Abstract for an Invited Paper
for the MAR09 Meeting of
The American Physical Society

Electronic Transport in Disordered Graphene Sheets and Nanoribbons

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In this talk I will present recent results of our numerical simulations of electronic transport in disordered graphene. Issues related to the scaling of the conductivity and the shot-noise Fano factor of large graphene sheets at zero and finite doping will be discussed. Our calculations are based on an efficient implementation of the recursive Green function method. I will also show how edge and bulk disorder may affect the mesoscopic conductance of graphene nanoribbons under a variety of realistic situations. We find that even for weak edge roughness, conductance steps are suppressed and a transport gap develops near the neutrality point due to strong localization. The gap inferred from our simulations is similar in magnitude to the energy gaps induced by other mechanisms, such as Coulomb blockade, many-body correlations, and lattice distortions. The effects of dephasing will also be discussed.