engineers were members of both the AIEE and the IRE, and many of these became Fellows of both organizations. When the two institutes merged in 1963, all AIEE and IRE Fellows automatically became Fellows of the IEEE. In 1942, the IRE had begun to issue citations to new Fellows, briefly describing their accomplishments. The AIEE followed suit in 1952, and the IEEE continued the practice after the merger.

Since 1963, the IEEE Grade of Fellow has been conferred by the Board of Directors upon a person with an extraordinary record of accomplishments in any of the IEEE fields of interest. A brief citation is issued to new Fellows describing their accomplishments and the total number selected in any one year does not exceed one-tenth percent of the total voting Institute membership.

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#### UFFC Fellows

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The UFFC Society has enjoyed an unusually high number of members who have become IEEE Fellows. For a complete listing of UFFC fellows see <http://www.ieee-uffc.org/about/fellows.html>.

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#### 2004 IEEE Fellow Award

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The IEEE Fellow Award was conferred upon  
**KENNETH MEADE LAKIN**

*"For contributions to thin-film resonator technology and applications."*

by the IEEE Board of Directors at their meeting in November 2003.

Ken will receive the Fellow award at the Awards ceremony during the 2004 IEEE International Ultrasonics, Ferroelectrics, and Frequency Control 50th Anniversary Joint Conference 24-27 August 2004 in Montreal, Canada.

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#### Thank You to Dick White

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Dick White



Fred Hickernell

Dick White has served as the Chair of the UFFC Fellows Committee since 1990. The UFFC has enjoyed a very high success rate of having our nominations accepted to advance to Fellow under Dick's leadership. Dick has stepped down from this post and will be succeeded by Fred Hickernell. We thank Dick for his splendid and dedicated service all these years. We wish Fred much success on our behalf.

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#### Fellow Nominations

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Now is the time to begin thinking about nominees for 2005 election. Nominations are due March 15th. Nomination kits for IEEE Fellow may be obtained at <http://www.ieee.org/about/awards/fellows/request.htm>. Fellow nominations and reference letters may be made via the web.



## UFFC AdCom

### AdCom Class of 2006

Welcome to the newly elected AdCom members! In order to maintain a balance of the technical interests and geographic diversity of our community, AdCom members are elected from each of our major technical areas and at least one representative from Region 8 – 10. The new AdCom class includes Peter M. Smith from Ultrasonics, Nava Setter from Ferroelectrics, Daniel S. Stevens from Frequency Control, and Victor P. Plessky from Region 8.

#### Peter M. Smith



**Peter M. Smith** (S'80 – M'88 – SM'96) received the B.Eng.Mgt. degree in Computer Engineering and the M.Eng. and Ph.D. degrees in Electrical Engineering from McMaster University (Hamilton, Ontario, Canada) in 1983, 1985 and 1988, respectively. Since July 1987, he has been with the Faculty of Engineering at McMaster University,

where he is a Professor and the Associate Dean.

Between 1995-97, he was the Student Activities Chair for Region 7 of the IEEE. He was Chair of Local Arrangements for the 1997 IEEE International Ultrasonics Symposium in Toronto. He has been a member of the Technical Program Committee for the IEEE International Ultrasonics Symposium since 1995 and is currently an Associate Editor for the Transactions on Ultrasonics, Ferroelectrics and Frequency Control.

His research interests are on acoustic wave devices and their applications to communication systems. He has published over 50 technical papers on these subjects, and he is the past recipient of the Ross Medal from the Engineering Institute of Canada.

Peter currently lives in Dundas, Ontario, with his wife Kerstin and their three children.

#### Nava Setter



**Nava Setter** obtained B.Sc. and M.Sc. degrees in Civil Engineering from the Technion – Israel Institute of Technology, and Ph.D. degree in Solid State Science from the Pennsylvania State University USA (1980). She worked in the area of electronic materials at the Pennsylvania State University, USA, at the University of Geneva,

Switzerland, and in Haifa, Israel.

Since 1989 she is a professor in Materials Science and Engineering and the director of the Ceramics Laboratory of

the Swiss Federal Institute of Technology in Lausanne (EPFL). She is an affiliated professor in the Microtechnology Engineering department, and teaches also at the Communication Engineering department of the EPFL. Her scientific interests are in the field of applied ferroelectric materials: The understanding and use of microscopic phenomena for development and improvement of new devices. Other interests include education at the university and the secondary school levels.

Her laboratory counts 35-40 researchers and collaborates in research projects with over 100 research institutes and industries in Europe, Asia and America. She authored and co-authored 250 scientific papers in the area of electronic materials for information and communication technologies and for sensors and actuators. She edited and co-authored a number of books and conference proceedings in these fields. She headed various European and Swiss research programs and served as the head of the Materials department of EPFL during 1996-1998. She has been nominated member of the Swiss Academy of Technical Sciences in 1995, received the SKORE-A award in 2001, the ISIF award on 2003, and was recently nominated distinguished lecturer of the IEEE UFFC Society.

#### Daniel S. Stevens



**Daniel S. Stevens** (M'79) received the B.S. and M.S. degrees in Mechanical Engineering, an M.S. degree in Applied Mathematics, and, in 1984, a Ph.D. in Mechanics from Rensselaer Polytechnic Institute. His Ph.D. work included the development of analytical models of doubly-rotated quartz crystal resonators. Following a post-doc at

RPI, in 1985 he joined the Frequency Control Products group of AT&T Bell Labs in North Andover, MA and was involved in the development of SAW and quartz crystal-based oscillator products.

Since 1995, when the AT&T-FCP group was acquired by Vectron International in Hudson, NH, he has been Director of R&D - Acoustic Wave Technologies. His technical interests include modeling and fabrication of acoustic wave resonators and filters, sensors, and packaging technologies. He has published over 30 papers in professional journals and conference proceedings and has several patents pending.

In service to the IEEE UFFC society, he has been a member of the Frequency Control Symposium Technical Program Committee since 1992 and is a newly appointed member of the UFFC Nominations Committee. He is a referee for the society's Transactions.

## Victor P. Plessky



**Victor P. Plessky** (M'92) was born near Gomel, Belarus (ex-USSR) on July 02, 1952. Now he lives in Switzerland; he has Russian citizenship. Before leaving USSR in 1991 he worked as a chief of laboratory in IRE of Academy of Sciences in Moscow region in Russia. He received his Ph.D. degree from the Moscow Institute of Physics and

His main sphere of interest is theory of microacoustics, surface acoustic waves (SAW) theory and devices, devices for signal filtering and frequency control, SAW-tags and SAW sensors. A few his works, such as discovery of the surface transverse waves (STW), or "Plessky Equation" for "leaky SAW" in periodic structures have received wide recognition. His monograph "Surface acoustic waves in inhomogeneous media" originally published in Russian, was translated and edited by Springer, in Germany.

For many years he has served as a Program Committee member for the IEEE Ultrasonics Symposium, chairing many Symposium sessions.

V. Plessky was teaching students during many years in parallel with his research work in different institutions: at special physical-mathematical schools, University in Moscow, and as a supervisor of eight Ph.D. students, successfully qualified. Being in Switzerland, he actively participates in collaboration with Helsinki University of Technology in Finland. He was visiting Professor in HUT during spring semesters in 1997, 2001, and 2003.

He has authored or co-authored over 150 papers and has many patents.

Technology (1978), Doctor of Science degree (habilitation) in physics and mathematics from the Institute of Radio-engineering and Electronics (IRE RAS, 1987), and the Full Professor title from Russian Government, 1995.

The last 12 years he has worked in Switzerland, first as a Principal Research Associate in a small company Micronas SA, in Neuchâtel area (Bevaix). After that he worked for Thales (ex Thomson) Microsonics, as Principal scientist, SAW design Bureau Manager. Currently he has his consulting company and collaborates with a few SAW companies.

## UFFC-Society AdCom Meeting Minutes of 5 October 2003 [Subject to AdCom Approval]



**Ahmad Safari**

The Administrative Committee (AdCom) meeting of the Ultrasonics, Ferroelectrics, and Frequency Control Society (UFFC-S) was called to order at 8:05 am, 5 October 2003, by Society President Ahmad Safari. The meeting was held in conjunction with 2003 International Ultrasonics Symposium held in Honolulu, Hawaii.

Sorah Rhee  
Ahmad Safari\*  
Walter Schulze\*  
Susan Trolrier-McKinstry\*  
Herman van de Vaart\*  
Marjorie P. Yuhas  
Fran Zappulla

Clemens Ruppel\*  
Tom Shrout\*  
Bernie Tittmann  
Bruce Tuttle\*  
John Vig\*  
Don Yuhas  
Kullervo Hynenén\*

(Note: All 25 voting members were present for most of the meeting's business, Jim Greenleaf and Bill O'Brien were present for report, but at conference most of the day. \* denotes voting members.)

Gerry Blessing summarized for the group who is a voting member of AdCom.

Jan Brown made and Lute Maleki seconded a motion that passed: To approve the 4 May 2003 (Tampa, Florida) AdCom minutes as corrected.

### Attendees

Koray Akdogan  
Gerald Blessing\*  
Mauricio P. daCunha\*  
Mike Garvey\*  
Gordon Hayward\*  
Fred Hickernell\*  
John Hossack\*  
Reinhard Lerch\*  
Lute Maleki\*  
Rajesh Panda\*

Art Ballato\*  
Jan Brown\*  
Mathias Fink\*  
Asha Hall  
David Hecht  
Jacqueline Hines\*  
John Kosinski\*  
Jian-yu Lu  
Kiyoshi Nakamura\*  
Bob Potter\*



**Jim Greenleaf**

Ahmad announced a minor modification to the agenda to have Jim Greenleaf give a report on the Hawaii meeting now, with more information to come later. Jim Greenleaf stated that the



conference had made the committed room block and that everything was going well. One problem is the number of cancellations, especially from China. Helen Routh said that people from China have had trouble getting visas, resulting in a loss of 8 orals, 8 posters, and 8 orals asked to switch to posters – more may not show up. FASS will put a sheet in each room showing what's cancelled and updating the schedule if transferred to later session. Helen stated that the rejection rate for papers this year was about 30%, and the technical program committee decided not to put four medical sessions in parallel, but rather to have some posters.

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## President's Report

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**Ahmad Safari, Gerry Blessing, Jian-yu Lu,  
and Marj Yuhas**



**Gerry Blessing**



**John Vig**

Ahmad Safari thanked everyone for coming. He discussed the review of the Ultrasonics Committee, which took place last night. All three technical areas have now been reviewed during the past two years. Ahmad established a new committee chaired by Gerry Blessing for Bylaw review. Financially we seem to be improving. In membership, we have a 10.7% reduction similar to IEEE. As Ahmad was unable to attend the recent TAB meeting, Gerry Blessing went in his place and gave a report. Gerry reported that a new society "Product Safety Engineering Society" was formed. He discussed continued concern of HQ with funding issues. There has been a significant reduction from what they expected in IEEE membership, ranging from 4-5% (which is tens of thousands of people) to almost 11% depending on whose figures are used. John Vig said IEEE is trying to figure out reasons for the drop. Potential issues are the dues (which were doubled for stu-

dents), and that when institutions subscribe to Xplore, people no longer need to be members to get the main benefits. Gerry has the comments from a statistical survey from HQ that was responded to by about 400 people in our society (20-25%). The results will be summarized and distributed to everyone on AdCom. Ahmad reminded everyone on AdCom to take a shirt as a souvenir, and requested that everyone please participate in the student breakfast Tuesday morning from 7-9am.

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## Secretary's Report

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**Jackie Hines**

Jackie Hines requested that attendees update the AdCom listing and took counts for lunch and dinner. Jackie reported that the e-mail alias was not working properly at that time.

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## Finance Report

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**Herman van de Vaart**

Chair Herman van de Vaart provided written and oral reports of the Society's finances. The operating statement covers eight months, while the budget is for the full year. Everything seems to be going OK. We received approximately 19k for being part of Transactions on Medical Imaging. The symposia are recorded immediately, but actuals get grossed up or down later. The 2002 Ultrasonics symposium netted much more than expected (about \$150k rather than \$44k), and the 2002 Ferroelectrics closed with a \$4.2k surplus. All of these numbers are preliminary – FASS invoices may take a few months to reach the treasurer and then time to go to HQ. The budget for 2004 was approved at last meeting in Tampa (no need for action here). Herman added \$\$ for web and membership updates, and for the CD archive. The society accepted a 3 year contract from FASS – starting in 2004, so the only unknown in transactions costs is printing and mailing. In 2004 only about half the members opted for hardcopy Transactions. Jan Brown said the contract states that overall Transactions production from FASS is a fixed fee of \$141 but there is an "up to \$20k" for phone, etc – direct expenses. This is included in the budget. Society net worth according to statements is about \$180k, but it is improving and should be \$250-300k by the end of this year. Infrastructure charges are dropping, and are now about \$75 per member, which is better than before (when it was about \$100 per member), but still high compared to other soci-

eties. John Vig will make a motion at the next Board of Directors meeting, that if societies make a surplus, a portion of the surplus will go into a “pot” that is not taxed and does not need special approval for use.

## Publications



Jan Brown, Fran Zappulla, Don Yuhass



Fran Zappulla

Jan Brown, Publications VP, presented a report. At the June TAB meeting, our decision to stay outside IEEE for publications was met with anxiety, and we were asked to reconsider this decision. There was much e-mail discussion, and we decided to move forward with signing the fixed price contract with FASS. We're now waiting for IEEE sign off on it, since the contract value is above \$25k (\$141k for

transactions production efforts and up to \$20k for direct expenses). The contract is retroactive to the last couple of months of 2003, and covers 2004, 2005, and 2006. Jackie will now pay nothing over \$141k for labor. A discussion ensued regarding the credibility of the contract amount and whether we need to audit FASS records. It was decided that as long as the contract is fixed price, we do not need to audit. Down the road we may be required to come back inside IEEE, but the FASS contract can be exited in 30 days if this happens. Fran Zappulla said that this would not affect us until

2005 or 2006. A discussion ensued regarding the scorecard being developed to evaluate publishing options. In preparation for this and to answer some of the questions we have about IEEE publications, Fran Zappulla gave a presentation on IEEE, including publications capabilities and pricing.

John Vig noted that IEEE has only the societies as a source of income and reserves. The Regions don't contribute (for example Philadelphia has about a \$1M reserve, but that's way above most). The publication revenue in 2002 was 53% of revenue. The PSPB is a volunteer board that oversees policies, procedures, and budgets for Pubs throughout IEEE. IEEE has a vision – to be the provider of choice for technical publications. Fran discussed the “4C's” analogy (Content, Currency, Convenience, and Cost). Following Fran's presentation, an active discussion regarding technical aspects of IEEE's publication capabilities, finances, page costs (now and historically) and potential member impact ensued. Issues discussed included lag time from review to publishing, process issues including all electronic from submit to publish and “real time” process flow, online access prior to print, multimedia, and historical and current page costs. UFFC is enjoying a return of reprint revenue, societies publishing inside IEEE were not until the review of our contract pointed out this difference. As a result IEEE Publications Services and Products Board (PSPB) voted to return this revenue to societies at the June meeting. The IEEE fee for the collection and return of this fee is charged on a per page basis and is much larger than the hourly rate charged by FASS. A comparison was made of the total cost per page of the UFFC Transactions. UFFC fully loaded per page cost for 2003 is \$209.10 compared to what it was in 1996 with IEEE publishing of \$215.71.

## Newsletter:

Jan Brown showed the new newsletter look, and stated that AdCom should encourage that every standing committee chair send in something for the newsletter. Also, information on conferences, etc. would be greatly appreciated (from the VP's of the three technical areas). Regarding society history, there is nothing in queue. It is our 50th anniversary next year, and historical recollections of once upon a time would be nice. Biographies of the people our awards are named after would be greatly appreciated. John Vig mentioned that a discussion of the agreement made when our societies joined would be interesting.



Fran Zappulla and John Vig



Sorah Rhee and Mauricio da Cunha



Jan Brown made and Fred Hickernell seconded a Motion that passed (24 in favor, 0 opposed): That Adcom approve expenditure of up to \$2000 for software and hardware updates for use in newsletter production.

### Web:

Sorah Rhee highlighted the new web page design, which includes a change of color (the salmon pink was changed to a nice blue), and now looks a lot like the Newsletter. Richard Chaio, after 5 years of service as the Utrasonics Web Editor, would like to retire. Clemens Ruppel will try to find a successor or appoint someone. Jan Brown said we should post the position on the announcements board of the conference. For the UFFC Fellows gallery, we have implemented about 40 so far. For some, we may not have current addresses. Koray Akdogan is doing the education web site, which should be up and running soon. Mike Garvey said that the web site for the 2004 conference coordinators has a password, and anyone who needs to access info for 2004 should ask Sorah Rhee for the site and password information. Bob Potter suggested that TPC members e-mail addresses be included there, and Mike Garvey said he would make it happen.

### Old Business:

Jan Brown made and John Vig seconded a motion that: The existent UFFC-S ByLaw statement for the EIC term of office that reads: "The normal term of office of the Editor-in-Chief shall be five years with the opportunity for reappointment." be amended to read: "The normal term of office of the Editor-in-Chief shall be three years, with the opportunity for reappointment to one additional term."



**John Kosinski, Bob Potter, and Herman van de Vaart**

A discussion ensued regarding this motion. Herman van de Vaart noted that we just established a committee to look into bylaw issues, and also that we have had only four editors in history of our society. Others asked why this is a problem. Gerry Blessing spoke in favor of the motion with the basic spirit and attitude that we want to rotate the contributions of membership, and it is not good for one person to go on in perpetuity for any part of our organization. Gerry strongly feels that if someone is doing a good job, then someone else can too, and that we should have limits on most of the significant positions. Others noted that while it is nice to have rotation, it may be hard to find people to find to do the job. Perhaps we should say not consecutive terms?

TAB periodicals – best practice – 2 year terms with up to two re-appointments – 6 years maximum. Ahmad called the question. John Kosinski and Mauricio P. da Cunha raised the question on what giving notice [of a pending vote for a change in bylaws] consists of, as they felt, even though this motion was made at the May 2003 AdCom meeting and tabled for a vote at this meeting [due to the requirement for adequate notice], that they did not get sufficient notice to vote on this issue at this meeting.

The motion passed (in favor-15, opposed-6, abstain-2).

Jan made and Art Ballato seconded a motion that: The existent UFFC-S ByLaw statement for Associate Editors that reads: "The terms of office for the Associate Editors shall be five years with the possibility for reappointment for only one additional term." Be amended to read: "The terms of office for the Associate Editors shall be three years, with the opportunity for reappointment to additional terms."

Following a brief discussion the motion passed (in favor-16, opposed-5, abstain-3)

### Transactions:



**Jian-yu Lu, Art Ballato, Marj Yuhas**

Jian-yu Lu presented summary of Transactions operations so far. The editorial office has completed its transition, moved to MC, and has started accepting multimedia manuscript submissions. A discussion of multimedia issues ensued, including IP and size limits (10MB), along with public access, which is made possible through IEEE.

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### Ferroelectrics Committee

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**Asha Hall, Koray Akdogan, Susan Trolie-McKinstry, and Bruce Tuttle**



**Al Meitzler**

Susan Trolier-McKinstry, Ferroelectrics VP, gave an oral report. Al Meitzler completed work on the Ferroelectrics standard. Jan Brown suggested the EIC waive page charges for publication, and Jian-Yu Lu did so. The ISAF 2002 Proceedings are out. For 2006 we voted at the last AdCom meeting to have Jon-Paul Maria as general chair. The venue is selected, with dates TBD depending on whether it is a joint conference or not. Jon-Paul is in the process of clarifying issues, and a memo of

understanding will be discussed at the Nov. 30 Boston Ferroelectrics Committee meeting. The MOU will be sent out to AdCom for response, but we can't wait until next AdCom meeting, since it has to go to next ISIF meeting in April 2004. Jackie will distribute the MOU to everyone for comments, then to only voting members for vote, and have conference services look at it at the same time AdCom is looking at it.

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### 2004 Joint meeting

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**Mike Garvey**

Mike Garvey submitted a status report on the 2004 meeting, which will be a joint meeting with Ultrasonics and Ferroelectrics in Montreal, 24-27 August 2004. Short courses and the AdCom meeting will be 23 Aug (Monday). The steering committee meeting June 13 in Chicago was very productive. Minutes are available if anyone is interested. Decided Feb 24, 2004 deadline for abstracts. A



**Lute Maleki, Mike Garvey, Asha Hall, Koray Akdogan**

joint TPC meeting will be held April 16, 2004 (Friday). Sessions will be organized Sat April 17 with TPC chairs and

FASS. Merging the structures of three meetings – finalized thinking about pricing uniformity. Consistent with prior planning meetings, prices were made uniform across all three areas. Short courses – one price gets you in to the short course/tutorial sessions for the day. Attendees sign up for which courses they plan to attend, and we will distribute notes (four power point slides per page) and CDs to attendees. John Prestage (FC), David Cheeke (Ultr), and Walter Schulze (Ferro) lead the TPC committee. Call for papers – want to e-mail – list Sorah is developing is almost complete, but we don't want to wait with deadline Feb 24th. Overall budget – about \$1Million – we have worked to define financial objectives of components of conference. Short courses – break even. Exhibits – same, with idea that exhibitors underwrite significant portion of the breaks and reception, etc. There will be three volumes of paper proceedings with 3 ISBN numbers, etc. All attendees will receive a CD (or set) with all three and indexes for all three paper versions. Luncheon on the first day will be included in registration, but the banquet will be extra. We expect about 1350 attendees. Rooms reserved covering about 1/3 of expected attendees. A volunteer has stepped forward to put together the web site. Registration will be handled through a FASS interface (an abstract to proceedings process for authors). Mike Garvey is looking for an A/V chair.

Herman van de Vaart made and Jan Brown seconded a motion that passed (unanimously): That we approve the proposed budget pending a change in the number of hardcopy Proceedings expected.

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### Frequency Control Committee

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**Lute Maleki**

Lute Maleki, Frequency Control VP, gave a report. The major event was that our relationship with PDA (Piezoelectric Device Association) was up for review based on the existing MOU. This review coincided with PDA losing a major person responsible for keeping everything together. No-one else could commit to taking care of exhibits. We jointly decided with PDA to sever formal ties and agreed PDA

would continue to support group 5 and chair it, but at the same time exhibits would be returned back to FCS. This required that we would complete two items of financial arrangements. One was the 2003 conference (which was successfully completed). Second, since PDA was responsible for maintaining representation in the international arena relating to manufacturing and their income would go away since it was linked to exhibits, we agreed to identify exhibitors that were PDA exhibitors and give back \$200 each for five years, until PDA got back on its feet. The objective behind tying with PDA in the first place was to support the manufacturing sector of FC (group 5), as we need to make sure it does not disappear. The name PDA exhibit will be removed from future conferences. Financially, this will be a plus for us – exhibitors have no other



place to go – we will have more income than we had before teaming w/PDA.

## 2002 and 2003 Symposia

The 2002 FC Symposium was officially closed. Mike Garvey spoke about the 2003 and 2004 meetings. The 2003 meeting in Tampa was joint with EFTF (European Frequency and Time Forum). Technically it was very successful. We had the same number of papers as in France in 1999, which was good, but attendance was down (SARS, Iraq, etc. didn't help). We did damage control with help from IEEE with the hotel, and hope to just about break even. The proceedings were published in 5 months. Generally, for FC we don't collect manuscripts at the meeting. For the Montreal meeting – what are rules? Marj Yuhas said we have mandatory electronic submission, with papers due at or before the conference. Ron Keller (at FASS) has modified the system so that abstract and paper submission use same tools.

## 2005 Symposium

Lute Maleki discussed 2005, which will be a joint conference with PTTI (Precise Time and Time Interval). A planning meeting has been held and a MOU signed. The general chair is Mike Driscoll and the conference will be in Vancouver (Gerry Blessing suggested contacting Stuart Foster for assistance).

## 2006 Symposium

For 2006, Baltimore, Philadelphia, and Orlando are being considered – a location should be decided by the next AdCom meeting.

## Frequency Control Review

Gerry Blessing summarized the action items from the May FC Committee review, many of which were self-instigated. Highlights include: (1) FC to take a proactive approach to add new people from the technical community; (2) Increase academic and industrial base; (3) Attention to international representation on its committee; (4) Post minutes on web site (which they have); and (5) Increased student support advocated.

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## Ultrasonics Committee

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**Clemens Ruppel**

Clemens Ruppel, Ultrasonics VP, gave a brief oral report.

## 2002 Symposium

Munich 2002 was very successful, and made \$152k (almost 50% surplus). All of the expenses were down – there were no exhibit costs (for room), and proceedings had much lower printing costs (due to only 61 hardcopies sold (excluding bookbroker)).

## 2003 Symposium

For 2003 we are looking forward to see what registration is.

Jim Greenleaf gave an update, stating we have 613 attendees (with 66 guests), which is slightly lower than expectations

but not a lot. There are 152 graduate students (included in 613). He's not sure they'll come to the meetings but that's a huge number. We expect 333 people for the Luau.

## 2004 Symposium

The '04 joint conference was covered by Mike Garvey under the Ferroelectrics report.

## 2005 Symposium

Planning for the '05 Ultrasonics in Rotterdam is going smoothly, and contracts with hotels are ready for review by IEEE. There is a question of who is going to do administration for the conference. A local organization may also do registration – we'll see. The conference is currently scheduled for Sept 18-21, 2005. A comment was made about this being high season for airfare, and Clemens will check into this and see if schedule should be adjusted.

## 2006 Symposium

The site for '06 is Vancouver, with Stuart Foster as general chair.

## 2007 Symposium

For 2007, we would like to get approval for John Kosinski as general chair with the meeting in NYC. Clemens Ruppel made and Jan Brown seconded a motion that passed (unanimously) that: We approve John Kosinski as general chair for 2007. The final details will be left up to the Ultrasonics Committee.

## 2008 Symposium

The discussion of '08 was going to Beijing, China. This would be right after the summer Olympics. Jian-Yu agreed to support this. We are not yet at point to ask for approval for him to be general co-chair, but at next AdCom meeting we want to be in position to ask for this and for having Ultrasonics in China for the first time.

## Ultrasonics Review

Gerry Blessing summarized the Ultrasonics review findings. Mathias Fink was the elected AdCom member on this review committee. The review looked at committee structure, publications, conferences, and other issues. Some of key points were – decreased representation of NDT community within Ultrasonics; Competition on future locations – is it healthy? Short courses – do we need to change topics more? Make it more "fresh"? Pump it up? Paper rejection rate (traditionally around 25-30%) – is it enough? Is it too much? Technical chair should consider anew if this should change. Standards – there is some discussion on standard terminology between three different groups, but we need to generate a document to summarize meanings. Exhibits – how to make it more attractive to exhibitors – perhaps include sales sessions? Susan Trolrier-McKinstry asked what the committee membership is and how it turns over. Clemens indicated that he took over in January 2003, and he had inherited part of the membership and tried to bring in new members. Every general and technical chair will be members. We have five groups within the symposium, so we need technical balance, but we also need international represen-

tatives and a balance between academia, industry, and government. Susan mentioned that Ferroelectrics had been asked to give list of who was on their committee for ten years or more – what about Ultrasonics? In the case of Ultrasonics, there has been a lot of turn over (no people over 10 years). John Kosinski asked if there are written records. There are not, as the Ultrasonics Committee has only been in existence since last change in bylaws – 1996 – so no one has been there 10 years. The committee needs to take minutes of their meetings and make a list of who has been on and how long.

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## Awards

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**Reinhard Lerch and Bernie Tittmann**

Reinhard Lerch stated that the election process for achievement and service awards was held this summer with – Jim Greenleaf for achievement and Bill O'Brien for service. Jackie Hines asked if we can change the W-9 requirements of headquarters, to avoid having awardees get tax forms before they get the awards. Jan Brown agreed to look into this.

## Distinguished Lecturer

Bernie Tittmann listed the distinguished lecturers, which are for '03-04 Steve Jefferts (FC) and for '04-05 Nava Setter (Ferro). Who should the distinguished lecturer be for '05-06? We should rotate into Ultrasonics. Bernie submitted summaries for three candidates, a vote was held and Ken Ya Hashimoto was selected for '05-'06 Distinguished Lecturer.

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## Publicity

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**Sorah Rhee**

Sorah Rhee presented a summary of publicity activities. Booths were set up at the Ultrasonics Symposium in Munich 2002 and Frequency Control in Tampa 2003, and Ultrasonics in Honolulu. Five new people signed up from FC meeting (very senior Europeans). The booth here in Hawaii has a DSL line for online registration. We are making a big UFFC mailing list, which is being compiled at

IMS. Rajesh Panda has the society member list, so please refer requests to him for info as needed.

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## Membership Services

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**Rajesh Panda**

Chair Rajesh Panda gave an oral and written report, and in summary we have 2154 members, down slightly more than 11%. Student membership is down 24%. We have high speed internet access at the symposium, and are providing free UFFC membership if they join IEEE at this conference. Rajesh will look into an e-mail reminding people to become Sr. members if they are eligible. We could send an e-mail periodically, and remind people they can nominate colleagues for Fellow, remind them to renew, remind them that we have the IEEE alias as a benefit. A new policy was approved for use of IEEE ID (FIEEE, SMIEEE, MIEEE, SIEEE(student)) on business cards, etc. Rajesh will be renewing the ambassador program. If anyone knows of members coming from low income countries please forward the information to Rajesh.

## Student Chapters

Asha Hall – IEEE Rutgers student chapter – advertised for joining UFFC. She then contacted student societies and advisors, sent out a plain text e-mail and also mailed out the postcards, fliers, and a letter asking societies and advisors to post them and support us. This drive started in the Northeast, but will spread out, but we need more postcards. Ahmad agreed to fund the purchase.

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## Standards

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**Art Ballato**

### Ferroelectric Standard

Art Ballato gave a written and oral report on the status of standards under development in each area. Susan Troler-Mckinstry and Art Ballato discussed Al Meitzler's yeoman's work on the Ferroelectrics Standard.

Art Ballato made and Susan Troler-Mckinstry seconded a motion that: The IEEE UFFC-Society AdCom formally acknowledges and commends the outstanding job done by Dr. Allan Meitzler for playing a major role in the organization and preparation of the revised IEEE Standard Definition of Terms Associated with Ferroelectrics and Related Materials. The motion was approved by acclamation (unanimously). The awards committee will take care of a plaque to be presented at the next meeting (joint meeting).



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## Fellows

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**Dick White, Jackie Hines, and Ahmad Safari**

Jackie Hines read Dick White's fellows reports, which stressed the reduced numbers of nominees. Jan Brown suggested sending out e-mails to encourage more nominees. Fred Hickernell stated that Dick White should get a certificate of thanks for his long years of service.

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## Nominations

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Bob Potter gave a written and oral report. Bob will try to get vice chair from the FC area. We have an outstanding list of people as nominees, and want the next elections to be done before next meeting. Three proposed nominees had not renewed. Jan Brown commented that two of the proposed nominees are on the Nominations Committee. Standard IEEE practice is that members of a nominating committee are not eligible for nomination. John Vig indicated that it would be up to us to revise the bylaws, since we should not have nominees on the nomination committee. We should have the ability to nominate by petition, and we should try to maintain a balanced breakout by technical area.

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## Historical Committee

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**Fred Hickernell**

Fred Hickernell stated that there are about 30 past society presidents, and we would like to have as many as possible attend the 2004 conference. Gerry Blessing has sent out an e-mail hoping they will attend the meeting. Several we can't locate, including Don White (Bell Labs), and Norm Foster (Bell Labs). Hopefully the person who started the Society may be there and speak at plenary briefly. Bernie Tittmann discussed his efforts to interview pioneers, and Fred encouraged him to write up or make videos of the interviews. Fred said that Ahmad had provided support for a Russian conference (from presidential funds), and that the funds went for student support.

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## Long Range Planning

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**John Vig**

John Vig sent out a revised strategic plan a few weeks before the meeting. John Vig made and Art Ballato seconded a motion that passed (unanimous approval): That we approve the long range plan (with typos corrected).

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## UFFC-S Representatives

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David Hecht, one of our representatives to JLT, presented a report on behalf of himself and John Lee. There was a substantial decrease in subscriptions from '02 to '03 – about a 30% drop – which was a result of the contraction in the optical telephone area. JLT is expecting on the order of a 50% page overrun, which corresponds to about \$200k. Fortunately they have a healthy reserve. All societies that are sponsors share in the deficits, but apportionment of profits and losses are proportional to subscribers from that society which for us is between 0.5 and 1% – so the shared profits (or loss) is negligible to our society.

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## New Business:

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### Education Committee



**Koray Akdogan and Gary Blessing**

Koray Akdogan described the new web page under construction with Sorah Rhee, and gave written and oral reports on the education committee. Ferroelectrics does not have as many educational materials as Frequency Control and Ultrasonics do, and Koray has contacted committee members and requested submission of tutorials, etc.

### Committee Listing on the Website

Lute Maleki mentioned that it would be helpful if committees and subcommittees of AdCom were on the committee web

site. Lute Maleki made and John Vig seconded a motion that passed (unanimously): That the names of chairs, vice chairs, and members of all committees and subcommittees will be posted on the web page, unless there is an IEEE policy that precludes it.

### Policies and Minutes

A suggestion was made that the policy section of the web site should have all approved minutes, and all policy motions. Gerry Blessing asked if this would be a task Sorah Rhee would be in charge of, and Sorah requested that the VPs send Sorah all such information for posting.

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## Election

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**Tom Shrout and Art Ballato**

Art Ballato has been nominated for President Elect. Art spoke about how he views our society and the future. Art thinks the reason for our existence is our publications and the intellectual property we generate. Secondly, as one of the smallest societies we have been subjected to the same loss of membership, but it is particularly serious for us. We should collar and drag in young people to enhance our membership – particularly graduate students. This may sound like motherhood and apple pie, but members really our bread and butter. Art was requested to step outside, and a discussion ensued, with a number of very complementary comments made by various AdCom members. A vote was made and Art Ballato was elected to the position of President-Elect (unanimous approval).

### Appreciation

Ahmad Safari will continue to be president through December 2003, then Gerry Blessing will become President in January 2004. The next AdCom meeting will be Saturday, April 17, 2004, in conjunction with the TPC meeting in Chicago for 2004 Montreal meeting. Ahmad presented certificates of appreciations to Walter Schulze, John Hossack, Jackie Hines, and Gordon Hayward, the outgoing elected AdCom members. He then made an announcement that John Vig is running for technical activity VP elect, and the vote is due Nov 12, 2003, so vote for John! Ahmad thanked all of us for our help running

AdCom for the last 2 yrs, which he said started a little bit bumpy, with a number of transitions. Jan Brown thanked Ahmad Safari for his leadership, and for shaking things up.

Jan Brown made and Mike Garvey seconded a motion for adjournment. The meeting was adjourned at 5:05 pm, 5 October 2003.

THE NEXT UFFC-S AdCom MEETING will be held on Saturday April 17, 2004 in Chicago in conjunction with the TPC meeting for the 2004 Joint Symposium.

**Jacqueline H. Hines**  
UFFC-S Secretary/Treasurer

## UFFC Presidency Changes

Ahmad Safari ends his two-year term of office in 2003. Gerry Blessing, who has been serving as President-Elect, takes over as President for 2004 and 2005. Art Ballato was elected to President-Elect.



**Gerry Blessing receives a Plaque for his service from Ahmad Safari**



**Gerry Blessing, the new UFFC President**



**Ahmad Safari**





**Gerry Blessing sings praises to Ahmad Safari**



**Art Ballato, Gerry Blessing and Ahmad Safari**

## Farewell to AdCom Class of 2003

President Ahmad Safari presented certificates of appreciation of service to the retiring AdCom Class of 2003.



**Jackie Hines**



**Walter Schulze**



**John Hassock**



**Gordon Hayward**

## The AdCom and Guests



**Bernie Tittmann and Kiyoshi Nakamura**



**Jian-yu Lu and Kiyoshi Nakamura**



**Sorah Rhee and John Hassock**



**Don Yuhas**



**Tom Shrout**



**Don Yuhas and Clemens Ruppel**



**Gordon Hayward**



**John Hassock**



**Laleh and Jaleh Safari**



**Margaret Ballato and Megan Yuhas**





**Mauricio da Cunha and wife**



**John Vig and Tania van de Vaart**



**Sorah Rhee, Mike Garvey, Don Yuhas (background),  
Herman van de Vaart and Tania Van de Vaart – How  
big was it Tania?**



**Don Yuhas and Bud Brown**



**Ahmad and Jaleh Safari with Rajesh Panda (middle)**



**Clemens Ruppel and guest Christine**



**Fred and Thresa Hickernell**



**Margaret Ballato and Marj Yuhas**



**Loretta Speidel, administrative assistant for the Transactions**



**Mary Lou Blessing**



**Bud and Natalie Brown**



**Thresa Hickernell**

## UFFC FINANCIAL REPORT

### 2003 Summary



**Herman van de Vaart**

The table below shows the preliminary UFFC Operating Financial Statement for 2003. It is preliminary because of the early deadline of this Newsletter so that several major items such as the final payment for the All Transactions Package, the Book Broker income, and the final IEEE Infrastructure charges are not known. For those items I used the original budget figures. As can be seen from the table, the estimated surplus of \$167.6K surpasses the budget net

substantially, primarily as a result of a higher than expected surplus from our Symposia. Specifically, the 2002 International Ultrasonics Symposium (IUS) in Munich resulted in a surplus of \$151.7K versus a budgeted surplus of \$54.0K. The 2002 International Frequency Control Symposium (IFCS) had a surplus of \$34.2K. Regarding the Transactions, the net is lower than budgeted due to lower than expected income from the voluntary and overlength page charges and a lower income from the All Transactions Income.

UFFC's net worth on 1/1/03 was \$136.1K. With the estimated 2003 surplus of \$167.6K and a possible increase in our reserves of \$49.1K due to favorable market conditions, the estimated net worth on 12/31/03 should be approximately

#### UFFC 2003

Transac ions  
Newsletter  
No io icals  
Sympo ia  
IEEE/TAB Ad i stra ion  
AdCom/Other  
**TOTAL**

INCOME		EXPENSE		NET	
BUDGET	ACTUAL	BUDGET	ACTUAL	BUDGET	ACTUAL
51		1			.
90		17			.
		7			.
<b>1,41</b>					.

\$352.8K. It is clear that after several years of critical financial conditions for both the IEEE and several Societies, UFFC's financial condition is improving again.

### 2003 Ultrasonics Symposium

The preliminary results for the 2003 Ultrasonics Symposium in Hawaii are also much better than expected. As of now, most of the bills have been paid with the exception of the expenses for the Proceedings. In round numbers, the registration/exhibit income was \$360K, expenses so far \$240K. Assuming Proceedings expenses of ~\$35K and Book Broker income of ~\$25K (comparable to the numbers for last year), we should end up with a surplus of about \$110K. The 2003 Frequency Control Symposium had a lower than expected attendance and ended up with an estimated surplus of \$2.1K.

### 2004 Budget

Finally, the IEEE Board of Directors has approved the Society budgets for 2004 with final adjustments for Book Broker income and reductions in infrastructure expenses. The bottom line for UFFC is:

Income: \$1,451.5K  
Expense: \$1,333.2K  
Net: \$118.3K

**Herman van de Vaart**  
**Chair UFFC Finance and Operations Committee**  
**Treasurer 2002 and 2003 IUS**  
**February 2, 2004**



# Ultrasonics, Ferroelectrics, and Frequency Control Society Administrative Committee & Associates

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## SOCIETY OFFICERS

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PRESIDENT	Gerald V. Blessing	Natl. Inst. of Standards & Tech (ret)
PRESIDENT-ELECT	Art Ballato	U. S. Army Comm.-Elec. Command
VP, FERROELECTRICS	Susan Trolier-McKinstry	The Pennsylvania State University
VP, FREQUENCY CONTROL	Lute Maleki	Jet Propulsion Laboratory
VP, ULTRASONICS	Clemens Ruppel	EPCOS AG
VP, PUBLICATIONS	Jan Brown	JB Consulting
SECRETARY-TREASURER	Jacqueline H. Hines	J. H. Hines Consulting

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## ELECTED ADMINISTRATIVE COMMITTEE MEMBERS

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2002 - 2004 Mauricio Pereira da Cunha, University of Maine  
 2002 - 2004 Bruce A. Tuttle, Sandia National Laboratories  
 2002 - 2004 John A. Kosinski, U. S. Army Communications-Electronics Command  
 2002 - 2004 Kiyoshi Nakamura, Tohoku University  
 2003 - 2005 Thomas R. Shrout, Pennsylvania State University  
 2003 - 2005 Mathias Fink, Universite Denis Diderot  
 2003 - 2005 Kullervo Hynen, Brigham and Women's Hospital Harvard Medical School  
 2003 - 2005 Mike Garvey, Summetricom Inc.  
 2004 - 2006 Victor P. Plessky, Consultant  
 2004 - 2006 Nava Setter, EPFL Swiss Federal Institute of Technology in Lausanne  
 2004 - 2006 Peter M. Smith, McMaster University  
 2004 - 2006 Daniel S. Stevens, Vectron International

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## STANDING COMMITTEE CHAIRS & VICE-CHAIRS

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AWARDS	Reinhard Lerch	University of Erlangen
Awards Vice-Chair*	Bernhard R. Tittmann	The Pennsylvania State University
FELLOWS*	Fred S. Hickernell	Motorola (retired)
FINANCE	Herman van de Vaart	VDV Associates
Finance Vice-Chair*	Jacqueline H. Hines	J. H. Hines Consulting
FERROELECTRICS	Susan Trolier-McKinstry	The Pennsylvania State University
Vice-Chair Ferroelectrics*	Steve Pilgrim	Alfred University
FREQUENCY CONTROL	Lute Maleki	Jet Propulsion Laboratory
Vice-Chair Frequency Control*	Samuel Stein	Timing Solutions, Inc.
MEMBERSHIP SERVICES	Rajesh K. Panda	Philips Medical Systems
Chapters Vice-Chair*	Elizabeth M. Herrera	Diebold Incorporated
NOMINATIONS	Bob Potter	Vectron International - Hudson
Vice-Chair Nominations*	TBD	
PUBLICATIONS	Jan Brown	JB Consulting
Vice-Chair Publications*	Don Yuhas	Industrial Measurement Systems, Inc.
TRANSACTIONS EDITOR*	Jian-Yu Lu	University of Toledo
Trans. Associate EIC*	Marjorie P. Yuhas	Industrial Measurement Systems, Inc.
NEWSLETTER EDITOR*	Jan Brown	JB Consulting
Newsletter Vice-Editor*	TBD	
WEB EDITOR-in-CHIEF*	Sorah Rhee	Fraunhofer-IBMT Technology Center Hialeah

STANDARDS	Eva S. Ferre-Pikal	University of Wyoming
Standards Vice-Chair*	TBD	
Sr. Past President	Fred S. Hickernell	Motorola (retired)
Jr. Past President	Ahmad Safari	Rutgers University
Sr. Student Member*(2003-2004)	Asha Hall	Rutgers University
Jr. Student Member*(2004-2005)	Oliver Keitmann-Curdes	Ruhr-University Bochum

## Ad Hoc Committees

EDUCATION*	E. Koray Akdogan	Rutgers University
HISTORIAN*	Fred S. Hickernell	Motorola (retired))
LONG RANGE PLANNING*	Ahmad Safari	Rutgers University
PUBLICITY AND EXHIBITION*	Sorah Rhee	Fraunhofer-IBMT Technology Center Hialeh

\*Non-voting position

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## SUB-COMMITTEE MEMBERS

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### STANDARDS

Ferroelectrics	Susan Trolier-McKinstry	The Pennsylvania State University
	Allen H. Meitzler	Retired
Loss in Acoustic Materials	Stewart Sherit	Jet Propulsion Laboratory
Piezoelectric Crystals	Bikash K. Sinha	Schlumberger-Doll Research
Piezomagnetic Technology	Robert W. Schwartz	University of Missouri - Rolla
Sensors, Actuators & Transducers	FabienJ. Josse	Marquette University
Surface Acoustic Wave Devices	Pierre Dufile	Thales Components
Time and Frequency	Eva Ferre-Pikal	University of Wyoming
UFFC Liaison to SCC – 27	John R. Vig	U.S. CECOM
Ultrasonic ID Tags	Clinton S. Hartman	RF SAW, Inc.
	Lewis T. Claiborne	RF SAW, Inc.

### WEB

Web Ed. for Ultrasound*	Richard Y. Chiao	GE Corporate R&D
Web Ed. for Ferroelectrics*	Sorah Rhee	Pennsylvania State University
Web Ed. for Freq. Control*	John R. Vig	U. S. Army Comm.-Elec. Command

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## DISTINGUISHED LECTURERS

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July 2002 – December 2003	K. Kirk Shung	University of Southern California
July 2003 – December 2004	Steven R. Jefferts	Natl. Inst. of Standards & Technology
July 2004 – December 2005	Nava Setter	EPFL Swiss Federal Institute of Technology
July 2005 – December 2006	Ken-ya Hashimoto	Chiba University

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## SYMPOSIA LEADERSHIP

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### ULTRASONICS SYMPOSIA

	Clemens C. W. Ruppel – chair	EPCOS AG
2004 Montreal, Canada (Joint UFFC Symposium)	R. Michael Garvey	Symmetricon Inc.
2005 Rotterdam, The Netherlands	Ton A. van der Steen	Thorax Centre
2006 Vancouver, Canada	Stuart Foster	University of Toronto
2007 New York City, USA	John A. Kosinski	U. S. Army Comm.-Elec. Command
2008 Beijing, China	Jian-yu Lu	University of Toledo



## FERROELECTRICS SYMPOSIA

2004 Montreal, Canada  
(Joint UFFC Symposium)  
2006 Raleigh, NC USA

Susan Trolier-McKinstry – chair  
R. Michael Garvey

The Pennsylvania State University  
Symmetricom Inc.

Jon-Paul Maria

North Carolina State University

## FREQUENCY CONTROL SYM.

2004 Montreal, Canada  
(Joint UFFC Symposium)  
2005 Vancouver, Canada  
2006 TBD

Lute Maleki – chair  
R. Michael Garvey

Jet Propulsion Laboratory  
Symmetricom Inc.

Michael M. Driscoll  
Michael M. Driscoll

Northrup Grumman Corp.  
Northrup Grumman Corp.

## UFFC-S REPRESENTATIVES

Committee on Man & Radiation  
Educational Activities EABE.  
Journal of Lightwave Technology

Paul J. Benkeser  
Koray Akdogan  
David L. Hecht  
John N. Lee

Georgia Institute of Technology  
Rutgers University  
Xerox Corporation, PARC  
Naval Research Laboratory

Sensors Council  
Superconductivity Council  
Transactions on Medical Imaging  
IEEE Professional Activities-PACE  
Publications Board  
TAB New Technology Directions

TBD  
Moises Levy  
Ahmed Amin  
TBD  
Jan Brown  
TBD

Retired  
Naval Undersea Warfare Center

JB Consulting

## IEEE Headquarters

Director Division IX  
TAB Managing Director  
IEEE General Manager

John A. Reagan  
Mary Ward-Callan  
Dan J. Senese

## Education

### The Education Committee of the UFFC: A New Committee



**Dr. E. Koray  
Akdogan**

It is a great privilege to be appointed as the chair of the Education committee (EdCom) of the UFFC –a new committee with a lot of potential to serve the Society at large, and especially the students.

The Education Committee of the UFFC has recently been chartered in year 2003. The mission of the EdCom is to promote the science and technology of Ultrasonics, Ferroelectrics and Frequency Control among undergraduate and graduate students in the allied engineering and physical sciences. The Committee reports directly to the President of UFFC.

Specific objectives of the EdCom can be summarized as: 1) to expose students to the Ultrasonics, Ferroelectrics and Frequency Control; 2) to provide students a forum to interact with senior scientists and engineers in academe and industry; 3) to promote web-based education; 4) to provide students with career information; and 5) to improve com-

munications among students. With your support, I see am confident that the EdCom will become a state-of-the art interactive platform through which technical information could effectively be disseminated to its members.

The EdCom's broad field-of-interest includes, but is not limited to, modern educational methods and technology, teaching materials, history of the science and engineering pertinent to UFFC, to name a few.

The EdCom web page has recently been constructed, but it is in its infancy. We, however, envision expanding it to accommodate a wide range of information and services that might prove to be very useful to especially undergraduate and graduate students. We also are looking for student volunteers —undergraduate and graduate— to participate in the EdCom activities, administrative or otherwise.

Please do not hesitate to drop me a line and provide your feedback to, as well as expectations from the EdCom.

Sincerely,

**E. Koray Akdogan**

**Chair, Educational Committee IEEE-UFFC**

**E-mail: [eka@rci.rutgers.edu](mailto:eka@rci.rutgers.edu)**

# Standards

## Standards Activities Report

### Volunteer

The IEEE UFFC Standards Committee is looking for proactive volunteers to populate a number of its subcommittees. Subcommittees are responsible for formulating standards in the various technical areas of interest to the UFFC Society. If you wish to volunteer, please contact Eva Ferre-Pikal: [evafp@uwoyo.edu](mailto:evafp@uwoyo.edu).

### New Standards Committee Chair

For many years Art Ballato ably served as the Standards Committee Chair. Under his leadership a large number of standards and projects have been maintained for the benefit of the technical community world-wide. We thank Art for his dedication, perseverance, and diligence in maintaining the course of our standards activities.

As Art assumes his new duties as UFFC President-Elect, Eva Ferre-Pikal will take over as Chair of the Standards Committee.



**Eva Ferre-Pikal**

#### About Eva Ferre-Pikal

Eva S. Ferre-Pikal received her B.S. degree in electrical engineering from the University of Puerto Rico, Mayaguez, in 1988. In 1989, she received her M.S. degree in electrical engineering from the University of Michigan, Ann Arbor. From 1988 to 1991 she worked for AT&T Bell Laboratories in Westminster, CO. She received her Ph.D. degree from

the University of Colorado at Boulder in 1996. The main topic of her thesis was the up-conversion of low frequency noise into phase and amplitude noise in BJT amplifiers.

From 1997 to 1998 she was a National Research Council Postdoctoral Research Associate at the National Institute of Standards and Technology. In 1998 she joined the Electrical Engineering Department at the University of Wyoming as an assistant professor. Her research interests are phase and amplitude noise processes in oscillators and amplifiers, the generation and synthesis of frequency stable signals, and the design and applications of low noise devices

### UFFC Standards and Projects

#### Ferroelectrics

Chair: Susan Trolrier-McKinstry

Vice-Chair: Al Meitzler

180-1986: IEEE Standard Definitions of Primary Ferroelectric Terms. Short dictionary of terms used to characterize ferro-

electric materials, particularly for piezoelectric applications. (Soon to be replaced by: IEEE Standard Definitions of Terms Associated with Ferroelectric and Related Materials. This is a much more comprehensive document than the present 180-1986. It contains a lot of fundamental theory, and treats other applications of ferroelectrics in addition to the piezoelectric applications).

#### Time and Frequency

Eva Ferre-Pikal

1139-1999: IEEE Standard Definitions of Physical Quantities for Fundamental Frequency and Time Metrology – Random Instabilities. Mathematical definitions of various measures by which time and frequency stabilities are characterized and quantified.

1193-1994: IEEE Guide for Measurement of Environmental Sensitivities of Standard Frequency Generators. Treatment of external influences, such as shock and temperature, that affect oscillators; how to characterize and measure these environmental factors.

UFFC Liaison to SCC-27 is John Vig. This group has completed an update to the above standard. The draft was accepted by the IEEE Standards Association in June 2003.

#### Surface Acoustic Wave Devices

Chair: Pierre Dufile

1037-1992: IEEE Standard Terms and Definitions for Surface Acoustic Wave (SAW) Devices. Short dictionary of terms and parameters associated with SAW interdigital transducers (IDTs), as well as SAW devices such as resonators and filters.



**Pierre Albert  
Dufile**

#### About Pierre Dufile

Pierre Albert Dufile has spent more than 20 years in the field of Surface Acoustic Wave Devices. BSEE ('71) and MSEE ('72) in Electrical Engineering from the University of Connecticut. Member of honor societies Eta Kappa Nu, Tau Beta Pi. Member of IEEE since 1969, UFFC since 1976. Also a member of the MTT group. Author and co-author of numerous papers published in the

Ultrasonics Symposium Proceedings from '80 to present. Author of numerous patents on Surface Acoustic Wave devices.

1976-1982 Senior design engineer at Andersen Laboratories  
1982-1987 Member of the Technical Staff and co-founder of Phonon Corp.

1987-1989 Chef Adjoint de Service Recherche, Thomson



SINTRA ASM, Valbonne, France  
1990-present Technical Director, US design center, Temex,  
Vernon, CT

Since 1976 has been designing many types of SAW devices  
and has been developing software for synthesis, analysis,  
and mask generation.

Presently technical director employed by Temex, US offices  
in Phoenix, Az.

Associated with Temex Microsonics, France (Note: the  
company Temex Microsonics (TMX) is formerly Thales  
Microsonics and Thomson Microsonics)

### Piezoelectric Crystals

Chair: Bikash K. Sinha

176-1987: IEEE Standard on Piezoelectricity. Comprehensive  
treatment of the theory and use of piezoelectricity in crystal  
resonators, with the emphasis on quartz in the limit where dis-  
sipation may be neglected. (A new subcommittee is taking up  
the task of dealing with dissipative piezoelectric materials.)

177-1966: IEEE Standard Definitions and Methods of  
Measurement for Piezoelectric Vibrators. Use of the pi-net-  
work method of extracting the equivalent electrical circuit  
parameters of a piezoelectric resonator from frequency meas-  
urements, with emphasis on high-Q quartz.

### Piezomagnetic Technology

Chair: Robert W. Schwartz

319-1990: IEEE Standard on Magnetostrictive Materials:  
Piezomagnetic Nomenclature. Dictionary of terms used to  
characterize magnetostrictive materials in the linear  
regime, where their behavior is analogous to piezoelectric  
materials as regards the forms of the phenomenological  
equations.



Stanley L. Ehrlich

We would like to thank Stanley L.  
Ehrlich for his years of service as  
Chair of this committee. We applaud  
Stanley for working tirelessly on our  
behalf.

### Ultrasonics in Medicine

Currently inactive

790-1989: Guide for Medical Ultrasound Field Parameter  
Measurements. A "how-to" standard, giving detailed recipes  
of how to measure and calibrate sound fields of medical  
modalities.

### Sensors, Actuators, and Transducers

Chair: Fabien J. Josse

P1182: IEEE Guide to Terms and Definitions of  
Ferroelectric, Frequency Control, and Ultrasonic Sensors.  
Project leading to a standard that will provide a broad char-  
acterization of sensors that use all the technologies pertinent  
to the UFFC Society.

### Ultrasonic ID Tags

Co-Chairs: Clinton S. Hartmann and Lewis T. Claiborne

A subcommittee has been partially constituted. A first draft  
of the standard has been formulated.

### Losses in Electromechanical Materials

Chair: Stewart Sheritt

Work has been progressing on the first draft of a proposed  
standard "Standards on Characterization of Losses in  
Electromechanical Materials."

## Publications

## UFFC Transactions

### Multimedia Manuscripts



Jian-yu Lu,  
Editor-in-Chief

IEEE TUFFC Started Accepting  
Submission of Multimedia Manuscripts  
on August 1, 2003

On August 1, 2003, the IEEE Trans-  
actions on Ultrasonics, Ferro-  
electrics, and Frequency Control  
(TUFFC) started to accept submis-  
sion of multimedia manuscripts via  
its Manuscript Central website:  
<http://tuffc-ieee.manuscriptcentral.com>.

Authors have been enthusiastic about the multimedia pos-  
sibilities. To date, we have received 5 multimedia submis-  
sions. One has been accepted for publication and four are in  
the review process. One of the authors added his comments in  
MC: "Our submission includes a movie showing  
results of our algorithm in progress. The ability to include this  
demonstration was a major reason for choosing the  
Transactions on UFFC given the recent decision to include  
multimedia files."

Detailed information for preparation and submission of  
multimedia manuscripts is in the "Information for  
Contributors". An example of PDF multimedia file is at:  
<http://www.ieee-uffc.org/tr/mexample.pdf>. The multimedia  
content (color pictures, sound, movies, or animations) can

be accessed by clicking on appropriate multimedia icons within the PDF file.

## Manuscript Central

It has been over a year since the introduction of Manuscript Central. Between June 1 2003 and March 26 2004, 634 manuscripts have been submitted. The acceptance rate for the manuscripts is around 75%. The vast majority of papers have been from the Ultrasonics community (85%) with only 8% from Frequency Control and 7% from Ferroelectrics. 30% off all the submitted manuscripts are in medical ultrasound.

## Timeliness Statistics

The current average time from submission to publication is slightly less than eight months. This is a vast improvement from the over two years that we were experiencing a few years ago. The two major contributing factors for this improvement are the use of Manuscript Central and the move from six to 12 issues per year.

We are working to reach a goal of four months from submission to publication. A little more than half of the current eight months is time spent in the review process with two of these months with the manuscript in the Authors hands for revision. The other half is time in the production process. The production staff has committed to reducing the production time to 55 days. To meet the goal of four months from submission to publication will require continued timelines of Associate Editors, reviewers and the authors themselves.

We currently have 45 associate editors and 1045 potential reviewers. If you would like to be an associate editor or a reviewer, contact the Editor-in-Chief, Jian-yu Lu ([jilu@eng.utoledo.edu](mailto:jilu@eng.utoledo.edu)).

## Future Work

Manuscript Central will continue to be used to identify bottlenecks in the peer-review process so that we may take corrective action. The production process is continually being streamlined.

Special issues are being developed:

- 50th Anniversary of the society issue with Jack Kusters as the Special Grand Guest Editor
- Ultrasonic Transducers for High Temperature Applications with guest Editors Gordon Hayward and Alistair McNab
- Coded Waveforms in Ultrasonic Imaging with guest editors Tom Thomas, and Richard Chiao and coordination by John Hassock
- Acoustic Wave Sensors and Applications with guest Editors Robert Weigel and Robert Hauser
- Micromachined Ultrasonic Transducers with guest Editor Pierre Khuri-Yakub

If you have other special issues you would like to see contact Jian-yu Lu.

We will continue to refine the multimedia manuscript process and encourage you to submit in a multimedia format where it makes exposition of your ideas more fruitful.

Finally, we are preparing the UFFC Archive for launching on the IEEE Xplore platform.

**Jian-yu Lu**  
**Editor-in-Chief**  
[jilu@eng.utoledo.edu](mailto:jilu@eng.utoledo.edu)

## Other Conferences

### VII International Conference For Young Researchers Wave Electronics and its Applications in Information and Telecommunication Systems St. Petersburg, Russia 12-15 September 2004

#### Schedule:

**Abstracts deadline:** 15 May 2004  
**Notice of acceptance:** 2 June 2004  
**Program:** 30 June 2004

#### Contact information:

Professor Sergei Kulakov  
State University of Aerospace Instrumentation

67, Bolshaya Morskaya Street, St. Petersburg, 190000, Russia  
Tel/ FAX: +7 (812) 108-4204, Tel.: +7 (812) 373-4216  
**E-MAIL:** [weconf@home.ru](mailto:weconf@home.ru)  
**Internet:** [www.cl.spb.ru/weconf](http://www.cl.spb.ru/weconf)

## INTRODUCTION

The first conference of this series took place in 1998. Since that time it has become a pleasant tradition to hold the conference every year. The organizers make every attempt to



present to our guests all the beauty of St. Petersburg and the magnificent Russian North.

Have you ever been to St.-Petersburg? If not yet, then come and feel the city's atmosphere and its soul. You will admire the granite embankments, the elegant silhouettes of palaces, the iron lacework of the railings around the Summer Garden, and hundreds of bridges spanning rivers and canals.

The wide and deep Neva River flows into the Gulf of Finland – a part of the Baltic Sea. It was Peter the Great's dream to establish a port city on this river to provide a route to various countries, to trade with them and to enrich each other with knowledge and experience. Alexander Pushkin, the Great Russian poet of the 19th century, called our city "a window to Europe".

St. Petersburg is one of the great cultural centers of Russia and the world due to its unique museums, including the Hermitage, the Russian Museum, and the palaces of Pushkin, Pavlovsk and Petrodvoretz. Today there are 181 museums in the city: 46 natural history and technology museums, 15 literary museums, 51 historical museums, 24 local history and ethnographical museums. Their total collections amount to more than 15 million displays of spiritual and material culture. The total annual number of museum visitors exceeds 30 million.

St. Petersburg has celebrated its 300-th anniversary. New and renovated bridges, embankments, transport junctions, tunnels have been built. The city's older areas are being gradually renewed. Architectural monuments are being actively restored to regain their original historical appearance. A number of anniversary-related projects and programs are currently ongoing in industry, science and culture. All these efforts will establish a solid foundation for the further development of St. Petersburg in the 21st century.

Peter the Great founded the city on 1703. The first foreign guests visited the city at that time. Since then, everyone who comes here with an open heart enjoys traditional Russian hospitality. The number of visitors grows every year. Some day you too may be among them.

Welcome to our beautiful city and enjoy staying with us!

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## CONFERENCE COMMITTEES

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### General Chair:

- Academician Y V. Gulyaev (Russia)

### Co-Chairmen:

- Academician A. S. Bugaev (Russia)
- Prof. A. A. Ovodenko (Russia)
- Prof. R. Besson (France)

### Technical Program Committee:

- Prof. G. D. Mansfeld (Russia),
- Dr. F.S. Hickernell (USA)

### Organizing Committee:

- Prof. S. Kulakov (Russia), - Chairman
- Mrs. L. Konovalova (Russia) - Scientific secretary

### Conference Organizers:

- St. Petersburg State University for Aerospace Instrumentation,
- Institute of Radioengineering and Electronics of Russian Academy of Sciences (Moscow).
- Ecole Nationale Supérieure de Mécanique et des Microtechniques (Besançon, France)
- Société Française des Microtechniques et de Chronométrie (France)

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## CONFERENCE TOPICS

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Topics to be considered include but not limited to:

- State-of-the-art of information processing methods;
- Optical information processing;
- Resonators and filters for information and telecommunication systems;
- Mathematical simulation of wave electronics devices;
- Image processing in the telecommunication systems;
- New technologies based on new phenomena in wave electronics and their perspectives;
- Acoustoelectronic and acousto-optic methods for environmental monitoring and human life protection;
- Acousto-optic methods for information processing;
- Optical fiber technology applications to sensors and communication systems;
- Properties of new acoustic materials;
- Acoustic and acousto-optic methods for the investigation of materials for wave electronics;
- Spin wave theory and applications;
- Wave electronic in space application

The Conference is for scientists and specialists under 35 years old, but the organizers would encourage leading Russian and Foreign scientists (without age restrictions to give overview lectures).

Time limits will be 30 minutes for invited lectures and 20 minutes for oral presentations. In addition a poster section and a roundtable discussion will be organized. Conference language is English.

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# The 2003 International Workshop on Precision Oscillations in Electronics and Optics: Theory and Applications September 19-20, Alushta, Crimea, Ukraine

The meeting was held on the beautiful coast of the Black Sea near downtown Alushta simultaneously with the International Conference on Advanced Optoelectronics and Lasers (CAOL). All presentations were published in the

Proceedings of the CAOL, volume II, and the most interesting topics were selected for the special issue of the Proceedings of SPIE. During the conference, the attendees had an opportunity to take part in excursions to a number of

historical sites in Crimea. In particular, Yalta has attracted many visitors to the Livadia Palace, in which Roosevelt, Stalin, and Churchill had a conference in 1945.

The event was organized jointly by the IEEE LEOS Ukraine Chapter, Kharkiv National University of Radio Electronics of Ukraine, University of Guanajuato of Mexico, Moscow Power Engineering Institute (Technical University) of Russia, LCEP and LPMO of France, NIST of USA, Tele and Radio Research Institute of Poland, Institute of Radio Engineering and Electronics of Czech Republic, Tavrida National University of Ukraine, National Academy of Sciences of Ukraine, Ministry of Education and Science of Ukraine, and University of Missouri, St. Louis, of USA.

Members of the Program Committee were Prof. Volodymyr Shokalo (Ukraine), Prof. Roger Bourquin (France), Prof. Remi Brendel (France), Prof. Stanislav Nedorezov (Ukraine), Dr. Krzysztof Weiss (Poland), Prof. Dmitry Tsarapkin (Russia), Dr. Thomas Parker (USA), Prof. Venceslav Kroupa (Czech Republic), Prof. Yuriy Koval (Ukraine), Prof. Yakov Shifrin (Ukraine), and Prof. Peter Handel (USA).

The purpose of the event was to discuss new theoretical problems associated with vibrations and oscillations, signal generation, and statistical methods in time and frequency. To help inform specialists in this area about the workshop, Dr. John Vig had placed the Call for Papers on the website of the IEEE Frequency Control community. Based on the submissions, the workshop was organized into four sections.

The first section "Crystal Resonators Theory" was chaired by Prof. Roger Bourquin and Prof. Stanislav Nedorezov. The newest results were reported on vibrations in crystal resonators excited in the lateral field and on the temperature sensitivity of STW propagation on various piezoelectric substrates (Prof. Dulmet and Prof. Bourquin); on the theory of vibrations in convex piezoelectric plates with asymmetry

(Prof. Nedorezov and Post-Grad St. Shmaliy, Jr.); and on the DLD of the high frequency BAW resonators (Prof. Bourquin and Dr. Boy) presented by Prof. Bernard Dulmet.

Problems on "Crystal Oscillators Theory and Noise" were discussed in the second section that was chaired by Prof. Remi Brendel and Prof. Yuriy Shmaliy. The most interesting presentations here covered modeling and simulation of crystal oscillators, namely employing dipolar analysis (Prof. Brendel, et al.), a generalized noise model (Prof. Shmaliy), and SPIE-aided simulation (Dr. Kosykh, et al., Russia). New results were reported on statistical dynamics of crystal oscillators with a nonlinear resonator and low drive level (Prof. Shmaliy and Dr. Rosales).

The third section "Oscillators Theory and Design" was chaired by Prof. Dmitry Tsarapkin. The principle problems were in the fields of sapphire loaded cavity oscillators (Mr. Shtin and Prof. Tsarapkin); high stability quartz oscillators utilizing anharmonic mode LFE resonators (Dr. Weiss, et al.); GPS-disciplined quartz frequency sources (Dr. Weiss, et al.); new DTCX structures employing modern microcontrollers (Dr. Kosykh); and single ion spectroscopy for optical clocks (Dr. Tamm et al., Germany).

Finally, the fourth section "Timekeeping and Applications" which was chaired by Dr. Krzysztof Weiss gathered scientists to discuss new trends in time dissemination. The most interesting results addressed were on applications of Kalman filtering for GPS-based timekeeping (Mr. Reyna et al., Mexico) and phase synchronization for time transfer (Prof. Koval, et al., Ukraine).

In addition, I would like to mention that the sea was warm, the weather in Crimea was nice, and the mountain surroundings were very comfortable.

**Prof. Yuriy Shmaliy**  
**Co-Chair**



**The workshop's most active participants.**



**After a session (r-l) Remi Brendel, Bernard Dulmet, Yuriy Shmaliy, and Oleksandr Shmaliy, Jr.**



**A castle known as "Lastochkino Gnezdo" ("Swallow's Nest") near Yalta**



**The traditional Ukrainian final meeting**



# History

## This Day in History

### 29 February 1860

Herman Hollerith, inventor of a punch-card tabulation machine that was first used to count the 1890 census and was a precursor of the electronic computer, was born on this day in Buffalo, New York, USA. The Tabulating Machine Company, which Hollerith formed in 1896, through a series of name changes and buyouts, eventually became the International Business Machines Corporation (IBM) in 1924.

### 1 March 1960

The Haloid Company (later the Xerox Corporation) shipped the first commercial photocopy machine, the Model 914.

### 6 March 1992

Early in the year, computer viruses attracted much attention because of the discovery of the Michelangelo virus, which was designed to activate itself on 6 March, the artist's birthday.

### 9 March 1851

Hans Christian Ørsted, a Danish physicist who discovered that electric current in a wire generates a magnetic field, died on this day.

### 12 March 1824

Gustav Robert Kirchhoff was born in Königsberg, Prussia (now Kaliningrad, Russia). A key contributor to electrical science, he formulated a set of eponymous laws on how electric circuits behave. He died on 17 October 1887 in Berlin, Germany.

### 14 March 1692

Petrus Van Musschenbroek was born in Leyden, the Netherlands. He invented the Leyden jar (it was invented almost simultaneously by von Kleist in Germany, but von Kleist never published—hence the invention's name), a capacitor that allowed early electrical scientists to collect electrical charge. Van Musschenbroek died in his native city on 19 September 1761.

### 16 March 1859

Aleksandr Stepanovich Popov (sometimes transliterated Alexander Popoff) was born on 16 March (4 March o.s.) 1859 in Turinskje Rudniki, Russia. A pioneer of wireless telegraphy, he is credited in Russia as the inventor of radio, although in most places Marconi is given priority. In the Soviet Union, 7 May was celebrated as Popov Day, commemorating the date of his first transmission in 1896. He died on 13 January 1906 (31 December 1905 o.s.) in St. Petersburg.

### 17 March 1958

A photovoltaic cell was first used in space on the United States' Vanguard 1, which was launched on this day; a radio transmitter on Vanguard was powered by 34 solar cells.

### 20 March 1886

The first commercial AC power plant in the United States went into service in Great Barrington, Massachusetts, USA. AC power distribution would soon supplant Edison's DC system and become a worldwide standard.

### 22 March 1895

Auguste and Louis Lumière made the first public demonstration of their cinématographe (or motion picture projector).

### 24 March 1870

Kotaro Honda was born in Aichi Prefecture, Japan. A metallurgist, he did pioneering studies of the magnetic properties of steels. He died in Tokyo, Japan on 12 February 1954.

### 27 March 1845

Wilhelm Conrad Röntgen, discoverer of x-rays, was born in Lennep in the Lower Rhine Province of Germany. For his feat he was awarded the first Nobel Prize in Physics. He died in Munich, Germany on 10 February 1923.

### 27 March 1855

Sir James Alfred Ewing, discoverer of magnetic hysteresis and developer of a seismograph, was born in Dundee, Angus, Scotland.

### 31 March 1931

AIEE Fellow Andre G. Clavier demonstrated the economy and quality of microwave telecommunication over a 40-kilometer path between Calais, France and Dover, England.

### 3 April 1973

Inventor Martin Cooper placed the first portable handheld phone call in New York City, New York, USA. Cooper was, at that time, a project manager at Motorola and leader of the corporation's cellular research.

### 12 April 1950

Morgan Sparks and Gordon Teal tested the first n-p-n junction transistor on this day, and William Shockley arranged for a demonstration within Bell Labs on 20 April. While not the first transistor, the junction type was easier to manufacture than the earlier point-contact transistors.

### 21 April 1774

Jean-Baptiste Biot was born in Paris. A mathematician and physicist who studied the Earth's magnetic field, together with Félix Savart he formulated a law concerning the magnetic field around a current-carrying conductor. He died on 3 February 1862 in his native city.

### 22 April 1592

Wilhelm Schickhard was born in Herrenberg, Germany.

Designer of an early mechanical adding machine, he died on 24 October 1635 in Tübingen.

#### 24 April 1898

IRE fellow Russell Harrison Varian was born in Palo Alto, California, USA. Together he and his brother Sigurd, also a Research Associate at Stanford University, invented the klystron. The eponymous company they founded was, along with Hewlett-Packard, one of the seeds around which Silicon Valley crystallized. He died on 28 July 1959 in his native town.

#### 28 April 1854

Hertha Ayrton (born Phoebe Sarah Marks) was born in Portsea, England. A pioneering woman scientist, she researched electric arcs and ripple effects. Among her many accomplishments, on 25 May 1899 she became the first woman elected to the IEEE's sister organization in the UK, the Institution of Electrical Engineers (IEE). She died on 26 August 1923 in New Cottage, England.

*This Day in History* is excerpted from a periodic service of the IEEE History.

## UFFC History Committee

### Historical Bibliography and Anecdotes

The History Committee of the UFFC Society is developing a bibliography of historical articles on the society and its technology developments which have already appeared in the literature. Also we are soliciting short anecdotal stories and personal remembrances (serious, interesting, and funny) of people and places associated with our society and/or its technologies. We will collect these for later publication and website placement. The bibliography information can be sent in the usual format of author, title, and journal/conference/newsletter information. The anecdotes in a story mode. Thanks.

Please send such information to Fred S. Hickernell, Email: [f.hickernell@ieee.org](mailto:f.hickernell@ieee.org) or 5012 East Weldon, Phoenix, Arizona 85018-6141, Phone 602-840-1719

Fred S. Hickernell  
Chair, History Committee

## Early History of UFFC 1953 - 1954

On the occasion of the IEEE Centennial (1884 – 1984) and the UFFC Transactions thirtieth anniversary, a portion of the November 1984 Transactions (IEEE TRANSACTIONS ON SONICS AND ULTRASONICS, VOL. SU-31, NO. 6,

NOVEMBER 1984 536) was devoted to the early history of the society. Reprinted here are some excerpts of that history.

## A Brief History of the Group on Sonics and Ultrasonics

STEPHEN WANUGA, MEMBER, IEEE, JOHN E. MAY, JR., SENIOR MEMBER, IEEE,  
AND THRYGVE R. MEEKER, MEMBER, IEEE

THE PROFESSIONAL GROUP on Ultrasonics Engineering (PGUE) was formed in March of 1953 at an informal meeting during the IRE Convention. The attendees at this meeting generated a strong move to formulate a group of professionals whose interests dealt with an engineering technology based on all aspects of ultrasonics; i.e., devices, circuitry, techniques, and applications.

A short time later, on May 6, 1953, the first administrative committee (AdCom) meeting was held in Washington, DC. The first officers were selected and elections took place for various committees that were appointed to carry out tasks to bolster the PGUE. Amor L. Lane was instrumental in getting the Group started and was elected as the first chairman. Other members of that first administrative committee were M. Kenny, J. Bernstein, W. G. Cady, M. D. Fagen, W. J. Fry, F. Massa, O. Mattiat, W. J. Mayo-Wells, and P. L. Smith.

It was at this first AdCom meeting that a technical session of the group was sponsored for the National Electronics Conference in Chicago on September 28, 1953 under the chairmanship of Dr. William J. Fry.

A second major undertaking of the Group occurred at the second AdCom meeting in October of 1953. It was at this meeting that plans were drawn for the first issue of the TRANSACTIONS. At the same time annual dues of \$2.00 were established for membership in the PGUE. The committee also succeeded in arranging sessions on ultrasonics for the next year's March 1954 IRE Convention. Early membership at the end of 1953 already established international interest from England, Japan, India, Sweden, and Switzerland. Interest in ultrasonics was high in the United States, and it supported the need for an active professional group in ultrasonics in the IRE.

On January 31, 1954 the group had 101 paid members and 198 unpaid members.

In June of 1954 the first copy of our group's TRANSACTIONS PGUE-1 appeared. A reprint of this first issue is enclosed in this special IEEE Centennial Issue.

The period of 1953-1954 is best summarized by the following Chairman's Report.

### 1953-1954 Chairman's Report

In the interval following the writing of my first report, published in our first issue of the TRANSACTIONS, our PGUE celebrated its first anniversary and reached its climax of activities.



It was originally planned to sponsor one session at the annual National Convention in New York last March. The response for papers being greater than anticipated resulted in the scheduling of two ultrasonic sessions. The chairman of the first session, featuring ultrasonic devices and delay lines, was our Group Vice-chairman, Morton Fagen of Bell Telephone Laboratories. The chairman of the second session, featuring ultrasonics in medicine, biology and chemistry, was Dr. Julia Herrick of the Mayo Clinic. All papers at the Convention appeared in the Convention Record published last June.

The third Administrative Committee meeting held in New York during the 1954 Convention outlined plans for the sponsorship of an ultrasonics session at WESCON in Los Angeles during August, 1954. For publishing these WESCON papers in a PGUE TRANSACTIONS, our Group was to receive up to \$400 from WESCON. This was part of a general financial plan

which was available to all the IRE Professional Groups. Francis X. Byrnes of the USN Electronic Laboratory was chairman of the WESCON Session.

All the sessions sponsored by PGUE were highly responsible for the spurt in membership growth of the Group. These facts were emphasized at the fourth Administrative Committee meeting held in June 1954 in New York. Morton Fagen's membership report of that date revealed that there were about 500 members well distributed over this country and in 9 different foreign countries. About 25 percent of this total were west of the Mississippi. Over 80 percent of the PGUE were not members of the Acoustical Society of America. It is also interesting to report that as of June, 1954, there were 75 members in metropolitan New York, 40 in Washington, D.C., 35 in Boston, 33 in Los Angeles, and 25 in Chicago. With the growth in membership, funds in the treasury rose from minus \$24.44 on December 31, 1953 to plus \$936.96 on June 30, 1954. It is hoped that Institutional listings (manufacturers' advertisements) in the TRANSACTIONS plus more paid-up memberships will add to the treasury. A greater balance would then permit better publications and more meetings.

The fourth Administrative Committee meeting saw the adoption of the Group Constitution and Bylaws, which are to be found in the back of this issue. The main business of the meeting, however, was the election of three new Administrative Committee members, as follows: Julia Herrick, Mayo Clinic; Warren P. Mason, Bell Telephone Laboratories; and Karl Van Dyke, Wesleyan University.

Many thanks are in order for the help given during the vital formative period of the group by the three retiring Administrative Committee members, W. G. Cady, W. J. Mayo-Wells, and Paul L. Smith. The three new members were chosen from a slate of six nominees selected by a Special Nominating Committee. The latter committee consisted of David Arenberg (Arenberg Ultrasonic Laboratory), Donald Berlincourt (Brush Laboratories), and Walter G. Cady (California Institute of Technology). Recognizing the large potential field from which this special committee could choose, it was no wonder that it was a difficult task to nar-

row down the list to a slate of six.

Since the group just entered its second year, the Administrative Committee decided to reelect the same officers for another year. They are listed on the inside cover of this issue. In addition, Julius Bernstein (Target Rock Corp., Long Island) was selected to be Treasurer. The same subcommittee chairmen were retained with the additions of William J. Fry as chairman of the Papers Study and Review Committee, and Julius Bernstein as chairman of the chapter-section Activities Committee.

In conclusion, I wish to express my appreciation for the Administrative Committee's vote of confidence by reelecting me. However, it is to all of you that I look for further support. First, the organization of chapters in some of the cities where there are strong nuclei of ultrasonics interests will be accomplished through some one person taking the initiative. Second, if you know of anyone interested or engaged in ultrasonics who is a potential PGUE member, forward his name to IRE Headquarters, and we will send him a complimentary PGUE TRANSACTIONS. Third, if there are any articles or any letters to the editor of interest to the Group, feel free to submit them. Remember, this is your Group. You have a platform of self-expression. Use it and it will serve to help you both technically and professionally.

**Amor L. Lane**  
**Chairman, PGUE**

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## The Membership

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The membership rate of growth of the group was small but steady. On July 31, 1954, the group had 254 paid members and 180 unpaid members; on December 31, 1954, 321 paid members and 145 unpaid members; on March 31, 1955, 347 paid members and 150 unpaid members; on May 31, 1955, 398 paid members and 143 unpaid members. Membership was solicited to strengthen the group and in April 1955, 150 copies of PGUE-2 were mailed to unpaid members together with an assessment notice and a brochure outlining the scope and activities of the PGUE.

Of special significance in the PGUE-3 was the publication of the constitution and bylaws of the PGUE as adopted by the AdCom. Also established was the Paper Review Board, which consisted of William J. Fry, Floyd Dunn, and Frank J. Fry. The third issue of the TRANSACTIONS appeared with formal notice of Oskar E. Mattiat as Editor in Chief and Don Berlincourt as Associate Editor. The issue contained three papers presented at the Ultrasonic Session of the Western Electronic Show (WESCON) August 25-27, 1954, three contributed papers, and the Cumulative index of the first three Transactions issues. On May 31, 1955 the balance in the treasury was \$1557.

At the June 27, 1955 AdCom meeting, the members suggested an attempt to publish the TRANSACTIONS on a set schedule, three times a year, March, September, and December.

It was at this meeting that considerable discussion was devoted to the question of whether the scope of interest of

the PGUE includes the field of piezoelectric devices and their applications; for example, frequency control devices. This field was not then covered by any professional group. It was the consensus of opinion that to meet the needs of people in this field and as an aid to group members engaged in the field of ultrasonics engineering, the PGUE should seek and continue to accept papers dealing with piezoelectric devices and their applications for publication in the group TRANSACTIONS.

One can realize that these early formative years were indeed laying the foundation of future ultrasonic devices, systems, and applications. The work involved in forming such a standing organization is best expressed in the following report:

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### **Our First Three Years-A Message From the Chairman**

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On May 6, 1953, the first Administrative Committee Meeting of the Professional Group on Ultrasonics Engineering was held in Washington, DC. to mark its official beginning. This meeting was our "constitutional convention." Now, three years later: the last three members of that first Administrative Committee are retiring from their official positions-Amor Lane, our first chairman and the guiding spirit of the Group's formation, Oskar Mattiat, Editor in Chief of the PGUE Transactions, and myself.

What can we say about our first three years? Looking back we can see how we have developed from our small beginnings — our membership has grown considerably and our treasury, that once had only a small IRE parent contribution, now has a good working sum. These things are important, and we are happy to report that measured in members and dollars we have made great progress. But there has been a larger progress — that of a unity of professional purpose and a dignity of standing and organization.

As a professional group specializing in ultrasonics engineering we publish a professional journal and organize technical sessions around the theme of ultrasonics at meetings of national importance. We "belong" in a way that the science of ultrasonics and its engineering applications did not belong three years ago. We have not done this by ourselves; the IRE provided the framework and, in a sense, made the niche into which we could fit by its Professional Group Program. But the structure was built by you, its members, by everyone who has ever given a paper at an ultrasonics session or written for the TRANSACTIONS, by members of our Standing Committees, and by all the past and present members of the Administrative Committee.

But our work has only begun. We would like to see the group double its membership in five years and the TRANSACTIONS grow in size and frequency of publication. Ultrasonics Group Chapters must yet be established in Boston, New York, Chicago, Washington and Los Angeles; out of these will grow regional symposia on ultrasonics across the country.

How will this development come about? With just a little push to help the strong natural force of growth, a little guid-

ance by your Administrative Committee, a little feedback judiciously applied by the IRE Executive Committee and the individual efforts of our members, participating and contributing to ultrasonic group activities on paper and the meeting floor.

Good Luck, gentlemen.

**M. D. Fagen**  
**Chairman, PGUE**

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### **THE EARLY YEARS**

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In the early years, the group struggled for recognition because the only technical sessions held were at WESCON and the IRE National Convention. The smaller groups such as PGUE and others came out second best (compared to well established groups) in the competition for sessions at these meetings. In addition, it also became clear that although important, the TRANSACTIONS alone were not enough to keep the group viable and growing.

For these reasons the Committee decided to plan the National Ultrasonics Symposium, which was to be held either immediately before or after the 1959 WESCON Conference August 18-21, 1959, and in the same geographical area. John E. May Jr., who was the Chairman of AdCom at the time, was pushing very hard to have this occur. Dr. Vincent Salmon kindly agreed to head the committee responsible for arrangements in connection with the first symposium.

During this period many groups met together as one Professional Groups Committee to discuss their financial difficulties, and they recommend changes in the IRE subsidy. Various motions were presented by numerous groups, and the committee suggested that all professional groups be subsidized by an amount equal to one third of the cost of all group publications, which are distributed free to members. This procedure would be in lieu of the current subsidy that amounted to one dollar for each paid member of the group. These were very trying times financially for many groups including the PGUE and many dedicated members continued their efforts and discussions with IRE headquarters on how the funding would be accomplished.

The TRANSACTIONS continued: PGUE-4, August 1956; PGUE-5, August 1957; PGUE-6, December 1957; 1958, no TRANSACTIONS; and PGUE-7, February 1959. Papers were solicited for the following fields: underwater sound, delay lines, transducer materials, ultrasonic cleaning and agitation, ultrasonic testing, and university research in ultrasonics.

In the meantime conference plans proceeded, and Vince Salmon did an outstanding job of organizing the first symposium at Stanford in 1959. The meeting was a success even though an unexpected date conflict occurred because the International Congress on Acoustics, which met at the same time, cut into the attendance appreciably.

An attempt to hold a second symposium in Boston in 1960 had to be aborted for lack of a chairperson. The year 1961 passed without a symposium, and in December 1962 John E.



May, Jr. organized a successful symposium in New York City. The meeting was successful and another milestone was passed, leading to the continual growth of annual symposia by the group. In 1960 two TRANSACTIONS appeared: one in February and another in June. The next issue appeared in March 1961, followed by the July 1962 issue. The next issue, the July 1963 TRANSACTIONS, contained seven papers that were presented at the 1962 Ultrasonics Symposium and three contributed papers. This issue also marked a significant step where eight associate editors were appointed to serve on the TRANSACTIONS Publication Committee with Editor in Chief Oskar E. Mattiat.

In 1964 the AdCom changed the name of the group to the Sonics and Ultrasonics Group and the TRANSACTIONS to the TRANSACTIONS on Sonics and Ultrasonics. The annual fee was raised to \$3.00. A cumulative index of 1954-1963 was published in the June 1964 issue along with papers of the 1963 Ultrasonic Symposium. Abstracts of all papers in the 1963 Ultrasonic Symposium were published in the November 1964 issue. In 1966 the TRANSACTIONS became a quarterly publication.

The year 1971 was a great challenge to the AdCom and the entire Group. Financial constraints in many Groups (including the Sonics and Ultrasonics Group) were making it extremely difficult to sustain existence. Many dramatic changes were also occurring within the IEEE boards. The challenges and changes are best described by an editorial from the July 1971 issue of this TRANSACTIONS.

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## Editorial

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This issue marks the end of an era for the IEEE G-SU and the beginning of a new one. These are rapidly changing times in the whole IEEE structure and we as a group must also change to keep pace.

One of the areas of change is in our editorial staff shown on the inside front cover. Oskar Mattiat, after serving our group as this TRANSACTIONS Editor ever since its inception 18 years ago has asked to be replaced, and it is with great regret that we have accepted his resignation. Oskar has seen this TRANSACTIONS grow from its uncertain sporadic beginnings to the internationally recognized, regular quarterly journal that we have today, and this steady growth in both [quantity and] quality has been largely due to Oskar's continued and expert guidance. We are indeed sorry to lose him. We also have had to replace four of our Associate Editors who have had to resign due to changes in their field of work. These are R. Bechmann, D. Berlincourt, R. N. Thurston, and D. L. White, and I would like to take this opportunity to thank them all on behalf of the group for their invaluable services.

We have been very fortunate in not only replacing the vacancies but also in increasing our staff to cover the newer aspects of the field, and it is with great pleasure that I welcome Steve Wanuga and John De Klerk as our new Editor and Assistant Editor and A. R. Braun, E. Lean, A. F. Metherell, M. B. Schultz, and F. S. Welsh as new Associate Editors in the areas noted on the inside front cover.

The other major area of change is in our method of printing this TRANSACTIONS. With the rapidly increasing cost of printing and the changes in IEEE group financing policy, we have to either substantially reduce the size of this TRANSACTIONS or to use much less expensive composing and printing methods. The IEEE G-SU AdCom has decided that to reduce the size of this TRANSACTIONS would be in direct opposition to the primary purpose of the group, which is to further the communication between those working the field of sonics and ultrasonics. Therefore, starting with the October 1971 issue, this TRANSACTIONS will be typewriter composed and printed by photo-offset. We are presently hoping to be able to have the composition done professionally within our publication budget rather than requiring authors to prepare camera-ready copy, as this will ensure a uniform appearance and avoid putting an additional burden on the authors. Although this TRANSACTIONS will not present quite as pleasing an appearance when typewriter composed, there is a real advantage in that we can increase the number of pages we can afford to publish, and we are looking forward to building this TRANSACTIONS into a broader publication that can more effectively serve the needs of all our members and of others working in the field. If you have any material you feel would be appropriate for this TRANSACTIONS, please contact any member of our Editorial staff.

In addition to the TRANSACTIONS we are initiating a policy of publishing conference proceedings for sale to interested persons. The first of these will be a compendium of the invited and tutorial papers presented at last year's Ultrasonics Symposium. This issue is now being prepared by Larry Kessler and is expected to be available this fall. Also planned are a proceedings of the IEEE Symposium on the Applications of Ferroelectrics to be held in June of this year, and under the editorship of J. De Klerk, the institution of a regular series of proceedings covering future Ultrasonics Symposia.

**N. F. FOSTER**

**Chairman Publications Committee**

A copy of the Editor's note from the first Ultrasonics Symposium Proceedings by Lawrence W. Kessler, Proceedings Editor, follows.

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## First Ultrasonics Symposium Proceedings Editor's Note

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For many years now the annual ultrasonics symposium has been a forum for new developments covering a broad spectrum of current topics in ultrasonics. This year's symposium was highlighted by a large number of "tutorial" and "invited" papers to satisfy the many levels of interest of the attendees. Realizing that written versions of these particular papers would constitute a valuable source of reference material, it was decided to collect as many of them as possible into one volume as a post-conference publication. Although,

unfortunately, it was not possible to get full participation, a majority of the papers do appear here. The manuscripts have been prepared for offset printing by the authors themselves and their cooperation is greatly appreciated.

**Lawrence W. Kessler**  
**Proceedings Editor**

The Proceedings of the next ultrasonic symposium were published for the year 1972, and its purpose is best described by the editor as follows.

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## **Second Ultrasonics Symposium Proceedings**

### **Editor's Note**

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For many years the annual ultrasonics symposium has been a forum for new developments covering a broad spectrum of current topics in ultrasonics on an international level. As the information disseminated at the symposium has not been recorded in the past, except for the "invited" papers in 1970, it was felt that a great deal of valuable information was lost each year, as many of the papers were never published. It was decided by the Administrative Committee to attempt to retrieve this information at future conferences. This Proceedings, the first to attract comprehensive and immediate coverage of the symposium, justifies the administrative committee's decision. I should like to thank the authors who responded to make the 1972 proceedings such a success. Correspondence from many authors indicated that the challenge of producing a good manuscript, which allowed them to prepare better talks and to publish their latest work in a shorter time than in the celebrated "letters" publications, was very well received.

In this Proceedings, an average of approximately 75 percent of the talks has been documented. Several sessions of the symposium, notably those on surface waves, have been documented 100 percent. It is hoped that this high percentage of participation will be continued in the future.

Originally it was felt that the Proceedings should include abstracts of those talks not submitted in manuscript form; however, this has not been done as the complete program, in abstract form, will be published in the January 1973 issue of IEEE Transactions on Sonics and Ultrasonics for archival purposes. Papers not included in this Proceedings will be indicated by an asterisk in the TRANSACTIONS. Manuscripts that have been received too late to be correctly placed in the table of contents appear at the end of the table under "Manuscripts Received Late."

**J. De Klerk**  
**Proceedings Editor**

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## **The early 70's**

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The early 70's were indeed a trying period and the AdCom worked very hard at improving the financial and professional stature of the group. John De Klerk, Norm Foster,

Stephen Wanuga, Larry Kessler, Bill O'Brien Jr., Bruce McAvoy, and many others were especially instrumental in turning the group's direction into one of growth and prosperity. Membership increased, and attendance at the symposia grew. Financial income greatly increased from the voluntary page charges of the TRANSACTIONS, Symposium Proceedings, symposium attendance, and membership dues. The group's treasury therefore improved. These benefits in turn were passed on to the membership in the form of increased pages in the TRANSACTIONS and Symposium Proceedings, stable membership dues, subsidized banquets at the symposia, and other activities beneficial to all members. The most important goal was achieved; that in making the Group on Sonics and Ultrasonics a highly solvent and technically acknowledged group in the IEEE structure.

There were many technological breakthroughs throughout these years. Who can forget, whether a participant or not, the high interest, enthusiasm, and voluminous work involving the study and application of surface acoustic wave devices in the late 1960's and 1970's. This technology had an important and beneficial contribution to the group and the entire sonics and ultrasonics community.

The AdCom continually strived to improve all aspects of the group and its membership. New areas of technology were added to the fields of interest, more invited speakers and additional sessions at the symposia were added, a large number of review papers and tutorial articles were added to the TRANSACTION publications, new committees were selected by the AdCom to extend our services, and local chapters were formed in many cities throughout the U.S. The constitution and bylaws were amended in the mid 1970's. In 1975 the Editor in Chief, Stephen Wanuga, announced publication of the TRANSACTIONS on a bimonthly schedule. Special issues in several of our technological areas were published and continue to enhance the TRANSACTIONS today. Ten associate editors were named to serve with the editor for the TRANSACTIONS. This increase in publications caused a vast number of paper reviewers to be continuously called on to review submitted papers. We are indebted to those reviewers for their time and responsiveness.

The IEEE, its elected officers, and all of its editorial staff are in turn the major focal point for all the groups and societies. Together and as one whole family, the complex record keeping of names, organizations, meetings, dates, financial status, and publications all seem to coordinate with the groups and society structures. Everyone affiliated within the IEEE structure should be proud of this cooperation and teamwork toward common goals.

In July 1976, the country paused to celebrate its bicentennial year, and the IEEE and many of the groups and societies acknowledged the celebration in some manner. The following is a reprint of an Editorial in the July 1976 bicentennial issue titled "Era of Sonics and Ultrasonics." An article titled "Sonics and Ultrasonics: Early History and Applications" by Warren P. Mason was published in the same issue also to commemorate the celebration.



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## Era of Sonics and Ultrasonics

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The bicentennial year should give us time to pause and consider the era of Sonics and Ultrasonics and perhaps look at the past, present, and future of our technology.

Sonics and Ultrasonics is a science of sound waves and a branch of acoustics, primarily dealing with elastic wave motion in solids, liquids, and gases as distinguished from those studies which relate to human hearing. Although many other terms have been used to describe frequency boundaries, i.e., infrasonics, supersonics, hypersonics, praetersonics, etc., many of the divisions can be considered artificial. All can fall into the general category used to describe the unity technology of sound, Sonics and Ultrasonics: that which encompasses the analysis, testing, and processing of techniques related to the use of vibratory energy.

Looking back for a moment, the seeds of this technology reflect back many years, to many pioneers and technological developments that had an important impact on scientific technology.

Dating from the basic, classical principles of sound established by Lord Rayleigh's Theory of Sound and Lamb's Dynamical Theory of Sound to the present ongoing series of volumes of Physical Acoustics by Warren Mason, many applications and extensions of basic principles have evolved. For example, the rediscovery of Rayleigh's wave propagation as discussed by Lord Rayleigh in 1885, played an important role in the exciting, evolutionary field of surface acoustic waves in the 1960's.

From the early basic principles, Sonics and Ultrasonics progressed into an era that saw emphasis on piezoelectricity and magnetostriction as a means of generating sound waves in air, liquids, and solids. Rochelle salt, ADP, X-cut quartz, and AT-cut quartz suddenly became familiar nomenclature used by scientists studying sound waves. Those studying physical acoustics now had a means of effective transduction using acoustic interferometry to study accurate velocity and attenuation data in gases and liquids. The pulse-echo and phasing techniques using these transducers had a tremendous impact allowing measurement of small specimens to determine elastic constants, velocity, and attenuation of a wide variety of ultrasonic materials. Next came the ferroelectric ceramics, such as barium titanate, lead titanate, zirconate, etc., that were rapidly accepted as high-coupling ultrasound generators. They quickly found use in low-frequency applications (<50 MHz) and are particularly suited, along with some magnetostrictive materials, for high-power applications.

The foundation of ultrasonic applications had already taken a giant step as crystal filters, delay lines, and a wide variety of ultrasonic industrial applications, devices, and techniques began to unfold.

In 1953 a dedicated group of workers met and formed the IRE Professional Group on Ultrasonic Engineering. In June of 1954 the first issue of the TRANSACTIONS OF THE IRE PROFESSIONAL GROUP ON ULTRASONIC ENGINEERING was published. The foresight of these individu-

als, who succeeded in organizing engineers and scientists working with ultrasonics, generated an official forum for the exchange of ideas and results of their individual research. In June of 1964, the title of the Group was changed to Sonics and Ultrasonics. The IEEE TRANSACTIONS ON SONICS AND ULTRASONICS has grown to bimonthly publication with a circulation of about 2800, and the Group's membership now stands at approximately 1700.

The technical growth of scientific and engineering applications of sonics and ultrasonics presently encompasses a vast and wide variety of devices and instrumentation. Low amplitude applications include single pass delay lines for MTI radar systems, pulse coding devices, computer applications, dispersive delay lines for LFM and other waveform filtering, mechanical filters, bandpass filters, thickness gages, and numerous nondestructive testing equipment used in determining defects in metals, glass, automobile tires, etc. Both bulk and surface acoustic wave techniques are utilized for these devices, and their applications include radar, sonar, and communications systems, plus a host of industrial applications. High-amplitude ultrasound is used in many cavitation effects for chemical and metallurgical control of material texture, for ultrasonic cleaning effects, and metal alloying techniques.

Other important uses of ultrasound lie in the diagnostics and therapeutics of medical applications, light imaging of ultrasonic beams, acoustic techniques for reproducing pictures by holographic means, and nondestructive evaluation of surfaces and solid bodies.

The years ahead will show continually exciting applications of sonics and ultrasonics. Acoustooptic interactions, acoustic imaging, nondestructive evaluation, medical ultrasonics with perhaps mass screening for early disease detection, ultrasonic microscopes, new miniaturized ultrasonic components and circuits, and other new concepts will all produce even more new technology and developments.

Obviously, not all of the important developments, nor all of the equally important contributors have been mentioned in this brief synopsis. Indeed, Sonics and Ultrasonics is indebted to many workers, both domestically and internationally and to the dedication and contribution of all those who have been and are associated with this technology.

To those who have gone, the pioneers, their work and achievements are still all important. To those who have been recent contributors, their technological developments and progress have had a tremendous impact on the growth and application of this scientific technology. To those who will continue, a new era is dawning, one that will produce more new Sonic and Ultrasonic technology, and one that will have new important breakthroughs for serving the modern technological world.

**Stephen Wanuga**  
Editor

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## Sonics and Ultrasonics in 1984

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Today, the Group on Sonics and Ultrasonics is a strong viable Group within the IEEE structure. Its field of techno-

logical interests encompasses many areas; acoustic holography and imaging; acoustooptic interactions; biological and medical applications; filters and resonators; industrial applications; nondestructive evaluation; physical acoustics; piezoelectric and magnetostrictive materials; SAW-based systems; SAW devices; and underwater sound.

The group is affiliated with many related IEEE Society/Council Periodicals such as the Journal of Solid State Circuits, Lightwave Technology, Medical Imaging, and Pattern Analysis and Machine Intelligence. In addition, the group is also active with the Frequency Control Symposium, the Ferroelectrics Group, and many other organizations that overlap within sonic and ultrasonic technology. The group has a vast international following and membership that involves a large number of countries.

Many committees that deal with all aspects of the group are continuously serving the membership. Some of these are Newsletter, Meetings, Nominations, Constitution and Bylaws, Awards, Memberships, Fellows, Standards, University Affiliates, Technical Program Chairman, Technical Program Committee, and numerous other subcommittees. Awards are presented annually to the best TRANSACTIONS paper and the achievement award winner. Several students are awarded subsidies to attend the ultrasonic symposium annually. Corporations also financially subsidize the symposium with banquet contributions.

This article has presented a brief summary of the history of the Group on Sonics and Ultrasonics. It should be obvi-

ous that it takes a large number of dedicated people to achieve such an outstanding professional organization. We have taken this time, the IEEE Centennial year to honor and recognize the many individuals who have given countless hours of their time, dedication, and purpose to achieving a successful and growing Group on Sonics and Ultrasonics. Many names of these individuals who were instrumental in achieving these results have been mentioned throughout this article. Obviously, there are names of many others that either through lack of documentation and space have not been specifically mentioned but are still recognized as significant contributors. To those and all the others - the members, the paper reviewers, the authors, the attendees, the sponsors, the financial supportees, and technical contributors, and the countless workers-you all are recognized for your contributions.

For the IEEE centennial year of celebration, the Group on Sonics and Ultrasonics is proud to have served in the many technical achievements in sonics and ultrasonics. May the next 100 years be as successful and rewarding with continuing technological achievements, service, and dedication from the Group on Sonics and Ultrasonics.

S. Wanuga is with the General Electric Company, Electronics Laboratory, Rm. 244, Electronics Park, Syracuse, NY 13221.

J. E. May is with AT&T Bell Laboratories, 1600 Osgood St., North Andover, MA 01845.

T. Meeker is with AT&T Bell Laboratories, 555 Union Blvd., Allentown, PA 18103.

## Around IEEE

### IEEE Job Site

The publishers of Weddle's 2004 Job Seeker's Guide to Employment Web Sites chose the IEEE Job Site as one of the top 30 out of a total of 40 000 online recruitment sites. Now, a Weddle's Top 30 User's Choice Award logo appears on the home page of the IEEE Job Site, [www.ieee.org/jobs](http://www.ieee.org/jobs)

Weddle's, which has been rating online recruitment since 1996, terms these citations "the people's awards," because more than 10 000 job seekers, human resources personnel, and job recruiters cast ballots. The Top 30 awards recognize the online recruitment sites that provide the best information and assistance for both the job seeker and the employer.

(This was excerpted from an article in The Institute 06 February 2004 by Carol Goodale, <http://www.theinstitute.ieee.org>)

### EMAIL Alias Service

**IEEE EMAIL ALIAS SERVICE BLOCKS MORE THAN 1.8 MILLION VIRUSES:** The IEEE Email Alias Service protected IEEE members and staff from more than 1.8 million viruses in 2003. Last year, 14,723 new IEEE email aliases were created, bringing the total to 93,157. IEEE members can sign up for this free service at <http://elec-comm.ieee.org/>.

### IEEE Releases One-Millionth Online Technology Document

The IEEE released its one-millionth online technical document to researchers on 22 January 2004. There are now more than 1,000,200 full-text technology papers, articles and standards in IEEE Xplore, the delivery system for IEEE online publications.

IEEE Xplore launched in May 2000 and has grown by more than 25 percent over the last 18 months. This includes more than 80,000 IEEE archival backfile documents from 1950-1987 added last year. A record 43.7 million full-text document PDFs were downloaded last year — about 88 percent more than in 2002.

IEEE Xplore is located at <http://ieeexplore.ieee.org>. The one-millionth online document may be read for free at <http://www.ieee.org/products/onlinepubs/resources/39jssc01-slee.pdf>

### IEEE Member Digital Library

The IEEE Member Digital Library ended its first year with 3,335 subscribers in more than 85 countries. Introduced in January 2003, the IEEE Member Digital Library provides subscribers with full-text online access to



up to 25 IEEE articles and papers from IEEE Xplore(R) per month.

For more information, visit <http://www.ieee.org/ieeemdl>

## Information On IEEE Online Collections

A new section of the IEEE Web site provides visitors with thorough, definitive information on IEEE online collections and other subscription options to access IEEE online technical documents. The new IEEE Publications Online information site is located at <http://www.ieee.org/onlinepubs>

This online resource provides comprehensive information on IEEE publications, product features, and subscription options for libraries, members and individuals. The site also helps users understand the multiple subscription options offered by IEEE, and provides pricing details, licensing information, key contacts, support services, training options and other important details related to IEEE online resources.

Highlights of the new site include:

- News about IEEE publications and online features
- Training resources, including free online seminars and OPAC linking instructions
- Tips to encourage organization-wide usage of IEEE collections
- A handy product comparison chart detailing features and benefits of IEEE online collections
- Complete title lists for online collections of IEEE journals and conference proceedings
- Testimonials from customers and users of IEEE information
- IEEE patent analysis and journal citation studies

- Contact information for IEEE account managers, training and technical support

Visit the new IEEE Publications Online site at: <http://www.ieee.org/onlinepubs>

## What's New' Subscriptions

Subscriptions to the 10 WHAT'S NEW @ IEEE email newsletters increased 9.7 percent last year to total 158,233.

The WHAT'S NEW @ IEEE newsletters are free and contain news on IEEE activities, industry trends, career development and new IEEE products. The three largest newsletters are Communications (25,098 subscriptions), Computing (22,528 subscriptions) and Wireless (20,767 subscriptions).

To subscribe to a WHAT'S NEW @ IEEE newsletter, visit <http://whatsnew.ieee.org>

## IEEE 2003 Year-End Numbers

The IEEE ended 2003 with

- more than 361,000 members in approximately 174 countries, almost 38 percent of whom are from outside the United States.
- nearly 64,000 student members.
- more than 30,000 society affiliates.
- 304 sections.
- 1,384 chapters.
- more than 1,200 student branches in 80 countries.
- over 300 student branch chapters.
- more than 130 affinity groups.
- 38 societies and 4 technical councils.

These news items were excerpted from online news letters by Jayne Cerone and Stephanie Russo.

## Editor's Comments



### Opportunity to Volunteer

President Gerry Blessing has invited you all to consider becoming more involved in the society. There are over 392 volunteer positions in the Society plus the roughly 1045 potential reviewers of the Transactions registered with Manuscript Central. Given that our Society has a little over 2300 members, this means that roughly 62% of our membership is serving in some volunteer capacity. It is the efforts of all the volunteers that keep our society technically strong and vibrant. There

are more opportunities to serve. There are vacant positions on the various committees of AdCom and especially Standards. Please let any Society officer know of your desire to serve.

### 50th Anniversary

May 6, 2003 marked the 50th anniversary of the Society. The celebration of this milestone will take place at the Joint Conference of all three of our technical communities in Montreal on 23 – 27 August 2004. Fred Hickernell, on behalf of the UFFC History Committee, is asking you for short anecdotal stories and personal remembrances (serious, interesting, or funny) of people and places associated with our society and/or its technologies. Now is your opportunity to contribute to the historical archive of UFFC. Please take this opportunity to answer Fred's solicitation for contributions. We would also

like to have a pictorial history exhibit at the Joint Symposium. If you have any photographs you have taken at the various society events, please contact Jan Brown ([jan.brown@ieee.org](mailto:jan.brown@ieee.org))

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### Student Photos

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In the Spring 2003 UFFC Newsletter, we published photos of all the student finalists in the Student Paper Contest at the Munich Ultrasonics Symposium. Your editor misplaced the list of the names of the students. We asked that the students identify themselves for us so we could properly put the names with the photos. The following students have been identified on the next page.

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### Thank you

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Thank all of you who sent articles and photos in for this issue. The photos capture what words cannot and pro-

vide a way for us to see each other. Thanks to the photographers and photo contributors of this issue Mike Garvey, Steve Jefferts, Kirk Shung, Ken-ya Hashimoto, Nava Setter, Eva Ferre-Pikal, Al Meitzler, Bob Potter, Fred Hickernell, Meirion Lewis, David Morgan, Steve Miller, Jacques Souquet, Gerry Blessing, Yuriy Shmaliy, and Jan Brown. Special appreciation to Paul Doto and his colleagues at IEEE headquarters for the design and production work.

Please continue to send me ([jan.brown@ieee.org](mailto:jan.brown@ieee.org)) information and photos as events occur so that we may post them on the Web and include them in the Fall Newsletter.

**Jan Brown**  
UFFC-S Newsletter Editor

## Division IX Director's Deliberations

### New Division IX Director

The IEEE Division IX, Signals, and Applications, members in the following Societies:

- Aerospace and Electronic Systems Society,
- Geoscience and Remote Sensing Society,
- Oceanic Engineering Society,
- Signal Processing Society,
- Ultrasonics, Ferroelectrics, and Frequency Control Society, and
- Vehicular Technology Society

have elected John Reagan as their Division Director for the 2004 – 2006 period. He succeeds John Vig who served as Division IX Director 2002-2004. Below is a brief message John provided for the UFFC-S Newsletter, plus his bio summary.

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### Message

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“So what can you expect of me as your incoming Division Director in 2004? Given what IEEE has been experiencing over the past couple of years, my first concern, as presented in my election statement, will be working for/supporting measures to put IEEE on a sound financial basis for the future. I believe that the various entities of IEEE should share fairly in the profits and expenses of IEEE. Conferences and publications are the lifeblood of IEEE societies. If a society does a good job in these activities, then it should not have financial problems. With proper management of overall IEEE activities, a society should not be excessively taxed for the services and assistance provided by IEEE. From what I’ve observed as Division Director-Elect this past year, at the IEEE TAB and Board of Director’s meetings, I think actions are in progress which will again put IEEE on a sound financial course. Thus, going forward we should not be spending beyond our means.

I will be working to insure this. The key to the continued success of IEEE is for societies to remain at the forefront of their respective fields of endeavor, as evidenced by successful, well attended conferences and sought after publications. From the activities and information I’ve seen this past year, I believe the societies in Division IX are doing a great job in this respect. I look forward to the opportunity to attend a UFFC-S AdCom and learn more about UFFC-S activities, particularly, how I can assist UFFC-S in achieving further success. Congratulations on this your 50th anniversary.”

**Best regards,**  
**John Reagan**

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### About John Reagan

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Dr. Reagan (M’82-SM’83-F’88) has worked in teaching and research at the University of Arizona for over thirty years. His research interests are in the general area of remote sensing with emphasis on atmospheric optics, laser radar (lidar), solar radiometry, and optoelectronics. He has conducted many supported research projects on the application of laser radar and solar radiometry for atmospheric sensing, including numerous publications on these topics. In recognition of his work in remote sensing, he was named fellow of IEEE in 1988 and received the IEEE Geoscience and Remote Sensing Society (GRS-S) Distinguished Achievement Award in 1995.

Over the past two decades he has been active in both the IEEE GRS-S and the IEEE Technical Activities Board (TAB).





**Omer Oralkan,**  
Stanford University



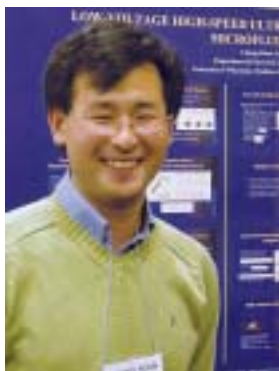
**Kieran Wall,** Queens  
University



**Joshua G. Knight,**  
Georgia Institute of  
Technology



**Tat Hean Gan,**  
University of Warwick



**Chung-Hoon Lee,**  
University of  
Wisconsin-Madison



**Mikael Wilm,** LPMO/  
CNRS –IMFC, Besancon  
(Not a Student Finalist)



**Takeshi Fujita,** National  
Defense Academy,  
Yokosuka, Japan



**Ivan V Anisimkin,** Institute  
of Radioengineering and  
Electronics, RAS, Moscow



**Caterina Gallippi,**  
Duke University



**C. E. Morton,** Queens  
University



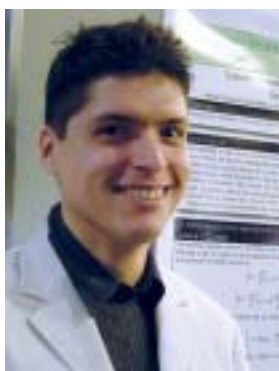
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**Alexander Mueller,**  
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**Claudio Cosenza,**  
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