



Department of Mathematics

Student Seminar

May 22, 2019 (Wednesday)
Room 210, Run Run Shaw Bldg., HKU

Mr. Jiaqi Leng

The University of Hong Kong

*MHD Turbulence in One Spatial Dimension***2:00 – 2:45pm**

Turbulence is one of the most ubiquitous phenomena in nature. In this talk, we mainly concern about turbulence arising from fluids consisting of charged particles, i.e., the turbulent behavior of Magnetohydrodynamics (MHD). We will first formulate the Riemann problems in the one-spatial-dimensional MHD system. Then, we will attempt to generalize the entropy theory in (strictly) hyperbolic PDE in order to analyze the Riemann problems. A novel numerical scheme will also be presented to give satisfactory numerical simulations for the Riemann problems.

Miss Xuayan Niu

The University of Hong Kong

*Theories of Local Minima: From Neural Networks to Non-convex Optimization***2:45 – 3:30pm**

Deep learning is a crucial method in data science based on the use of artificial neural networks (ANN) that are implicitly inspired by animal brains. Despite of their superiority in practice, deep learning algorithms can be extremely intractable as optimization problems. As a step toward understanding the loss surface of those algorithms, this project focuses on the local minima problems in various forms of neural networks, from easy to complex, finally to the induced perturbable gradient basis model of general non-convex functions. The key principle is to find the specific circumstances and assumptions, under which every local minimum is a global minimum.

Mr. Chuwen Wang

The University of Hong Kong

*Geometric Substructures on Uniruled Projective Manifolds and the Recognition Problem***3:30 – 4:15pm**

The theory of varieties of minimal rational tangents (VMRT) on uniruled projective manifolds, especially Fano manifolds has been developed by Hwang, Mok and others over the last twenty years. In this talk, we will review the basics of VMRT theory and sub-VMRT structures. We will then introduce the recognition problem for sub-VMRT structures, i.e., the recognition of a submanifold from its sub-VMRT structure. In particular, two special cases will be presented, the recognition of a sub-Grassmannian and a linear section of a sub-Grassmannian under some conditions.