THE HONG KONG UNIVERSITY OF SCIENCE & TECHNOLOGY

Department of Mathematics

SEMINAR ON APPLIED MATHEMATICS

Wasserstein Hamiltonian Flow and Its Structure Preserving Numerical Schemes

By

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Abstract

We study discretizations of Hamiltonian systems on the probability density manifold equipped with the L2-Wasserstein metric. Based on discrete optimal transport theory, several Hamiltonian systems on graph (lattice) with different weights are derived, which can be viewed as spatial discretizations to the original Hamiltonian systems. We prove the consistency and provide the approximate orders for those discretizations. By regularizing the system using Fisher information, we deduce an explicit lower bound for the density function, which guarantees that symplectic schemes can be used to discretize in time. Moreover, we show desirable long time behavior of these schemes, and demonstrate their performance on several numerical examples. This presentation is based on a joint work with Prof. Haomin Zhou (Georgia Tech) and Prof. Luca Dieci (Georgia Tech).

Date : **21 June 2024 (Friday)**
Time : **3:00p.m.-4:00p.m.**
Venue : **Room 4502 (near Lift 25/26)**

All are Welcome!