Hong Kong Probability Seminar

https://sites.google.com/site/hkprobability/

Date: **October 8, 2025 (Wednesday)**
Venue: **Room 210, Run Run Shaw Building, HKU**

9:00 – 10:30am: James Mingo (Queen's University)

Infinitesimal Independence: Real and Complex

Abstract: Infinitesimal independence is a way of analyzing the fine structure of the limit eigenvalue distribution of random matrix ensembles. The fine structure detected depends on the symmetry group of the matrix entries. Infinitesimal independence can be used to analyze genus expansions and spike models. I will present recent results on the unitary and orthogonal cases. The talk will be based on recent work with Pei-Lun Tseng, Guillaume Cébron, and Josué Vázquez.

10:30 – 11:00am: Coffee break

11:00 – 12:30pm: Wangjun Yuan (The Southern University of Science and Technology)

Strong convergence for tensor GUE random matrices

Abstract: In this talk, I will first introduce the background of free probaiblity, including the conception of strong convergence. Then I will discuss our result which is motivated by considerations from quantum physics -- in particular, understanding nearest neighbor interactions in quantum spin systems. We consider iid GUE acting on multipartite state spaces, with components on more than half of sites and identity on the remaining sites. In particular, any two GUEs have some sites in common.

We show that under proper assumptions on the dimension of the sites, strong asymptotic freeness holds. I will also discuss the interpolation technology recently introduced by Bandeira, Boedihardjo and van Handel. This is a joint work with Benoit Collins.

All are welcome