

Topologically protected electronic transport in graphene-boron nitride heterostructures

D. Abergel¹

¹Nordita, KTH Royal Institute of Technology and Stockholm University, Roslagstullsbacken 23, Stockholm 10691, Sweden

Graphene nanoribbons have been suggested for use as nanoscale conducting wires which could connect devices in an integrated circuit. Implementing this would be highly advantageous for fabrication of such circuits. However, lattice scale disorder was shown to be prohibitively detrimental to the transport properties of such nanoribbons. In this talk, we show that topological protection generated by lateral heterostructures of graphene with hexagonal boron nitride can circumvent this difficulty, and the transport through such heterostructures is remarkably robust against all the common forms of lattice scale disorder created by contemporary fabrication techniques. This reopens the possibility of utilizing graphene ribbons as chip-scale conducting wires.

[1] D.S.L. Abergel, *arXiv preprint* 1609.01608 (2016).