



THE HONG KONG UNIVERSITY OF SCIENCE & TECHNOLOGY

Department of Mathematics

SEMINAR ON PROBABILITY

Branching random walk in random spatial environment

By

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Abstract

We study branching random walks in spatial random environment on the integers. For a fixed branching distribution μ on $\mathbb{N}_0$ and a given realisation of the environment $\{\omega_z\}_{z \in \mathbb{Z}} \in (0, 1)^{\mathbb{Z}}$, at each time step a particle produces a random number of offspring according to μ . Each offspring born from a parent located at $z \in \mathbb{Z}$ jumps to $z+1$ with probability ω_z and to $z-1$ with probability $1-\omega_z$.

Under some regularity conditions, we prove quenched localisation and an annealed CLT for the displacement of the leftmost (resp. rightmost) particle of this branching random walk. In particular, we will discuss how the large-deviation estimates for slow-down and speed-up probabilities impact the proof. This is based on joint work with Alice Callegaro and Nina Gantert (TU Munich).

Date : 15 July 2026 (Wednesday)

Time : 2:00p.m. – 3:00p.m.

Venue : Room 4475 (near lift 25/26)

All are Welcome!