北 师 大 随 机 数 学 研 究 中 心 学 术 交 流 会

线下：北师大后主楼1124　　线上：腾讯会议ID 384 890 513

2021年12月26日（周日）				
报告时间	**报告人**	**报告题目**		**主持人**
08:20-08:30	开 场 词（ 陈 木 法 院 士 ）			
08:30-09:00	陈昕昕	Yaglom theorems for 4-dim critical branching random walks		马宇韬
09:00-09:30	何　辉	Brownian CRT conditioned to be large		
09:30-10:00	洪文明	Harmonic function of the random walks in random environment (in time) and its applications		
10:00-10:20	中场休息及交流			
10:20-10:50	李增沪	Strong Feller and ergodic properties of the (1+1)-affine process		何　辉
10:50-11:20	廖仲威	Probability approximation method for the neutral r-alleles Wright-Fisher model with mutations		
11:20-11:50	马宇韬	Fisher information among beta ensembles		
报告时间	**报告人**	**报告题目**		**主持人**
14:00-14:30	毛永华	Markov链之随机化模型及应用		陈昕昕
14:30-15:00	蒲　飞	CLT for SPDEs		
15:00-15:30	王颖喆	单生单死过程的代数式收敛性		
15:30-15:50	中场休息及交流			
15:50-16:20	张　梅	Lower deviations for supercritical branching processes with immigration		李增沪
16:20-16:50	袁成桂	Dynamical behaviors of the tumor-immune system in a stochastic environment		
16:50-17:20	张余辉	向上或向下一致有限程马氏链的经典问题		

Yaglom theorems for 4-dim critical branching random walks

Xinxin CHEN *Beijing Normal University*

Abstract:We consider a discrete-time branching simple random walk in $\mathbb{Z}^4$ where each particle independently makes simple random walk and produces a random number of children so that the offspring law is of mean 1 and of finite variance. The classical Yaglom theorem says that conditioned on the survival up to time n, the number of alive particles at time n is of order n. We study the branching random walk starting from some far away site $x \in \mathbb{Z}^4$ conditioned on hitting the origin and obtain a Yaglom theorem on the corresponding occupation time.

Brownian CRT conditioned to be large

Hui HE *Beijing Normal University*

Abstract: Consider a sub-critical Brownian CRT. By conditioning the local time of the tree to be large, we obtain different limiting trees in three regimes. The talk is based on a on-going work with Abraham and Delmas.

Harmonic function of the random walks in random environment (in time) and its applications

Wenming HONG *Beijing Normal University*

Abstract:We formulate a harmonic function for the random walks in random environment, based on which the quenched probability for the random walks conditioned to stay positive has been established. As an application, we prove the quenched invariance principles for random walks conditioned to stay positive. (Jointly with Shengli Liang).

Backward stochastic differential equation on a Riemannian manifold

Zenghu LI *Beijing Normal University*

Abstract: We prove some estimates for the variations of transition probabilities of the (1+1)-affine process. From those estimates we deduce the strong Feller and the ergodic properties in total variation distance of the process. The key strategy is the pathwise construction and analysis of several Markov couplings by strong solutions of stochastic equations. This is a joint work with Shukai Chen.

Probability approximation method for the neutral r-alleles Wright-Fisher model with mutations

Zhongwei LIAO *Beijing Normal University at Zhuhai*

Abstract: We consider the one-locus, r-alleles Wright-Fisher model with N diploid individuals. The Wright-Fisher model and its approximating diffusion model are compared in terms of the expected value of a smooth but arbitrary

function of nth-generation gene frequency. The error estimation can be characterized explicitly by the mutation parameters, population size and the derivatives of the smooth function. The main idea is the Lindeberg principle of probability approximation. Further work is still in progress, including models with selections and the mean square error estimation.

Fisher information among beta ensembles

Yutao MA *Beijing Normal University*

Abstract: In this talk, we present the Fisher information among β-ensembles when β scales with n. Under appropriate assumptions, we offer the exact order of the corresponding Fisher informations. As application, we prove that β-Laguerre ensembles doesn't satisfy the logarithmic Sobolev inequality under some framework.

Markov 链之随机化模型及应用

Yonghua MAO *Beijing Normal University*

Abstract: 从华先生的投入产出模型开始，讲述有限Markov 链的遍历性的应用，然后探讨有关模型的随机化问题. 最后，介绍Markov链讲义的计划与进展.

CLT for SPDEs

Fei PU *Beijing Normal University*

Abstract: I will present some recent progress on the central limit theorem for stochastic partial differential equations. Collaborations with Le Chen, Davar Khoshnevisan, Zenghu Li and David Nualart.

单生单死过程的代数式收敛性

Yinzhe WANG *Beijing Normal University*

Abstract: 介绍一些特殊类型马氏过程代数式收敛性的判定, 包括单生单死过程, 树上的随机游动等.

Lower deviations for supercritical branching processes with immigration

Mei ZHANG *Beijing Normal University*

Abstract: For a supercritical branching processes with immigration $\{Z_n\}$, it is known that under suitable conditions Z_n/c_n converges almost surely to a finite and strictly positive limit, where c_n is a sequence of positive numbers. We are interested in the limiting properties of $\mathbb{P}(Z_n = k_n)$ with $k_n = o(c_n)$ as $n \to \infty$. We give asymptotic behavior of

such lower deviation probabilities in both Schröder and Böttcher cases, unifying and extending the previous results for Galton-Watson processes in literature. The talk is based on the joint works with Sun Qi and Xie Chunyan.

Dynamical behaviors of the tumor-immune system in a stochastic environment

Chenggui YUAN *Swansea University*

Abstract: This talk will discuss dynamical behaviors of the tumor-immune system perturbed by environmental noise. The model describes the response of the cytotoxic T lymphocyte to the growth of an immunogenic tumour. The main methods are stochastic Lyapunov analysis, comparison theorem for stochastic dierential equations (SDEs) and strong ergodicity theorem. Firstly, we prove the existence and uniqueness of the global positive solution for the tumor-immune system. Then we go a further step to study the boundaries of moments for tumor cells and eector cells and the asymptotic behavior in the boundary equilibrium points. Furthermore, we discuss the existence and uniqueness of stationary distribution and stochastic permanence of the tumor-immune system.

向上或向下一致有限程马氏链的经典问题

Yuhui ZHANG *Beijing Normal University*

Abstract: 由于连续时间马氏链的唯一性等价于扩大空间上嵌入链的常返性, 利用此思想和位势理论及极限逼近方法, 我们研究了向上或向下一致有限程马氏链，给出其唯一性，常返性和遍历性等经典问题.