



THE HONG KONG UNIVERSITY OF SCIENCE & TECHNOLOGY

Department of Mathematics

SEMINAR ON PDE

**From large deviations around porous media, to PDEs
with irregular coefficients, to gradient flow structures**

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Abstract

We consider the large deviations of the rescaled zero-range process about its hydrodynamic limit, the porous medium equation. This leads to the analysis of the skeleton equation, an energy-critical, degenerate parabolic-hyperbolic PDE with irregular drift. In this talk, we present a robust well-posedness theory for such PDEs based on concepts of renormalized solutions, the equation's kinetic form, and commutator estimates. The relationship of these large deviations principles to a formal gradient flow interpretation of the porous medium equation will be demonstrated by deducing an entropy dissipation equality from the large deviations and reversibility.

Date: 13 November 2025 (Thursday)

Time: 4:00pm

Zoom Meeting: <https://hkust.zoom.us/j/99582842944> (Passcode: 046828)

All are Welcome!