北京大学量子材料科学中心

International Center for Quantum Materials, PKU

Seminar

Exploring spin dynamics of atomic-scale nanomagnets

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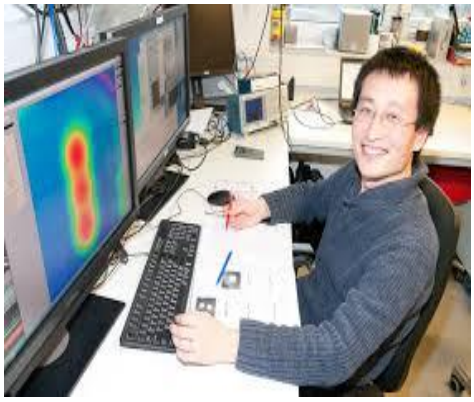

Time: 10:00am, June 30, 2016 (Thursday)

时间：2016年6月30日 （周四）上午10:00

Venue: Room W563, Physics building, Peking University

地点：北京大学物理楼，西563会议室

Abstract

Nanomagnets play an important role in the development of technologies such as spintronics and quantum information processing. Critical to such applications is the ability of completely understand and control the structure and dynamical properties of the nanomagnets. In this talk, I will report exploring single-atom or few-atom nanomagnets with low temperature and high magnetic field scanning tunneling microscopy (STM). I will first talk about three-dimensional mapping of the magnetic anisotropy of individual magnetic atoms by tracking the variations of the spin inelastic electron tunneling spectra. We constructed artificial nanomagnets by manipulating individual atoms with the STM tip and measured the spin dynamics of the nanomagnets with all electronic pump-probe technique. We found that the spin dynamics of the nanomagnets can be fully controlled by tuning the atomic exchange coupling with the magnetic STM tip. Furthermore, I will show that the atomic nanomagnets can be used as sensor to detect the magnetic state of single and multiple nearby antiferromagnets and achieve an energy resolution of ~10 micro-electrovolts.

About the speaker

Shichao Yan is now a postdoctoral research associate in University of Illinois at Urbana-Champaign, United States. He received his B.Sc. degree in Material science and engineering from Shangdong University in 2006, and Ph.D. in condensed matter physics from the Institute of Physics, Chinese Academy of Sciences in 2012. During his Ph.D., he visited Wilson Ho's group in University of California at Irvine in 2009. After graduation, he joined Max Planck Institute for the Structure and Dynamics of Matter and Max Planck Institute for Solid State Research from 2012-2015 as a postdoctoral researcher. Shichao Yan's current research is in the electronic structure of quantum materials by using low-temperature scanning tunneling microscopy. So far, he has published papers in journals including Nature Nanotechnology, Nature Communications, Nano Letters, ACS Nano etc.