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THE HONG KONG UNIVERSITY OF SCIENCE & TECHNOLOGY

Department of Mathematics

SEMINAR ON PDE

Aggregation-diffusion equation: symmetry, uniqueness and non-uniqueness of steady states

By

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Abstract

The aggregation-diffusion equation is a nonlocal PDE that arises in the collective motion of cells. Mathematically, it is driven by two competing effects: local repulsion modeled by nonlinear diffusion, and long-range attraction modeled by nonlocal interaction. In this talk, I will discuss several qualitative properties of its steady states and dynamical solutions.

Using continuous Steiner symmetrization techniques, we show that all steady states are radially symmetric up to a translation. (joint work with Carrillo, Hittmeir and Volzone). In a recent work, we further investigate whether they are unique within the radial class, and show that for a given mass, uniqueness/non-uniqueness of steady states are determined by the power of the degenerate diffusion, with the critical power being m = 2. (joint work with Delgadino and Yan.)

Date : 24 September 2021 (Friday)

Time : 9:00am

Zoom Meeting : https://hkust.zoom.us/j/91948451738 (Passcode: 774559)

All are Welcome!