**6th Singapore Mathematics Symposium**

**Date:** 25 September, 2015 (Friday)
**Venue:** Nanyang Technological University (SPMS LT2)
**Time:** 1pm – 5:15pm

**Schedule:**
1:00 – 1:10: Welcome by Ling San, SMS president
1:10 – 2:00: Stochastic control in optimal investment by Dai Min, NUS
2:00 – 2:50: Spectral statistics of the Spearman's rank correlation matrix by Pan Guangming, NTU
2:50 – 3:20: Tea break
3:20 – 4:10: On liars and paradoxes by Ng Keng Meng, NTU
4:10 – 5:00: Hyperbolicity and Weil-Petersson geometry on moduli spaces of canonically polarized manifolds by To Wing Keung, NUS
5:00 – 5:15: Poster Prize Presentation and Closing Remarks

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**Titles/abstract at 6th Singapore Mathematics Symposium**

**Speaker:** Professor Dai Min (Department of Mathematics, NUS)

**Title:** Stochastic control in optimal investment

**Abstract:** I will talk about two singular stochastic control problems arising from optimal investment: one with transaction costs and the other with capital gains taxes. The associated value functions are governed by variational inequality equations which give rise to two free boundaries corresponding to optimal buy and sell boundaries. The difference between the two models is emphasized.

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**Speaker:** Professor Pan Guangming (School of Physical and Mathematical Sciences, NTU)

**Title:** Spectral statistics of the Spearman's rank correlation matrix

**Abstract:** This talk is about the Spearman’s rank correlation matrix which can be regarded as a high dimensional extension of the classical non-parametric statistic Spearman’s rank correlation coefficient between two independent random variables. We establish its CLT by a two-step comparison approach. We then construct a distribution-free statistic to test complete independence for components of random vectors, which is applicable to the heavy-tailed distributions such as Cauchy distribution.

**Speaker:** Professor Ng Keng Meng (School of Physical and Mathematical Sciences, NTU)

**Title:** On liars and paradoxes

**Abstract:** Paradoxes have fascinated mathematicians throughout history, for instance, the famous Zeno's paradox have deep implications not only in the understanding of mathematics, but have philosophical consequences. In this talk we discuss how the Liar's paradox has shaped the development of mathematical logic and our understanding of the foundations of mathematics. We will provide an accessible introduction of Gödel's Incompleteness Theorems.

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**Speaker:** Professor To Wing Keung (Department of Mathematics, NUS)

**Title:** Hyperbolicity and Weil-Petersson geometry on moduli spaces of canonically polarized manifolds

**Abstract:** In this talk, I will discuss a joint work with Sai-Kee Yeung concerning the Weil-Petersson metric on the moduli space of canonically polarized manifolds. In particular, our result shows that such moduli space is Kobayashi hyperbolic.

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