

# **THEORIEKOLLOQUIUM**

Mittwoch, den 16.11.16 um 13:15 in MC 351

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## **Weak and strong correlation in Dirac systems**

In this talk we present our results on the effect of weak to strong correlations in graphene system. For weak interactions we show that the Dirac nature of spectrum provides a chance for a collective excitation formation in the triplet channel of particle-hole excitations. We then address the question of Mott transition in massless and massive Dirac fermions. We find that the Hubbard  $U$  can dynamically generate negative mass giving rise to a massless Dirac spectrum for a range of interactions. For very strong interactions that place the system in the Mott phases, we find a novel collective state of two spinons which is facilitated by the background of condensed charge bosons.