



# 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:** From entanglement to quantum cryptography

**Speaker:** Xiongfeng Ma  
(*Institute for Interdisciplinary Information Sciences, Tsinghua University*)

**Time:** 4:00pm, Wednesday, September 14, 2016  
(3:30~4:00pm, Tea, Coffee, and Cookie)

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

#### Abstract

Entanglement, “the spooky action at a distance”, plays a crucial role in the foundation test of quantum mechanics. In quantum information processing, entanglement becomes an important resource for various tasks, such as teleportation, quantum computation, and cryptography. Intuitively, entanglement means a strong nonlocal correlation between distant parties, which essentially offers a secure key generation tool. Various Bell’s inequality test experiments have proved that eavesdropping (as a local hidden variable) can be fundamentally ruled out. In this talk, I shall link the basic concept of entanglement with the security of key distribution. Meanwhile, I shall also discuss some of the recent developments in the field, such as the measurement-device-independent quantum key distribution.