The Hong Kong University of Science and Technology

Department of Mathematics

<u>Seminar on Applied Mathematics</u>

A Local-Nonlocal Transmission Problem

By

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Abstract

I will discuss the solutions to some elliptic equations which change abruptly across a smooth interface. The main equation of interest, motivated by applications to atmospheric dynamics, is local on one side of this interface and nonlocal on the other, and features a critical nonlinear drift term. The major difficulty of the problem stems from a lack of scale invariance caused by the different orders of the different principal terms. While the existence of weak solutions follows from standard methods, the continuity of them across the interface requires a careful investigation of the scale dependence. The main results are a De Giorgi-Nash-Moser type continuity theorem, an in-depth analysis of the nonlocal analogue of the transmission condition satisfied by the frozen-coefficient equation, and a perturbative result for sufficiently smooth interfaces.

Date: *Thursday, 22 June 2017*

Time: *11:00a.m. - 12:00 p.m.*

Venue: *Room 4504, Academic Building (near Lifts 25&26), HKUST*

All are welcome!