Weekly Seminar

Time: 4:00pm, Sept. 18, 2013 (Wednesday)
2013 9 18 4:00
Venue: Room 607, Conference Room A , Science Building 5
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Abstract

While traditional electronic components based on silicon technology are reaching the limit of miniaturization, researchers in both academia and industry are desperately searching for alternative materials and developing novel nanoscale devices based on new mechanisms. Understanding of the electronic transport in these novel nanoscale systems is crucial for both fundamental physics exploration and future technological applications. The first part of my talk will focus on electronic transport in graphene, a monolayer of carbon atoms which has shown tremendous potential on many applications. I will mainly discuss the electron ballistic transport phenomenon, proximity induced supercurrent and geometry-dependent minimum conductivity in substrate supported graphene, together with the controllable periodic ripples on suspended graphene membrane. In the ballistic transport regime, electrons propagate in graphene without any obstacle and scattering only happens on the interface of graphene and electrodes. This phenomenon can be realized by quantum interference of multiple reflected electronic waves between normal electrodes and multiple Andreev reflections from superconducting electrodes. Our discoveries ma4(v)-d