

PROGRAM AND REGISTRATION

36th International Symposium on Ultrasonic Imaging and Tissue Characterization

June 13 – 15, 2011
Hotel Palomar Arlington
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 technical contributions will be presented this year. Many of the presentations will deal with clinical evaluation of novel methodologies and instrumentation for tissue characterization.

The program includes sessions on imaging, quantitative ultrasound/bone, ARFI (acoustic radiation force imaging)/elasticity and tumor monitoring, as well as four 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 three sessions are technical and will present overviews on shear-wave imaging, contrast and insulin resistance and diabetes.

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Ernest J. Feleppa
Riverside Research, New York

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PROGRAM

SUNDAY, JUNE 12

5:00 p.m. **Wine reception in hotel lobby**
Preregistrant badges available for pick-up

MONDAY, JUNE 13

7:00 a.m. **Registration/Breakfast**

8:00 a.m. **Introduction**
Ernest J. Feleppa, *Symposium Chairman*

8:05 a.m. **1. IMAGING**
Chmn: Gregg E. Trahey, *Duke U.*

1.1 **Comparative resolution, gain and depth-of-field measurements in B-mode and short-lag spatial coherence images**, Muyinatu A. Lediju, Jeremy Dahl and Gregg E. Trahey, *Duke U.*

1.2 **Harmonic coherence imaging using short-lag spatial coherence: demonstration of basic principles and experimental and simulation results**, Jeremy J. Dahl, Gianmarco F. Pinton and Gregg E. Trahey, *Duke U. and Institut Langevin, ESPCI*

1.3 **Performance evaluation of short-lag spatial coherence imaging in the presence of acoustical noise**, Marko Jakovljevic, Dongwoon Hyun, Gregg Trahey and Jeremy Dahl, *Duke U.*

1.4 **Super-resolution imaging of a large number of scatterers using time reversal and MUSIC**, Yassin Labyed and Lianjie Huang, *Los Alamos National Lab*

1.5 **Imaging small targets using synthetic-aperture ultrasound**, Lianjie Huang, Yassin Labyed, Michael Williamson,

Robert Rosenberg, Philip Heintz and Daniel Sandoval, *Los Alamos National Lab and U. New Mexico*,

1.6 Quantitative tracking of tendon motion from ultrasonic images using curved M-mode, Paul Otto, Lindsey Curatalo, Avinash Eranki, Laura Prosser, Diane Damiano, Katharine Alter and Siddhartha Sikdar, *George Mason U. and NIH*

1.7 FDA-approved smartphone ultrasound system, William D. Richard, David M. Zar, Sailesh Chutani and Roman Solek, *Washington U. in St. Louis, Z&R Technologies, Mobicante, Inc. and Interson Corp.*

1.8 High-resolution ultrasonic method for 3D fingerprint imaging, R.Gr. Maev, F. Severin and Moeen Uddini, *Inst. Diagnostic Imaging Research, Canada*

1.9 Characterization of the spatial resolution of different high-frequency imaging systems using a novel anechoic-sphere phantom, Erwan Filoux, Jonathan Mamou, Orlando Aristizabal and Jeffrey A. Ketterling, *Riverside Research and New York U. School Med.*

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

10:45 a.m. **2. QUANTITATIVE ULTRASOUND 1**
Chmn: William D. O'Brien Jr., *U. Illinois*

2.1 Acoustic microscopy imaging of breast tumors, E. Yu. Maeva and I. Seviaryna, *U. Windsor*

2.2 Detection of metastases in dissected lymph nodes of colorectal, gastric and breast-cancer patients using high-frequency ultrasound, Ernest J. Feleppa, Jonathan Mamou, Emi Saegusa-Becroft, Alain Coron, Michael Oelze, Tadashi Yamaguchi, Junji Machi, Masaki Hata, Eugene Yanagihara and Pascal Laugier, *Riverside Research, U. Hawaii and Kuakini Med. Ctr., U. Pierre et Marie Curie and CNRS, U. Illinois, Urbana Champaign and Chiba U.*

2.3 Cross-platform comparison of backscatter coefficient from four clinical imaging systems in four well-characterized phantoms, Lauren A. Wirtzfeld, Kibo Nam, Goutam Ghoshal, Viksit Kumar, Ivan M. Rosado-Mendez, Alexander D. Pawlicki, Ernest L. Madsen, Timothy A. Bigelow, Michael L. Oelze, James A. Zagzebski, Timothy J. Hall and William D. O'Brien Jr., *U. Illinois at Urbana-Champaign, U. Wisconsin, Madison and Iowa State U.*

2.4 Ultrasonic backscatter coefficient measurement agreement across multiple imaging platforms from *in vivo* rodent tumors, Lauren A. Wirtzfeld, Goutam Ghoshal, Ivan M. Rosado-Mendez, Kibo Nam, Viksit Kumar, Alexander D. Pawlicki, Michael A. Kurowski, Nathan R. Hirtz, Emily L. Hartman, Rita J.

Miller, Douglas G. Simpson, Timothy A. Bigelow, James A. Zagzebski, Michael L. Oelze, Timothy J. Hall and William D. O'Brien Jr., *U. Illinois at Urbana-Champaign, U. Wisconsin and Iowa State U.*

2.5 Detection of layers of aligned collagen in human cervical tissue using ultrasound, Lisa M. Reusch, Helen Feltovich, Lindsey Carlson, Jeremy J. Dahl, Mark L. Palmeri, Kevin Eliceiri and Timothy J. Hall, *U. Wisconsin-Madison, Intermountain Healthcare and Duke U.*

11:55 p.m. **Lunch**

1:40 p.m. **3. SHEAR-WAVE IMAGING**
Chmn: Mark L. Palmeri, *Duke U.*

3.1 Using quantitative shear-wave elasticity imaging techniques to noninvasively characterize liver fibrosis, Mark L. Palmeri, Ned C. Rouze, Michael H. Wang, Manal Abdelmalek, Cynthia Guy and Kathryn R. Nightingale, *Duke U. and Duke U. Med. Ctr.* (overview).

3.2 Vibration Elastography: overview and clinical results, Kevin J. Parker, Zaegoo Hah and Deborah Rubens, *U. Rochester* (invited)

3.3 Exploration of the human cervix using acoustic-radiation-force-impulse measurements, Lisa M. Reusch, Helen Feltovich, Lindsey C. Carlson, Jeremy J. Dahl, Mark L. Palmeri and Timothy J. Hall, *U. Wisconsin-Madison, Intermountain Healthcare and Duke U.* (invited)

3.4 Measurements of viscoelastic properties of myocardium using wave-propagation methods, Matthew W. Urban, Cristina Pislaru, Ivan Nenadic and James F. Greenleaf, *Mayo Clinic Coll. Med.* (invited)

3.5 Rapid acquisition of ARFI-induced shear-wave velocity estimates using temporally-interleaved displacement tracking, Peter J. Hollender, Richard R. Bouchar and Gregg E. Trahey, *Duke U.*

3.6 Acoustical near-field imaging by dynamic strain analysis over the Lamb-wave field, Kano Teramoto, Ryoji Inoue, Mahbub Hasan and Tawhidul Islam Khan, *Saga U.*

3.7 Tracking shear wave propagation in 3D using a real-time volumetric imaging ultrasound transducer, Michael Wang, Brett Byram, Mark Palmeri, Ned Rouze and Kathryn Nightingale, *Duke U.*

3:28 p.m. **Coffee**

4:05 p.m. **4. QUANTITATIVE ULTRASOUND 2/BONE**
Chmn: Michael L. Oelze, *U. Illinois*

4.1 **Comparison of the backscattered power loss in multiparous versus nulliparous cervixes**, Lisa M Reusch, Helen Feltovich, Lindsey C. Carlson, Kevin Eliceiri and Timothy J Hall, *U. Wisconsin, Madison and Intermountain Healthcare*

4.2 **Three-dimensional impedance map analysis and comparison of normal and fatty rabbit liver**, Alexander D. Pawlicki, Alexander J. Dapore, Sandhya Sarwate and William D. O'Brien, Jr., *U. Illinois at Urbana-Champaign*

4.3 **Improvements in measurements of BUA and SOS in human calcaneus**, Keith A. Wear, *Food and Drug Administration*

4.4 **Using Bayesian methods to characterize the presence of attenuation artifacts arising from overlapping fast and slow waves in cancellous bone**, Amber M. Nelson, Joseph J. Hoffman, Mark R. Holland, Katsunori Mizuno, Yoshiki Nagatani, Mami Matsukawa and James G. Miller, *Washington U. in St. Louis, Doshisha U. and Kobe City Coll. Tech.*

4.5 **Ultrasonic manipulation of bone cells, *in vivo* adaptation and tissue mechanical strength**, Yi-Xian Qin, Shu Zhang, Suzanne Ferreri and Jacky Cheng, *Stony Brook U.*

5:15 p.m. **Wine reception in hotel lobby**

TUESDAY, JUNE 14

7:00 a.m. **Registration/Breakfast**

8:00 a.m. **5. TUMOR MONITORING**
Chmn: Gregory J. Czarnota, *U. Toronto*
Michael Kolios, *Ryerson U.*

5.1 **Three-dimensional power Doppler ultrasound for characterizing tumor vascular response to radiation**, Ahmed El Kaffas, Anoja Giles and Gregory J. Czarnota, *Sunnybrook Health Sciences Ctr. and U. Toronto*

5.2 **Quantitative ultrasound and diffuse optical spectroscopy evaluations of treatment response in patients with locally-advanced breast cancer receiving chemotherapy**, Omar Falou, Naum Papanicolau, Hany Soliman, Jacqueline Spayne, Rebecca Dent, Martin Yaffe, Michael C. Kolios and Gregory J. Czarnota, *Sunnybrook Health Sciences Ctr., U. Toronto and Ryerson U.*

5.3 **Conventional frequency, quantitative-ultrasound evaluation of tumor cell death response in locally-advanced breast cancer patients to chemotherapy treatment**, Naum Papanicolau, Rebecca Dent, Sunil Verma, Maureen Trudeau, Jacqueline Spayne, Sara Iradji, Ervis Sofroni, Justin Lee, Martin Yaffe, Michael Kolios and Gregory J. Czarnota, *Sunnybrook Health Sciences Ctr., U. Toronto and Ryerson U.*

5.4 **Quantitative-ultrasound and power-Doppler evaluation of tumor cell death response in bladder-cancer xenograft treated with radiation-enhancing microbubble disruption**, William Tran, Alborz Gorjizadeh, Naum Papanicolau, Sara Iradji and Gregory J. Czarnota, *Sunnybrook Health Sciences Ctr. and U. Toronto*

5.5 **Tissue characterization of tumor response to microbubble-based vascular disruption using photoacoustic imaging**, Joris Nofiele Christina Kim, Azza Al Mahrouki, F. Stuart Foster, Michael C. Kolios and Gregory J. Czarnota, *Sunnybrook Health Sciences Ctr., U. Toronto and Ryerson U.*

5.6 **Quantitative and parametric analysis employing conventional frequency ultrasound of cancer treatment effects *in vivo***, Naum Papanicolau, Anoja Giles, Michael Kolios and Gregory Czarnota, *Sunnybrook Health Sciences Ctr., U. Toronto and Ryerson U.*

9:25 a.m. **Coffee**

10:05 a.m. **6. CONTRAST**
Chmn: Jeffrey Ketterling, *Riverside Research*

6.1 **High-frequency response of polymer-shelled ultrasound contrast agents: influence of shell parameters**, Jeffrey A. Ketterling, Parag V. Chitnis, Sujeeth Raj Koppolu, Jonathan Mamou and Daniel Gross, *Riverside Research and Polytechnic Inst. New York U.* (overview)

6.2 **On the utility of subharmonic contrast microbubble signals**, F. Forsberg, J.K. Dave, V.G. Halldorsdottir, J.R. Eisenbrey, J.S. Raichlen, J.B. Liu, C. Miller, J.M. Gonzalez, M.E. McDonald, D.A. Merton, D. Brown and V. Navarro, *Thomas Jefferson U. and Drexel U.* (invited)

6.3 **Dynamics of contrast microbubbles and their subharmonic response for noninvasive blood pressure estimation**, Kausik Sarkar, Amit Katiyar and Flemming Forsberg, *U. Delaware and Thomas Jefferson U.* (invited)

6.4 **Intravascular subharmonic imaging of atherosclerosis: *in vivo* pilot study**, A. Sridharan, J.R. Eisenbrey, E.D. deMuinck, M.M. Doyley and F. Forsberg, *Thomas Jefferson U., Drexel U., Dartmouth Med. School and U. Rochester*

6.5 Theoretical and experimental investigation of the dynamics of ultrasound contrast agents: occurrence of higher subharmonics, Amin Jafari Sojahrood, Raffi Karshafian, Gregory J. Czarnota, Yanjun Gong, Eno Hysi, Tyrone Porter and Michael C. Kolios, *Ryerson U., U. Toronto and Ontario Cancer Inst. and Boston U.* (invited)

6.6 Characterization of single ultrasound contrast agent collapse dynamics using postexcitation rebound signals, Daniel King and William O'Brien, Jr., *U. Illinois at Urbana-Champaign* (invited)

6.7 Estimating concentration of ultrasound contrast agents with backscatter coefficients, Scott M. Leithem, William D. O'Brien, Jr. and Michael L. Oelze, *U. Illinois at Urbana-Champaign* (invited)

12:00 p.m. **Lunch**

1:30 p.m. **7. QUANTITATIVE ULTRASOUND 3**
Chmn: Ernest J. Feleppa, *Riverside Research*

7.1 Power-spectral estimation for quantitative ultrasound in the presence of specular echoes, Adam Luchies, William D. O'Brien, Jr. and Michael L. Oelze, *U. Illinois at Urbana-Champaign*

7.2 A graphical user interface for quantitative ultrasound data analysis, Timothy J. Hall, Lindsey Carlson, Andrew Battles, David P. Duncan, James A. Zagzebski and William D. O'Brien Jr., *U. Wisconsin, U. Illinois at Urbana-Champaign and Siemens Healthcare USA*

7.3 Ultrasonic backscatter coefficient quantitative estimates from Chinese hamster ovary and BALB/3T3 cell pellet biophantoms, Aiguo Han, Rami Abuhabsah, James P. Blue, Jr., Sandhya Sarwate and William D. O'Brien, Jr., *U. Illinois at Urbana-Champaign*

7.4 A simulation study on the photoacoustic signals from nonaggregating and aggregating erythrocytes, Ratan K. Saha, Eno Hysi and Michael C. Kolios, *Ryerson U.*

7.5 Estimations of acoustic attenuation and backscatter coefficient of rodent tumor-mimicking structures, Ivan M. Rosado-Mendez, Kibo Nam, Lauren A. Wirtzfeld, Goutam Ghoshal, Alexander D. Pawlicki, Viksit Kumar, Ernest L. Madsen Timothy A. Bigelow, Michael L. Oelze, James A. Zagzebski, William D. O'Brien Jr. and Timothy J. Hall, *U. Wisconsin, Madison, U. Illinois at Urbana-Champaign and Iowa State U.*

7.6 Attenuation and backscatter coefficient estimates in layered tissue-mimicking phantoms, Kibo Nam, Ivan M.

Rosado-Mendez, Lauren A. Wirtzfeld Goutam Ghoshal, Alexander D. Pawlicki, Viksit Kumar, Ernest L. Madsen, Timothy A. Bigelow, Michael L. Oelze, James A. Zagzebski, William D. O'Brien Jr. and Timothy J. Hall, *U. Wisconsin, U. Illinois at Urbana-Champaign and Iowa State U.*

2:55 p.m. **Coffee**

3:35 p.m. **8. QUANTITATIVE ULTRASOUND 4**
Chmn: Timothy J. Hall, *U. Wisconsin*

8.1 Development of artery-mimicking poly(vinyl alcohol) cryogel phantoms, Benjamin L. Johnson, Joseph J. Hoffman, Jonathan I. Katz, Mark R. Holland and James G. Miller, *Washington U. in St. Louis*

8.2 Ultrasonic propagation properties of fibroadenomas in vitro, Ellora Sen-Gupta, Alexander D. Pawlicki, Lauren A. Wirtzfeld, Rita J. Miller, Andrew P. Battles and William D. O'Brien, Jr., *U. Illinois at Urbana-Champaign*

8.3 Investigation of cerebral hemodynamic alterations in response to blunt cervical vascular injuries, Dianna Purvis, Tayseer Aldaghlis, Anne Rizzo and Siddhartha Sikdar, *George Mason U. and Inova Fairfax Hosp.*

8.4 Wide-bandwidth measurement (22 MHz–105 MHz) of the ultrasonic attenuation of the coronary artery layers, Joseph J. Hoffman, Benjamin L. Johnson, Mark R. Holland, Russell J. Fedewa and James G. Miller, *Washington U. in St. Louis and Volcano Corp.*

8.5 On-axis evaluations of the power-law impulse response for a circular piston, Christopher T. Johnson and Robert J. McGough, *Michigan State U.*

8.6 Numerical evaluations of power-law Green's function, Donald J. VanderLaan and Robert J. McGough, *Michigan State U.*

5:00 p.m. **Wine reception in hotel lobby**

WEDNESDAY, JUNE 15

7:00 a.m. **Registration/Breakfast**

8:00 a.m. **9. REVIEW, PRIORITIES AND FUNDING OF NIH PROGRAMS**
Chmn: Ernest J. Feleppa, *Riverside Research*

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

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

9.3 **NIH/CSR**, Lee Rosen, *Scientific Review Administrator for Biomedical Imaging Technology, Center for Scientific Review, NIH* (invited)

8:45 a.m. **PANEL DISCUSSION**
Moderator: James G. Miller, *Washington U.*

9:15 a.m. **10. ARFI/ELASTICITY**
Chmn: Kathy R. Nightingale, *Duke U.*

10.1 Recent results and advances in transthoracic cardiac acoustic radiation force impulse imaging, David P. Bradway, Stephen J. Rosenzweig, Joshua R. Doherty, Dongwoon Hyun and Gregg E. Trahey, *Duke U.*

10.2 Intracardiac ARFI imaging: applications, advancements and results, Peter J. Hollender, Stephanie A. Eyerly, Stephen J. Hsu, Patrick D. Wolf and Gregg E. Trahey, *Duke U. and Siemens Med. Systems*

9:43 a.m. **Coffee**

10:15 a.m.
10.3 Demonstration of a freehand B-mode/ARFI imaging system as a real-time clinical tool, Joshua R. Doherty, Douglas M. Dumont and Gregg E. Trahey, *Duke U.*

10.4 Photoacoustic detection of acoustic radiation force induced displacements in ocular tissues, Ronald H. Silverman, Raksha Urs, Harriet O. Lloyd, Jeffrey A. Ketterling, Fanting Kong and Y-C Chen, *Columbia U. Med. Ctr., Riverside Research and Hunter Coll.*

10.5 Prostate-deformation modeling for elastography using finite-element analysis, Zhennan Yan, S. Kaisar Alam, Shaoting Zhang, Dimitris Metaxas and Ernest J. Feleppa, *Riverside Research and Rutgers U.*

10.6 Monitoring the physiological-level electric-field-induced mechanical changes (PLEFIMC) in general soft biological tissues with ultrasound, Ozkan Doganay and Yuan Xu, *Ryerson U.*

11:11 a.m. **11. INSULIN RESISTANCE AND DIABETES**
Chmn: James G. Miller, *Washington U.*

11.1 Opportunities for ultrasonic tissue characterization: relationships between obesity, insulin resistance and Type 2 Diabetes Mellitus and the potential effects on cardiac structure and function, Gautam K. Singh, *Washington U. School Med.* (overview)

11.2 Imaging and Diabetes Mellitus: role of ultrasound and other modalities in noncardiac diagnosis and treatment monitoring, Brian Garra, *Washington DC Veterans Affairs Med. Ctr. and Food and Drug Administration* (invited)

11.3 Relationship between insulin resistance and cardiac dysfunction in obese children, Mark R. Holland, B. Seth Goldstein, Deborah Hicks, John Hosie, Diana Hartman and Gautam K. Singh, *Washington U. School Med.*

12:00 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 \$500 (\$535 if postmarked after **May 27**). Graduate students who identify their school and advisor on the registration form will be charged \$300 (\$325 after **May 27**). Postdoctoral fellows must pay the full registration fee.

Advance registration is requested in order to complete local arrangements. Please send the registration card on the last 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 \$25.00 fee *per registration* (\$15 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 Palomar Hotel Arlington beginning at 7:00 a.m. on Monday, June 13.

HOTEL

The Hotel Palomar Arlington (1121 19th Street, North, Arlington, VA 22209; 703 351 9170) will be the headquarters for all meeting activities. Located two blocks from the previous Symposium venue and a short walk from the historic Georgetown district, the Palomar Arlington is a luxury, 4-star boutique hotel designed by the world-famous architect, I.M. Pei. The meeting will take place in the Vivace room, a beautiful, large ballroom with classroom seating for 100 attendees and high ceilings for unrestricted views of the projector screen. The hotel offers numerous amenities for registered guests. These include:

- Morning reception (6:00 -9:00 a.m.) — coffee and tea
- Evening reception (5:00-6:00 p.m.) — white and red wine
- State-of-the-art, 24-hour fitness center
- Free WiFi (registration required)

For additional information, see the hotel web site:

<http://www.hotelpalomar-arlington.com/>.

The Symposium has guaranteed a limited number of rooms at a special Symposium rate of \$249 for a single or double room. Unfortunately, that block has already been filled. If you are interested in reserving a room at the hotel, contact Dr. Linzer (mmlinzer@verizon.net, 301 649 6886) *as soon as possible*. If rooms are still available, we will try to reserve an additional block of rooms. As we will be financially responsible for any rooms that have not been reserved, you must commit to reserve your rooms within three days after you are notified that the room block is available. Rooms may be reserved by logging onto the hotel web site using the link above. The group code is TIS0612.

SOCIAL PROGRAM

Breakfast will be served each morning before the opening session. It will include breakfast wraps, cold and hot cereal, fresh fruit slices and berries, pastries and bagels & cream cheese. Coffee and tea will be available during the morning sessions and coffee, tea and soda at mid-afternoon breaks. A wine reception (free for hotel guests) will be held in the hotel lobby at 5:00-6:00 p.m. on Sunday, Monday and Tuesday evenings. Attendees who are not registered at the hotel may purchase drinks at Domaso's bar adjoining the lobby.

CASUAL DRESS CODE

We encourage all participants to bring only casual clothes. Casual dress will make all of us more comfortable and simplify our packing. So please help us make the Symposium an informal, relaxed, productive experience in our exciting new venue, the Hotel Palomar Arlington.

TRANSPORTATION

The Hotel Palomar Arlington is located one block from the Washington Metro subway stop in Rosslyn, placing it within

minutes of downtown Washington, Capitol Hill and National Airport (5 stops on the Blue Line). Bus service to Dulles Airport, as well as to New York City, is available across the street from the hotel. The NYC buses cost as little as \$25 each way and feature free WiFi and electrical outlets. The hotel is also serviced by shuttle service from National and Dulles Airports. Valet parking in the garage adjacent to the hotel (including unlimited in/out parking) is provided for hotel guests at \$15/day. Rates for self-parking are somewhat lower.

ABSTRACTS

Prior to the meeting, the program and abstracts, in both pdf and Word™ formats, will be sent out to our mailing list and made available on our website, uitc-symposium.org. Downloading these files onto a laptop, tablet or smartphone will allow attendees to read and annotate them during the sessions. The Vivace ballroom will be furnished with tables (with electrical outlets) for supporting these devices as well as food and drink items.

Attendees who have not downloaded the program and abstracts prior to the meeting can do so at the registration desk. Printed copies will be available at additional cost.

FOR ADDITIONAL INFORMATION, contact:

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