

PROGRAM AND REGISTRATION

34th International Symposium on Ultrasonic Imaging and Tissue Characterization

In memory of Robert F. Wagner

June 10 – 12, 2009
Holiday Inn Rosslyn @ Key Bridge
Arlington, VA

The annual International Symposia on Ultrasonic Imaging and Tissue Characterization have long been recognized as being one of the world's leading forums concerned with ultrasonic technology for medical applications. Sixty-two technical contributions will be presented this year, the largest number in the history of the meeting. Many of the presentations will deal with clinical evaluation of novel methodologies and instrumentation for tissue characterization.

The program includes sessions on tissue parameters, contrast, imaging, bone, elasticity/ARFI as well as five special sessions. In one special session, NIH representatives will discuss current proposal-review policies and procedures and research-funding opportunities at their agency. The other four sessions are technical and will present overviews on photoacoustic and acousto-optic imaging, cardiac imaging, statistics and classification, and quantitative high-frequency methods for therapy monitoring. A special memorial session for Robert F. Wagner will open the program.

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Riverside Research Institute, New York

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PROGRAM

WEDNESDAY, June 10

7:30 a.m. **Registration/Coffee and Pastry**

8:30 a.m. **Introduction**
Ernest J. Feleppa, *Symposium Chairman*

8:35 a.m. **Robert F. Wagner Memorial Session**
Chmn: Keith Wear, *Food and Drug Administration*

Bob Wagner –The King of Ultrasound Speckle, Keith Wear,
Food and Drug Administration

Bob Wagner – Critical themes for the medical diagnostic community, David Brown, *Food and Drug Administration*

Fond recollections of my gentle mentor in the ROC world, Ernest J. Feleppa, *Riverside Res. Inst.*

Bob Wagner's contributions to ultrasonic characterization of myocardium, James G. Miller, *Washington U. in St. Louis*

Bob Wagner and the Dutch connection, Johan M. Thijssen,
Radboud U. Nijmegen Children's Hosp.

Imaging Genius – a remembrance of Bob Wagner, Hector Lopez, *National Institutes of Health*

Bob Wagner – remembrance and contributions, Ronald H. Silverman, *Weill Cornell Med. Coll. and Riverside Res. Inst.*

Bob Wagner and ultrasonic tissue characterization – great memories – great future? Brian Garra, *U. Vermont*

9:30 a.m. **1. TISSUE PARAMETERS 1**
Chmn: Michael L. Oelze, *U. Illinois*

1.1 **High frequency ultrasonic characterization of excised atherosclerotic carotid plaque**, Matthew McCormick, Tomy Varghese, R.J. Dempsey, Jim Zagzebski and Ernest Madsen, *U. Wisconsin-Madison*

1.2 Evaluating the importance of blood flow on the estimation of envelope statistics from ultrasonic backscatter, David P. Hruska, William D. O'Brien, Jr. and Michael L. Oelze, *U. Illinois at Urbana-Champaign*

1.3 Importance of animal viability in quantitative ultrasound imaging and characterization of solid tumors, Zachary T. Hafez, Maria-Teresa Herd, Janelle J. Anderson, Rita J. Miller, James P. Blue, Jr., Sandhya Sarwate, Michael L. Oelze, James A. Zagzebski, Timothy J. Hall and William D. O'Brien, Jr. *U. Illinois at Urbana-Champaign and U. Wisconsin-Madison*

1.4 Modeling and comparing backscatter coefficient estimates for phantoms containing spheres with tissue-like density and compressibility, Janelle J. Anderson, Michael R. King, Maria-Teresa Herd, Jun Song, Kibo Nam, William D. O'Brien, Jr., Ernest L. Madsen, James A. Zagzebski and Timothy J. Hall, *U. Wisconsin-Madison, Iowa State U. and U. Illinois at Urbana-Champaign*

10:25 a.m. **Coffee**

10:55 a.m. Chmn: Ernest J. Feleppa, *Riverside Res. Inst.*

1.5 Detection of metastases in dissected lymph nodes of cancer patients using HFU QUS, Ernest Feleppa, Jonathan Mamou, Masaki Hata, Alain Coron, Junji Machi, Pascal Laugier and Eugene Yanagihara, *Riverside Res. Inst., U. Hawaii, CNRS and U. Pierre et Marie Curie*

1.6 Characterization of pancreatic cancer and intra-abdominal lymph node malignancy using spectrum analysis of *in vivo* endoscopic ultrasound imaging, Ronald E. Kumon, Michael J. Pollack, Ashley L. Faulx, Kayode Olowe, Farees T. Farooq, Victor K. Chen, Yun Zhou, Richard C. K. Wong, Gerard A. Isenberg, Michael V. Sivak, Amitabh Chak and Cheri X. Deng, *U. Michigan, Case Med. Ctr. and Case Western Reserve U.*

1.7 Template-matching methods for ultrasonic imaging implanted brachytherapy seeds, Kaiser Alam, Jonathan Mamou, Ernest J. Feleppa, Andrew Kalisz, Sarayu Ramachandran and Ronald D. Ennis, *Riverside Res. Inst. and Roosevelt Med. Ctr.*

1.8 Quantitative ultrasound for staging hepatic steatosis in obese children, G. Weijers, J.M. Thijssen, M. Hopman, A. Haudum, A. Starke and C.L. de Korte, *Radboud U. Nijmegen Med. Ctr. and U. Veterinary Med. Hannover*

11:50 a.m. **Lunch**

1:10 p.m. **2. PHOTOACOUSTIC AND ACOUSTO-OPTIC IMAGING**

Chmn: Ronald A. Roy, *Boston U.*

2.1 Utilizing light and sound for biomedical imaging, Ronald A. Roy and Parag V. Chitnis, *Boston U. and Riverside Res. Inst.* (invited overview)

2.2 Combined optoacoustic and ultrasonic imaging of breast cancer: from mice to patients, Alexander A. Oraevsky, *Fairway Medical Technologies and Seno Medical Instruments* (invited)

2.3 Photoacoustic imaging of the eye, Ronald H. Silverman, Ying-Chih Chen, Fanting Kong and Harriet O. Lloyd, *Weill Cornell Med. Coll., Riverside Res. Inst. and Hunter Coll.* (invited)

2.4 Optical property measurement in diffuse media using acousto-optic pressure contrast imaging, Todd W. Murray, Puxiang Lai and Ronald A. Roy, *Boston U.* (invited)

2.5 Photoacoustic tomography: high-resolution imaging of optical contrast *in vivo* at new depths, Lihong V. Wang, *Washington U. in St. Louis* (invited)

2:40 p.m. **3. CONTRAST**

Chmn: Flemming Forsberg, *Th. Jefferson U.*

3.1 *In vivo* noninvasive cardiac subharmonic pressure estimation, Flemming Forsberg, Valgerdur G. Halldorsdottir, Jaydev Dave, Maureen McDonald, Ji-Bin Liu, Corina Leung and Kris Dickie, *Thomas Jefferson U., Drexel U. and Ultrasonix Med. Corp.*

3.2 Pressure estimation for monitoring neoadjuvant chemotherapy of breast cancer: *in vitro* measurements, Valgerdur G. Halldorsdottir, Lauren Leodore and Flemming Forsberg, *Thomas Jefferson U. and Drexel U.*

3.3 Subharmonic response from single contrast agents subjected to high-frequency excitation, Parag V. Chitnis, Jonathan Mamou and Jeffrey A. Ketterling, *Riverside Res. Inst.*

3.4 Response of ultrasound contrast agents to overpressure, Parag V. Chitnis, Paul Lee and Jeffrey A. Ketterling, *Riverside Res. Inst.*

3:35 p.m. **Coffee**

4:05 p.m. **4. IMAGING**

Chmn: Gregg E. Trahey, *Duke U.*

4.1 Respiratory-gated, high-frequency annular-array imaging of mouse embryos with coded excitation, Orlando Aristizábal, Jonathan Mamou, Daniel H. Turnbull and Jeffrey A. Ketterling, *Riverside Res. Inst. and New York U.*

4.2 **Effect of weighting techniques for synthetic aperture focusing on tumor size measurement with high-frequency ultrasound**, L.A. Wirtzfeld, M.E. Gregor, A. Fenster and J.C. Lacefield, *U. Western Ontario*

4.3 **OpenGL-assisted scan conversion**, William A. Steelman and William D. Richard, *Washington U. in St. Louis*

4.4 **USB ultrasound probes for use with cell phones**, William D. Richard and David M. Zar, *Washington U. in St. Louis*

4.5 **Analysis of ultrasonic clutter in cardiac images**, Muiyinat Lediju, Brett Byram and Gregg E. Trahey, *Duke U.*

4.6 **3-D cardiac motion tracking: frame rate and IQ versus detected data comparisons**, Brett Byram, Greg Holley, Daniel Need, Doug Giannantonio and Gregg Trahey, *Duke U.*

4.7 **Development and validation of phase-sensitive radio-frequency-based 3-dimensional echocardiography speckle tracking**, Ping Yan, Congxian Jia, Donald P. Dione, Kailasnath Purushothaman, Qifeng Wei, Karl Thiele, Matthew O'Donnell, James S. Duncan and Albert J Sinusas, *Yale U., U. Washington and Philips Medical Systems*

5:45 p.m. **Adjourn**

6:15 – 8:15 p.m. **Cocktail Reception**
Dogwood Room

THURSDAY, JUNE 11

7:30 a.m. **Coffee and Pastry**

8:30 a.m. **5. CARDIAC IMAGING**
Chmn: Shunichi Homma, *Columbia-Presbyterian*

5.1 **Role of ultrasound in cardiac care and research**, Shunichi Homma, *Columbia-Presbyterian Med. Ctr.* (invited overview)

5.2 **Serial 3D high frequency ultrasound evaluation of left ventricular contractile dyssynchrony in mice after myocardial infarction**, Yinbo Li, Christopher D. Garson, Yaqin Xu, Patrick, A. Helm, Brent A. French and John A. Hossack, *U. Virginia* (invited)

5.3 **In vivo validation of myocardial elastography to quantify variable levels of myocardial ischemia**, Wei-Ning Lee, Jean Provost, Kana Fujikura, Jie Wang and Elisa E. Konofagou, *Columbia U.* (invited)

5.4 **Multiscale overcomplete wavelet-based representations for classification of atherosclerotic plaque using backscattered radiofrequency intravascular ultrasound signals**, Amin Katouzian and Andrew F. Laine, *Columbia U.* (invited)

9:43 a.m. Chmn: James G. Miller, *Washington U.*

5.5 **Progress in myocardial tissue characterization based on the cyclic variation of backscatter**, Benico Barzilai, Mark R. Holland, Brian R. Lindman and James G. Miller, *Washington U. in St. Louis* (invited)

5.6 **Measurements of the cyclic variation of myocardial backscatter – Does the analysis method matter?**, Christopher W. Lloyd, Mark R. Holland and James G. Miller, *Washington U. in St. Louis*

5.7 **Impact of transcatheter aortic valve replacement on cyclic variation of myocardial backscatter in patients with severe aortic stenosis**, Brian R. Lindman, Benico Barzilai, Mark R. Holland and James G. Miller, *Washington U. in St. Louis*

5.8 **Echocardiographic tissue characterization demonstrates differences between the left and right sides of the ventricular septum in the hearts of normal subjects**, Mark R. Holland, Allyson A. Gibson, Adam Q. Bauer and James G. Miller, *Washington U. in St. Louis*

5.9 **Differences in cardiac features between normal and type 2 diabetic subjects based on Bayesian model analysis of the measured cyclic variation of myocardial ultrasonic backscatter**, Christian C. Anderson, Allyson A. Gibson, Linda R. Peterson, Jean E. Schaffer, Mark R. Holland and James G. Miller, *Washington U. in St. Louis*

10:55 a.m. **Coffee**

11:20 a.m. **6. STATISTICS AND CLASSIFICATION**
Chmn: Keith Wear, *FDA*
Ronald H. Silverman, *Weill Cornell Med. Coll. and Riverside Res. Inst.*

6.1 **The basics of multivariate classification**, Ronald H. Silverman, *Weill Cornell Med. Coll. and Riverside Res. Inst.* (invited overview)

6.2 **Introduction to computer-aided diagnosis algorithms**, Nicholas Petrick, *FDA* (invited)

6.3 **Machine learning for diagnostic classification: perils and pitfalls in practice**, Mark J. Rondeau, *the self-similar group, NY and Riverside Res. Inst.* (invited)

6.4 **Lesion detectability in diagnostic ultrasound**, Keith A. Wear, *FDA* (invited)

6.5 **Advances in classification and tissue-type imaging of cancerous prostate tissue using modern machine-learning tools**, Mark Rondeau, Ernest Feleppa, Paul Lee and Christopher Porter, *Riverside Res. Inst. and Virginia Mason Med. Ctr.*

12:45 p.m. **Lunch**

1:55 p.m. **7. BONE**

Chmn: Pascal Laugier, *U. Pierre et Marie Curie*

7.1 **Spatially-averaged apparent backscatter transfer function from human cancellous bone**, Brent K. Hoffmeister and Sue C. Kaste, *Rhodes Coll. and St. Jude Children's Research Hosp.*

7.2 **Fast and slow wave properties of cancellous bone derived from sonometry measurements using Bayesian inference**, Christian C. Anderson, Michal Pakula, Mark R. Holland, G. Larry Bretthorst, Pascal Laugier and James G. Miller, *Washington U. in St. Louis and Lab. d'Imagerie Parametrique, U. Paris 6*

7.3 **Influence of mineral nanostructural characteristics on cortical bone stiffness assessed by 1 GHz acoustic microscopy, synchrotron radiation μ CT and small angle X-ray scattering**, Fabienne Rupin, Mathilde Mouchet, Aurélien Gourrier, Kay Raum, Françoise Peyrin, Amena Saïed and Pascal Laugier, *U. Paris, CNRS, ESRF, Martin Luther U. Halle-Wittenberg and CREATIS*

7.4 **Experimental measurement of guided-mode phase velocities using multi-emitters and multi-receivers arrays in contact**, Jean-Gabriel Minonzio, Maryline Talmant and Pascal Laugier, *U. Pierre et Marie Curie and CNRS*

2:50 p.m. **8. TISSUE PARAMETERS 2**

Chmn: Ernest J. Feleppa, *Riverside Res. Inst*

8.1 **Estimation of average acoustic concentration of cells using ultrasonic backscatter techniques**, Jun Song, Jennifer L. King, James P. Blue, Jr., Michael L. Oelze and William D. O'Brien, Jr., *U. Illinois at Urbana-Champaign*

8.2 **Estimations of local attenuation coefficients using back-scattered radio frequency signals**, Alexander Haak, Timothy A. Bigelow, Kibo Nam, Tomy Varghese, Ernest L. Madsen, James A. Zagzebski, Timothy J. Hall and William D. O'Brien, Jr., *U. Illinois at Urbana-Champaign, Iowa State U. and U. Wisconsin-Madison*

8.3 **Attenuation and backscatter measurement: transitioning from laboratory to clinical systems**, Kibo Nam, Maria-Teresa Herd, Timothy A. Bigelow, Michael L. Oelze, William D. O'Brien, Jr., Tomy Varghese, Ernest L. Madsen, Timothy J. Hall and James A. Zagzebski, *U. Wisconsin-Madison, Iowa State U. and U. Illinois at Urbana-Champaign*

8.4 **Inter-laboratory comparison of attenuation measured using through transmission**, Maria-Teresa Herd, Zachary T. Hafez, Janelle J. Anderson, Ernest L. Madsen, James A. Zagzebski, Timothy J. Hall and William D. O'Brien, Jr., *U. Wisconsin-Madison and U. Illinois at Urbana-Champaign*

8.5 **Analysis of human fibroadenomas using three-dimensional impedance maps**, Michael R. King, Josephine Harter, Sandhya Sarwate, Michael L. Oelze, James A. Zagzebski, Timothy J. Hall and William D. O'Brien, Jr., *U. Illinois at Urbana-Champaign and U. Wisconsin-Madison*

8.6 **Efficient and accurate reconstruction of 3-D tissue volumes for the creation of three-dimensional impedance maps**, Alexander Dapore, Michael R. King, Sandhya Sarwate, Timothy J. Hall, William D. O'Brien, Jr. and Minh N. Do, *U. Illinois at Urbana-Champaign and U. Wisconsin-Madison*

4:15 p.m. **Coffee**

4:35 p.m. **9. ELASTICITY/ARFI**

Chmn: Stephen McAleavey, *U. Rochester*

9.1 **On the mechanisms producing elasticity imaging contrast in breast cancer**, Michael F. Insana, Marko Orescanin, Jing Xu and Rebecca D. Yapp, *U. Illinois at Urbana-Champaign*

9.2 **Three-dimensional strain imaging using electrode displacement**, Nicholas Rubert, R.J. DeWall, S. Bharat, Tomy Varghese, C. Brace, L. Sampson, A. Andreano, T.J. Hall, J.A. Zagzebski and F.T. Lee Jr., *U. Wisconsin-Madison*

9.3 **Feasibility of modulus estimation using radio-frequency electrode vibration**, Ryan J. DeWall and Tomy Varghese, *U. Wisconsin-Madison*

9.4 **Validation of shear-modulus estimates obtained using spatially-modulated acoustic-radiation force**, Stephen McAleavey and Menoj Menon, *U. Rochester*

9.5 **ARFI imaging of abdominal ablation and liver lesion biopsy**, David Bradway, Brian Fahey, Rendon Nelson and Gregg E. Trahey, *Duke U.*

9.6 **Real-time 2D imaging of thermal and mechanical tissue response to focused ultrasound**, Dalong Liu and Emad S. Ebbini, *U. Minnesota Twin Cities*

6:00 p.m. **Adjourn**

FRIDAY, JUNE 12

7:15 a.m. **Coffee and Pastry**

8:30 a.m. **10. REVIEW, PRIORITIES AND FUNDING OF NIH PROGRAMS**
Chmn: Ernest J. Feleppa, *Riverside Res. Inst.*

10.1 **NIH/CSR**, John Firrell, *Scientific Review Officer for Surgical Sciences, Biomedical Imaging and Bioengineering IRG, Center for Scientific Review, NIH* (invited)

10.2 **NIH/NCI**, Houston Baker, *Program Director, Imaging Technology Development Branch, Cancer Imaging Program, National Cancer Institute, NIH* (invited)

10.3 **NIH/NIBIB**, Hector Lopez, *Program Director, Division of Applied Science and Technology, National Institute for Biomedical Imaging and Bioengineering, NIH* (invited)

9:15 a.m. **PANEL DISCUSSION**
Moderator: James G. Miller, *Washington U.*

9:45 a.m. **11. QUANTITATIVE HIGH-FREQUENCY METHODS FOR THERAPY MONITORING**
Chmn: Gregory Czarnota, *U. Toronto*

11.1 **Probing the basic mechanisms of cell death detection using high-frequency and very-high-frequency ultrasound**, Michael Kolios, *Ryerson U. and U. Toronto* (invited)

11.2 **Cell death detection using low-frequency ultrasound *in vitro* and *in vivo***, Gregory Czarnota, *U. Toronto* (invited)

11.3 **Dynamic contrast-enhanced ultrasound for the evaluation of anti-angiogenic treatments**, John Hudson, Ross Williams, Gordon Lueck, Athavan Sureshkumar, Mostafa Atri, Georg A. Bjarnason and Peter N. Burns, *U. Toronto, Sunnybrook Health Sci. Ctr. and Toronto General Hosp.* (invited)

10:35 a.m. **Coffee**

11:00 a.m. Chmn: Michael Kolios, *Ryerson U.*

11.4 **Quantitative ultrasound considerations for monitoring therapy**, Michael L. Oelze, *U. Illinois at Urbana-Champaign* (invited)

11.5 **Tools for planning and performing longitudinal cancer studies in mice using high-frequency ultrasound imaging**, James Lacefield, *U. Western Ontario* (invited)

11.6 **A framework for temperature imaging using the change in backscattered ultrasonic signals**, Yuzheng Guo, Jason W. Trobaugh and R. Martin Arthur, *Washington U. in St. Louis*

11.7 **3D temperature imaging using change in ultrasonic backscattered energy: estimation of temperature during nonuniform heating**, Debomita Basu, R. Martin Arthur, Jason W. Trobaugh, Yuzheng Guo and William L. Straube, *Washington U. in St. Louis*

11.8 **Real-time, tissue-change monitoring on the Sonablate® 500 during high-intensity focused ultrasound (HIFU) treatment of prostate cancer**, Narendra T. Sanghvi, Wohsing Chen, Roy Carlson, Ralf Seip, and Kris Dines, *Focus Surgery, Philips Research and 3XDATA Corp*

12:15 p.m. **Adjourn**

GENERAL INFORMATION

REGISTRATION

All attendees are charged a registration fee to help defray the costs of conducting the Symposium. The general registration fee is \$400 (\$425 if postmarked after **May 25**). Graduate students who identify their school and advisor on the registration card will be charged \$210 (\$225 after **May 25**).

Advance registration is requested in order to complete local arrangements. Please send the registration card on the next page along with your registration fee (checks made payable to "Tissue Characterization Symposium," *no purchase orders, please*) to:

**Symposium on Ultrasonic Imaging
and Tissue Characterization**

2 Fulham Court
Silver Spring, MD 20902

Checks must be in U.S. dollars and drawn on a U.S. bank. Add a \$30 processing fee if the check is not drawn on a U.S. bank.

You can pay by credit card for an additional \$20.00 fee (\$10 additional for student registration). Please mail the registration card with your credit card number and expiration date to the above address or fax it to (301) 649-3447. *Dynamedia* will be noted as the payee on your credit card statement.

Late registration will be held at the Holiday Inn Rosslyn @ Key Bridge beginning at 7:30 a.m. on Wednesday, June 10.

HOTEL

The Holiday Inn Rosslyn @ Key Bridge, 1900 N. Fort Myer Drive, Arlington, Virginia, 22209, will be the headquarters hotel for all meeting activities. The hotel is located only a short walk from Georgetown and one block from the Metro subway stop at Rosslyn Station, placing it within minutes of the major tourist attractions in Washington, DC. Hotel amenities include a business center, wireless

internet connection, parking, indoor swimming pool and a fitness center.

Registrants are urged to contact the hotel directly, either by mail or fax (703- 522-8864), using the enclosed registration card. *The card must be received by **May 9** to ensure accommodations at the hotel and to ensure receiving the special Symposium rate.* You may also call (800-368-3408; 703-807-2000) or book online (HiRosslyn.com – select [Book Online](#)). If you do so, refer to Group Code **TCS** and give times of arrival/departure, smoking or nonsmoking preference and credit card guarantee. The special rate will be honored for those wishing to extend their stay at the hotel.

SOCIAL PROGRAM

A social program is planned to provide an opportunity for informal contacts and discussion among the participants. This will include the official Symposium cocktail reception on Wednesday evening, June 10. Additional tickets for guests will be available at the registration desk

TRANSPORTATION

The Holiday Inn Rosslyn @ Key Bridge is conveniently located one block from the Washington Metro stop at Rosslyn Station. Travelers arriving at National Airport may board the Metro at the Airport. The hotel is also serviced by shuttle service from National and Dulles Airports. Free parking in the hotel garage is provided for guests of the hotel.

FOR ADDITIONAL INFORMATION, contact:

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