

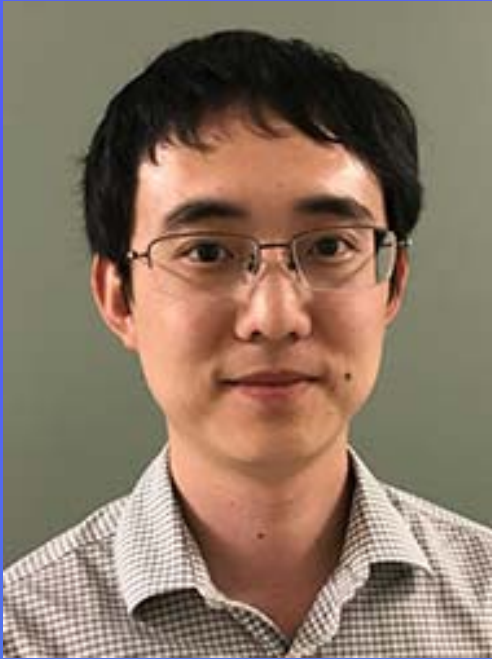
学术报告

报告题目: Probing Topological Valley Physics in Bilayer Graphene

报告人: 巨龙 (MIT助理教授)

时 间 : 2019年1月9日 (周三) 上午10:00-11:30

地 点 : 清华-富士康纳米科技研究中心四楼406会议室



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Abstract: Graphene has been a model solid state system where novel quantum phenomena emerge from the interplay between symmetry, band topology and reduced dimensionality. In particular, AB-stacked bilayer graphene has a unique bandstructure with an electrically tunable bandgap and a valley-dependent Berry phase. These features result in unusual electrical and optical properties, for which optical spectroscopy/microscopy are powerful characterization tools.

In this talk, I will first show our experimental demonstration of the topological valley transport at AB/BA stacking domain walls in bilayer graphene. By combining near field infrared nanoscopy with low temperature electron transport, we showed that a 1D conducting channel exists at this structural domain wall, which can be attributed to the quantum valley Hall edge states in gapped bilayer graphene. Moreover, I will present our recent efforts on probing the excitons in bandgap-tuned bilayer graphene through advanced optical spectroscopy tools. I will show that due to the electron pseudospin and Berry curvature effects, these excitons obey distinct valley-dependent optical selection rules from that in conventional semiconductors and feature a large valley g-factor of 20 in magnetic field.