

2023 哈尔滨工业大学随机分析研讨会

时间：2023 年 6 月 16-18 日

地点：哈尔滨工业大学一校区明德楼 B 区 201-1 学术报告厅

与会专家（以姓名字母为序）

- 成灵妍 南京理工大学
韩邦先 中国科学技术大学
胡二彦 天津大学
黄 兴 天津大学
黎怀谦 天津大学
李建阁 哈尔滨工业大学
李瑞囡 上海对外经贸大学
李宋子 中国人民大学
刘 伟 武汉大学
蒲 飞 北京师范大学
王宇钊 山西大学
王振富 北京大学
吴黎明 哈尔滨工业大学
张朝恩 哈尔滨工业大学
张 登 上海交通大学

会议联系人

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张朝恩: chaoenzhang@hit.edu.cn

会议日程

6月17日上午

08:40-08:50 报到

08:50-09:00 欢迎致辞（许全华）

主持人：吴黎明

09:00-09:50 张 登

Strichartz and local smoothing estimates for stochastic dispersive equations

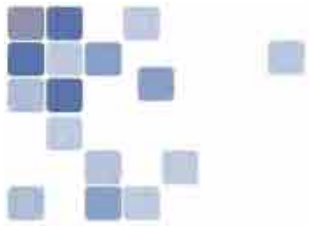
10:20-11:10 黎怀谦

Wasserstein Convergence for Empirical Measures of Subordinated Fractional Brownian Motions on the Flat Torus

11:10-12:00 黄 兴

Well-Posedness for McKean-Vlasov SDEs with Distribution Dependent Stable Noises



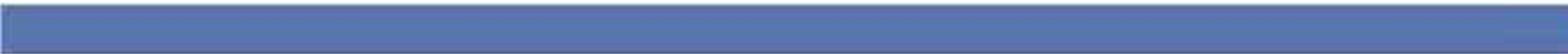


会议日程

6月17日下午

主持人：张登

- 14:00-14:50 王振富
Entropy Method in the Mean Field Limit Problem
- 15:10-16:00 李宋子
The limiting behavior of the free path length of the periodic Lorentz gas in the Boltzmann-Grad limit
- 16:00-16:50 蒲飞
Gaussian fluctuation for spatial average of super-Brownian motion



会议日程

6月18日上午

主持人：王振富

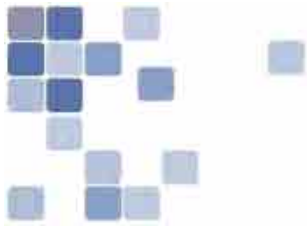
09:00-09:50 韩邦先
非负曲率空间上的 log-Sobolev 不等式

10:10-11:00 胡二彦
Parabolic mean value inequality and on-diagonal upper bound of the heat kernel on doubling spaces

11:00-11:50 王宇钊
The concavity of entropy power and applications in functional inequalities

6月18日下午 自由讨论





报告题目与摘要

6月17日上午

Strichartz and local smoothing estimates for stochastic dispersive equations

张 登
上海交通大学

Abstract: Strichartz and local smoothing estimates play the key roles in the theory of dispersive equations. In this talk, we will show the pathwise Strichartz and local smoothing estimates for a general class of stochastic dispersive equations driven by linear multiplicative noise, including especially the stochastic Schroedinger and Airy equations. Several applications to stochastic nonlinear problems will then be given, including the pathwise well-posedness, the high integrability of stochastic solutions and the large deviation principle for the small noise asymptotics.

Wasserstein Convergence for Empirical Measures of Subordinated Fractional Brownian Motions on the Flat Torus

黎怀谦
天津大学

Abstract: I will talk about rates of convergence for Wasserstein distance W_p between empirical measures associated with the subordinated fractional Brownian motion and the uniform distribution on the flat torus for all $p \in [1, \infty)$. In particular, our results coincide with recent ones on the diffusion process and the fractional Brownian motion. As an application, we provide similar results for time-discretized subordinated fractional Brownian motions. The main ideas will be explained.

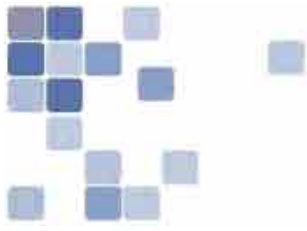
报告题目与摘要

Well-Posedness for McKean-Vlasov SDEs with Distribution Dependent Stable Noises

黄兴
天津大学

Abstract: The well-posedness is established for McKean-Vlasov SDEs driven by α -stable noises ($1 < \alpha < 2$). In this model, the drift is Hölder continuous in space variable and Lipschitz continuous in distribution variable with respect to the sum of Wasserstein and weighted variation distances, while the noise coefficient satisfies the Lipschitz condition in distribution variable with respect to Wasserstein distance. The main tool relies on Zvonkin's transform {as well as Duhamel's formula and a two-step fixed point argument.





报告题目与摘要

6月17日下午

Entropy Method in the Mean Field Limit Problem

王振富
北京大学

Abstract: Entropy/energy based methods have been shown useful in the mean field limit/propagation of chaos of large systems of interacting particles. We will present recent progress in this direction and in particular the long time convergence result based on entropy/Fisher information.

The limiting behavior of the free path length of the periodic Lorentz gas in the Boltzmann-Grad limit

李宋子
中国人民大学

Abstract: In this talk, we study the limiting behavior of the free path length of the periodic Lorentz gas in the Boltzmann-Grad limit, and present the asymptotic formula of its tail distribution and the central limit theorem. The key ingredient in our results is the relation between the distribution of free path length in the Boltzmann-Grad limit and the dynamics of non-quasi unipotent flow on the lattice space, as shown in Marklof-Strombergsson(2008).

报告题目与摘要

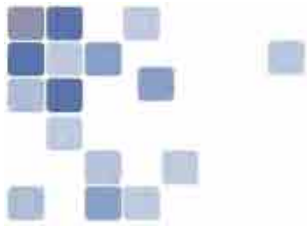
Gaussian fluctuation for spatial average of super-Brownian motion

蒲飞

北京师范大学

Abstract: Let $\{u(t, x)\}_{(t, x) \in \mathbb{R}_+ \times \mathbb{R}}$ be the density of one-dimensional super-Brownian motion starting from Lebesgue measure. Using the Laplace functional of super-Brownian motion, we prove that as $N \rightarrow \infty$, the normalized spatial integral $N^{-1/2} \int_0^N [u(t, z) - 1] dz$ converges jointly in (t, x) to Brownian sheet in distribution. This is based on joint work with Zenghu Li.





报告题目与摘要

6月18日上午

非负曲率空间上的 log-Sobolev 不等式

韩邦先
中国科学技术大学

Abstract: 在 log-Sobolev 不等式的研究中有两个重要的情形，一个是无维数限制的正曲率下界的情形，另一个是有限维的非负曲率情形。那么，无维数限制的非负曲率条件下，log-Sobolev 不等式应该是什么形式？它是否有最佳形式？是否可以取等号？在这个报告中我将介绍一些这个方面的研究结果。

Parabolic mean value inequality and on-diagonal upper bound of the heat kernel on doubling spaces

胡二彦
天津大学

Abstract: In this talk, we investigate the diagonal upper bound of heat kernels for regular Dirichlet forms on metric measure spaces with volume doubling condition. As hypotheses, we use the Faber-Krahn inequality, the generalized capacity condition and an upper bound for the integrated tail of the jump kernel. The parabolic mean value inequality for subcaloric functions plays an important role.

报告题目与摘要

The concavity of entropy power and applications in functional inequalities

王宇钊
山西大学

Abstract: In this talk, we derive the concavity of entropy power of probability density solving the nonlinear p -Laplacian diffusion equation on \mathbb{R}^n and compact Riemannian manifold with nonnegative Ricci curvature. We also prove the concavity of entropy power along the geodesic flow on Wasserstein space over Riemannian manifold with nonnegative Ricci curvature. As an application, we give new proofs of some optimal functional inequalities, including L^p Nash inequality, L^p Log-Sobolev inequality, L^p -Sobolev inequality and L^p -Gagliardo-Nirenberg inequalities on \mathbb{R}^n .

