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Carbon nanotube- MoS2 p-n junction: Fabrication and transport properties UDAI BHANU, MUAHMMAD ISLAM, SAIFUL KHONDAKER, Department of Physics, Nanoscience Technology Center, University of Central Florida — Integrating two different nanoscale semicondcutors of opposite carrier types are of great interest for many electronic and optical applications. Few layers molybdenum disulfide (MoS_2) is an n-type semiconductor while semiconductoing single walled carbon nanotubes (SWNT) show p-type behavior. In this work, we demonstrate a simple technique for integrating these two semiconductors for fabricating a p-n junction. Few layers MoS_2 device were mechanically exfoliated from a single crystal of MoS_2 and making electrical contact via electron beam lithography. Another pair of electrodes, which are orthogonal to MoS_2 device, is deposited and semiconducting reach SWNT(s-SWNT) solution was dielectrophoretically assembled between the second pair of electrodes. The s-SWNT goes over the MoS_2 and fabricates two p-n junctions. We will discuss the electronic transport properties of the fabricated devices.

Udai Bhanu
Department of Physics, Nanoscience Technology Center,
University of Central Florida

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