

Etter Memorial Lecture

9:45 a.m. February 26, 2015 • 331 Smith Hall

John Rogers

Professor

Departments of Chemistry & Materials Science and Engineering
University of Illinois Urbana-Champaign

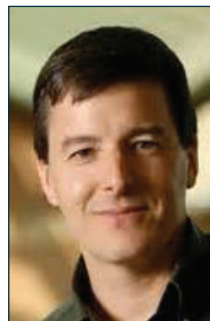
Biodegradable Electronics

Abstract

A remarkable feature of the modern integrated circuit is its ability to operate in a stable fashion, with almost perfect reliability. Recently developed classes of electronic materials create an opportunity to engineer the opposite outcome, in the form of devices that dissolve completely in water, with harmless end products. The enabled applications range from green consumer electronics to bio-resorbable medical implants—none of which would be possible with technologies that exist today. This talk summarizes recent work on this physically transient type of electronics, from basic advances in materials chemistry, to fundamental studies of dissolution reactions, to engineering development of complete sets of device components, sensors and integrated systems. Biodegradable nerve stimulators, intracranial monitors and pacemakers provide some recent demonstrations of devices that address unmet clinical needs.

<http://www.matse.illinois.edu/faculty/Rogers.html>

Professor John A. Rogers obtained bachelor degrees in chemistry and physics from the University of Texas, Austin, in 1989. From the Massachusetts Institute of Technology, he received master degrees in physics and in chemistry in 1992, and a doctorate 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 currently Swanlund Chair Professor at University of Illinois at Urbana-Champaign, with primary appointments in the departments of Chemistry and of Materials Science and Engineering, and joint appointments in several other departments. He is director of the Seitz Materials Research Laboratory.



Rogers' research includes fundamental and applied aspects of materials for unusual electronic and photonic devices, with an emphasis on bio-integrated and bio-inspired systems. He has published more than 450 papers and is inventor on more than 80 patents, more than 50 of which are licensed or in active use. Rogers is a Fellow of the IEEE, APS, MRS and AAAS, and he is a member of the National Academy of Engineering and the American Academy of Arts and Sciences. His research has been recognized with many awards, including a MacArthur Fellowship, the Lemelson-MIT Prize, the ACS Baekeland Award, the MRS Mid-Career Researcher Award, the ASME Robert Henry Thurston Award and the Smithsonian Award for Ingenuity in the Physical Sciences. He delivered the Kavli Lecture at the spring 2014 American Chemical Society Meeting.

Margaret C. Etter Memorial Lecture in Materials Chemistry

Margaret "Peggy" Cairns Etter was born on September 12, 1943. She died on June 10, 1992, from cancer. In 1974, she received her doctorate in chemistry from the University of Minnesota under the direction of Jack Gougoutas. She taught organic chemistry at Augsburg College in 1975-76, and worked at the 3M Company from 1976 to 1983. She returned to the University of Minnesota as a post-doctoral fellow with Robert Bryant in 1984 and, within a year, had secured an independent academic appointment. Peggy rose rapidly through the ranks and, in 1990, was promoted to full professor.

Peggy's outstanding characteristics as a scientist were her infectious enthusiasm, uncompromising scientific standards, and creativity. Her research group made major contributions in the applications of solid-state nuclear magnetic resonance spectroscopy, the design and properties of organic non-linear optical materials, and most significantly, in the understanding and utilization of hydrogen-bonding interactions in crystals. This was reflected in nearly 80 research papers and in several landmark review articles in prestigious journals.

Outside recognition in the form of fellowships from the Sloan and Bush Foundations and an Iota Sigma Pi Award for Excellence in Chemistry represent incomplete reflections of the impact of this work. One of her extramural "side projects" was to found a company called "Rochelle Crystal Corporation," for which Peggy was named St. Paul Businessperson of the Year in 1986.

Host: Professor Andreas Stein
Refreshments will be served prior to the seminar.