When: **Friday 12:40 – 13:40**
Where: **ETB 1020**

Speaker: **Limei Tian**

Assistant Professor
Department of Biomedical Engineering
Texas A&M University

Title: **Sensing Technologies for Advanced Health Care**
Date: **4-12-2019**

Abstract: Plasmonic biosensors are considered to be highly promising for the development of simple, portable, sensitive, on-chip biodiagnostics for resource-limited settings. While there has been a tremendous progress in the rational design of plasmonic nanotransducers with high sensitivity and the development of hand-held read-out devices, the translation of these biosensors to resource-limited settings is hindered by the poor thermal, chemical and temporal stability of biorecognition elements. Degradation of the sensitive reagents and biodiagnostic chips compromises analytical validity, preventing accurate and timely diagnosis. In this talk, I will present the design and implementation of plasmonic biosensors that rely artificial antibodies as recognition elements. This approach overcomes the poor stability of existing plasmonic biosensors and takes them closer to real-world applications in resource-limited settings.

In the second part of the talk, I will discuss the recent advances in the design and fabrication of skin-interfaced wearable medical devices capable of continuously measuring and wirelessly transmitting biophysical and biochemical information. These novel bioelectronic systems are expected to revolutionize healthcare by improving outcomes and reducing costs, as they become integral parts of modern, connected medical infrastructure. I will show that large-area, skin-like electrical interfaces enable, via advanced pattern recognition algorithms, real-time control of robotic prosthesis. These platforms are also magnetic resonance imaging (MRI)-compatible, thereby allowing for the simultaneous measurements of electroencephalography (EEG) and functional MRI. Finally, I will discuss our ongoing research efforts in wearable biomedical devices to facilitate accurate disease diagnosis and personalized medicine.

Bio: Limei Tian is an Assistant Professor in the Department of Biomedical Engineering at Texas A&M University. Her research interests include the design, synthesis and fabrication of novel materials and devices, which can expand the fundamental understanding of biotic-abiotic interactions at various length scales and foster technologies that enable advanced health care, renewable energy, environmental monitoring and homeland security. She earned her Ph.D. from the Department of Mechanical Engineering and Materials Science at Washington University in St. Louis in 2014. Limei Tian was a Beckman Institute Postdoctoral Fellow at the University of Illinois at Urbana-Champaign from 2015 to 2018. She is the recipient of National Science Foundation summer institute fellowship (2011), Materials Research Society graduate student award (2013), Chinese Government Award for outstanding students abroad (2014) and Beckman Institute Postdoctoral Fellowship (2015).