

Ultrasonic Industry Association

Program Announced for 2008 Symposium in Washington DC



The 37th Annual UIA Symposium will be held 7 - 9 April 2008 at the Sheraton Suites Alexandria, outside of Washington DC

The final schedule for the UIA Symposium is now available. **"We are pleased with the high caliber of presentations for this year's symposium"**, noted Ronald Manna, 37th Annual Symposium Chair. **"Our roster of presentations is an excellent overview of the latest research and advancements in both industrial and medical ultrasonic applications."**

The program is divided into three separate days -- and registration is available daily or for the full symposium.

Monday's focus is on industrial and scientific applications of ultrasound, with keynote speaker Kenneth S. Suslick, Professor of Chemistry, University of Illinois at Urbana-Champaign.

Wednesday's focus is on medical applications, with keynote speakers Flemming Forsberg, PhD, Professor of Radiology, Thomas Jefferson University, Jefferson Medical College and Levon Nazarian, M.D., Professor of Radiology, Thomas Jefferson University, Jefferson Medical College.

New this year are workshops that will provide in-depth information on ultrasound design considerations. These workshops will be held sequentially, starting Monday afternoon and continuing on Tuesday morning.

Tuesday afternoon is a tour of the new FDA laboratory in Silver Springs, MD. Pre-registration is required for this tour.

Tuesday evening UIA goes to the Cosmos Club for a special dinner... and a moonlight bus tour of Washington DC on our return to our hotel. This event is included in the full symposium registration fee.

All the information you need is included in this issue. Register soon!

Special points of interest:

- Industrial and Scientific Sessions Monday, 7 April, 2008
- Medical Sessions Wednesday, 9 April, 2008
- Workshops Monday afternoon 7 April and Tuesday morning, 8 April, 2008
- Tour of new FDA labs Tuesday afternoon, 8 April, 2008
- Dinner at the Cosmos Club and Moonlight Tour of Washington DC on Tuesday evening, 8 April, 2008

Poster Presentations Address Additional Topics

UIA is continuing its new poster presentation format introduced at last year's symposium.

There are posters in both the industrial and medical sessions. All will be available for discussion with the authors during Tuesday

morning and other times as the authors' schedules allow.

On Tuesday morning each author will have the opportunity to present a brief 3 minute overview of their findings. This session will be accompanied by 3 slides

highlighting each poster.

This format provides the maximum exposure to the wide range of posters offered in a compact time.

For the complete list of posters for both industrial and medical topics, please go to page 6.

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Kenneth S. Suslick,
Marvin T. Schmidt
Professor of
Chemistry at Illinois
and researcher at
Beckman Institute for
Advanced Science
and Technology, is an
invited speaker for the
Industrial Sessions on
Monday, April 7, 2008
during the UIA
Symposium.

See page 4 for
full workshop
descriptions

2008 Symposium Schedule

Monday, 7 April, 2008 *Industrial and Scientific Sessions*

- 7:45 - 8:30 am Continental Breakfast and Registration
- 8:30 - 9:30 am *Development of a Very High Power Ultrasonic Additive Manufacturing System*, Matt Short, Karl Graff, Peihui Zhang, Matt Bloss, EWI, USA
- 9:30 - 10:00 am *Ultrasound Enhanced Glucose Release from Corn in Ethanol Plants*, Samir Kumar Khanna, Melissa Montalbob, J (Hans) van Leeuwen, B, Gowrishankar Srinivasan and David Grewell, Department of Agricultural and Biosystems Engineering, Iowa State University, USA
- 10:00 - 10:30 am *A Study on rod-type ultrasonic radiator*, Guangping Zhou, Zhaofeng Liang, Zhengzhong Li, Shenzhen Polytechnic, China
- 10:30 - 11:00 am Refreshment break in exhibits
- 11:00 - 11:30 am *Design of Ultrasonic Converters and Generators for Textiles Cutting and Welding Applications*, Orland Guedes, Decoup+, France
- 11:30 - 12:00 noon *Finite element modelling of ultrasonic tension and compression tests and ultrasonic forming processes*, Margaret Lucas, Yusof Daud, Andrea Cardoni, Department of Mechanical Engineering, University of Glasgow, UK
- 12:00 - 1:00 pm Lunch
- 1:00 - 1:15 pm New Product Award Presentation
- 1:15 - 2:15 pm Invited Speaker Kenneth S. Suslick, Professor of Chemistry, University of Illinois at Urbana-Champaign, USA
- 2:15 - 2:45 pm *Ultrasonic Cleaning of Particle and Natural Organic Matter Fouled Membranes*, Mikko O. Lamminen, Dong Chen, Harold W. Walker, Linda K. Weavers, Environmental Engineering and Geodetic Science, The Ohio State University, USA
- 2:45 - 3:15 pm *Recent Developments in Ultrasonic Machining*, Tim Frech, Karl Graff, Matt Short, Peihui Zhang, EWI, USA
- 3:15 - 3:30 pm Refreshment break in exhibits
- 3:30 - 5:00 pm *Workshop I: Langevin Sandwich Transducer Characterization/Measurement*, George Bromfield, Piezo Innovations and Tony Crandall, ZEVEX International Inc, USA
- 5:30 - 6:30 pm Wine and Cheese Reception

Tuesday, 8 April 2008 *Workshops and FDA Tour*

- 7:00 - 8:00 am Continental Breakfast
- 7:30 - 9:00 am *Workshop II: Acoustic output measurements*, Mark Hodnett, National Physical Laboratory, UK
- 9:15 - 10:45 am *Workshop III: HIFU Transducer Design/Characterization*, Adam Morris, Better UltraSonic Technologies, USA
- 11:00 - 12:30 pm Poster Presentations and Poster Sessions
- 11:45 - 12:30 pm HIFU Industry Council meeting
- 12:15 - 1:15 pm Lunch

2008 Symposium Schedule

Tuesday, 8 April 2008 *Workshops and FDA Tour, continued*

- 1:30 – 5:15 pm Tour of FDA
- 6:30 -- 10:00 pm Depart for Evening at Cosmos Club *This event is included in the full symposium registration fee and includes a moonlit view of Washington DC's sites on our luxury coach after our dinner. Additional tickets for companions are available.*

Lunch is included on the bus to the FDA Lab: Choice of deli sandwich or wrap, potato chips or pretzels, fruit salad, pasta salad or potato salad, jumbo cookie and beverage (water or soda).

Wednesday, 9 April 2008 *Medical Sessions*

- 7:45 - 8:10 am Continental Breakfast and Registration
- 8:15 - 9:15 am *IQuantitative Measurements and Therapeutic Applications using Ultrasound Contrast Microbubbles*, Flemming Forsberg, PhD, Professor of Radiology, Thomas Jefferson University, Jefferson Medical College, USA
- 9:15 - 9:45 am *Gas Filled Bubbles for Diagnosis and Therapy*, Rajan Ramaswami, ImaRx Therapeutics, USA
- 9:45 - 10:15 am *Drug Delivery Through Cornea and Sclera Aided by Therapeutic Ultrasound*, Robin Shah, Vesna Zderic, Department of Electrical and Computer Engineering, The George Washington University, USA
- 10:15 - 11:00 am Refreshment break in exhibits
- 11:00 - 11:30 am *MR guided Focused Ultrasound Surgery for Early Breast Cancer*, Hidemi Furusawa M.D, Kiyoshi Namba M.D, Junichi Shidoka, Masuko Inomata, Emiko Hirabara, Chiaki Tanaka, M.D, Hiroshi Nakahara M.D, Eiichiro Machida M.D, Minoru Matsuda M.D, Kansei Komaki M.D, Breastopia Namba Hospital, Japan
- 11:30 - 12:00 noon *The Feasibility Study of High Intensity Focused Ultrasound Combining with Ultrasound Contrast Agent to Damage Hepatic VX2 Tumors in Rabbits*, Ji Xiaojuan, Wang Zhibiao, Yi Qijian, Zou Jianzhong, Chen Wenzhi, Department of Cardiology, Children's Hospital of Chongqing Medical University, Institute of Ultrasound Engineering in Medicine, Chongqing University of Medical Sciences, China
- 12:00 - 1:00 pm Lunch
- 1:00 - 2:00 pm *Interventional Musculo-Skeletal Ultrasound*, Levon Nazarian, M.D., Professor of Radiology, Thomas Jefferson University, Jefferson Medical College, USA
- 2:00 - 2:30 pm *High Intensity Therapeutic Ultrasound Ablation of Tendons Ex Vivo*, Robert Muratore, Frederic L. Lizzi Center for Biomedical Engineering, Riverside Research Institute, USA
- 2:30 - 3:00 pm Refreshment break in exhibits
- 3:00 - 3:30 pm *Memoriam: Dr. Luiz Duarte; New Clinical Studies Utilizing Vibrational Therapy*, Roger Talish, Juvent Inc., USA
- 3:30 - 4:00 pm *Antimicrobial and Antibiofilm Activity of Noncontact Ultrasound is Verified using In Vitro and In Vivo Testing Systems*, Kan Lam, Sisy Shi, Dino Ochoa, Jerry Cowart, Mike Peterson, Bridge Pts Inc., USA
- 4:00 - 4:45 pm *Valuation of Enabling IP, Reaching The End Game*, Peter Cope, InfiniTech, LLC, USA



Flemming Forsberg, PhD, Professor of Radiology, Thomas Jefferson University, Jefferson Medical College, is an invited speaker for the Medical Sessions.

Levon Nazarian, M.D., Professor of Radiology, Thomas Jefferson University, Jefferson Medical College, USA is an invited speaker for the Medical Sessions on Wednesday, April 9.

These workshops are held on Monday afternoon and Tuesday morning, April 7 - 8, 2008, during the UIA Symposium. You may register for the full symposium, which will include these workshops or for just one or more of these workshops.



Room rates for the UIA Symposium are \$209 single/double. Call +1.703.836.4700 to make your reservations

**801 N. Saint Asaph St
Alexandria, Virginia 22314
USA**

Workshop Descriptions

High Power Ultrasonic Transducer Modeling and Characterization

George Bromfield, PiezoInnovations and Tony Crandall, ZEVEX International Inc

Target audience:
Designers or engineers who may be involved in developing high power, Langevin sandwich ultrasonic transducers, and would like an introduction into the design, computer modeling and measurement of output parameters of this type of transducer.

Subjects to be covered
Basic theory relating to the design of Langevin sandwich ultrasonic transducers including the application of bias stress and simple half-wave horn design. A worked example of a practical transducer design using simple theory to estimate inputs for the PiezoTran computer model.

Practical demonstration of the assembly of transducer components, the application of bias stress and testing. Testing to include low power impedance analyzer data, and high power measurements using a power meter and optical and laser vibrometer methods. Measured data will be compared with PiezoTran model output.

Acoustic Output Measurements

Mark Hodnett, National Physical Laboratory

Target audience:
Those who may be involved in developing ultrasound systems or transducers, and would like an introduction into the techniques and devices available that can characterize the acoustic field and give information on beam distribution, power output levels etc. both in R&D and Production test.

- Subjects to be covered:*
- Background to measurement requirements
 - Relevant standards and the differing demands
 - Hydrophones and their use
 - Radiation force balances and their use
 - Optical technique
 - QA methods for ultrasound transducers

HIFU Transducer Design Considerations

Adam Morris, Better UltraSonic Technologies

Target audience:
Those who may be involved in developing HIFU ultrasound systems or transducers, and would like an introduction into the design requirements, materials and modeling methods pertinent to this type of transducer.

Subjects to be covered:
Transducer design begins with Defining the Application: organ type, method of treatment, time and volume,

Power or Pressure required, durable or disposable; this leads to definition of: Frequency and Sound Field which allows us to begin the design: single or multi- element, shape and focus, active material, matching layers, power densities and limitations, tuning; evaluation of thermal considerations in the design – to cool or not to cool;

Finally, one must test the output characteristics: sound field, power, impedance , etc., while under full power.

Discussion of some options and equipment, Environmental Stress Screening.

Symposium Headquarters Hotel

Surrounded by the charm and history of Old Town, Sheraton Suites Old Town Alexandria offers easy access to Ronald Reagan Washington National Airport and Washington D.C.

Complimentary shuttle service is offered to National Airport,

where the Metro will take you throughout the District of Columbia to enjoy the nation's history as you visit the nearby Jefferson Memorial, Washington Monument, Lincoln Memorial and other museums and monuments during your free time.

You will stay in one of the spacious 247 two-room suites where a great night's sleep awaits you between the crisp sheets, plush mattress, and cozy duvet of the Sheraton Sweet Sleeper (SM) Bed.

Karl Graff - Honorary UIA Member

Dr. Graff received his Ph.D. from Cornell University in the field of theoretical and applied mechanics after earning his B.S. and M.S. degrees from Purdue University. Dr. Graff served on the faculty of The Ohio State University (OSU) for a number of years and chaired two academic departments, including the Department of Welding Engineering. While presiding over the department, the program was greatly expanded and a Ph.D. degree curriculum was established. In 1984, Dr. Graff led the effort to establish the Edison Welding Institute (EWI) and served on its Board of Trustees. In 1987, Dr. Graff left OSU to head EWI, overseeing its growth to one of the leading welding research organizations in the world. From 1987 until his retirement in 2000, Dr. Graff built EWI from a small organization operating from a converted warehouse into the largest industrially-driven engineering and consulting organization in North America dedicated to materials joining technology. Under Dr. Graff's leadership, EWI was selected by the US Navy to operate its

national center of excellence in welding and joining. In 1995, Dr. Graff also led the development and construction of EWI's 132,000 square foot technical center on the OSU research campus. The facility includes offices and laboratories for OSU's welding engineering faculty, thus ensuring continued close collaboration between the University and the Institute.

Dr. Graff's personal research interests have been concentrated in the field of high power ultrasonics and its applications, such as plastic welding, metal welding and various processing applications with high power ultrasonics. Dr. Graff is a recognized authority in the field of high power ultrasonics. His book, *Wave Motion in Elastic Solids*, published in 1975, is still a widely used reference for the field. Dr. Graff has authored numerous publications in the field of high power ultrasonics. He has presented his work at a number of industrial and academic conferences, including UIA Symposiums. Dr. Graff has served as an

Executive Director of UIA for many years and thus contributed in preparing a great number of UIA Symposiums. His contributions to UIA and the field of high power ultrasonics greatly assisted in advancing UIA from a small group of enthusiasts to a recognized international forum for industry professionals.

Dr. Graff is also well recognized in the high power ultrasonics community as a historian of this field. His personal contacts within the worldwide ultrasonics community provided him a unique knowledge of the people and events in this field, which he had graciously shared at UIA Symposia.

After his retirement as Executive Director in September 2000, Dr. Graff became a part-time EWI principal engineer. In his current role, he works with EWI engineers and member companies to advance the application of high power ultrasonics to joining of metals and plastics as well as to pursue innovative applications of high power ultrasonics.



Dr. Karl Graff will have the title of "honorary member" of the Ultrasonic Industry Association conferred upon him during this symposium.

New Product and Applications Contest

Have you developed a new product that uses ultrasonic energy? Do you have a new application for an existing ultrasonic product?

The board of directors of the Ultrasonic Industry Association wants to help gain recognition for new ultrasonic energy products and applications.

Here's a way to promote your new product or application.

The process is a simple one...

1. Decide which category you want to enter: Best new product using ultrasonic energy or Best new application for existing ultrasonic product

2. Complete the entry form and submit to UIA by 31 January 2008
3. You'll be notified by 28 February, in time to make your plans to attend the 37th UIA Symposium at the Sheraton Suites Alexandria, outside of Washington, DC.

[Click here](#) to go to the information and entry form for the New Product and Applications Contest.

UIA Poster Sessions provide symposium participants with the opportunity to view the latest advances in ultrasonic research in industry, ultrasonic science and medical applications on Tuesday, 8 April

Industrial and Scientific Posters

Evaluation of Copper and Zinc Buffer Sheets in Ultrasonic Welding of Aluminum, Maria Baboi, David Grewell, Department of Agricultural and Biosystems Engineering, Iowa State University, USA

Further Advances in IQ Series Ultrasonic Power Supplies, Leo Klinstein, Dukane Intelligent Assembly Solutions, USA

Measurement of Ultrasonic Power and Determining the Impedance of the Load Terminating an Ultrasonic System, Nick Maropis, USA

Obtaining the Optimized Shape of the Horn for Long Life and Maximum Amplification Factor, Sahand Pirouzpanah, Alireza Shahidi, Said Sarkar, Sharif University, Iran

Sonotrode Shape Optimization for High Efficiency Sonochemistry Reactor Using FEM, Sahand Pirouzpanah, Alireza Shahidi, Said Sarkar, Sharif University, Iran

Disaggregation and surface modification of nanometer-sized diamond particles as abrasive agents by ultrasound exposure for polishing and texturing hard disk with high recording density, Shinichi Takeuchi, Shintaro Isa, Norimichi Kawashima, Takeyoshi Uchida, Tsuneo Kikuchi, Toin University of Yokohama, Japan

Medical Posters

Ultrasonic Motion Analysis System for Estimating Segment's Stabilization, Nima Hemmati, Mohammad Djavod Abolhassani, Research Center for Science and Technology In Medicine, Tehran University of Medical Science, Department of Medical Radiation Engineering, Amirkabir University of Technology, Iran

Circuit Grounding to Minimize Noise, Alan Lipsky, USA

Simulations of HIFU Application in Tumor Treatment: Impact of Air or Bone Interfaces, Pavan Luckoor, Vesna Zderic, PhD, Department of Electrical and Computer Engineering, The George Washington University, USA

Optimization of Lesion Formation using HIFU at Large Tissue Depths, Joshua Samuels, Vesna Zderic, PhD, Department of Electrical and Computer Engineering, The George Washington University, USA

Evidence for Cavitation as the Dominant Mechanism of Action in Ultrasonic Surgical Devices, Mark E. Schafer, Sonic Tech, Inc., USA

A Novel High Intensity Focused Ultrasound Driving Synchronization and Driving System, David Steines, Dr. Vesna Zderic, Dr. Kie-Bum Eom, Department of Electrical and Computer Engineering, The George Washington University, USA

Principles of Piezoelectric Dynamometry for Low-Frequency High-Power Transducer Characterization, Foster B. Stulen, Ethicon Endo-Surgery, USA

Trial Fabrication and Estimation of Cavitation Sensor with Hydrothermally Synthesized PZT, Shinichi Takeuchi, Yuki Seto, Norimichi Kawashima, Minoru K. Kurosawa, Toin University of Yokohama, Japan

Cost-effective Radiation Force Balance for Calibration of Therapeutic Ultrasound Devices, Faezeh Razjouyan, Vesna Zderic, Department of Electrical and Computer Engineering, The George Washington University, USA

Soft Tissue Phantom for Ultrasonic and Optical Imaging, O'tega Ejofodomi, Vesna Zderic, Colleen Papadopoulos, Jason Zara, Department of Electrical and Computer Engineering, The George Washington University, USA

Contrast Harmonic Ultrasound Imaging of Myocardial Perfusion, Vesna Zderic, PhD, Luther Swift, MS, and Matthew Kay, PhD, Department of Electrical and Computer Engineering, Department of Pharmacology and Physiology, The George Washington University, USA

A Solid State Thermal Method of Determining the Output Power Generated by Ultrasound Transducers, Bajram Zeqiri, Pierre N Gélât and Jill Barrie, Acoustics Group, Quality of Life Division, National Physical Laboratory, UK

A Power Delivery Hole?

I am suggesting there is a spectral hole in the efficient delivery of ultrasonic energy. This hole occurs between say 200kHz and 500kHz. In this region, the volume of piezoelectric is small and the construction difficult for a conventional Langevin bolted transducer. The frequency is also too low for effective focusing of radiating ultrasound at least in the field of medical ultrasound. Yes, one could take a quantitative approach and use a number of ultrasonic transducers or piezoelectric elements acting together. This approach may be fine for bulk treatment of a volume of material. But in several therapeutic applications of ultrasonic energy, one is often required to deliver a precise amount of power to targeted tissue.

To this point, the argument has been tech-push. That is, how can this be accomplished? Of course once one introduces "tech-push", one is obligated to discuss "market-pull" and the why. Rather than considering true market-pull, let's consider "effect-driven". Here I am merely leaving you with a couple of questions. Are there ultrasonic effects (mechanical or thermal) that are more prominent or more effective in this range of 200kHz and 500kHz? Do inherent advantages exist at the wavelengths in this region compared with those at frequencies below 200 kHz and above 500 kHz?

I'd be interested in your comments on this matter. Please e-mail uia@ultrasonics.org with your thoughts.

The Symposium Chairmen have pulled together an excellent program for our Symposium to be held in Washington, DC, April 7-9. DC is a great place to visit in the Spring. So please plan to attend and encourage a colleague to attend as well. While the program has been set, there are still opportunities to submit applications for the "Best New Product of 2007 Award" and the "Graduate Research Award". Information and applications can be found on our website, www.ultrasonics.org. The UIA Board looks forward to seeing you all in DC.

Happy New Year!

Foster Stulen

"Is there a spectral hole in the efficient delivery of ultrasonic energy?" asks Foster Stulen, UIA President.

HIFU Meeting Schedule

The Annual HIFU Industry Council will meet on Tuesday, 8 April from 11:45 am - 12:30 pm. The agenda for this meeting will cover these items:

- 1) How are international standards developed?
- key organizations and contacts

- past and upcoming meetings
 - communication techniques within working groups
 - acronym glossary
- 2) Which aspects of high intensity therapeutic ultrasound should be standardized?

- 3) What are the concerns of UIA members?
- review of issues from 2007 UIA symposium
- discussion of new concerns

HIFU Industry Council is chaired by Robert Muratore, Ph.D., Principal Member of the Research Staff, Frederic L. Lizzi Center for Biomedical Engineering, Riverside Research Institute

Do you work with your local university? Make sure they know about the UIA **Graduate Research Paper Award**. The winner receives \$1,000 and the opportunity to present the paper at the symposium. [Click here](#) for more information or go to www.ultrasonics.org **Deadline is February 26, 2008.**

A "Duckie" Day in DC!

Arrive early on Sunday for a special tour. We begin on land, aboard the brand new fleet of DC Ducks which are amphibious vehicles refurbished for comfort and aesthetic appeal. The DC Ducks will take you on a journey through the city on



land and in the water.

We depart from the Sheraton Suites Alexandria at 12:15 to travel to Union Station, and then proceed throughout Washington -- while our tour guide provides a brief "highlight" tour of the city.

Before you know it, our Duck will then launch into the water -- a very exciting moment, indeed -- and take you along the Potomac River, past Reagan National Airport,

around Haines Point, past the War College on Fort McNair, and past the gigantic original sculpture -- "The Awakening" -- which consists of a giant man rising from the ground.

Next, we'll return to land and cross 14th Street Bridge for a look at the other side of DC and the foot of Capitol Hill.

We'll return to our hotel by 3:00 pm.

Tickets are available for \$80 per person.

Our Symposium Location

Washington, DC is a powerful symbol not only of our nation but also of democracy and freedom.

Founded in 1749 and listed on the National Register of Historic Places, Alexandria is nationally recognized for its abundance of 18th- and 19th-century architecture, historic attractions, award-winning restaurants and eclectic shopping. With five Metro stations and a range of hotels to suit every taste, Alexandria is the perfect gateway to all that Greater Washington has to offer.

Our hotel offers complimentary shuttle service every half hour to National Airport. From there, you can take the Metro to most tourist attractions. Taxis are also available to take you to DC. UJA will have information at our registration desk that will include maps of the area, suggestions for sites to visit and ideas about restaurants for your dining pleasure on Monday night.

Here's some information to help you plan your free time

during the symposium...

For a podcast and slide show on Alexandria, go to: http://visitalexandriava.com/about/virtual_tour

For an interactive map of Alexandria, go to <http://map.mapnetwork.com/destination/alexandria/>

For a map of the Metro system and a trip planner that provides public transportation instructions to and from locations of your choice, go to <http://www.wmata.com/metro/rail/systemmap.cfm>

When Pierre Charles L'Enfant gazed northward along the banks of the Potomac River in 1791, he envisioned a "pedestal waiting for a monument." Since that day, Washington, DC has evolved into a fascinating, lively city combining grand, neoclassical government buildings, monuments, memorials, museums and the National Mall with art, theatre, music and culture.

Washington, DC is a powerful symbol not only of our nation but also of democracy and freedom. The District of Columbia's neighborhoods, people, history and culture truly embody the American Experience—from Duke Ellington to John Phillip Sousa and from the Civil War to civil rights. Only in Washington, DC can visitors be inspired by touring the magnificent Capitol Building and Washington Monument by day and be moved by taking in magical performances by the National Symphony Orchestra and world-class opera by night.

During your stay in the nation's capital, we encourage you to discover Washington, DC as more than just a tourist. Become a part of the American Experience. Marvel at the Lincoln Memorial. See the Star-Spangled Banner. Explore Jacqueline Kennedy's Washington through a city-wide celebration and discover how her love of the arts and the city transformed Washington.

A Tribute to Dr. Luiz Romariz Duarte 1931 – 2007

On July 28, 2007, we lost a brilliant scientist who made a remarkable contribution to the Orthopaedic community in the use of ultrasound treatment of bone fractures. He was also a beloved friend whose insight, appreciation of life, and a great sense of humor enriched all of our lives.

Dr. Luiz Duarte was born on December 15, 1931, in Rio de Janeiro, Brazil. He spent most of his youth in the state of Bahia, and moved to Sao Paulo to pursue his college education. Luiz obtained his PhD from Purdue University in 1965 and worked for a short time at the Brookhaven National Laboratory doing research. He chose to return to Brazil and make Sao Carlos his home. He and his lovely wife, Ruth raised three children, Fernando, Marcelo, and Priscila and seven grandchildren.

It was in his position at the University of Sao Paulo that Luiz first met a very well known Japanese Orthopaedic doctor, Dr. Fukada. Luiz was fascinated by Dr. Fukada's lectures where he taught that it was important to get fracture patients on their feet and weight bearing as soon as possible. Luiz theorized that ultrasound pressure waves would subject a fracture to a form of

mechanical loading and he proceeded to do clinical research in this area. His promising results from animal and clinical experiments



in Brazil resulted in his technology being patented and acquired by Exogen Inc., in 1985. Exogen started animal studies and clinical trials in the United States with the intent of obtaining Food and Drug Administration (FDA) medical approval. The technology received Premarket Approval (PMA) from the FDA in 1994. Today Dr. Duarte's technology is very successful, with a market size approaching \$100 million dollars in annual sales.

Dr. Duarte is the inventor of what was first viewed by many in the scientific community as an oxymoron, i.e., the use of low intensity (diagnostic levels) pulsed ultrasound – therapeutically. As a founder of Exogen, I had the pleasure and privilege to meet Dr. Duarte and his lovely family. Over

the past 20+ years, Luiz became a scientific partner, co-inventor, and most of all, a very dear friend. Luiz was a caring and devoted father and grandfather. He was a man of integrity. He devoted his entire life carrying out scientific research concentrating on helping his fellow man. He was a humble, very bright man, and a gifted teacher who loved life. He loved the ocean. He would always say that one of life's greatest pleasures was a cold beer on a hot day!

I will end this eulogy with a quote from his daughter, Priscila. "I like to think of the legacy he left us – a curiosity about life, a hunger for knowledge, an example of a life whose riches owe little to money, and model of what a father and grandfather should be. Those are all great gifts! We love him so very much. Always have and always will."

Roger Talish

Priscila Duarte

Dr. Duarte is the inventor of what was first viewed by many in the scientific community as an oxymoron, i.e., the use of low intensity (diagnostic levels) pulsed ultrasound – therapeutically.



37TH Annual UIA Symposium

7 – 9 April 2008

**Sheraton Suites
Alexandria
Washington, DC**

COMPLETE THIS FORM – OR REGISTER ONLINE AT WWW.ULTRASONICS.ORG

1 PLEASE TYPE OR PRINT

First name _____
 Last name _____
 Nickname for badge _____
 Position/Title _____
 Employer _____
 Employer City/State _____

2 FOR MAILING PURPOSES, I PREFER MY HOME ADDRESS WORK ADDRESS AS FOLLOWS:

Address _____
 City, State, Zip _____

To help us contact you during the day, please note your preferred numbers:

Telephone _____ Email _____

[I am attending the HIFU Industry Council Meeting and qualify to register at UIA member rates](#)

Please DO NOT include my name and mailing information in any published lists



SPECIAL ACCOMMODATIONS - If you require special accommodations for a disability to attend this meeting, please check this box. We will contact you to discuss this further.

3 PLEASE REGISTER ME IN THE FOLLOWING MANNER:

		Amount Due
Full Conference - Member	\$715	\$ _____
Full Conference – Non member	\$835	\$ _____
YES! I will attend the Tuesday Evening Event		_____
Daily Rate – Member (circle day) M T W	\$325	\$ _____
Daily Rate – Non member (circle day) M T W	\$400	\$ _____
Tuesday Evening Event (included in full conference fee)	\$145	\$ _____
Duckie Tour of DC, Sunday 1 – 3 pm	\$ 80	\$ _____
	Daily	Full Conference
Speaker	\$195	\$ _____
Student	\$145	\$ _____

4 METHOD OF PAYMENT

FIN for voucher use only: 13-6130371

Payment enclosed. Please make checks payable to: UIA
 Charge my: Master Card Visa Person's name on card: _____
UIA accepts only MC and Visa

EXP _____ / _____

Signature _____

5 CORRESPONDENCE INFORMATION – REGISTER ONLINE AT WWW.ULTRASONICS.ORG

Mail registration form and all payments to:
 UIA, P O Box 2307,
 Dayton, OH 45401-2307 USA



Address for express mail only:
 11 West Monument Ave, Ste 510
 Dayton, OH 45402-1233 USA



Fax registration form to:
 +1.937.586.3699



For further information call:
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WWW.ULTRASONICS.ORG

How can ultrasonics enhance the value of your business?

UIA is the international business forum for users, manufacturers, and researchers of ultrasonics. Our members use acoustic vibrations to improve materials, industrial processes, and medical technology. We call this "powering sound ideas."

Let's work together to power *your* sound ideas. Contact a member consultant or company through our [Referral Network](#), learn about ultrasonics with our [online primer](#), or meet industry leaders at our [next symposium](#).

Cosmos Club - Tuesday Night Event

The Cosmos Club is a private social club, incorporated in Washington, D.C. in 1878 by men distinguished in science, literature and the arts.

Since its founding, the Club has elected as members individuals in virtually every profession that has anything to do with scholarship, creative genius or intellectual distinction. Among its members, over the years, have been three Presidents, two Vice Presidents, a dozen Supreme Court justices, 32 Nobel Prize winners, 56 Pulitzer Prize winners and 45 recipients of the Presidential Medal of Freedom.

The Cosmos Club stands as the closest thing to a social headquarters for Washington's intellectual elite. On its walls hang portraits of Club members who have received Nobel Prizes, Pulitzer Prizes, Presidential Medals of Freedom, and Cosmos Club Awards. Located in the Dolly Madison room is a bust by Frederick Hart, the same artist who created the famous statue of three soldiers on the Vietnam Memorial Mall. UIA Symposium participants will have the opportunity to enjoy the history of the United States represented in this unique club.

This dinner event is included in the full symposium registration fee. Additional tickets for companions may be purchased at \$145.

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— Wallace Stegner

