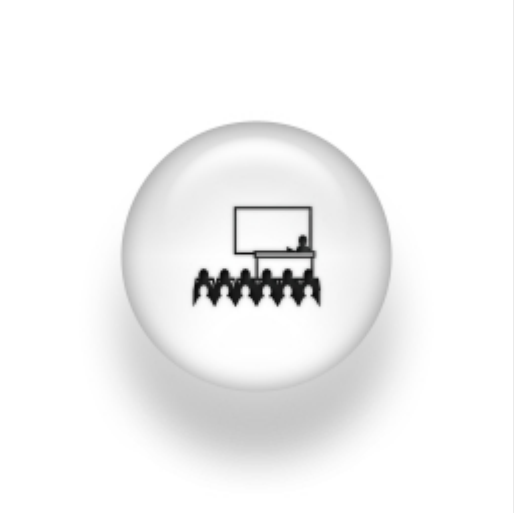
Spin transport in graphene

Wednesday, 4 May 2011. 12:00-13.00



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ABSTRACT:
In this talk I will review our recent work on two topics related to spin transport in graphene:
1) First, I will discuss some fundamental (some would say academic) issues related to the conductance quantization expected for 2D topological insulators in the context of graphene nanoribbons. In particular, I will explore the extent to which disorder and (the lack of) inversion symmetry play a role in this manifestation of the topological nature of grahene with strong spin-orbit coupling.
2) Second, I will discuss our proposal to unveil magnetism in hydrogenated graphene. The reasons why magnetic phenomena in graphene remain elusive are still unclear, but are definitely rooted in two issues: 1) the formation of individual magnetic moments, which is plagued with technical and fundamental difficulties, and 2) the underlying antiferromagnetic correlations inherent to graphene, which do not favor the observation of a collective behavior. I will present a critical analysis of the first issue and propose a way to unveil the antiferromagnetic correlations based on spin-dependent features in the conductivity of bulk graphene, chemically modified by hydrogen adatoms.