北京大学量子材料科学中心

Seminar

# Nanoscale characterization of materials and devices using SPM-based spectroscopies


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**Time: 10:00am, Sep. 30, 2017 (Saturday)**

**2017 9 30 10:00**

**Venue: Room W663, Physics building, Peking University**

**663**


As the size of devices and the thickness of films have been reduced, nanoscale characterization of materials and devices has become important to understand microscopic mechanisms limiting device performance. For this purpose, various scanning probe microscope (SPM) based spectroscopic techniques have been invented and applied [1].
In this talk, demonstrate the nanoscale characterization in graphene devices, i) the importance of the edge channel using scanning gate microscopy [2] and ii) the many-body graphene physics using scanning tunneling microscopy [3], respectively. Then, introduce a newly emerged SPM-based photothermal induced resonance (PTIR) technique [4,5], which combines atomic force microscope and optical spectroscopy. discuss the materials properties of organometal trihalide perovskite photovoltaic materials and metamaterials at nanoscale measured by using PTIR [6-9]. Very recently, I succeeded to improve the sensitivity of PTIR by ~ 50 folds as applying optomechanical resonance tips to PTIR. briefly discuss the improved sensitivity down to single molecules and the new measurement scheme in thermal relaxation properties of materials. [10]



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