

Abstract Submitted  
for the MAR16 Meeting of  
The American Physical Society

**Towards Lego Snapping; Integration of Carbon Nanotubes and Few-Layer Graphene** MOHSEN NASSERI, MATHIAS BOLAND, M. JAVAD FARROKHI, DOUGLAS STRACHAN, University of Kentucky — Integration of semiconducting, conducting, and insulating nanomaterials into precisely aligned complicated systems is one of the main challenges to the ultimate size scaling of electronic devices, which is a key goal in nanoscience and nanotechnology. This integration could be made more effective through controlled alignment of the crystallographic lattices of the nanoscale components. Of the vast number of materials of atomically-thin materials, two of the sp<sup>2</sup> bonded carbon structures, graphene and carbon nanotubes, are ideal candidates for this type of application since they are built from the same backbone carbon lattice. Here we report carbon nanotube and graphene hybrid nanostructures fabricated through their catalytic synthesis and etching. The growth formations we have investigated through various high-resolution microscopy techniques provide evidence of lego-snapped interfaces between nanotubes and graphene into device-relevant orientations. We will finish with a discussion of the various size and energy regimes relevant to these lego-snapped interfaces and their implications on developing these integrated formations.

Mohsen Nasser  
University of Kentucky

Date submitted: 06 Nov 2015

Electronic form version 1.4