北京大学量子材料科学中心

International Center for Quantum Materials, PKU

Seminar

Exploring charge dynamics and many-body interactions in graphene by optical spectroscopy

Zhiqiang Li

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Time: 4:00pm, Dec. 3, 2012 (Monday)

时间：2012年12月3日 （周一）下午4:00

Venue: Room 607, Conference Room A , Science Building 5

地点：理科五号楼607会议室

Abstract

The novel physics of graphene and its unique mechanical and chemical properties have led to unprecedented interest in this material. In this talk, I will present our recent studies of charge dynamics and many-body effects in graphene and few-layer graphene using optical and magneto-optical spectroscopy. Plasmons -- collective oscillations of charge carriers -- are important in understanding the many body physics of graphene. Our infrared study in magnetic field up to 18T showed that the plasmon resonance in graphene splits into edge and bulk plasmon modes in magnetic fields. The lifetime of the edge magneto-plasmon increases significantly with magnetic field, which provides new insights in the edge physics of graphene. Furthermore, we demonstrated that the coupling of graphene sheets leads to entirely new properties in few-layer graphene, including new effects in band structure, band gap and electron phonon interactions. I will also give an introduction to the research facilities at the National High Magnetic Field Lab and how to become a user of the lab.

References:

Yan et al, Nano Lett. 12, 3766 (2012).

Li et al, Phys. Rev. Lett. 108, 156801 (2012).

Lui et al, Nature Physics 7, 944 (2011).

About the Speaker

Zhiqiang Li is a scholar/scientist at the National High Magnetic Field Lab (NHMFL) in Florida, USA. He got his BS degree in physics department, Peking University in 2002, and PhD in University of California, San Diego in 2008. He then did a postdoc at physics department, Columbia University until 2011. Currently, Dr. Li is in charge of the infrared program at NHMFL. His group is exploring the physics of graphene, two-dimensional atomic crystals and other systems using optical and magneto-optical spectroscopy.

Dr. Li's group website: http://fs.magnet.fsu.edu/%7Ezli/index.html