International Workshop on SPDEs and Related Topics

Date: December 18-22, 2014

Venue: Jiangsu Normal University, New Century Grand Hotel Xuzhou, 1 Huxi Road, Xuzhou, China (Tel: 0516-87888888)

江苏师范大学，徐州开元名都大酒店（徐州市湖西路 1 号，电话 0516-87888888）

Contact: Yingchao Xie (谢颖超 ycxie@jsnu.edu.cn, 13512569978)

	December 19 Friday	**December 20 Saturday**	**December 21 Sunday**	**December 22 Monday**
8:30-8:55	**Opening & Group Photo**	Zenghu Li	Fengyu Wang	Jianglun Wu
8:55-9:20		Xicheng Zhang	Yongsheng Song	Jianliang Zhai
9:20-9:45	Zhenqing Chen	Shaoqin Zhang	Dejun Luo	Xiaoman Dou
9:45-10:10	**Tea Break**			
10:10-10:35	Kyeonghun Kim	Lihu Xu	Juan Yang	Rangrang Zhang (**10:10-10:30**)
10:35-11:00	Panki Kim	Longmin Wang	Qing Zhou	Rui Zhang (**10:30-10:50**)
11:00-11:25	Qi Zhang	Yulin Song		Xiaobin Sun (**10:50-11:10**)
12:00-13:30	**Lunch**			
14:30-14:55	Ting Yang	Rongchan Zhu	**11:30 Tour** Please bring your ID card and gather at the hotel lobby to take shuttle bus. After the tour and dinner, we will go back to the hotel together by bus.	**Departure**
14:55-15:20	Eryan Hu	Jieming Wang		
15:20-15:45	Yong Chen	Xin He		
15:45-16:10	**Tea Break**			
16:10-16:35	Huijie Qiao	Xiangchan Zhu		
16:35-16:55	Liang Li	Xing Huang		
16:55-17:15	Longjie Xie	Linlin Wang		
18:00-19:30	**Dinner**			

Daily Program

Tuesday, December 18　开元名都	
Registration	
18:00-20:00	**Dinner　开元名都 四季轩**

Daily Program

Friday, December 19　开元名都 怡元厅前场		
8:30-9:20	**Opening Ceremony and Group Photo**	
9:20-9:45	Zhenqing Chen	Heat kernels of discontinuous Markov processes
9:45-10:10	**Tea Break**	
10:10-10:35	Kyeonghun Kim	Some L_p-estimates for second-order SPDEs on general non-smooth domains
10:35-11:00	Panki Kim	Fractional time stochastic partial differential equations
11:00-11:25	Qi Zhang	Stochastic recursive control problem in non-Markovian framework and associated backward stochastic partial differential equation
12:00-13:30	**Lunch　开元名都 怡元厅后场**	
14:30-14:55	Ting Yang	Gradient estimates for harmonic functions of fractional Laplacian perturbed by non-local operators
14:55-15:20	Eryan Hu	Dirichlet heat kernel estimates for a class of stable-like processes
15:20-15:45	Yong Chen	On the fourth moment theorem for the complex multiple Wiener-Ito integrals
15:45-16:10	**Tea Break**	
16:10-16:35	Huijie Qiao	Nonlinear filtering of stochastic dynamical systems with Levy noises
16:35-16:55	Liang Li	Weak martingale solutions of stochastic Landau-Lifshitz-Gilbert equation coupled with Maxwell’s equation
16:55-17:15	Longjie Xie	Sobolev differentiable flows of SDEs with local Sobolev and super-linear growth coefficients
18:00-19:30	**Dinner　开元名都 怡元厅后场**	

Daily Program

Saturday, December 20　　开元名都 怡元厅前场		
8:30-8:55	Zenghu Li	Forward and backward stochastic equations of super-Levy processes
8:55-9:20	Xicheng Zhang	Holder estimates for nonlocal-diffusion equations with drifts
9:20-9:45	Shaoqin Zhang	Strong Feller property and irreducibility for non-linear monotone SPDEs
9:45-10:10	**Tea Break**	
10:10-10:35	Lihu Xu	Ergodicity of stochastic SDEs driven by degenerate noises
10:35-11:00	Longmin Wang	Boundary Harnack principle for critical fractional Laplacian with drift
11:00-11:25	Yulin Song	Density functions for the supremum of Wiener-Poisson functionals
12:00-13:30	**Lunch　开元名都 宴宾楼 3 楼包厢**	
14:30-14:55	Rongchan Zhu	Existence and uniqueness of solutions to stochastic functional differential equations in infinite dimensions
14:55-15:20	Jieming Wang	Martin boundary and boundary Harnack principle for Laplacian perturbed by non-local operators
15:20-15:45	Xin He	Local limits of random trees
15:45-16:10	**Tea Break**	
16:10-16:35	Xiangchan Zhu	Three-dimensional Navier-Stokes equations driven by space-time white noise
16:35-16:55	Xing Huang	Order-preservation for multidimensional stochastic functional differential equations with jumps
16:55-17:15	Linlin Wang	Derivative formulae and Harnack inequalities for SDEs with jumps
18:00-19:30	**Dinner　开元名都 宴宾楼 3 楼包厢**	

Daily Program

Sunday, December 21　　开元名都 淮海 1 厅		
8:30-8:55	Fengyu Wang	Hypercontractivity and applications for stochastic hamiltonian systems
8:55-9:20	Yongsheng Song	Gradient estimates for nonlinear diffusion semigroups by coupling methods
9:20-9:45	Dejun Luo	A note on Constantin and Iyer's stochastic representation of the Navier-Stokes equation
9:45-10:10	**Tea Break**	
10:10-10:35	Juan Yang	SPDEs with two reflecting walls and two singular drifts
10:35-11:00	Qing Zhou	On optimal mean-field type control problems of stochastic systems with jump processes under partial information
11:30	**Gather (please take your ID card) at the hotel lobby for lunch, tour and dinner**	
12:00-14:00	**Lunch 徐州寻梦园大酒店**	
14:00-17:00	**Tour**	
17:00-19:00	**Dinner 金卮餐饮徐州总店**	

Daily Program

Monday, December 22　　开元名都 怡元厅前场		
8:30-8:55	Jianglun Wu	Two recent results on a Burgers type nonlinear SPDE
8:55-9:20	Jianliang Zhai	Asymptotics of 2-D stochastic Navier-Stokes equations
9:20-9:45	Xiaoman Dou	Drift perturbation of subordinate Brownian motions with Gaussian component
9:45-10:10	**Tea Break**	
10:10-10:30	Rangrang Zhang	Exponential convergence for 3D stochastic primitive equations of the large scale ocean
10:30-10:50	Rui Zhang	Functional central limit theorems for supercritical superprocesses
10:50-11:10	Xiaobin Sun	Smoothness of density and ergodicity for state-dependent switching diffusions
12:00-13:30	**Lunch　开元名都 怡元厅后场**	

Closing

International Workshop on Stochastic Partial Differential Equations and Related Topics

Abstract

On the fourth moment theorem for the complex multiple Wiener-Ito integrals

Yong Chen

(Hunan Univesity of Science and Technology)

In this paper, a product formula of Hermite polynomials is given and then the relation between the real Wiener-Ito chaos and the complex Wiener-Ito chaos (or: multiple integrals) is shown. By this relation and the known multivariate extension of the fourth moment theorem for the real multiple integrals, the fourth moment theorem (or say: the Nualart-Peccati criterion) for the complex Wiener-Ito multiple integrals is obtained. This is a joint work with Yong Liu.

Heat kernels of discontinuous Markov processes

Zhenqing Chen

(University of Washington)

Discontinuous Markov processes and non-local operators have been under intense study recently, due to their importance both in theory and in applications. Many physical and economic systems have been successfully modeled by non-Gaussian jump processes. The infinitesimal generator of a discontinuous Markov process in $\mathbb{R}^n$ is no longer a differential operator but rather a non-local (or, integro-differential) operator. Transition density function, also called heat kernel, of a Markov process encodes all the information about the process.

While there is a long history in the study of heat kernels for diffusions, the study of heat kernels for jump-diffusions or non-local operators is quite recent. In this talk, I will survey the recent development in the study of sharp two-sided heat kernel estimates for a large class of discontinuous processes, including both symmetric and non-symmetric stable-like processes. These results can be viewed as the counterpart of DeGiorgi-Nash-Moser-Aronson theory for non-local operators. Applications to the solutions of stochastic differential equations driven by stable processes will also be given.

Drift perturbation of subordinate Brownian motions with Gaussian component

Xiaoman Dou

(Tsinghua University)

We study drift perturbation of subordinate Brownian motions with Gaussian component on $\mathbb{R}^d$ with $d \geq 1$. We establish the existence and uniqueness of the fundamental solution (also called heat kernel) of the operator $\mathcal{L}^b = \Delta + \psi(\Delta) + b \cdot \nabla$, where ψ is the Laplace exponent of a one-dimensional non-decreasing Lévy process (called subordinator) and b is an $\mathbb{R}^d$-valued function in Kato class $\mathbb{K}_{d,1}$. We further derive the sharp two-sided estimates of the heat kernel of $\mathcal{L}^b$.

Local limits of random trees

Xin He

(Beijing Normal University)

In this talk we review previous results and current progress on local limits of random trees. We first talk about local limits of Galton-Watson trees, and discuss three different conditionings of G-W trees. Then we give a quick introduction to Lévy trees and discuss local limits of Lévy trees.

Dirichlet heat kernel estimates for a class of stable-like processes

Eryan Hu

(Beijing Institute of Technology)

We establish the sharp bounds of Dirichlet heat kernel on $C^{1,1}$ open set $D \subset \mathbb{R}^d$ for the following non-local operator on $\mathbb{R}^d$:

$$\mathcal{L}f(x) = \text{p.v.} \int_{\mathbb{R}^d} (f(x+z) - f(x)) \frac{\kappa(x,z)}{|z|^{d+\alpha}} \mathrm{d}z,\ f \in C_b^2(\mathbb{R}^d), x \in \mathbb{R}^d,$$

where $d \geq 1$, $\alpha \in (0,2)$ and $\kappa : \mathbb{R}^d \times \mathbb{R}^d \mapsto \mathbb{R}$ satisfies the following conditions: $0 < \kappa_0 \leq \kappa(x,z) \leq \kappa_1$, $\kappa(x,z) = \kappa(x,\lambda z)$ for all $\lambda \in \mathbb{R}$ and $\kappa(\cdot,z) \in C^{\alpha+\varepsilon_0}$ for all $z \in \mathbb{R}^d$ and for some $\varepsilon_0 > 0$. Furthermore, we can establish the corresponding Green function estimates and bounded harnack principle on D.

Order-preservation for multidimensional stochastic functional differential equations with jumps

Xing Huang

(Beijing Normal University)

Sufficient and necessary conditions are presented for the order-preservation of stochastic functional differential equations on $\mathbb{R}^d$ with non-Lipschitzian coefficients driven by the Brownian motion and Poisson processes. The sufficiency of the conditions extends and improves some known comparison theorems derived recently for one-dimensional equations and multidimensional equations without delay, and the necessity is new even in these special situations.

Some L_p-estimates for second-order SPDEs on general non-smooth domains

Kyeonghun Kim

(Korea University)

A quite complete L_p-theory for the second-order linear SPDEs on the entire space was introduced by N.V. Krylov around 1994. Since then, the theory has been extened to the half space, smooth domains and C^1-domains. It turns out that solutions of SPDEs on domains behave very widely near the boundary, and one cannot control the second and higher order derivatives of solutions in the classical Sobolev spaces without weights. It is also known that C^1 domains are as good as C^∞ domains if one seek solutions in certain weighted Sobolev spaces, but behaviors of solutions on Lipschitz domains are dramatically different from solutions on C^1 domains.

In this talk, we give a short survey on regularity results on the half space and C^1 domains. Then, we introduce recent L_p-estimates on SPDEs defined on general non-smooth domains.

Fractional time stochastic partial differential equations

Panki Kim

(Seoul National University)

In this talk, we introduce a class of stochastic partial differential equations (SPDEs) with fractional time-derivatives, and study the L_2-theory of the equations. This class of SPDEs can be used to describe random effects on transport of particles in medium with thermal memory or particles subject to sticking and trapping.

Weak martingale solutions of stochastic Landau-Lifshitz-Gilbert equation coupled with Maxwell's equation

Liang Li

(Chinese Academy of Sciences)

The Landau-Lifshitz-Gilbert equation describes the evolution of the magnetization under a critical temperature. And the Maxwell's equations describe how electric and magnetic fields are generated and altered by each other and by the magnetization. In this talk we are going to consider a stochastic Landau-Lifschitz-Gilbert equation coupled with the Maxwell's equation. The existence and some regularities of weak martingale solutions will be proved.

Forward and backward stochastic equations of super-Levy processes

Zenghu Li

(Beijing Normal University)

The process of distribution functions of a one-dimensional super-Levy process is characterized as the pathwise unique solution of a stochastic integral equation driven by Gaussian and Poisson time-space noises, which generalizes the recent work of Xiong (AOP, 2013) on super-Brownian motion. To prove the pathwise uniqueness of the solution we establish connection of the stochastic integral equation with some backward doubly stochastic equation with jumps. This is based on a joint work with Hui He and Xu Yang.

A note on Constantin and Iyer's stochastic representation of the Navier-Stokes equation

Dejun Luo

(Chinese Academy of Sciences)

Using Kunita's formula for the pull-back of vector fields under the stochastic flow, we first give an alternative proof to Constantin and Iyer's stochastic representation of the Navier-Stokes equation. Compared to Constantin and Iyer's proofs, ours is simpler and has the advantage of being easily generalized to manifold case. This is an ongoing work with Shizan Fang.

Nonlinear filtering of stochastic dynamical systems with Lévy Noises

Huijie Qiao

(Southeast University)

Nonlinear filtering is investigated in a system where both the signal system and the observation system are under non-Gaussian Lévy fluctuations. Firstly, the Zakai equation is derived, and it is further used to derive the Kushner-Stratonovich equation. Secondly, by a filtered martingale problem, uniqueness for strong solutions of the Kushner-Stratonovich equation and the Zakai equation is proved. Thirdly, under some extra regularity conditions, the Zakai equation for the unnormalized density is also derived in the case of α-stable Lévy noise.

Gradient estimates for nonlinear diffusion semigroups by coupling methods

Yongsheng Song

(Chinese Academy of Sciences)

Our purpose is to obtain gradient estimates for certain nonlinear partial differential equations by coupling methods. First we derive uniform gradient estimates for a certain semilinear PDEs based on the coupling method introduced in Wang (2011) and the theory of backward SDEs. Then we generalize Wang's coupling to the G- expectation space and obtain gradient estimates for nonlinear diffusion semigroups, which correspond to the solutions of a certain fully nonlinear PDEs.

Density functions for the supremum of Wiener-Poisson functionals

Yulin Song

(Nanjing University)

By using Bismut's approach to Malliavin calculus for jump processes, we obtained a criterion for the existence of density functions of the supremum of one-dimensional Wiener-Poisson functionals. As an application, the existence of density functions for supremum of SDEs forced by Lévy processes was discussed.

Smoothness of density and ergodicity for state-dependent switching diffusions

Xiaobin Sun

(Nankai University)

This paper is concerned with a class of stochastic differential equations with state-dependent switching. The Malliavin calculus is used to study the smoothness of the density of the solutions under the Hormander type conditions. Moreover, the strong Feller property of the process is obtained by using the Bismut formula. The irreducibility of the semigroup associated with the equations is discussed under some natural conditions. As a consequence the existence and uniqueness of the invariant measure and then the ergodicity for the equations are also discussed.

Hypercontractivity and applications for stochastic hamiltonian systems

Fengyu Wang

(Beijing Normal University)

The hypercontractivity is proved at the first time for the Markov semigroup associated to a class of finite/infinite dimensional stochastic Hamiltonian systems. Consequently, the Markov semigroup is exponentially convergent to the invariant probability measure in entropy, and is compact for large time. These strengthen the hypocoercivity results derived in the literature. Since the log-Sobolev inequality is invalid for the associated Dirichlet form, we introduce a general result on the hypercontractivity using the Harnack inequality with power. The main results are illustrated by concrete examples.

Martin boundary and boundary Harnack principle for Laplacian perturbed by non-Local operators

Jieming Wang

(Beijing Institute of Technology)

For $d \geq 3$ and $0 < \beta < 2$, consider the operator $\mathcal{L}^b = \Delta + \mathcal{S}^b$, where

$$\mathcal{S}^b f(x) := \int_{\mathbb{R}^d} (f(x+z) - f(x) - \nabla f(x) \cdot z 1_{\{|z| \leq 1\}}) \frac{b(x,z)}{|z|^{d+\beta}} \mathrm{d}z,$$

$b(x,z)$ is a bounded measurable function on $\mathbb{R}^d \times \mathbb{R}^d$ with $b(x,z) = b(x,-z)$ for $x, z \in \mathbb{R}^d$ and $b(x,z) \geq 0$ for a.e. $z \in \mathbb{R}^d$. In the previous work, it is proved that there exists a

conservative Feller process X^b with its infinitesimal generator $\mathcal{L}^b$. We show that for a bounded $C^{1,1}$ domain D, the Matin boundary for the process X^b_D killed upon leaving D can be identified with the Euclidean boundary. We further give the integral representation of harmonic function with respect to X^b on the domain D. Finally, using the integral formula of harmonic function, the boundary Harnack principle for the operator $\mathcal{L}^b$ under some conditions is established. This is a joint work with Zhenqing Chen.

Derivative formulae and Harnack inequalities for SDEs with jumps

Linlin Wang

(Wuhan University)

In this talk, we shall investigate derivative formulae and Harnack Inequalities for SDEs with jumps. Here, the SDEs take the following form:

$$X_t = x + \int_0^t b(X_s)\mathrm{d}s + \int_0^t \sigma_1(X_s)\mathrm{d}W_s + \int_0^t \sigma_2(X_{s-})\mathrm{d}L_s.$$

On one hand, when the coefficients satisfy some smooth and bounded assumptions, we establish derivative formulae of Bismut-Elworthy-Li's type for SDEs driven by multiplicative α-stable-like noises. On the other hand, when the drift coefficient satisfy some monotone assumption and the diffusion term disappear, we get the Harnack and log-Harnack inequalites for stochastic differential equations driven by additive anisotropic subordinated Brownian motions (in particular, cylindrical α-stable processes). Moreover, the gradient estimates in both cases are also derived.

Boundary Harnack principle for critical fractional laplacian with drift

Longmin Wang

(Nankai University)

Let $d \geq 2$ and b a Hölder continuous vector field on $\mathbb{R}^d$. In this talk, we will prove the boundary Harnack principle with explicit rate for $-(-\Delta)^{1/2} + b \cdot \nabla$ in a bounded $C^{1,1}$ open set D. The rate depends on the boundary value of drift b and equals to $1/2$ only when b is tangent to the boundary ∂D. As an application, we will establish the sharp two-sided estimates for the Green function of $-(-\Delta)^{1/2} + b \cdot \nabla$ in D with zero exterior condition under stronger regularity assumptions on b. In general, the Green function is also not comparable to that of unperturbed operator $-(-\Delta)^{1/2}$. This is a joint work with Zhenqing Chen.

Two recent results on a Burgers type nonlinear SPDE

Jianglun Wu

(Swansea University)

In this talk, two recent results – one about global existence of a unique solution and another regarding to the finite explosion time – will be presented for a Burgers type nonlinear SPDE driven by Lévy space-time white noise.

Sobolev differentiable flows of SDEs with local Sobolev and super-linear growth coefficients

Longjie Xie

(Wuhan University)

By establishing a characterization for Sobolev differentiability of random fields, we prove the weak differentiability of solutions to stochastic differential equations with local Sobolev and super-linear growth coefficients with respect to the starting point. Moreover, we also study the strong Feller property and the irreducibility of the associated diffusion semigroup.

Ergodicity of stochastic SDEs driven by degenerate noises

Lihu Xu

(University of Macau)

In this talk, we shall use a coupling technique to prove the exponential ergodicity of a 2D SDEs driven by degenerated noises.

SPDEs with two reflecting walls and two singular drifts

Juan Yang

(Beijing University of Posts and Telecommunications)

We study stochastic partial differential equations with two reflecting smooth walls and two singular drifts , driven by space-time white noise with non-constant diffusion coefficients. The existence and uniqueness of the solutions is established. We also obtain the pathwise properties of the solutions. In particular, we present the critical parameter for the solution to hit reflecting walls.

Gradient estimates for harmonic functions of fractional Laplacian perturbed by non-local operators

Ting Yang

(Beijing Institute of Technology)

Suppose $d \geq 2$ and $0 < \beta < \alpha < 2$. We consider the non-local operator $\mathcal{L}^b = \Delta^{\alpha/2} + \mathcal{S}^b$, where

$$\mathcal{S}^b f(x) := \lim_{\varepsilon \to 0} \mathcal{A}(d, -\beta) \int_{|y-x|>\varepsilon} (f(y) - f(x)) \frac{b(x, y-x)}{|y-x|^{d+\beta}} \, \mathrm{d}y,$$

$\mathcal{A}(d, -\beta) = \beta 2^{\beta-1} \pi^{-d/2} \Gamma((d+\beta)/2) \Gamma(1-\beta/2)^{-1}$, and $b(x, z)$ is a bounded measurable function on $\mathbb{R}^d \times \mathbb{R}^d$ with $b(x, z) = b(x, -z)$ for $x, z \in \mathbb{R}^d$. It gives arise to a conservative strong Feller process X^b on the canonical Skorokhod space $\mathbb{D}([0, +\infty), \mathbb{R}^d)$ with jumping kernel $J^b(x, y) = \frac{\mathcal{A}(d,-\alpha)}{|x-y|^{d+\alpha}} + b(x, y-x) \frac{\mathcal{A}(d,-\beta)}{|x-y|^{d+\beta}}$. We establish the gradient estimates for harmonic functions for X^b (or, equivalently, for non-local operator $\mathcal{L}^b$) on bounded Lipschitz domains. Moreover, the comparison constants in the gradient estimates are independent of b with $\|b\|_\infty \leq A < +\infty$. So by passing $A \downarrow 0$, these estimates recover the gradient estimates for symmetric α-stable processes obtained in [K. Bogdan et.al, *Ill. J. Math.* 2002].

Asymptotics of 2-D stochastic Navier-Stokes equations

Jianliang Zhai

(University of Science and Technology of China)

We prove a central limit theorem and establish a moderate deviation principle for two-dimensional stochastic Navier-Stokes equations with multiplicative noise. The weak convergence method plays an important role.

Stochastic recursive control problem in non-Markovian framework and associated backward stochastic partial differential equation

Qi Zhang

(Fudan University)

The stochastic recursive control problem is introduced by the solution of backward stochastic differential equation. It includes some control problems revelent to the stochastic recursive differential utilities and thus plays a big role in the mathematical finance problems. When the coefficients in the system are random rather than deterministic functions, things are much different. For example, the associated HJB equation for the stochastic recursive control problem is no longer a PDE but a backward stochastic partial differential equation. In this talk we introduce some recent studies for this topic. This is a joint work with Qingxin Meng.

Exponential convergence for 3D stochastic primitive equations of the large scale ocean

Rangrang Zhang

(Chinese Academy of Sciences)

In this paper, we consider the global well-posedness and ergodicity for the three-dimensional viscous primitive equations describing the large-scale oceanic motion under a random forcing, which is an additive white in time noise. Firstly, we prove the existence and uniqueness of global strong solutions to the initial boundary value problem for the stochastic primitive equations by Faedo-Galerkin method. Subsequently, by applying the coupling method from Odasso to the equations, we obtain the existence and exponential convergence of invariant measure for the equations.

Functional central limit theorems for supercritical superprocesses

Rui Zhang

(Peking University)

In this talk, we first establish a central limit theorem for a large class of general supercritical superprocesses with spatially dependent branching mechanisms satisfying a second moment condition. This central limit theorem generalizes and unifies all the central limit theorems obtained recently in Milós (2012) and our paper (Acta Appl. Math., 130 (2014), 9-49) for supercritical super Ornstein-Uhlenbeck processes. The advantage of this central limit theorem is that it allows us to characterize the limit Gaussian field. Furthermore, we establish some functional central limit theorems for such superprocesses. In the particular case when the state E is a finite set and the underline motion is an irreducible Markov chain on E, our results are superprocess analogs of the functional central limit theorems of Jason (2004) for supercritical multitype branching processes. This is a joint work with Yanxia Ren and Renming Song.

Strong Feller property and irreducibility for non-linear monotone SPDEs

Shaoqin Zhang

(Central University of Finance and Economics)

Strong Feller property and irreducibility are study for a class of non-linear monotone stochastic partial differential equations with multiplicative noise. Hölder continuity of the associated Markov semigroups are discussed in some special cases. The main results are applied to several examples such as stochastic porous media equations, stochastic fast diffusion equations.

Holder estimates for nonlocal-diffusion equations with drifts

Xicheng Zhang

(Wuhan University)

We study a class of nonlocal-diffusion equations with drifts, and derive a priori Φ-Hölder estimate for the solutions by using a purely probabilistic argument, where Φ is an intrinsic scaling function for the equation. This is a joint work with Zhenqing Chen.

On optimal mean-field type control problems of stochastic systems with jump processes under partial information

Qing Zhou

(Beijing University of Posts and Telecommunications)

We consider the problem of partially observed optimal control for stochastic systems which are driven by Brownian motions and an independent Poisson random measure with a feature that the cost functional is of mean-field type. When all the system coefficients and the objective performance functionals are allowed to be random, possibly non-Markovian, Malliavin calculus is employed to derive a maximum principle for the optimal control of such a system where the adjoint process is explicitly expressed. We also investigate the mean-field type optimal control problems for systems driven by mean-field type stochastic differential equations with jump processes, in which the coefficients contain not only the state process but also its marginal distribution under partially observed information. The maximum principle is established using convex variational technique with an illustrating example about linear-quadratic optimal control.

Existence and uniqueness of solutions to stochastic functional differential equations in infinite dimensions

Rongchan Zhu

(Beijing Institute of Technology)

In this paper, we present a general framework for solving stochastic functional differential equations in infinite dimensions in the sense of martingale solutions, which can be applied to a large class of SPDE with finite delays, e.g. d-dimensional stochastic fractional Navier-Stokes equation with delays, d-dimensional stochastic reaction-diffusion equation with delays, d-dimensional stochastic porous media equation with delays. Moreover, under local monotone conditions for the nonlinear term we obtain the existence and uniqueness of strong solutions to SPDE with delays.

Three-dimensional Navier-Stokes equations driven by space-time white noise

Xiangchan Zhu

(Beijing Jiaotong University)

In this paper we studyIn 3D Navier-Stokes (NS) equation driven by space-time white noise by using regularity structure theory introduced by Martin Hairer and paracontrolled distribution proposed in [GIP13]. We obtain local existence and uniqueness of solutions to the 3D Navier-Stokes equation driven by space-time white noise. We also study the approximations to 3D Navier-Stokes (NS) equation driven by space-time white noise by paracontrolled distribution. We should subtract some drift terms in approximating equations such that it converges to 3D NS equation driven by space-time white noise. These drift terms, which come from renormalizations in the solution theory, converge to the solution multiplied by some constant depending on approximations.

Participants List

Ning Cao 曹宁	Jiangsu Normal University, Xuzhou	641453198@qq.com
Bin Chen 陈彬	Jiangsu Normal University, Xuzhou	binchen@jsnu.edu.cn
Chuanzhong Chen 陈传忠	Hainan Normal University, Haikou	ccz0082@yahoo.com.cn
Peng Chen 陈鹏	Jiangsu Normal University, Xuzhou	973732852@qq.com
Lei Chen 陈磊	Jiangsu Normal University, Xuzhou	chenlei@jsnu.edu.cn
Xian Chen 陈娴	Peking University, Beijing	chenxian@amss.ac.cn
Yong Chen 陈勇	Hunan Univesity of Science and Technology, Xiangtan	zhishi@pku.edu.cn
Zhenqing Chen 陈振庆	University of Washington, USA	zchen@math.washington.edu
Zhao Dong 董昭	Chinese Academy of Sciences, Beijing	dzhao@amt.ac.cn
Xiaoman Dou 窦小曼	Tsinghua University, Beijing	dou.xiaoman@gmail.com
Pengbin Feng 冯鹏斌	University of Chinese Academy of Sciences, Beijing	fengpengbin11@mails.ucas.ac.cn
Weiwei Gu 顾维维	Jiangsu Normal University, Xuzhou	793267044@qq.com
Zhenling Han 韩珍岭	Jiangsu Normal University, Xuzhou	jssdcherish@163.com
Xin He 贺鑫	Beijing Normal University, Beijing	hexin@bnu.edu.cn
Linfang Hou 侯林芳	Chinese Academy of Sciences, Beijing	houlinfang13@mails.ucas.ac.cn
Eryan Hu 胡二彦	Beijing Institute of Technology, Beijing	hueryan@bit.edu.cn
Zechun Hu 胡泽春	Nanjing University, Nanjing	huzc@nju.edu.cn
Xing Huang 黄兴	Beijing Normal University, Beijing	hxsc19880409@163.com
Chen Jia 贾晨	Peking University,Beijing	jiac@pku.edu.cn
Kyeonghun Kim	Korea University, Korea	kyeonghun@korea.ac.kr

Panki Kim	Seoul National University, Korea	zpkim@snu.ac.kr
Liang Li 厉亮	Chinese Academy of Sciences, Beijing	liangli@amss.ac.cn
Shihu Li 李石虎	Jiangsu Normal University	81273130@qq.com
Yueling Li 李月玲	Jiangsu Normal University, Xuzhou	lylmath@jsnu.edu.cn
Zenghu Li 李增沪	Beijing Normal University, Beijing	lizh@bnu.edu.cn
Chengcheng Ling 令成成	Beijing Jiaotong University，Beijing	11271004@bjtu.edu.cn
Wei Liu 刘伟	Jiangsu Normal University, Xuzhou	mathwliu@gmail.com
Yong Liu 刘勇	Peking University, Beijing	liuyong@math.pku.edu.cn
Dejun Luo 罗德军	Chinese Academy of Sciences, Beijing	luodj@amss.ac.cn
Ting Ma 马婷	Chinese Academy of Sciences，Beijing	matingting2008@yeah.net
Zhiming Ma 马志明	Chinese Academy of Sciences, Beijing	mazm@amt.ac.cn
Xue Peng 彭雪	Chinese Academy of Sciences	pengxuextq@126.com
Huijie Qiao 乔会杰	Southeast University, Nanjing	hjqiaogean@yahoo.com.cn
Sai Shi 侍赛	Jiangsu Normal University	shuiyeyizhou@163.com
Yinghui Shi 时颖慧	Jiangsu Normal University, Xuzhou	shiyinghui@jsnu.edu.cn
Renming Song 宋仁明	University of Illinois,USA	rsong@math.uiuc.edu
Yongsheng Song 宋永生	Chinese Academy of Sciences, Beijing	yssong@amss.ac.cn
Yulin Song 宋玉林	Nanjing University, Nanjing	songyl@amss.ac.cn
Xiaobin Sun 孙晓斌	NankaiUniversity, Tianjin	xbsun@mail.nankai.edu.cn
Chunyan Tao 陶春燕	Jiangsu Normal University	1312854023@qq.com
Dongya Tao 陶冬亚	Jiangsu Normal University	dytao770929@163.com

Yan Tao 陶燕	Jiangsu Normal University	1481193037@qq.com
Fengyu Wang 王凤雨	Beijing Normal University, Beijing	wangfy@bnu.edu.cn
Jieming Wang 王洁明	Beijing Institute of Technology, Beijing	wangjm@bit.edu.cn
Linlin Wang 王琳琳	Wuhan University, Wuhan	wanglinlin201296@gmail.com
Longmin Wang 王龙敏	Nankai University, Tianjin	wanglm@nankai.edu.cn
Yue Wang 汪跃	Beijing Jiaotong University，Beijing	11271012@bjtu.edu.cn
Jianglun Wu 吴奖伦	Swansea University, UK	j.l.wu@swansea.ac.uk
Weina Wu 武伟娜	Nankai University	wuweinaforever@mail.nankai.edu.cn
Hui Xiao 肖惠	Chinese Academy of Sciences, Beijing	15510115718@163.com
Longjie Xie 解龙杰	Wuhan University, Wuhan	xlj.98@whu.edu.cn
Yingchao Xie 谢颖超	Jiangsu Normal University, Xuzhou	ycxie@jsnu.edu.cn
Lihu Xu 徐礼虎	University of Macau, Macau	xulihu2007@googlemail.com
Libai Xu 徐礼柏	Jiangsu Normal University	1272228927@qq.com
Tiange Xu 徐天戈	University of Chinese Academy of Sciences, Beijing	xutiange@gucas.ac.cn
Jianlong Xue 薛建龙	Jiangsu Normal University	993145733@qq. com
Li Yang 杨莉	Jiangsu Normal University	1049417767@qq.com
Juan Yang 杨娟	Beijing University of Posts and Telecommunications, Beijing	juanyang@bupt.edu.cn
Ting Yang 杨婷	Beijing Institute of Technology, Beijing	yangt@bit.edu.cn
Ting Yang 杨婷	Jiangsu Normal University	418177030@qq.com
Jianliang Zhai 翟建梁	University of Science and Technology of China, Hefei	zhaijl@ustc.edu.cn
Chen Zhang 张晨	Jiangsu Normal University	1162533432@qq.com
Deng Zhang 张登	Shanghai Jiao Tong University	zhangdeng@amss.ac.cn

Qi Zhang 张奇	Fudan University, Shanghai	qzh@fudan.edu.cn
Rangrang Zhang 张让让	Chinese Academy of Sciences, Beijing	zhangrang6973@163.com
Rui Zhang 张蕊	Peking University, Beijing	ruizhang8197@gmail.com
Shaoqin Zhang 张少钦	Central University of Finance and Economics, Beijing	zhangsq@cufe.edu.cn
Tusheng Zhang 张土生	University of Manchester, UK	tusheng.zhang@manchester.ac.uk
Xicheng Zhang 张希承	Wuhan University, Wuhan	xichengzhang@googlemail.com
Meiling Zhao 赵美玲	Jiangsu Normal University	545380913@qq.com
Xinyu Zhao 赵新宇	Jiangsu Normal University	1009861417@qq.com
Qing zhou 周清	Beijing University of Posts and Telecommunications, Beijing	zqleii@bupt.edu.cn
Hong Zhu 朱虹	Jiangsu Normal University	nonahong@163.com
Rongchan Zhu 朱蓉禅	Beijing Institute of Technology, Beijing	zhurongchan@126.com
Xiangchan Zhu 朱湘禅	Beijing Jiaotong University, Beijing	zhuxiangchan@126.com
Xiaoyu Zhu 朱笑雨	Jiangsu Normal University	705478763@qq.com