

Printing Techniques for Macroelectronics

John A. Rogers, University of Illinois, Urbana, Illinois, USA

Abstract

Solution processable conductors, dielectrics and semiconductors represent enabling materials for electronic circuits that can be fabricated on plastic sheets by continuous, high speed printing techniques. It is generally believed that these types of systems, which can cover large areas, will be important for new applications in consumer electronics. This talk describes the operational aspects of flexible transistors and circuits that use printable semiconductors based on silicon, gallium arsenide, indium phosphide, carbon nanotubes and organic polymers. It summarizes the soft lithographic techniques used to fabricate these systems, and demonstrates their use for patterning with resolution at the scale of an individual macromolecule (1-2 nm).

Author Biography

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 served as a research Director from 2000-2002. He is currently Founder Professor of Engineering at University of Illinois at Urbana/Champaign, where he pursues his research interests in unconventional methods for micro/nanofabrication, plastic and molecular electronics and unusual photonic systems.