

# Joint Seminar

## Joint Statistics Seminar

co-organized with

## Center for Statistical Science

*The Hong Kong University of Science and Technology*

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### **Discerning Non-Stationary Microstructure Noise and Time-Varying Liquidity at Ultra High Frequency**

by

**Mr. Richard Yongrui Chen**  
**University of Chicago**

**Date: February 1, 2016 (Monday)**

**Time: 4:30 p.m. – 5:30 p.m.**

**Venue: Room 4047 (LSK Business Building)**

#### ***Abstract***

In this talk, we will investigate the implication of non-stationary market microstructure noise to integrated volatility estimation, provide statistical tools to test stationarity and non-stationarity in market microstructure noise, and discuss how to measure liquidity risk using high frequency financial data. In particular, we discuss the impact of non-stationary microstructure noise on TSRV (Two-Scale Realized Variance) estimator, and design three test statistics by exploiting the edge effects and asymptotic approximation. The asymptotic distributions of these test statistics are provided under both stationary and non-stationary noise assumptions respectively, and we empirically measure aggregate liquidity risks by these test statistics from 2006 to 2013. As byproducts, functional dependence and endogenous market microstructure noise are briefly discussed. Simulation studies corroborate our theoretical results. Our empirical study indicates the prevalence of non-stationary market microstructure noise in the New York Stock Exchange.

*All interested are welcome!*

*For details, please contact ISOM Department.*

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