



THE HONG KONG UNIVERSITY OF SCIENCE & TECHNOLOGY

Department of Mathematics

## **SEMINAR ON PURE MATHEMATICS**

### **Majority dynamics on sparse random graphs**

by

**Prof. Jeong Han KIM**

Korea Institute for Advanced Studies, Korea

#### **Abstract**

Majority dynamics on a graph  $G$  is a deterministic process such that every vertex updates its  $\pm 1$ -assignment according to the majority assignment on its neighbor simultaneously at each step. Benjamini, Chan, O'Donnell, Tamuz and Tan conjectured that, in the Erdős-Rényi random graph  $G(n, p)$ , the random initial  $\pm 1$ -assignment converges to a 99%-agreement with high probability whenever  $p = \omega(1/n)$ .

This conjecture was first confirmed for  $p \geq \lambda n^{-1/2}$  for a large constant  $\lambda$  by Fountoulakis, Kang and Makai. Although this result has been reproved recently by Tran and Vu and by Berkowitz and Devlin, it was unknown whether the conjecture holds for  $p < \lambda n^{-1/2}$ . We break this  $\Omega(n^{-1/2})$ -barrier by proving the conjecture for sparser random graphs  $G(n, p)$ , where  $\lambda' n^{-3/5} \log n \leq p \leq \lambda n^{-1/2}$  with a large constant  $\lambda' > 0$ .

**Date : 17 April 2023 (Monday)**

**Time : 4:30pm**

**Venue : Room 4472 (Lifts 25/26)**

*All are Welcome!*