2019 RCBU Biomedical Ultrasound Symposium Day

Thursday, November 7, 2019
8:00am-5:00pm

RICHARD FELDMAN BALLROOM
FREDERICK DOUGLASS COMMONS
UNIVERSITY OF ROCHESTER
RIVER CAMPUS
ROCHESTER, NY

Support for the RCBU Biomedical Ultrasound Symposium was provided by the Edwin and Pam Carstensen Family Endowment, the Rochester Center for Biomedical Ultrasound, and the Department of Biomedical Engineering at the University of Rochester.
2019 RCBU BIOMEDICAL ULTRASOUND SYMPOSIUM DAY

Thursday, November 7, 8am-5pm

AGENDA

8:00-8:45AM  Arrive and Continental Breakfast
8:45-9:00AM  Welcome & Introduction of Distinguished Lecturer
              Diane Dalecki, Ph.D.
              Director, Rochester Center for Biomedical Ultrasound
              Chair and Distinguished Professor of Biomedical Engineering
              University of Rochester
9:00-10:00AM Distinguished Edwin L. Carstensen Lecture
              Improving Urinary Stone Lithotripsy: One Outgrowth of RCBU Research
              Michael Bailey, Ph.D.
              Center for Industrial and Medical Ultrasound, Applied Physics Laboratory
              Departments of Mechanical Engineering, and Urology
              University of Washington
10:00-10:10AM Break
10:10-11:10AM Trainee Presentations
              Moderator: Stephen A. McAleavey, Ph.D.
              Associate Professor of Biomedical Engineering
              University of Rochester
11:10-11:45AM Clinical Challenges
              Giovanni Schifitto, M.D., M.S.
              Professor of Neurology, and Imaging Sciences
              University of Rochester
11:45-1:15PM Lunch, Scientific Poster Session, and Networking
1:15-2:30PM  Introduction of Distinguished RCBU Alumni Lecturer
              Diane Dalecki, Ph.D.
1:30-2:30PM  Distinguished RCBU Alumni Lecture
              Tele-Ultrasound Deployment in Rural Areas of Peru
              Benjamín Castañeda Aphan, Ph.D.
              Department of Biomedical Engineering
              Pontificia Universidad Católica del Perú
2:30-3:00PM  Trainee Presentations
              Moderator: Denise C. Hocking, Ph.D.
              Professor of Pharmacology and Physiology
              University of Rochester
3:00-3:30PM  Installation of Diane Dalecki as the Kevin J. Parker Distinguished Professor in Biomedical Engineering
3:30-5:00PM  Poster Session, Networking & Refreshments
Distinguished Edwin and Pam Carstensen Family Lecture

Improving Urinary Stone Lithotripsy: One Outgrowth of RCBU Research

Michael Bailey, Ph.D.
Center for Industrial and Medical Ultrasound, Applied Physics Laboratory
Departments of Mechanical Engineering, and Urology | University of Washington

Michael Bailey is a Senior Principal Engineer at the Applied Physics Laboratory, and Associate Professor of Mechanical Engineering and Adjunct Associate Professor of Urology at the University of Washington. His research interests include cavitation, shock wave lithotripsy, high intensity focused ultrasound, and ultrasound imaging. He is a Fellow of the Acoustical Society of America (ASA). He has served on the Board of the International Society for Therapeutic Ultrasound (ISTU), the Bioeffects Committee of the American Institute for Ultrasound in Medicine (AIUM), and the ASA Executive Council. He received the R. Bruce Lindsay Award from ASA in 2004, and the Frederic Lizzi Early Career Award from ISTU in 2008. Dr. Bailey serves as program director of an NIH NIDDK program project grant on kidney stone lithotripsy, which is entering its 25th year.

Improving Urinary Stone Lithotripsy: One Outgrowth of RCBU Research

Shock wave lithotripsy (SWL) – the use of noninvasive acoustic waves to break urinary stones – is just one area of biomedical ultrasound, and research experience in kidney stone lithotripsy can serve as an example of translational research. Our team's research grew out of RCBU research, and RCBU members, Profs. Carstensen, Dalecki, and Blackstock have served as External Advisors on our NIH Program Project Grant that is continuing into its 25th year. This talk will present background on kidney stones and SWL, some of the history of the RCBU research on SWL, and a report on our recent applied work directed at changing clinical management of stones and the more broadly applicable scientific advances associated with this effort. The translational goal of our recent effort is to overcome the scientific challenges to developing and testing an office-based ultrasound system to image, break, and reposition stones and fragments to facilitate their natural clearance. This effort has required work from developing theoretical models to conducting clinical trials, and has led to advances in scientific areas of acoustics, cavitation, transducer design, acoustic radiation force, and bio-effects.

Distinguished RCBU Alumni Lecture

Tele-Ultrasound Deployment in Rural Areas of Peru

Benjamin Castañeda Apfan, Ph.D.
Department of Biomedical Engineering | Pontificia Universidad Católica del Perú

Benjamin Castaneda is Professor and Chair of Biomedical Engineering, and founder of the Medical Imaging Laboratory, at the Pontificia Universidad Católica del Perú (PUCP). Dr. Castaneda’s research expertise includes quantitative elastographic imaging, computed aided diagnosis tools, and telemedicine. In 2013, Dr. Castaneda received the Academic Innovator Award from the Peruvian Government for his continuous work in the development of medical technology, and that same year, he won the Best Patent from the Peruvian Government for an automated staining system for tuberculosis detection. The same invention received a silver medal at the International Exhibition of Inventions of Geneva in 2014. Dr. Castaneda is the founder of Medical Innovation & Technology, a Peruvian start-up focused on development of telemedicine technology for rural areas. He is currently a member of the Peruvian Committee for Health Informatics and the IEEE Bio-Imaging & Signal Processing Technical Committee.

Tele-Ultrasound Deployment in Rural Areas of Peru

Millions lack access to adequate diagnostic imaging services in rural areas worldwide. As a low-cost and portable imaging modality, ultrasound will play a key role in correcting these disparities. However, access to ultrasound technology is limited by availability of trained sonographers and readers in rural areas. As a solution, an ultrasound-based telemedicine imaging system has been developed for deployment in rural areas in which ultrasound naïve rural health workers perform volume sweep imaging (VSI) protocols based on only external body landmarks for diagnosing obstetric, gallbladder, and thyroid pathology. Our telemedicine ultrasound system was piloted in an academic setting at the Pontifical Catholic University of Lima and in the Peruvian rainforest. Health workers were trained on VSI protocols, image capture, labeling, and electronic transmission over 2-3 days. Trainees then obtained images from patients requiring obstetrics, gallbladder, or thyroid scans. Images were uploaded to a cloud-based system and then downloaded and read by radiologists all using custom software. Preliminary results suggest that trainees can learn VSI protocols within 3 days. Our complete telemedicine system can provide a low-cost and scalable diagnostic service suitable for deployment in rural areas.
THE KEVIN J. PARKER DISTINGUISHED PROFESSORSHIP IN BIOMEDICAL ENGINEERING

The Kevin J. Parker Distinguished Professorship in Biomedical Engineering has been named to honor the renowned work and longstanding contributions of Kevin J. Parker, PhD. The professorship will support faculty members within the department and recognize high scholarly achievement in biomedical engineering.

This professorship, along with four other endowed distinguished professorships, was established in 2001 with royalties from the Blue Noise Mask, a technology invented by Parker and Theophano Mitsa ’88 (MS), ’91 (PhD) which improves the speed and appearance of digital images. The Blue Noise Mask remains one of the University of Rochester’s most widely used inventions and illustrates the value and importance of basic academic research in the field of engineering.

Diane Dalecki ’83, ’85 (MS), ’93 (PhD), installed in 2016 as the Distinguished Professor in Biomedical Engineering, has been named the inaugural Parker Distinguished Professor. A professor of biomedical engineering, and electrical and computer engineering at the University of Rochester, Dalecki serves as chair of the Department of Biomedical Engineering and director of the Rochester Center for Biomedical Ultrasound. Her lab is dedicated to advancing the use of ultrasound in medicine and biology by developing novel diagnostic ultrasound techniques and discovering and advancing new applications of ultrasound for therapy and tissue engineering.

THE EDWIN AND PAM CARSTENSEN FAMILY ENDOWMENT

The Edwin and Pam Carstensen Family Endowment was established to honor the legacy of Edwin L. Carstensen and ensure that his vision of the Rochester Center for Biomedical Ultrasound endures. Edwin L. Carstensen was a pioneer in the field of biomedical ultrasound and internationally recognized throughout his career for his advances in understanding the interaction of ultrasound fields with biological tissues. He was the Founding Director of the Rochester Center for Biomedical Ultrasound (RCBU), a multidisciplinary research center dedicated to advancing the use of biomedical ultrasound in imaging and therapy. Professor Carstensen, the Arthur Gould Yates Professor Emeritus of Engineering, was a member of the Department of Electrical and Computer Engineering at the University of Rochester for over fifty years. Professor Carstensen was a member of the National Academy of Engineering, and his outstanding scientific achievements were widely recognized with numerous awards and honors. The fund was enabled by a generous seed gift from the Carstensen family. To contribute to the Edwin and Pam Carstensen Family Endowment, contact Derek Swanson at derek.swanson@rochester.edu or 585.273.1341.

THE ROCHESTER CENTER FOR BIOMEDICAL ULTRASOUND

The Rochester Center for Biomedical Ultrasound (RCBU) was created at the University of Rochester to unite professionals in engineering, medical, and applied science communities at the University of Rochester, Rochester General Hospital, and the Rochester Institute of Technology. Since its founding in 1986, the RCU has grown to nearly 100 members, with several visiting scientists from locations around the world. The Center provides a unique collaborative environment where researchers can join together to investigate the use of high frequency sound waves in medical diagnoses and therapy. RCBU laboratories provide a rich environment for graduate training in biomedical ultrasound where students have access to state-of-the-art research facilities in order to engage in leading-edge research in ultrasound. For more information on the RCU or on graduate training opportunities, please contact RCU Director Diane Dalecki at dalecki@bme.rochester.edu or visit our website at rochester.edu/rcbu.