

Materials in 2-Dimension and Beyond

By Prof. Philip Kim

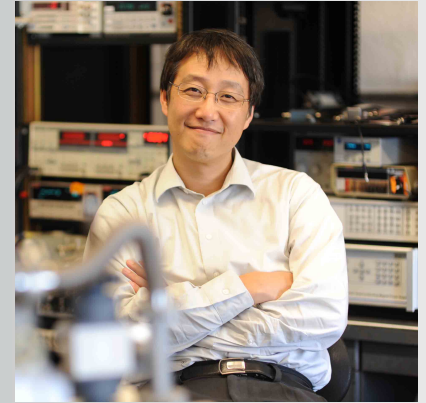
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ABSTRACT

The recent advent of atomically thin 2-dimensional materials such as graphene, hexa boronitride, layered transition metal chalcogenide and many strongly correlated materials, where weak van der Waals (vdW) force holds the layers together, has provide a new opportunity of studying novel quantum phenomena in low dimensional systems. The vdW layered materials consist of covalently bonded atomic layers entities that weakly interact with other constituents. With a strong built-in anisotropy in their components, vdW materials often show a quasi-low dimensionality leading to strongly correlated electron behaviors. These materials in 2-d limits also allow us to apply new experimental techniques such as electrolyte gating, scanning potentiometry, and electromechanical magnetometry. 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.

BIOGRAPHY

Prof. Philip Kim received his B.S. in physics at Seoul National University in 1990 and received his Ph. D. in Applied Physics from Harvard University in 1999. He was a Miller Postdoctoral Fellow in Physics from the University of California--Berkeley during 1999--2001. In 2002, he joined in Department of Physics at Columbia University as a faculty member, where he is now Professor of Physics. His research area is experimental condensed matter physics with an emphasis on physical properties and applications of nanoscale low-dimensional materials. The focus of Prof. Kim's group research is the mesoscopic investigation of transport phenomena, particularly, electric, thermal, and thermoelectrical properties of low dimensional nanoscale materials. Prof. Kim published more than 120 papers in professional journals, including Nature, Science, and Physical Review Letters. He has received numerous honors and award including the Oliver E. Buckley Prize (2014), Loeb Lectureship, Harvard (2012); Dresden Barkhausen Award (2011); Yunker Lectureship, Oregon State University, (2011); Chapman Lectureship, Rice University, (2009); IBM Faculty Award (2009); Ho-Am Science Prize (2008); American Physical Society Fellow (2007); Columbia University Distinguished Faculty Award (2007); Recipient Scientific American 50 (2006); and the National Science Foundation Faculty Career Award (2004).



EVENT DETAILS

DATE:

Wednesday,
February 5, 2014

TIME:

11:00 AM

LOCATION:

Babbio 122
Stevens Institute of Technology

ATTENDANCE:

Public

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