Stacking van der Waals atomic layers: quest for new quantum materials

Philip Kim
Professor of Physics and Applies Physics
Harvard University

Abstract

Modern electronics heavily rely on the technology to confine electrons in the interface layers of semiconductors. In recent years, scientists discovered that various atomically thin van der Waals (vdW) layered materials can be isolated. In these atomically thin materials, quantum physics allows electrons to move only in an effective 2-dimensional (2D) space. By stacking these 2D quantum materials, one can also create atomic-scale heterostructures with a wide variety of electronic and optical properties. We demonstrate the enhanced electronic and optoelectronic performances in the vdW heterostructures, suggesting that these a few atom thick interfaces may provide a fundamental platform to realize novel physical phenomena. In this talk, we will discuss several research efforts to realize unusual quasiparticle pairing mesoscopic devices based on stacked vdW interfaces between 2-dimensional materials.

Philip Kim's Bio: https://scholar.harvard.edu/philipkim/bio