
# 2024 RCBU Biomedical Ultrasound Symposium Day

## TUESDAY, NOVEMBER 12, 2024
## 8:00AM-5:00PM

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

Zoom link for live broadcast: https://rochester.zoom.us/j/93675886456

Support for the RCBU Biomedical Ultrasound Symposium is 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.

# 2024 RCBU BIOMEDICAL ULTRASOUND SYMPOSIUM DAY

## AGENDA

*Tuesday, November 12, 8am–5pm*

**8:00AM** — **Arrive and Continental Breakfast**

**8:45-9:00AM** — **Welcome & Introduction of Distinguished Lecturer**
**Diane Dalecki, Ph.D.**
The Kevin J. Parker Distinguished Professor in Biomedical Engineering
Director, Rochester Center for Biomedical Ultrasound
Department of Biomedical Engineering, University of Rochester

**9:00-10:00AM** — **Distinguished Edwin L. Carstensen Lecture**
*Quantitative Imaging Biomarkers: Medical Imaging Meets Metrology*
**Timothy J. Hall, Ph.D.**
Professor of Medical Physics and Biomedical Engineering
University of Wisconsin-Madison

**10:00-10:05AM** — **Break**

**10:05-11:15AM** — **Trainee Presentations**
Moderator: Stephen A. McAleavey, Ph.D.
Chair and Associate Professor of Biomedical Engineering
University of Rochester

**11:15-NOON** — ***Clinical Challenges:*** *Histotripsy for Liver Malignancy*
**Koji Tomiyama, M.D.**
Associate Professor of Surgery, Division of Transplant Surgery
University of Rochester

**NOON-1:15PM** — **Lunch, Scientific Posters, and Networking**

**1:15-1:30PM** — **Introduction of Distinguished RCBU Alumni Lecturer**
Diane Dalecki, Ph.D.

**1:30-2:30PM** — **Distinguished RCBU Alumni Lecture**
*Enabling Ultrasound Techniques for Tissue Characterization*
**Karla P. Mercado-Shekhar, Ph.D.**
Assistant Professor of Biological Sciences and Engineering
Indian Institute of Technology (IIT) Gandhinagar

**2:30-3:15PM** — ***Hot Topic:*** *Histotripsy: A Focused Ultrasound Therapy for More Than Just Tissue Ablation*
**Kenneth B. Bader, Ph.D.**
Assistant Professor of Radiology
University of Chicago

**3:15-5:00PM** — **Poster Session and Networking**

# DISTINGUISHED LECTURERS

## Distinguished Edwin L. Carstensen Lecture

*Timothy J. Hall, Ph.D.*
*Professor of Medical Physics and Biomedical Engineering*
*School of Medicine and Public Health, University of Wisconsin-Madison*

Dr. Timothy J. Hall is a Professor of Medical Physics and Biomedical Engineering at the University of Wisconsin-Madison. He is an international leader in quantitative imaging biomarker technology and phantom development. Throughout his career, he has innovated algorithm development for several quantitative ultrasound parameters (e.g., backscatter coefficients, attenuation coefficients, tissue elasticity characterization, and parameters derived from them), developed methods for image formation, reported fundamental noise properties of parametric images, led the effort for system integration, and led initial clinical trials. He has also served as the Chair of the Radiological Society of North America (RSNA) Quantitative Imaging Biomarkers Alliance (QIBA). In recognition of his contributions to the field, Dr. Hall has been named a Fellow of the American Institute of Ultrasound in Medicine (AIUM), and a Fellow of the American Institute for Medical and Biological Engineering (AIMBE).

**Quantitative Imaging Biomarkers: Medical Imaging Meets Metrology**

Analysis of medical images is dominated by subjective assessment that demonstrably has relatively poor repeatability and reproducibility. In some cases, subjective assessment can be augmented or replaced with objective measurement of a quantitative imaging biomarker. Qualification of a biomarker is analogous to qualification of a serum assay, and as such, properly standardized imaging biomarkers can be considered an assay. The long history of quantification of quantitative parameters derived from ultrasound “images” (actually, the data that underlies image formation) provides fertile groundwork for approaching what Kit Hill termed ‘telehistology’. Some history behind one of these biomarkers and the prospects for future development are highlighted.

---

## Distinguished RCBU Alumni Lecture

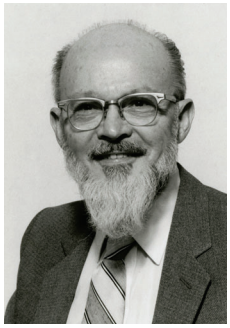
*Karla P. Mercado-Shekhar, Ph.D.*
*Assistant Professor of Biological Sciences and Engineering*
*Indian Institute of Technology (IIT) Gandhinagar*

Dr. Karla Mercado-Shekhar is an Assistant Professor of Biological Sciences and Engineering at the Indian Institute of Technology (IIT) Gandhinagar. She received her B.S. in Biomedical Engineering from Boston University and her M.S. and Ph.D. in Biomedical Engineering from the University of Rochester, as a Provost’s Fellow. She was a Postdoctoral Fellow at the University of Cincinnati College of Medicine and a recipient of a postdoctoral research supplement grant from the National Institutes of Health. Dr. Mercado-Shekhar co-leads the Medical Ultrasound Engineering (MUSE) Lab where her research focuses on ultrasound tissue characterization, viscoelasticity imaging, and drug delivery. She has been recognized as a Scholar by the IEEE Ultrasonics, Ferroelectrics, and Frequency Control Society. She serves on the Advisory Editorial Board of the journal Ultrasound in Medicine and Biology, and the Technical Program Committees of the IEEE International Ultrasonics Symposium and the Biomedical Acoustics Technical Committee of the Acoustical Society of America.

**Enabling Ultrasound Techniques for Tissue Characterization**

Ultrasound can provide information about tissue structure and stiffness for improved diagnosis. In this talk, I will discuss our team’s efforts to advance elastography and parametric imaging approaches based on raw ultrasound data for characterizing tumors and imaging anisotropic tissues. I will also report studies on developing and characterizing viscoelastic tissue-mimicking phantoms for validation of elastography approaches and gold-coated perflourocarbon nanodroplets for theranostic applications. I will conclude with an overview of my experiences in establishing the Medical Ultrasound Engineering (MUSE) Lab at IIT Gandhinagar.

# 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, please contact Derek Swanson at derek.swanson@rochester.edu or 585.273.1341.**

# PAST RCBU BIOMEDICAL ULTRASOUND SYMPOSIUM DISTINGUISHED LECTURERS

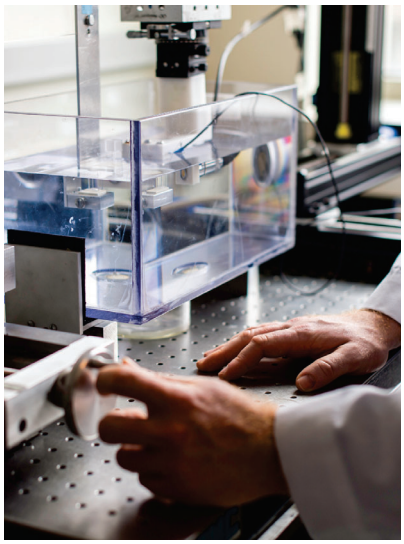
***Distinguished Edwin L. Carstensen Lecture***

2018 Frederick W. Kremkau Ph.D.
2019 Michael Bailey, Ph.D.
2021 Kevin J. Parker, Ph.D.
2022 Kathy Nightingale, Ph.D.
2023 Stanislav Emelianov, Ph.D.

***Distinguished RCBU Alumni Lecture***

2018 Theresa Tuthill, Ph.D.
2019 Benjamin Castañeda Aphan, Ph.D.
2021 Maggie Zhang, M.D., Ph.D.
2022 Manoj Menon, Ph.D.
2023 Thomas Szabo, Ph.D.

# 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 RCBU 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 RCBU or on graduate training opportunities, please contact RCBU Director Diane Dalecki at dalecki@bme.rochester.edu or visit our website at **rochester.edu/rcbu.**