

Harvard University Department of Physics Colloquium

Monday, April 6, 2020

4:30PM ~ via Zoom

Colloquium Virtual Tea

4:00PM ~ via Zoom

Twistronics: manipulating electronic behavior in two-dimensional materials

The discovery of graphene, a single sheet of carbon atoms, ushered in an era of two-dimensional materials that make it possible to manipulate electronic behavior in novel ways. Recently, experimenters have managed to control the *stacking* of two or more layers of graphene and other 2D materials with remarkable precision. Simple theoretical models, as well as accurate electronic structure calculations predict that the electronic properties in stacked 2D layers depend sensitively on the relative orientation (the “twist angle”) between successive layers; the term “twistronics” was introduced to describe this effect. For special twist-angle values, electron localization and high density of states can be achieved, producing remarkable effects that include superconductivity at a *relative* high temperature. In this talk I will discuss the origin of the single-electron behavior from a microscopic, theoretical point of view in representative 2D materials. I will attempt to highlight what we understand well and what still remains a mystery about the behavior of electrons confined by twisted multi-layered materials.



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Join by SIP conference room system

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