

**Department of Mathematics
City University of Hong Kong**

Special Colloquium

Organised by Prof. Tong YANG and Prof. Tao LUO

Least Action, Incompressible Flow and Optimal Transport

by

**Professor Jian-Guo LIU
Duke University
USA**

Abstract :

In this talk, I will describe a striking connection between Arnold's least-action principle for incompressible Euler flows and geodesic paths for Wasserstein distance. The least action problem for geodesic distance on the "manifold" of fluid blob shapes exhibits instability due to micro-droplet formation. We will show that the Wasserstein geodesic is given by a weak solution to a compressible pressure-less equation and it is a limit of a sequence of weak solutions to incompressible Euler equation. A connection with fluid mixture models via a variant of Brenier's relaxed least action principle for generalized Euler flows will be outlined. As a natural generalization and application, I will discuss the so called p-euler equation and a conformal mapping formulation for two-dimensional water wave equations. This is a joint work with Bob Pego, Dejan Slepcev and Lei Li.

Date: 27th June, 2017 (Tuesday)
Time: 4:30 – 5:30pm
**Venue: B5-311, Blue Zone, Floor 5, Academic Building 1
City University of Hong Kong**

**** All interested are welcome ****

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