北京大学量子材料科学中心

International Center for Quantum Materials, PKU

Weekly Seminar

Advanced scanning probe microscopy studies on the atomically thin films

Shuai-Hua Ji

Department of Physics, Tsinghua University

Time: 3:00 pm, Sept. 13, 2023 (Wednesday)

时间：2023年9月13日 （周三）下午3:00

Venue: Room w563, Physics building, Peking University

地点：北京大学物理楼，西563会议室

Abstract

Atomically thin films, which can be viewed as ideal two-dimensional physical systems, usually exhibit many unusual properties absent in the bulk counterparts. Our works mainly focus on the growth of these low-dimensional materials by molecular beam epitaxy, and in situ characterization of their electronic and transport properties by our advanced scanning probe microscopy. In this talk, I will present our recent progress on several different ultra-thin films: (1) the oscillation of electronic-band-gap size induced by crystalline symmetry change in ultrathin PbTe Films [1], (2) the BCS-BEC crossover of FeSe monolayer near the charge neutrality point [2], (3) direct visualization of electric current induced dipoles of atomic impurities in bilayer graphene by scanning tunneling potentiometry [3].

References:

[1] Kai Chang et al., Phys. Rev. Lett. 131, 016202 (2023).
[2] Haicheng Lin et al., Phys. Rev. B 107, 104517 (2023).
[3] Yauwu Liu et al., arXiv:2309.01182.

About the speaker

Shuaihua Ji is a professor of Department of Physics, Tsinghua University. He received his PhD in 2008 from Institute of Physics, Chinese Academy of Sciences. Then he worked in IBM T. J. Watson research center and Columbia University as a postdoctoral member. He joined Department of Physics of Tsinghua University in 2012. His research work mainly focuses on the exotic properties of low-dimensional quantum materials studied by advanced scanning probe microscopy.