

The School of Electrical and Computer Engineering DISTINGUISHED SEMINAR SERIES 2017

The Distinguished Seminar Series of the School of Electrical and Computer Engineering (ECE) presents the work of internationally recognized researchers. This seminar series is intended to provide an open platform for the faculty and students, to have a dialog with leading researchers in various fields of ECE, and to build-up a dynamic and vibrant culture of research and academic exchange in the ECE department. All seminars are free and open to the public.



Endoscopic Optical Imaging for Early-Stage Cancer Detection

3:20 - 4:20 p.m. Thursday, March 9 | ATRC 102

Dr. Jennifer Kehlet Barton - Professor, Interim Director, BIO5 Institute Department of Biomedical Engineering University of Arizona

Jennifer Barton received the BS and MS degrees in electrical engineering from the University of Texas at Austin and University of California Irvine, respectively. She worked for McDonnell Douglas (now Boeing) on the Space Station program before returning to The University of Texas at Austin to obtain the Ph.D. in Biomedical Engineering in 1998. She is currently Professor of Biomedical Engineering, Electrical and Computer Engineering, Optical Sciences, and Agriculture and Biosystems Engineering at the University of Arizona. She has served as department head of

Biomedical Engineering, Associate Vice President for Research, Interim Vice President for Research, and is currently Interim Director of the BIO5 Institute, a collaborative research institute dedicated to solving complex biology-based problems affecting humanity. Barton develops miniature endoscopes that combine multiple optical imaging techniques, particularly optical coherence tomography and fluorescence spectroscopy. She evaluates the suitability of these endoscopic techniques for detecting early cancer development in patients and pre-clinical models. She has a particular interest in the early detection of ovarian cancer, the most deadly gynecological malignancy. Additionally, her research into light-tissue interaction and dynamic optical properties of blood laid the groundwork for a novel therapeutic laser to treat disorders of the skin's blood vessels. She has published over 100 peer-reviewed journal papers in these research areas. She is a fellow of SPIE- the International Optics Society, and a fellow of the American Institute for Medical and Biological Engineering.

Seminar Abstract

With multiple mechanisms of contrast, high sensitivity, high resolution, and the possibility to create miniature, inexpensive devices, light-based techniques have tremendous potential to positively impact cancer detection and survival. Many organs of the body can be reached in a minimally-invasive fashion with small flexible endoscopes. Some organs, such as the fallopian tubes and ovaries, require extremely miniature (sub-mm) and flexible endoscopes to avoid tissue cutting. Additionally, some modalities, such as side-viewing optical coherence tomography, are naturally suited to miniature endoscopes, whereas others like forward-viewing reflectance or fluorescence imaging, may require performance tradeoffs. The development of small, robust and fiber-delivered advanced light sources, miniature fiber bundles, and sensitive detectors has aided the development of novel miniature endoscopes. In this talk, I will discuss our recent advancements in endoscope design for multimodality optical early detection of colon and ovarian cancer.

Refreshments and drinks will be offered after each seminar.



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