量子材料科学中心
International Center for Quantum Materials
Seminar

Some novel effects in two-dimensional layered materials

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- **Time: 4:00pm, June 17, 2015 (Wednesday)**
- **时间：2015年 6月17日（周三）下午4:00**
- **Venue: Room W563, Physics Building, Peking University**
- **地点：北京大学物理楼 西563**

Abstract

In this talk, I will introduce two pieces of work in two-dimensional layered materials done in our group. In the first work, we report an unusual valley polarization (VP) up to 70% for B exciton in monolayer $MoSe_2$, while that for A exciton is less than 3%, and a small but finite negative VP for A^- trion. These results reveal several new intra- and inter-valley scattering processes which significantly affect valley polarization. Another one is the observation of an ultralow-frequency collective compression mode (CCM) in atomically thin black phosphorus (BP). This novel CCM indicates an unusually strong interlayer coupling in BP, which is quantitatively supported by a phonon frequency analysis and first-principles calculations. The CCM and another branch of low-frequency Raman modes shift sensitively with changing number of layers, allowing an accurate determination of the thickness up to tens of atomic layers.

References: arXiv:1503.08631; arXiv:1503.06577

About the speaker

Zhang Qingming graduated from Nanjing University in 1992 as a bachelor and got his Ph. D in condensed matter physics in Nanjing University in 1997. He worked as a professor from 2004 to 2008 at department of Physics, Nanjing University and moved to Renmin University in 2008. He worked at Walther-Meissner Institute at Garching, Germany from 2000 to 2002, supported by Alexander von Humboldt foundation. His research interests include: 1) Raman scattering in unconventional superconductors and correlated electron systems; 2) Spin frustrated systems; 3) Excitations in low dimensional materials; 4) Inelastic light scattering technique under extreme conditions.