Tunable Phenomena in Graphene: From Quantum Critical Dirac Fluid to Engineered Mott Insulator

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Venue: MAS Executive Classroom 1 (SPMS-MAS-03-06)
Host: Asst Prof Gao Weibo

Abstract
The electronic structure of graphene depends sensitively on the layer number and stacking. Monolayer graphene is famously known to have massless Dirac electrons, while ABC stacked trilayer can have a remarkably large electron mass at low energy. In this seminar I will discuss unique phenomena that emerge in these two very different systems. Using an on-chip terahertz spectroscopy, we directly probe the quantum critical electrodynamics of massless Dirac fluid in boron nitride-encapsulated monolayer graphene. In ABC trilayer graphene, we exploit the Moire superlattice between graphene and boron nitride to realize strongly correlated behavior such as a tunable Mott insulator.

Short Biography
Feng Wang received a B.A. from Fudan University, Shanghai, in 1999 and a Ph.D. from Columbia University in 2004. From 2005-2007, he has been a Miller Fellow with Miller Institute for Basic Science at Berkeley. He joined the physics faculty in Berkeley in fall, 2007 and became a full professor in 2016. He has published more than 10 papers in Nature, Science and has won many awards such as 2010: DOE Early Career Award, 2010: Hellman Family Faculty Award, 2010: Packard Fellow, 2011: The Presidential Early Career Award for Scientists and Engineers, 2013: Bakar Fellow. He has become a fellow of APS in 2016.