

319b Synthesis & Mechanics of Nanotubes and Nanowires

Rodney Ruoff

I will discuss: (i) Synthesis of B and nanoribbons, nanotubes, and nanowires and synthesis of CaB₆ nanowires (ii) Measurements of the mechanics of carbon nanotubes and boron nanowires (a) by tensile loading and also (b) by mechanical resonance excited by mechanical or electrical means. (ii) I will also briefly present a new theory (developed with Nicola Pugno, Politecnico di Torino) for fracture of nanoscale structures: Quantized Fracture Mechanics.

We gratefully acknowledge the grant support from the Office of Naval Research "Mechanics of Nanostructures" grant under award No. N000140210870, the NASA University Research, Engineering and Technology Institute on Bio Inspired Materials (BIMat) under award No. NCC-1-02037, and the NSF grants NIRT: Electrical and Mechanical Properties of Boron and Metal and Nanoscale Devices Built from them (NSF #0210120) and NIRT: Synthesis, Characterization and Modeling of Aligned Nanotube Arrays for Nanoscale Devices and Composites (NSF #0304506).