



PHYSICS COLLOQUIUM: New Quantum Materials by Twisting and Stretching

Abhay Pasupathy
Department of Physics
Columbia University



About The Speaker:

Abhay Pasupathy is a Professor of Physics at Columbia University, where he has been since 2009, and is also a group leader at Brookhaven National Laboratory since 2019. His group studies low dimensional materials by scan probe microscopy and cryogenic transport. Materials of interest include layered two-dimensional samples of all types, metal insulator transition metal oxides, and unconventional superconductors.

Abstract:

The quantum mechanical electronic states of a solid are set by its chemical composition and atomic structure. The electronic states in turn determine the interesting quantum phases that the solid exhibits. Tuning quantum phases in solids is therefore typically achieved using solid-state chemistry to change composition or structure. Over the past 15 years, the class of two-dimensional materials has emerged as a new playground to realize quantum phenomena. This class of materials began with graphene, but has quickly blossomed to include two-dimensional semiconductors, insulators, topological insulators, superconductors and magnets. Individual atomic layers of these materials can now be assembled nearly at will into unique multilayer structures by the simple process of "putting things on top of other things". In this talk, I will review some of the recent developments in this field that now allow us to realize many unique electronic structures using basic building blocks that are individual atomic sheets, and the new quantum phases that emerge in these structures. I will also discuss the many exciting but unrealized possibilities for the future in this materials class.

Date:

10/22/2021

Time:

10:30 AM-11:50 AM

Link:

Please contact
snsgradstaff@ucmerced.
edu for the Zoom
information.

For more information, contact : Mehmet Baykara
mehmet.baykara@ucmerced.edu