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Graphene under one-dimensional periodic potentials using DNA-assembled parallel nanotubes as a periodic gate array YONG WU, Univ of California - Riverside, SI-PING HAN, WILLIAM GODDARD, California Institute of Technology, MARC BOCKRATH, Univ of California - Riverside — Graphene under an applied one-dimensional (1D) periodic potential is predicted to show many interesting and unique phenomena such as electron supercollimation and additional Dirac points [1], and some progress has been made in observing graphene in this regime [2]. Here, we use parallel nanotubes assembled using DNA linkers [3] as a back gate to apply periodic or quasi-periodic 1D potentials to graphene layers. The pitch of the nanotube array can be controlled by the linker length which we can vary from 8nm-20nm. We can independently control the periodic potentials using the nanotube array and the carrier density using a top gate to study the transport properties of the system. Our latest results will be discussed.

[1] Anisotropic behaviours of massless Diracfermions in graphene under periodicpotentials, Nature Physics, C-H Park, Steven Louie
[2] Tunable Superlattice in Graphene To Control the Number of Dirac Points, Mandar M. Deshmukh
[3] DNA-Linker-Induced Surface Assembly of Ultra Dense Parallel Single Walled Carbon Nanotube Arrays, Nanoletter, Si-ping Han, William Goddard

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