

Abstract Submitted  
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**Physics of aligned arrays of single-walled NTs: From transistor to diode applications** SLAVA V. ROTKIN, Department of Physics and Center for Advanced Materials and Nanotechnologies, Lehigh University, JOHN A. ROGERS, Beckman Institute and Frederick Seitz Materials Research Laboratory, University of Illinois at Urbana-Champaign — NTs have been originally proposed as a 1D high mobility semiconductor material for field-effect transistors (FET). This format is though appeared to be less practical due to low values of the currents through a single NT channel. On contrary, NT massive parallel arrays have already found implementation in flexible and RF electronics. Can we think of NT arrays being another semiconductor thin film materials? Where does the conventional knowledge apply for NT parallel array devices? This talk discusses specialized aspects of physics of electronic and optoelectronic device prototypes and presents recent results for NT FETs and LEDs (light-emitting diode) in parallel array geometries. Cross-talk between individual NTs in the array allows to beat the statistical “noise” in the device properties which appears due to randomized NT distribution in the array. Although, taking this into account, device-level characteristics should be used with a care to extract a single NT physical parameters.

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