

NINTH EDITION

# BAGWELL LECTURE

2017

Tue May 2, 11<sup>am</sup>–12<sup>noon</sup> → Burton Morgan 121

*Lecture Series held in fond memory of Philip F. Bagwell, former Professor in Electrical and Computer Engineering, to celebrate his spirit of deep thinking across disciplines.*

PREVIOUS SPEAKERS

Federico Capasso > Wilfried Haensch > Zhores Alferov  
Eugene Fitzgerald > Steve Hillenius > Jeff Hawkins  
Albert Overhauser > Herb Kroemer

# JOHN ROGERS

Northwestern University



**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. Rogers was a Junior Fellow in the Harvard University Society of Fellows and subsequently worked at Bell Laboratories, first as a Member of Technical Staff and later as Director of the Condensed Matter Physics Research Department. He then spent 13 years on the faculty at the University of Illinois at Urbana-Champaign, most recently as the Swanlund Chair Professor, in cross-disciplinary multi-departmental appointments, and served as Director of the Seitz Materials Research Laboratory. In 2016, he joined Northwestern

University as the Louis Simpson and Kimberly Querrey Professor of Materials Science and Engineering, Biomedical Engineering, Mechanical Engineering, Electrical Engineering and Computer Science, Chemistry and Medicine, where he is also the founding Director of the newly endowed Center on Bio-Integrated Electronics.

**Rogers' research** includes fundamental and applied aspects of nano/molecular scale fabrication as well as 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 550 papers, and is an inventor on over 100 patents and patent applications, more than 70 of which are licensed or in active use by large companies

and startups that he has co-founded. His research has been recognized with many awards including the MRS Mid-Career Researcher Award, the Lemelson-MIT Prize, and a MacArthur Fellowship. Rogers is a member of the National Academy of Engineering, the National Academy of Sciences, and the American Academy of Arts and Sciences; he is a Fellow of the Institute for Electrical and Electronics Engineers, the American Physical Society, the Materials Research Society, the American Association for the Advancement of Science, and the National Academy of Inventors. He received an Honoris Causa Doctorate from the École Polytechnique Fédérale de Lausanne and holds Honorary Professorships at Fudan University and Zhejiang University.

## SOFT, BIOCOMPATIBLE OPTOELECTRONIC INTERFACES TO THE BRAIN

**ADVANCED OPTOELECTRONIC SYSTEMS** capable of intimate integration into the depth and/or onto the surface of the brain have the potential to accelerate progress in neuroscience research and to establish new therapies in clinical medicine. Specifically, capabilities for injecting electronics, light sources, photodetectors, multiplexed sensors, programmable microfluidic networks and other components into precise locations of the deep brain and for softly laminating them onto targeted regions of the cortical surface will open up unique and important opportunities in stimulation, inhibition and real-time monitoring of neural circuits. In this talk, we will describe foundational concepts in physics and materials science for these types of technologies, in 1D, 2D and 3D architectures. Examples in system level demonstrations include experiments on freely moving animals with 'cellular-scale', injectable optofluidic neural probes for optogenetics research and with bioresorbable, implantable intracranial sensors for treatment of traumatic brain injury.



EVENT CO-ORGANIZED BY  
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Purdue University Discovery Park  
Department of Electrical and Computer Engineering

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