

Mechanical and Aerospace Engineering

# Distinguished Scholar Lecture

F E A T U R I N G



**Prof. John Rogers**

*Lee J. Flory-Founder Chair in Engineering  
University of Illinois Urbana*

*Bio-Integrated Electronics: From Brain Monitors to  
Epidermal Human Machine Interfaces*  
SCOB 252 • Friday, October 28, 2011 • 2:00 PM

#### **ABSTRACT**

Biology is curved, soft and elastic; silicon wafers are not. Semiconductor technologies that can bridge this gap in form and mechanics will create new opportunities in devices that adopt biologically inspired designs or require intimate integration with the human body. This talk describes the development of ideas for electronics that offer the performance of state-of-the-art, wafer-based systems but with the mechanical properties of a rubber band. We explain the underlying materials science and mechanics of these approaches, and illustrate their use in bio-integrated, 'tissue-like' electronics with unique capabilities for mapping cardiac electrophysiology, in both endocardial and epicardial modes, for performing electrocorticography and for skin-based physiological status monitoring. Demonstrations in live animal models illustrate the functionality offered by these technologies, and suggest several clinically relevant applications.

#### **BIOSKETCH**

Professor John A. Rogers obtained BA and BS degrees in chemistry and in physics from the University of Texas, Austin, in 1989. From MIT, he received SM degrees in physics and in chemistry in 1992 and the PhD degree in physical chemistry in 1995. From 1995 to 1997, Rogers was a Junior Fellow in the Harvard University Society of Fellows. He joined Bell Laboratories as a Member of Technical Staff in the Condensed Matter Physics Research Department in 1997, and served as Director of this department from the end of 2000 to 2002. He is now the Lee J. Flory-Founder Chair in Engineering at University of Illinois at Urbana/Champaign with a primary appointment in the Department of Materials Science and Engineering. Rogers' research includes fundamental and applied aspects of materials and patterning techniques for unusual electronic and photonic devices, with an emphasis on bio-integrated and bio-inspired systems. He has published more than 300 papers and is inventor on more than 80 patents, more than 50 of which are licensed or in active use.

Reception to follow in Portico of ISTB 1