



復旦大學

Fudan University



**复旦大学物理系物质科学报告**

**Physics Department Colloquium**

**Ultimate precision limit and optimal probe states in quantum metrology**

**Prof. Haidong Yuan**

**Department of Mechanical and Automation Engineering  
The Chinese University of Hong Kong**

**Abstract:** The main quest in quantum metrology is to find out the highest achievable precision with given resources and design schemes that attain that precision. In this talk I will present a general framework for quantum metrology which relates the ultimate precision limit directly to the underlying dynamics. This framework provides efficient methods for computing the ultimate precision limit and optimal probe states. It also provides an analytical formula of the precision limit with arbitrary pure input states, which spares the need of optimization over equivalent Kraus operators as required in previous studies. I will further demonstrate the power of the framework by deriving a sufficient condition on when ancillary systems are not useful for improving the precision limit.

**Time: 2:00pm, Tuesday, Jun. 23, 2015**

**Location: Physics Building, Room 221B**

**(Cookies and coffee will be served from 1:30 pm)**