

## Wallace H. Coulter Foundation Biomedical Engineering Seminar Series

**K. C. TOUSSAINT, JR., PH.D.** is a Professor in the School of Engineering at Brown University. Prior to joining Brown, Dr. Toussaint was on faculty at the University of Illinois at Urbana-Champaign for 12 years, where he rose to the rank of Professor in the Department of Mechanical Science and Engineering. Dr. Toussaint directs the laboratory for Photonics Research of Bio/nano Environments (PROBE Lab), an interdisciplinary research group which focuses on both developing nonlinear optical imaging techniques for quantitative assessment of biological tissues, and novel methods for harnessing plasmonic nanostructures for light-driven control of matter.

He is a recipient of a 2010 NSF CAREER Award, the 2014-2015 Dr. Martin Luther King, Jr. Visiting Associate Professor at MIT, the 2015 Illinois Dean's Award for Excellence in Research, the 2017 Illinois Everitt Award for Teaching Excellence, and the 2019 Distinguished Promotion Award. Dr. Toussaint is also a Fellow of the OSA and SPIE, and Senior Member in the IEEE. In addition, he served as the PI and inaugural Director of the US National Science Foundation (NSF) Nanomanufacturing (nanoMFG) Node at the University of Illinois at Urbana-Champaign from 2017-2019.



### DR. KIMANI TOUSSAINT

Professor of Engineering

Brown University

#### Strategies For Quantitative Second-Harmonic Generation Imaging And Its Applications

**ABSTRACT:** Advances in light microscopy has helped to elucidate a variety of biological phenomena. Nonlinear microscopy has expanded the toolset by offering routes to enhanced resolution, contrast, and specificity. This talk will highlight our work developing quantitative second-harmonic generation (SHG) microscopy, a type of 2nd-order nonlinear microscopy. Specifically, we will review the

quantitative SHG microscopy techniques pursued by the laboratory for Photonics Research of Bio/nano Environments (PROBE Lab) for assessment of a variety of collagenous tissues, and discuss our recent efforts to integrate optical beam shaping with this imaging modality. This talk will conclude with a brief discussion of some of the very recent directions pursued by the PROBE lab.



Through the generous support of the Wallace H. Coulter Foundation the Department of Biomedical Engineering facilitates weekly lectures each year during academic terms. Experts in all areas of Biomedical Engineering are invited to campus to provide a research seminar and to meet with faculty and students and to tour our academic and research facilities.

Friday, March 20, 2020  
9:00AM-10:00AM Room EC 2300