Speaker: Leonid LEVITOV (Massachusettes Institute of Technology)

Title: Chiral Stoner magnetism in Dirac bands, by Leonid Levitov (MIT)

Abstract: This talk will argue that Stoner magnetism in bands endowed with Berry curvature is profoundly influenced by the chiral interaction between Berry's orbital magnetization and spin chirality density. In graphene multilayers, moiré or non-moiré, carriers moving in the presence of a spin texture see it as a source of a pseudo-magnetic field coupled to their orbital motion through a chiral spin-dependent Aharonov-Bohm effect. The corresponding pseudo-magnetic fields take different values in different valleys and can be present even without an externally applied B field. This interaction favors chiral spin textures such as skyrmions -- the topologically protected objects with particle-like properties, stabilized in the ground state. The chiral interaction softens the threshold for Stoner instability, rendering chiral spin-ordered phases accessible under realistic conditions.

based on Zhiyu Dong and L.L.
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