



**The Hong Kong Polytechnic University  
Department of Applied Mathematics**

## **Colloquium**

**On**

**Continuous Quantum Hypothesis Testing**

**by**

**Dr. Mankei Tsang  
Department of Electrical and Computer Engineering  
National University of Singapore**

### **Abstract**

I will discuss a general quantum hypothesis testing theory that enables one to test hypotheses about any aspect of a physical system, including its dynamics, based on a series of observations. For example, the hypotheses can be about the presence of a weak classical signal continuously coupled to a quantum sensor, or about competing quantum or classical models of the dynamics of a system. Two potential applications of the theory, namely, quantum detection of a classical stochastic waveform and test of harmonic-oscillator energy quantization, are discussed. This talk is based on M. Tsang, Phys. Rev. Lett. 108, 170502 (2012) and M. Tsang and R. Nair, Phys. Rev. A 86, 042115 (2012).

Bio: Dr. Mankei Tsang obtained his PhD in Electrical Engineering from Caltech in 2006. He was a postdoctoral fellow at MIT working with Prof. Seth Lloyd and Prof. Jeffrey H. Shapiro in 2008-2009, before moving to the University of New Mexico in 2010 to work with Prof. Carlton M. Caves. He won the Singapore National Research Foundation Fellowship in 2011 and joined NUS as an Assistant Professor in the same year, with joint appointments at the Department of Electrical and Computer Engineering and the Department of Physics. His research interests include quantum measurement and control theory, quantum optics, nonlinear optics, and nano-optics.

**Date : 7 January, 2013 (Monday)**

**Time : 3:30 p.m. – 4:30 p.m.**

**Venue : HJ610, The Hong Kong Polytechnic University**

**\* \* \* ALL ARE WELCOME \* \* \***