Workshop on Hyperbolic Partial Differential Equations (I)

June 18, 2019

Organizers:

Shijin Deng (Shanghai Jiao Tong University)

Yachun Li (Shanghai Jiao Tong University)

Weike Wang (Shanghai Jiao Tong University)

Sponsors:

National Natural Science Foundation of China

Shanghai Jiao Tong University

Plenary Speakers:

Hermano Frid (IMPA, Brazil)

Tong Li (University of Iowa, USA)

Ronghua Pan (Georgia Institute of Technology, USA)

Schedule:

08:30-12:00, Plenary lectures, Middle Lecture Room, Math Building

08:30-09:30 (Chair: Yachun Li)
Some problems about nonlinear parabolic-hyperbolic equations (Hermano Frid)

09:30-09:45 Tea Break

09:45-10:45 (Chair: Shijin Deng)
Mixed-type PDEs arising from chemotaxis modeling (Tong Li)

10:45-11:00 Tea Break

11:00-12:00 (Chair: Weike Wang)
Global dynamics on 1D compressible MHD (Ronghua Pan)

14:00-16:00, group discussion

Abstracts:

Some problems about nonlinear parabolic-hyperbolic equations

Hermano Frid (Instituto Nacional de Matemtica Pura Aplicada, Brazil)

In this talk I will give an overview of the joint work with Prof. Y. Li about nonlinear degenerate parabolic-hyperbolic equations under the High-End Project for Foreign Researchers, 2017-2019. I will present two results: one is about a mixed type initial-boundary value problem, and the other one is about the decay of generalized almost periodic entropy solutions to these equations.

Mixed-type PDEs arising from chemotaxis modeling

Tong Li (University of Iowa, USA)

We investigate global existence and long time behavior of solutions for PDE models of chemotaxis. In particular, we study oscillatory traveling wave solutions to an attractive chemotaxis system. The convective part of this system is of mixedtype. The oscillatory nature of the traveling wave comes from the fact that one far-field state is in the elliptic region and another in the hyperbolic region. Such traveling wave solutions are shown to be linearly unstable.

Global dynamics on 1D compressible MHD

Ronghua Pan (Georgian Institute of Technology, USA)

Global dynamis of classical solutions of 1D Compressible MHD with large initial data has an interesting history and is challenging. We will report a recent progress made by my joint work with X. Qin.