

Chez Pierre

Presents ...

Friday, February 15, 2019

12:00pm Noon

MIT Room 4-331

Special Chez Pierre Seminar

Abhay Pasupathy – Columbia University

“Twisting and Stretching van der Waals Bilayers: an Atomic-Scale View”

With the magic of scotch tape, it has now become possible to create artificial layered materials with unique electronic properties. An example of this is a twisted bilayer, where two single layer sheets of a layered material can be stacked together to create a bilayer, but with a controllable twist between the layers. Such structures have new single-electron and many body properties that each of the individual layers may not exhibit. I will discuss two such materials in this talk. The first of these is twisted bilayer graphene, a material which displays interesting new electronic phases including insulating behavior, superconductivity and magnetism. I will discuss scanning tunneling microscopy measurements of this material from my laboratory where we can visualize the atomic structure and measure the excitations of this unique material. The second material I will discuss is heterostrained transition metal dichalcogenides. I will show that strain applied to one layer relative to the other can create new atomic structures termed "strain solitons". I will discuss the formation, manipulation and electronic properties of these solitons.

