

The Hong Kong University of Science and Technology

Department of Mathematics

Seminar on Applied Mathematics

Part 1 - Modeling and simulation of flow in fractured porous media: adaptation and a two-scale model

by Dr. Huangxin CHEN Xiamen University

<u>Abstract</u>

In this talk an adaptive mixed finite element method will be introduced for the Darcy flow in a twodimensional fractured porous media. The discrete fracture model (DFM) is applied and we derive a robust residual-based a posteriori error estimator for the problem. We will further introduce a two-scale reduced model for simulating the flow in the porous media with conductive fractures. Several numerical results will be shown to demonstrate the efficiency of the adaptive algorithm and the proposed two-scale model.

Part 2 - A data-driven approach for interface motion by Dr. Dong WANG University of Utah

<u>Abstract</u>

In this talk, we present a framework for approximating unknown interface motions using observation data and deep neural networks. In particular, we consider that the interface is implicitly represented by characteristic functions. Then, we apply the neural networks to predict the interface motion from the observation data. The data needed are only pairs of the initial condition and interface position after onetime step. Several numerical experiments will be presented to demonstrate the performance of the method.

Date: Time: Venue:

Thursday, 27 June 2019 3:00p.m. – 4:30p.m. Room 3472, Academic Building, (Lifts 25-26), HKUST

All are welcome!