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THE HONG KONG UNIVERSITY OF SCIENCE & TECHNOLOGY

Department of Mathematics

SEMINAR ON PROBABILITY

Free Energy Fluctuations in Critical Spin Glass Models

By

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Abstract

Spin glass models describe high-dimensional spin systems with random interactions. An important problem in spin glass theory is to understand free energy fluctuations, especially their behavior near phase transitions. In this talk, I will discuss recent progress on free energy fluctuations in critical spin glass models, including the Sherrington–Kirkpatrick model and a broad class of symmetric perceptron models. A key ingredient is a new comparison strategy that connects free energy fluctuations to the critical behavior of the Baik–Ben Arous–Péché (BBP) phase transition in random matrix theory. This talk is based on joint work with Shuyang Gong (Yale), Brice Huang (Stanford), and Zhangsong Li (PKU).

Bio: Hang Du is a Ph.D. student in Mathematics at MIT, advised by Nike Sun. He received his B.S. in Mathematics from Peking University. His research interests lie in probability theory, statistical physics, and combinatorial statistics, with a particular focus on spin glasses, random graphs, and high-dimensional statistical inference.

Date : 13 November 2026 (Friday)
Time : 11:00a.m.-12:00noon
Venue : Room 4502 (near Lift 25/26)

All are Welcome!