

# IMS Seminar

Friday, February 9, 2024

1:00 PM, Science 1 - Room G01

*\*Snacks, coffee, and tea will be served beginning at 12:30 p.m.*



**Dr. John A. Rogers**

Simpson-Querrey Professor

Materials Science and Engineering

Biomedical Engineering and Medicine

Northwestern University

(Hosted by Drs. Xueju Wang and Yi Zhang)

## Materials for Transient Electronics

**Abstract:** A remarkable feature of modern integrated circuit technology is its ability to operate in a stable fashion, almost indefinitely, without physical or chemical change. Recently developed classes of electronic materials create an opportunity to engineer the opposite outcome, in the form of ‘transient’ devices that dissolve, disintegrate, degrade or otherwise physically disappear at triggered times or with controlled rates. Water-soluble classes of transient electronic devices serve as the foundations for applications in zero-impact environmental monitors, ‘green’ consumer electronic gadgetry and bio-resorbable medical implants. This talk describes the foundational concepts in materials science, electrical engineering and assembly processes for bio/ecoresorbable electronics in a variety of formats and with a range of functions. Wireless stimulators that accelerate neuroregeneration of injured peripheral nerves and pacemakers that minimize risks after cardiac surgeries represent some recent system level examples.

**Biography:** 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 1997 and then served as Director of the Condensed Matter Physics Research Department from the end of 2000 to 2002. He then spent thirteen years on the faculty at University of Illinois, most recently as the Swanlund Chair Professor and Director of the Seitz Materials Research Laboratory. In the Fall of 2016, he moved to Northwestern University where he is Director of the Querrey-Simpson Institute for Bioelectronics. He has coauthored nearly 900 papers and he is co-inventor on more than 100 patents, more than 70 of which are licensed to large companies or to startups that have emerged from his labs. His research has been recognized by many awards, including a MacArthur Fellowship (2009), the Lemelson-MIT Prize (2011), the Smithsonian Award for American Ingenuity in the Physical Sciences (2013), the MRS Medal from the Materials Research Society (2018), the Benjamin Franklin Medal from the Franklin Institute (2019), a Guggenheim Fellowship (2021) and the IEEE Biomedical Engineering Award (2024). He is a member of the National Academy of Engineering, the National Academy of Sciences, the National Academy of Medicine and the American Academy of Arts and Sciences.