

Percolation theory of the minimal conductivity of graphene

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Transport in undoped graphene is related to percolating current patterns in the networks of N- and P-type regions reflecting the strong bipolar charge density fluctuations. Transmissions of the P-N junctions, though small, are vital in establishing the macroscopic conductivity. In this talk a random resistor network model of the minimal conductivity will be proposed and scaling dependencies of the conductance on the doping and disorder, the quantum magnetoresistance and the corresponding dephasing rate will be discussed.