

Speaker: B. Andrei BERNEVIG (Princeton University)

Interacting Topological Flat Bands

I will present a generic method to construct flat bands, a Proof that the eigenvalues of flat bands are naturally written as a difference but not necessarily a sum of atomic bands, thereby rendering them, in most cases, topological, and a catalogue of all flat band materials existent in nature

I will then add interactions to flat Bands and show that in some projected models with a rotational symmetry, the stiffness of the collective modes: cooper pair mass, goldstone stiffness etc, is related to the minimal quantum metric. These models are almost exactly solvable despite being interacting. I will make connections to twisted bilayer graphene and the interacting flat bands there