DREXEL UNIVERSITY
Materials Science and Engineering
College of Engineering

Department of Materials Science and Engineering,

PhD Candidacy Exam

May 28, 2015 at 9:30AM
AEL 162 (MEM Seminar Room)

Carbon Nanotubes for Field Effect Transistors

Name: Amanda Huon
Advisor: Dr. Steven May

Abstract

Today electronic devices play an increasingly important role in our society and the need for smaller, faster, more functional gadgets requires one thing: better transistors. Based on Moore's Law, silicon technology has been thriving for the past 50 years, with the number of transistors doubling by a factor of two every two years. The current silicon transistor size processed by Intel today is 14 nm. However, industry and researchers have run into problems and delays as they scale the transistor gate length into the nanometer regime. Due to the physical limitations in scaling the gate length for silicon, a solution is to look at a new material technology. Carbon nanotubes, because of their unique one-dimension body and excellent electronic properties, have been explored for applications in electronic devices, specifically as a candidate material for transistor channels.

In this talk, I will discuss the material properties of a carbon nanotube and give an overview of what makes the ideal materials for high performance transistors. I will then discuss the benefits of nanotubes in transistors and give a literature review of research of the fabrication and characterization of nanotube transistors. Finally, challenges and current breakthroughs in carbon nanotube transistors will be discussed.