

2011 Nonlinear Reaction-Diffusion Equations Summer School

Shanxi University
July 17-27, 2011

Organizing Committee:

Weiping Yan, Fuyi Li, Yuanwei Qi, Junping Shi, Zhanping Liang

Main Speakers:

Xinfu Chen (University of Pittsburgh, USA),
Yuanwei Qi (University of Central Florida, USA/ Shanxi University, China),
Junping Shi (College of William & Mary, USA/Shanxi University, China),
Mingxin Wang (Harbin Institute of Technology, China)

General Schedule:

School Days: June 17-21, and June 23-27.

School Break: June 22.

Main Class Time: 9:00-11:00 in the morning, and 14:00-16:00 in the afternoon.

Lecture Time (by other speakers): 11:00-12:00 in the morning (for some days).

Lunch Break: 12:00-14:00.

Office Hour (quastion/answer): 16:00-17:00.

Daily Schedule:

Date	6/17	6/18	6/19	6/20	6/21	6/22
9:00-11:00	Shi	Qi	Wang	Wang	Chen	Break
11:00-12:00	Lecture		Lecture			Break
12:00-14:00	Lunch	Lunch	Lunch	Lunch	Lunch	Break
14:00-16:00	Shi	Wang	Qi	Chen	Qi	Break
16:00-17:00	Shi	Wang	Qi	Chen	Qi	Break

Date	6/23	6/24	6/25	6/26	6/27
9:00-11:00	Wang	Wang	Chen	Qi	Qi
11:00-12:00					
12:00-14:00	Lunch	Lunch	Lunch	Lunch	Lunch
14:00-16:00	Shi	Shi	Shi	Chen	Chen
16:00-17:00	Shi	Wang	Shi	Qi	Chen

Lectures:

Xinfu Chen: *Traveling Waves and Asymptotic Expansions*

Yuanwei Qi: *Introduction to Traveling Wave Solutions*

classical works of KPP, Fife & McLeod, and Aronson & Weinberger. Any, if I have time, to talk about my recent works with Xinfu Chen on Auto-Catalytic Systems.

Junping Shi: *Introduction to Reaction-diffusion systems, and Bifurcation Theory*

1. Models from physics, chemistry, and biology.
2. Review of 1D and 2D ODE techniques.
3. Mechanism of diffusion.
4. Analytical bifurcation theory.
5. Global Bifurcation Theory; Turing Bifurcation; Hopf Bifurcation.

Mingxin Wang: *Stability and topological methods*

1. The basic results of upper and lower solutions methods for parabolic and elliptic equations, some weak comparison principle (without proof mostly)
2. The basic results of eigenvalue problems (without proof mostly)
3. Some methods for the stability of constant steady states
4. Topological theory in cones and some simple applications
5. Relations between the stability and index of steady states and applications.