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Carbon Nanotube-Graphene Nanoscroll Hybrid Structures OLEG

MARTYNOV, UC: Riverside, SINCHUL YEOM, Caltech, MARC BOCKRATH, UC: Riverside — Graphene nanoscrolls (GNS) are a spiral one-dimensional tubular form of graphitic carbon [1]. Recently a number of methods have been devised to produce GNS; however, they suffer from low yield and poor controllability. Consequently, GNS provide a relatively unexplored system with some theoretically promising and unique properties [2][3][4]. We will discuss our progress towards GNS synthesis using a wet process modeled after Xie et al [5], producing a GNS from single or multilayer graphene on an Si/SiO₂ substrate. We propose a novel method to produce a nested multiwalled carbon nanotube (MWCNT)-nanoscroll structure using aligned MWCNT transfer onto exfoliated graphene. Latest progress and measurements on these MWCNT-nanoscroll hybrids will be presented. [1] S. Braga et al., Nano Lett., 4 (5), pp 881-884 (2004). [2] V. Coluci et al., Phys. Rev. B 75, 125404 (2007). [3] X. Shi et al., Appl. Phys. Lett. 95, 163113 (2009). [4] M. Fogler et al., Phys. Rev. B 81, 161408(R) (2010). [5] X. Xie et al., Nano Lett. , 9 (7), pp 2565-2570 (2009).

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