THE HONG KONG UNIVERSITY OF SCIENCE & TECHNOLOGY

Department of Mathematics

SEMINAR ON PDE

Local and nonlocal ODEs in the singular fractional Yamabe problem

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Abstract

In conformal geometry, the Yamabe problem asks for Yamabe metrics, or conformal metrics of constant scalar curvature. In search of singular Yamabe metrics, one is led to the study of the Lane-Emden equation with a Sobolev-subcritical exponent that depends on the dimension of the singularity. The radial profile, which solves a classical ODE, is well-understood. One could pose the same problem concerning the fractional curvature, a general notion that includes the scalar curvature, the curvatures associated to Paneitz and GJMS operators, as well as those with non-integer order. For the investigation of the corresponding radial profile, we discuss the development of the nonlocal ODE theory. Apart from the localizing Caffarelli-Silvestre extension, we show that nonlocal ODE can also be understood as a coupled infinite system of second order ODEs. Finally, we also mention a simple while surprising transformation that reduces the nonlocal ODE into almost a scalar first order ODE. This is a joint work with Azahara DelaTorre.

Date: 19 September 2024 (Thursday)

Time: 4:00pm

Zoom Meeting: https://hkust.zoom.us/j/99949395972 (Passcode: 045553)

All are Welcome!