DAY 2 (24 June): 9:00 – 9:40

Coulomb interaction, ripples, and the minimal conductivity of graphene

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I will show that the unscreened Coulomb interaction in graphene provides a positive, universal, and logarithmic correction to scaling of zero-temperature conductivity with frequency. The combined effect of the disorder due to wrinkling of the graphene sheet and the long range electron-electron interactions is a finite positive contribution to the dc conductivity. This contribution is disorder strength dependent and thus *non-universal*. The low-energy behavior of such a system is governed by the line of fixed points at which both the interaction and disorder are finite, and the density of states is exactly linear. An estimate of the typical random vector potential representing ripples in graphene brings the theoretical value of the minimal conductivity into the vicinity of $4e^2/h$, as observed in numerous experiments.