INVITED

Electron Transport in van der Waals Heterostructures

Philip Kim

Department of Physics, Columbia University

The recent advent of atomically thin 2-dimensional materials such as graphene, hexa boronitride, layered transition metal chalcogenide and many strongly correlated materials, has provided a new opportunity of studying novel quantum phenomena in low dimensional systems and their heterostructures utilizing them for novel electronic devices. With a strong built-in anisotropy in their components, vdW materials often show a quasi-low dimensionality leading to strongly correlated electron behaviors. Moreover, combination of different layered constituents may produce heterogeneous and functional materials. In this lecture, we will discuss to develop the method of transferring two-dimensional atomic layers of van der Waals solids to build functional heterostacks. We will discuss novel electron transport phenomena can occur across the heterointerfaces of designed quantum stacks to realize exotic charge transport phenomena in atomically controlled quantum heterostructures.