

Biodegradable Electronics



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Urbana, IL**

Date : Wednesday, September 9, 2015

Time : 6:00 pm – 7:00pm

Location : Guyon Auditorium

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.

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 currently Swanlund Chair Professor at University of Illinois at Urbana/Champaign, with a primary appointment in the Department of Materials Science and Engineering, and joint appointments in several other departments, including Bioengineering. He is Director of the Seitz Materials Research Laboratory.

Rogers' has published more than 500 papers, and is inventor on over 80 patents, more than 50 of which are licensed or in active use to various start-ups and large companies. Rogers is a Fellow of the IEEE, APS, MRS and the AAAS, and he is a member of the National Academy of Sciences, the National Academy of Engineering, the National Academy of Inventors and the American Academy of Arts and Sciences. His research has been recognized with many awards, including a MacArthur Fellowship in 2009, the Lemelson-MIT Prize in 2011, the MRS Mid-Career Researcher Award and the Robert Henry Thurston Award (American Society of Mechanical Engineers) in 2013, the 2013 Smithsonian Award for Ingenuity in the Physical Sciences and the 2014 Eringen Medal of the Society for Engineering Science.