Seminar

Department of Physics

Low-Dimensional Properties of Atomically-Thin Materials and Systems

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Abstract

Atomically-thin materials represent the thinnest possible components of future device applications with extreme reduction in size scales. While tremendous progress has recently been made in understanding the large-scale properties of atomically-thin materials, the low-dimensional aspects, although critical to the smallest device sizes, have received comparatively much less attention. Within this important field of atomically-thin materials, I will discuss our recent experimental investigations of the synthesis, local mechanical and electrical properties determined through various scanning probe microscopies, and transport characteristics of these low-dimensional systems. These experiments on atomically-thin materials focus on their edges, ordered low-dimensional phases contained within them, integration with lower-dimensional materials (such as 1D nanotubes), and the electrical transport behavior at extremely confined scales -- work which probes the ultimate limits of device-size scaling.

Some of our related publications

[1] *ACS Nano*, 5, 6403–6409 (**2011**)
[2] *Physical Review B*, 87, 035417 (**2013**)
[3] *Applied Physics Letters*, 105, 243109 (**2014**)
[4] *Advanced Materials*, DOI: 10.1002/adma.201404060 (**2014**)

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