

Abstract Submitted  
for the MAR06 Meeting of  
The American Physical Society

**Large Area Aligned Arrays of SWNTs for High Performance Thin Film Transistors.** COSKUN KOCABAS, University of Illinois Urbana Champaign Department of Physics, SEONG JUN KANG, JOHN ROGERS, University of Illinois Urbana Champaign Materials Science and Engineering — This talk will emphasize a convenient method for generating large scale, horizontally aligned arrays of pristine, single walled carbon nanotubes (SWNTs). The approach uses guided growth, by chemical vapor deposition (CVD), of SWNTs on Y-cut single crystal quartz substrates. Studies of the growth reveal important relationships between the density and alignment of these tubes, the CVD conditions and the morphology of the quartz. Electrodes and dielectrics patterned on top of these arrays yield thin film transistors (TFTs) that use the SWNTs as effective thin film semiconductors. Channel length scaling of device mobility, on current and off current provide insights into the transport characteristics. Combining the aligned arrays with random networks, which are grown simultaneously through the use of patterned catalysts, yields ‘all-tube’ based devices. The ability to build high performance devices of this type suggests significant promise for large scale aligned arrays of SWNT in electronics, sensors and other applications.

Coskun Kocabas  
University of Illinois Urbana Champaign Department of Physics

Date submitted: 04 Jan 2006

Electronic form version 1.4