



THE HONG KONG UNIVERSITY OF SCIENCE & TECHNOLOGY

Department of Mathematics

SEMINAR ON APPLIED MATHEMATICS

**Reconstruction of phase field model with
an EnKF-based restoration framework**

By

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Abstract

Incomplete or damaged regions disrupt the consistency of numerical simulations, making both analysis and prediction challenging. In this study, we present an efficient and flexible restoration framework of reconstructed solution for phase field model. A sixth-order nonlinear phase-field model is adopted to describe the restoration dynamics, where parameter estimation is essential for accurate restoration results. To address this challenge, the Ensemble Kalman Filter (EnKF) data assimilation method is employed to iteratively estimate optimal model parameters with partial observations sampled from the target phase field states to be reconstructed. The estimated parameters are then incorporated into the governing model to reconstruct the missing morphology. A series of twin experiments are conducted to systematically evaluate the effectiveness and robustness of the method under controlled settings. The results confirm that the EnKF-based restoration framework is capable of reliably restoring structures even with complex.

Date : 3 August 2026 (Monday)

Time : 10:00a.m. – 11:00a.m.

Venue : Room 4502 (near Lift 25/26)

All are Welcome!