

### BME Seminar Series

---

#### **Muyinatu A. Lediju Bell, PhD**

Assistant Professor

Dept. of Electrical and Computer Engineering

Joint appointment Dept. of Biomedical Engineering

Johns Hopkins University



**Date:** Monday, March 6, 2017

**Time:** 1:30 pm

**Location:** Traylor 707-09, Medicine Campus

Video-teleconferenced to Clark 110, Homewood Campus

**Host:** Dr. Warren Grayson

Light lunch will be served in Traylor 709

---

### **Revolutionizing Image Formation to Improve Clinical Outcomes**

**Abstract:** With the ability to provide real-time information about our complex, dynamic anatomy, ultrasound and photoacoustic images represent two powerful tools to diagnose medical diseases and guide intricate surgeries. However, these tools are limited by the presence of noise artifacts known as acoustic clutter, which are particularly evident when imaging overweight and obese patients. Traditional amplitude-based signal processing methods insufficiently discriminate noise from true signals in these patients. In this talk, I describe my novel coherence-based beamforming methods, which I initially developed to reduce acoustic clutter in ultrasound images. I then demonstrate how my work translates to photoacoustic imaging to enable novel applications of photoacoustic-guided surgeries with specialized, task-specific light delivery systems that attach to surgical tools. These novel contributions may be integrated with robots to further improve surgical navigation in minimally invasive procedures, expanding the technical envelope of ultrasound and photoacoustic imaging systems, with potential to revolutionize current diagnostic and surgical standards of patient care.

#### **Bio**

Muyinatu A. Lediju Bell, PhD is an Assistant Professor of Electrical and Computer Engineering with a joint appointment in the Department of Biomedical Engineering at Johns Hopkins University, where she directs the Photoacoustic and Ultrasonic Systems Engineering (PULSE) Lab. Dr. Bell earned her B.S. degree in Mechanical Engineering (biomedical engineering minor) from the Massachusetts Institute of Technology, received her Ph.D. degree in Biomedical Engineering from Duke University, completed a postdoctoral fellowship at Johns Hopkins University, and conducted research abroad as a Whitaker International Fellow at the Institute of Cancer Research in the UK. She is the author of over 40 scientific journal articles and conference proceedings, holds a patent for SLSC beamforming, and is the recipient of numerous awards, grants, and fellowships, including the MIT Technology Review 35 Innovators Under 35 Award (2016), the NIH K99/R00 Pathway to Independence Award (2015), the UNCF-Merck Postdoctoral (2012) and Graduate (2011) Research Fellowships, and the Whitaker International Fellowship (2009).