清华大学高等研究院

Institute for Advanced Study, Tsinghua University

物理学术报告
Physics Seminars (biweekly)

Title: **Mapping the electronic structure of each ingredient oxide layer of high-Tc cuprate superconductors**

Speaker: **Can-Li Song**

Department of Physics, Tsinghua University

Time: **4:00pm, Wednesday, Oct 28, 2015**

(3:30~4:00pm, Tea, Coffee, and Cookie)

Venue: **Conference Hall 322, Science Building, Tsinghua University**

Abstract

Understanding the mechanism of high transition temperature (Tc) superconductivity in cuprates has been hindered by the apparent complexity of their multilayered crystal structure. Using a cryogenic scanning tunneling microscopy (STM), we report on layer-by-layer probing of the electronic structures of all ingredient planes (BiO, SrO, CuO2) of cuprate superconductors prepared by argon-ion bombardment and annealing (IBA) technique (a top-down strategy). We show that the well-known pseudogap (PG) feature observed by STM might be a property of the BiO planes and thus irrelevant directly to Cooper pairing. The CuO2 planes are exclusively characterized by a small gap inside the PG. The small gap becomes invisible near Tc, which we identify as the superconducting gap. The above results constitute severe constraints on any microscopic model for high Tc superconductivity in cuprates.