

# Nearly flat bands in graphene based moire materials

Jeil Jung

Department of Physics and Smart Cities, University of Seoul

Abstract:

The physics of twisted bilayer and multilayer graphene has gained a renewed interest after the experimental observation of flat band superconductivity at appropriate twist angles and pressure-tunable interlayer coupling. In this presentation I will introduce how the details of interlayer coupling, twist angles and gate-induced electric fields can combine to facilitate the onset of isolated and narrow bandwidth 'flat bands' in twisted multilayer-graphene systems where Coulomb interactions play a dominant role. The electronic structure modeling uses input from ab initio calculations and experimental data. Our studies indicate that the conditions for band narrowing and isolation can be expected in a variety of twisted graphene systems and they are achieved more easily when the constituent materials have a band gap, which in rhombohedrally stacked multilayers can be produced by a perpendicular electric field.