

Summer 2020 Online Talks on Partial Differential Equations

Organizers: Xuezhang Chen & Jun Li
Department of Mathematics & IMS, Nanjing University

2020年7月14日 - 9月1日

一、报告题目与摘要:

(I) **Zoom:** ID: 976 003 3388 PW: 20200430

黄锐 (华南师范大学)

Title: Traveling waves for time-delayed diffusion equations

Time: 14 July, 10:30-11:20

Abstract: This talk is about the traveling waves for time-delayed reaction-diffusion equations with degenerate diffusion or nonlocal dispersion term. For the degenerate case, we will show the existence of smooth and sharp type traveling waves, and the global stability of traveling waves. While, for the nonlocal dispersion case, we will show the stability of the monotone/non-monotone and critical/non-critical traveling waves. We will also give some numerical simulations to confirm our theoretical results.

李竞 (中科院数学所)

Title: Serrin-type criterion and large-time behavior for full compressible Navier-Stokes system

Time: 14 July, 16:00-16:50

Abstract: In this talk, we present some recent results concerning the Serrin-type blowup criterion for 3D full compressible Navier-Stokes system which states that the strong or smooth solution exists globally if the density is bounded from above and the velocity satisfies Serrin's condition.

(II) **Zoom:** ID: 654 3755 6390 PW: 20200430

韩青 (University of Notre Dame)

Title: The Loewner-Nirenberg Problem in Cones

Time: 23 July, 9:00-10:00

Abstract: Loewner and Nirenberg discussed complete metrics conformal to the Euclidean metric and with a constant scalar curvature in bounded domains in the Euclidean space. The conformal factors blow up on boundary. The asymptotic behaviors of the conformal factors near boundary are known in C^2 -domains. In this talk, we discuss asymptotic behaviors near vertices of cones. We will prove that solutions on finite cones are well-approximated by the solution in the corresponding infinite cone. To derive optimal estimates, we need to study a class of elliptic operators over spherical domains. These operators are singular on boundary. We will study the eigenvalue problem with the homogeneous Dirichlet boundary value and investigate boundary behaviors of the eigenfunctions.

(III) **Zoom:** ID: 654 3755 6390 PW: 20200723

麻希南 (中国科技大学)

Title: Some geometrical properties of the harmonic functions arising from the convexity

Time: 28 July, 9:30-10:20

Abstract: We introduce two superharmonic functions: the first one comes from the Gaussian curvature for the convex level sets of harmonic functions, and the other superharmonic function arises from the convexity for the Green function on convex domain. From the superharmonicity we can get some geometric consequences. This is the joint work with Zhang Wei.

张挺 (浙江大学)

Title: Local and global existence of pathwise solution for the stochastic Boussinesq equations with multiplicative noises

Time: 28 July, 10:30-11:20

Abstract: In this talk, we consider the stochastic Boussinesq equations in \mathbb{T}^d with the nonlinear multiplicative noises. At first, we establish the local existence of pathwise solutions. Then, we establish the global existence of pathwise solution when the noises are non-degenerate, which show that the linear multiplicative noises would provide a regularizing effect: the global existence of solution occurs with high probability if the initial data are sufficiently small, or if the noise coefficients are sufficiently large. (Based on the work with Lihuai Du)

(IV) **Zoom:** ID: 681 7076 5815 PW: 20200804

金天灵 (The Hong Kong University of Science and Technology)

Title: Regularity, extinction and bubbling for fast diffusion equations in bounded domains

Time: 11 August, 10:00-11:00

Abstract: We will first show optimal boundary regularity for bounded positive weak solutions of fast diffusion equations in smooth bounded domains. This solves a problem raised by Berryman and Holland in 1980 for these equations in the subcritical and critical regimes. Then we study extinction profiles of solutions to Sobolev critical fast diffusion equations with the Brezis-Nirenberg effect. We show that the convergence rates of the relative error in regular norms are at least polynomial. Exponential decay rates are proved for generic domains. Results for Sobolev subcritical fast diffusion equations are also obtained. Our proof makes use of regularity estimates, a curvature type evolution equation, as well as blow up analysis. This is joint work with Jingang Xiong.