Titles and Abstracts

Room A-211

January 26, 2026 - Monday, Room A-211

A pursuit of a random walker

Mikhail Lifshits
St. Petersburg State University

Key Words: Pursuit, Minimal Energy, Brownian motion

Abstract: We consider the problem of approximation of a non-smooth random process by a smoother one.

Formally, we minimize a sort of energy (an integral functional of the derivative of the approximating process) under some constraints on the distance (uniform or average one) between the approximated and the approximating processes.

If the whole trajectory of the approximated process is available (the so-called non-adaptive setting), we have a rather usual approximation problem. If only the past trajectory of the approximated process is available (the adaptive setting), then one has a pursuit problem that essentially belongs to the optimal control theory.

The talk surveys some results obtained by in collaboration with I.Ibragimov, Z.Kabluchko, E.Setterqvist and some lecturer's students.

Biography:

Born in Moscow, USSR, in 1956, graduated from Leningrad State University in 1978 and obtained the Candidate of Sciences (PhD) degree in 1981 and Doctor of Sciences degree in 1993 from the same university. Professor at St.Petersburg State University since 2000. Lectured as an invited professor in France, Sweden, USA, and other countries. Field of scientific interests: theory of random processes. Author of the books "Gaussian Random Functions" (Kluwer, 1995), "Lectures on Gaussian Processes" (Springer, 2012), "Random Processes by Example" (World Scientific, 2014) and more than 130 scientific articles.

Weakly self-avoiding walk in a Pareto-distributed random potential

Wolfgang König
Technische Universität Berlin

Key Words: random walk in random potential, random variational problem, weakly self-avoiding walk

Abstract: We investigate a model of continuous-time simple random walk paths in the d-dimensional discrete space undergoing two competing interactions: an attractive one towards the large values of a random potential, and a self-repellent one in the spirit of the well-known weakly self-avoiding random walk. We take the potential to be i.i.d.~Pareto-distributed, and we tune the strength of the interactions in such a way that they both contribute on the same scale for diverging time. Our main results are (1) the identification of the logarithmic asymptotics of the partition function of the model in terms of a random variational formula, and, (2) the identification of the path behaviour that gives the overwhelming contribution to the partition function. (Joint work with Nicolas Petrelis, Renato Soares dos Santos and Willem van Zuijlen)

Biography:

1994 PhD at University of Zurich (supervisor: Erwin Bolthausen)

2000 Habilitation at TU Berlin

2003/4 Heisenberg Scholarship from DFG (German Science Foundation)

1995 - 2004 postdoc positions at Nijmegen, TU Berlin, BRIMS Bristol, Fields Institute Toronto, and professorship substitution at Cologne.

2004 - 2009 professor for Stochastic Processes at Leipzig University

since 2009 professor for Probability Theory at TU Berlin and head of group "Interacting Random Systems" at Weierstrass Institute Berlin

since 2015 Deputy Director of Weierstrass Institute Berlin

The continuous Derrida-Retaux branching process in the Brownian CRT

Thomas Duquesne
Sorbonne University

Key Words: Hierarchical Renormalization Model, Growth-Fragmentation Process, Brownian Continuum Random Tree

Abstract: The continuous Derrida-Retaux branching process is the (conjectural) scaling limit of the discrete Derrida-Retaux hierarchical renormalization model. This

convergence has been proved by Y. Hu, B. Mallein, and M. Pain for a closely related model which is exactly solvable The continuous Derrida-Retaux branching process can be viewed as a population of cells evolving according to a process of linear growth and uniform fragmentation, the time parameter varying in [0, 1).

We provide a first definition of the continuous Derrida-Retaux branching process. Then we state a law of large numbers involving 4-dimensional Bessel bridges, as conjectured in the discrete case. This limiting law is obtained by analytical means. Finally, we give a new construction of the continuous Derrida-Retaux branching process using the Brownian Continuum Random Tree: it provides a better understanding of certain aspects of the continuous Derrida-Retaux process and,

in particular, provides a probabilistic explanation for the limiting law involving 4-dimensional Bessel bridges.

This presentation is based on the article by B. Derrida, T.D., and Z. Shi published

in the Annals of IHP 2024 and on a work in progress with E. Aïdékon, B. Derrida, and Z. Shi.

Biography:

Since Sept. 2007 Professor at Sorbonne University

2012-2015 Part time at the Ecole Normale Supérieure de Paris

2002-2007 Assistant Professor at Paris-Saclay University

1999-2002 Teaching assistant at the Ecole Normale Supérieure Paris-Saclay

1998-1999 Teaching assistant at Sorbonne University

1994-1998 Student at the Ecole Normale Supérieure de Paris.

The Derrida-Retaux model on a geometric Galton--Watson tree

胡跃云 **Yueyun Hu**
Université Paris 13

Abstract: This talk is based on a joint work with Gerold Alsmeyer and Bastien Mallein. We consider a generalized Derrida-Retaux model on a Galton-Watson tree with a geometric offspring distribution. For a class of recursive systems, including the Derrida-Retaux model with either a geometric or exponential initial distribution, we characterize the critical curve using an involution-type equation and prove that the free energy satisfies the Derrida-Retaux conjecture.

Biography:

Since 2005, I have been Professor at LAGA, University of Paris XIII, France, following a position as CNRS Researcher at the University of Paris VI from 1996 to 2005. My research interests are in probability theory, with a particular focus on branching random walks, random walks in random environments on lattices and trees, as well as probabilistic models inspired by statistical mechanics, such as recursive models on trees.

Application of Liouville quantum gravity to 2D Statistical Physics

孙鑫 **Xin Sun**
Peking University

Key Words: Liouville quantum gravity, Schramm-Loewner evolution, percolation

Abstract: I will use 2D percolation as an example to demonstrate how Liouville quantumgravity (LQG) is used in the recent progress on the exact solvability in 2D statistical physics. Comparing to previous applications of quantum gravity instatistical physics based on the Knitznik-Polyakov-Zamolodchikov (KPZ) relation, the crucial novelty of the recent applications is the interplay between the exact solvability in Liouville conformal field theory andthe coupling theory of LQG and SLE.

Biography:

Xin Sun is a Professor of Mathematics at Beijing International Center for Mathematical Research, Peking University.

He got his bachelor degree from Peking University and Ph.D. from MIT. He was a postdoc at Columbia University as a Simons Junior Fellow, and then a faculty member at University of Pennsylvania, before returning to Peking University in 2023.

His research area is probability theory and mathematical physics. He has won NSF Career Award, Bernoulli New Researcher Award, Rollo Davidson Award, and Alibaba Damo fellowship, and ICBS Frontier Science Award. He is an invited sectional speaker at ICM 2026.

Hausdorff dimension of exceptional points of the scaling limit of 3D uniform spanning tree

李欣意 **Xinyi Li**
Peking University

Key Words: Random fractal; uniform spanning tree; loop-erased random walk

Abstract: I will talk about the calculation of the Hausdorff dimension of several types of exceptional points in the scaling limit of three-dimensional uniform spanning tree (UST). We will discuss how these quantities are determined by a family of intersection exponents related to simple random walk and loop-erased random walk. We will also give some conjectures on the (non)-existence of these exceptional points. This talk is based on an ongoing joint work with Omer Angel, David Croydon, Saraí Hernández-Torres, Runsheng Liu, Xiangyi Liu and Daisuke Shiraishi.

Biography:

Xinyi Li is an Associate Professor at Beijing International Center for Mathematical Research, Peking University. He graduated from ETH Zurich in 2016 and worked as a Dickson instructor at the University of Chicago between 2016 and 2019. As a probabilist, his research interests include random fractals (in particular those derived from random walk and Brownian motion) and statistical physics.

January 27, 2026 - Tuesday, Room A-211

Stochastic integral representations for the Lévy forest

李增沪 **Zenghu Li**
Beijing Normal University

Key Words: Lévy process, branching process, Ray-Knight theorem

Abstract: We present a stochastic integral representation for the local time of the height process of a spectrally positive Lévy process stopped at a hitting time. From the representation we derive a strong stochastic equation of the type of Dawson and Li (Ann. Probab., 2012). This leads to a representation of the Ray-Knight theorem of Le Gall and Le Jan (Ann. Probab., 1998) and Duquesne and Le Gall (Astérisque, 2002), which codes the genealogical forest of a continuous-state branching process. The result extends the recent work of Aidékon et al. (Sci. China Math., 2024) for a Brownian motion with a local time drift.

Biography:

Zenghu Li is a Professor of Mathematics in Beijing Normal University, serving as the Director of MOE Key Laboratory of Mathematical and Complex Systems.

Branching Brownian motion and branching random walks with penalties

Anton Bovier
Universität Bonn

Key Words: spatial branching processes, repulsion, polymer models

Abstract: I discuss two cases of spatial branching processes where configurations where particles at any given time are close to each other receive an exponential penalty. If the underlying process is branching Brownian motion, the penalised process avoids the penalty by postponing the first branching time. I give a rather detailed description of the resulting process and in particular drive a universal limit process when the penalty tends to zero. The second model is based on binary discrete time branching random walks. Here, branching cannot be suppressed and the process is forced to expand exponentially fast in space. I give bounds on the speed of expansion and on the shape of the process.

This is based on work with Lisa Hartung and Frank den Hollander.

Biography:

Anton Bovier is a German mathematician and physicist known for his work in probability theory and statistical physics. He studied physics at the University of Bonn, earning his Diplom in 1981. He received his PhD in 1986 from ETH Zurich. Bovier's research focuses on metastability in Markov chains, spin glass models, and mathematical statistical mechanics. He is a professor at the University of Bonn, affiliated with the Institute for Applied Mathematics. In 2013, he was elected a Fellow of the Institute of Mathematical Statistics. He directed the Les Houches Summer School on mathematical statistical mechanics in 2005 and was an invited speaker at the International

Congress of Mathematicians in Madrid in 2006, discussing metastability from a potential-theoretic perspective. A prolific researcher, Bovier has supervised at least 23 PhD students. His key publications include Statistical Mechanics of Disordered Systems: A Mathematical Perspective (2006), Metastability: A Potential-Theoretic Approach (2015, with Frank den Hollander), and Gaussian Processes on Trees: From Spin Glasses to Branching Brownian Motion (2016). His work also spans mathematical biology, including population dynamics and adaptive evolution.

The extremal point process of branching Brownian motion

Julien Berestycki
University of Oxford

Key Words: Point-process, extremes, branching Brownian motion.

Abstract: A bit more than ten years ago, in a joint work with Elie Aidekon, Eric Brunet, and Zhan Shi, we gave a description of the extremal point process of the one-dimensional branching Brownian motion. In this talk, I will review some more recent progress on the case of higher dimension.

Based on joint works with Yujin Kim. Eyal Lubetsky, BastienMallein, Roman Stasinski, and Ofer Zeitouni.

Biography:

Julien Berestycki is a French mathematician and Professor of Probability and Statistics at the University of Oxford, where he is based in the Department of Statistics and is also a Tutorial Fellow of Magdalen College. He specializes in probability theory, with a focus on stochastic models involving branching phenomena, coalescent processes, branching random walks, random trees, and related probabilistic structures that arise both in pure mathematics and in applications such as population genetics and physical sciences. Born and educated in France, Berestycki graduated from ENSAE and Université Paris VI and earned his PhD in Probability from Université Paris VI in 2003 under the supervision of Jean Bertoin. After early academic roles in Marseille and Paris, he joined Oxford in 2014. His research contributions include influential work on branching Brownian motion, reaction–diffusion equations, and coalescent theory.

On the information-theoretic approach to geometric analysis on manifolds and Ricci flow

李向东 **Xiangdong Li**
Chinese Academy of Sciences

Key Words: Shannon entropy, Renyi entropy, curvature-dimension condition, Ricci flow

Abstract: In his 1948 seminal paper, Shannon introduced the notion of entropy power and proved the so-called entropy power inequality on Euclidean space. It plays an

important role in the information theory. In this talk, I'll present an information theoretic approach to the study of geometric analysis on manifolds and Ricci flow.

Biography:

李向东，中国科学院数学与系统科学研究院华罗庚应用数学首席研究员、中科院“百人计划”入选者，曾任中国科学院数学与系统科学研究院随机分析中心主任。1999 年博士毕业于中国科学院应用数学研究所和葡萄牙里斯本大学；2000 年至 2003 年在牛津大学数学研究所从事博士后研究；2003 年获法国图卢兹大学 Maitre de Conference 终身职位；2007 年获法国图卢兹大学“指导研究证书”(Habilitation a Diriger des Recherches)；2008-2009 年任复旦大学数学科学学院教授。2009 年 12 月至今任中国科学院数学与系统科学研究院研究员，2015 年至今兼任中国科学院大学岗位教授并主讲随机分析等课程。李向东研究员的主要研究领域为随机分析与随机微分几何，其研究成果受到国际上多名著名数学家的高度关注。

On the empty balls of critical and subcritical super-Brownian motions with general branching mechanisms

熊捷 **Jie Xiong**
Southern University of Science and Technology

Key Words: Branching random walk, super-Brownian motion, empty balls

Abstract: In this talk, I will explore various limiting behavior of the radius of the largest ball around the origin which is not occupied by a super-Brownian motion and that not by a branching random walk according to the spatial dimension as time tends to infinity. This talk is based on two joint papers with Shuxiong Zhang and Jiawei Liu.

Biography:

Professor Xiong received his bachelor's degree from Peking University in 1983 and his doctorate degree from the University of North Carolina at Chapel Hill in 1992. He joined the Department of Mathematics at the University of Tennessee in 1993 and was promoted to associate professor with tenure in 1999. He was promoted to professor in 2004. In 2012, he was invited to join the University of Macau as a tenured professor. In 2017, he joined the Department of Mathematics of Southern University of Science and Technology as a chair professor. Jie Xiong‘s research focuses on branching processes, stochastic partial differential equations, stochastic filtering and control and their applications, especially mathematical problems related to financial mathematics and biomathematics. A notable feature of his work is the combination of rigorous mathematics with practical motivations. He has published 4 books in Springer, IMS Monograph, Oxford University Press and World Science Press. He has published more than 100 academic papers in world-class journals such as Annals of Probability, Probability Theory and Related Fields, and SIAM Journal of Control and Optimization.

On the smoothness of the convex hull of multidimensional Lévy processes

Loïc Chaumont
Université d'Angers

Key Words: Lévy process, convex hull, smoothness

Abstract: Let H be the convex hull of the path of a multidimensional Lévy process up to time 1. We give sufficient conditions for the boundary of H to have no corners a.s. In dimension 2 these conditions make the boundary of H a.s. everywhere smooth. They are based on Rogozin-type integral criteria for regularity of points. We also give conditions for the boundary of the convex hull H to have a singular point a.s. Our proofs are mainly based on extensions of fluctuation identities, namely Pecherskii-Rogozin's and Fristedt's identities in higher dimension together with a subsampling approach to analyze the local behavior of Lévy processes at their extrema.

This is a joint work with Jorge González Cázares and Aleksandar Mijatović

Biography:

Loïc Chaumont completed his doctoral thesis at the University Paris 6 and defended it in 1994. He then served as an assistant professor at the same university until 2006. Since then, he has been a professor at the University of Angers (France). He was the director of the mathematics laboratory at the University of Angers from 2012 to 2016. His research focuses primarily on the theory of stochastic processes. He has studied, in particular, random walks, Lévy processes, self-similar Markov processes, and branching processes. He has also been interested in tree structures related to branching processes: Galton-Watson trees and Lévy trees.

Continuous state branching processes in a Markov additive environment

Juan Carlos Pardo
Centro de Investigación en Matemáticas A.C.

Key Words: Continuous state branching processes in random environment, exponential funcionals, Markov additive processes

Abstract: In this talk, we introduce continuous state branching processes in a Markovian additive environment and study the asymptotic behaviour of the survival and non-explosion probabilities in the case when the branching mechanism is of the form $\psi(\lambda) = c\lambda^{\alpha}$ when $\alpha \in (0, 2]$.

Biography:

Juan Carlos Pardo obtained a B.Sc. in Actuarial Science (2000) and an M.Sc. in Mathematical Sciences (2001) from UNAM, and an M.Sc. in Probability and Applications (2003) from the University of Paris VI. He received his Ph.D. in Mathematics from the same university in 2007 under the supervision of Prof. Loïc Chaumont. He held a Postdoctoral Fellowship at the University of Bath with Prof. Andreas Kyprianou.

Since 2009, he has been a researcher at CIMAT and is a Level III member of Mexico's National System of Researchers. He was a Royal Society Research Advanced Fellow (2015–2018) and David Parkin Chair (2018–2019) at the University of Bath.

His research interests include random dynamical systems, Lévy processes, self-similar processes, branching processes, random trees, stochastic games, and stochastic analysis, with recent work on stable processes and branching in random environments with applications to biology.

January 28, 2026 - Wednesday, Room A-211

Absorption rate in Flemming-Viot systems and velocity in N-BBM

Éric Brunet
ENS, PSL, CNRS, Sorbonne Université, Université Paris-Cité

Key Words: In the Flemming Viot system in one dimension, N particles diffuse with a drift towards the origin and get absorbed at the orgin. Whenever a particle is absorbed, it is reborn at the position of one of the remaining particles.

Abstract: In The N-BBM, N particles diffuse and branch at random times. Each time a branching event occurs, the leftmost particle is removed.

These two systems are, in some sense similar. In my talk, I will highlight some similarities, but also some interesting differences.

Biography:

Éric Brunet teaches physics at Sorbonne University, Paris, and works at the physics department of the École Normale Supérieure. He has worked on variants of the Fisher-KPP equation and on reaction-diffusion system such as the BBM or the N-BBM.

An introduction to self-similar Markov trees

Jean Bertoin
University of Zurich

Key Words: Self-similarity, random continuous tree, branching processes

Abstract: The purpose of the talk is to provide a gentle and informal introduction to a recent monograph written jointly with Nicolas Curien and Armand Riera on self-similar Markov trees. These form a remarkable family of random compact real trees further endowed with a decoration function and a natural finite measure; as the terminology suggests, they are self-similar objects that further satisfy a Markov branching property. Self-similar Markov trees arise as the scaling limits of a great variety of Galton-Watson processes with integer types. They encompass many random real trees that have been studied over the last decades, such as the Brownian CRT, stable Lévy trees, fragmentation trees, and growth-fragmentation trees.

Biography:

I was born in 1961 in Lyon (France). I received my PhD from the University Paris VI in 1987 under the supervision of Marc Yor.I became Professor at the University Pierre-et-Marie Curie in 1987, and I joined the University of Zurich in 2011.I also work partly at the Ecole Normale Superieure Paris. I supervised over 30 PhD students.

Self-Similar Markov Trees and applications

Nicolas Curien
Université Paris-Sud Orsay

Key Words: Random Trees, Lévy processes, self-similarity

Abstract: Self-similar Markov trees constitute a remarkable family of random Compact real trees carrying a decoration function that is positive on the skeleton. As the terminology suggests, they are self-similar objects that further satisfy a Markov branching property. They appear as scaling limits of many natural Galton--Watson trees with integer types and pop-up in various models of random planar geometry such as the Brownian sphere. In this talk, we will survey the definition and core properties of self-similar Markov trees and demonstrate their utility in two key applications:

1) to prove universality of critical exponents in catalytic variables and

2) to construct the scaling limits of leaf-growth Markov chains in the spirit

of Caraceni--Stauffer--Luczak--Winkler.

Based on joint works with A. Contat, J. Bertoin, W. Fleurat, A. Riera and D. Twigt.

Biography:

Nicolas Curien is a French mathematician and professor at Université Paris-Saclay. His research focuses on probability theory and the geometry of random structures such as planar maps and random surfaces. He is a recipient of several international prizes, and a member of several gastronomic societies.

January 29, 2026 - Thursday, Room A-211

Self-Reinforced Preferential Attachment

Frank den Hollander
Mathematisch instituut, Universiteit Leiden

Key Words: growing random graph, preferential attachment, self-reinforcement

Abstract: We consider a preferential attachment random graph with self-reinforcement. Each time a new vertex comes in, it attaches itself to an old vertex with a probability that is proportional to the sum of the degrees of that old vertex at all prior times. The resulting growing graph is a random tree whose vertices have degrees that grow polynomially fast in time. We compute the growth exponent, show that it is strictly larger than the growth exponent in the absence of self-reinforcement, and develop insight into how the self-reinforcement affects the growth.Joint work with S. Bhamidi, Y. Dahiya, R. van der Hofstad, R. Ray.

Biography:

FdH received his PhD in Mathematical Physics at the University of Leiden in 1985. From 1985 to 2005 he held assistant, associate and full professor positions at the universities of Delft, Utrecht, Nijmegen and Eindhoven. From 2005 to 2023 he was head of the probability group at the Mathematical Institute of Leiden University, where he is currently emeritus professor. Over the years he held visiting professor positions in Bangalore, Berkeley, Bonn, Erlangen, Florence, G¨ottingen, Heidelberg, Lucca, Toronto and Vancouver.

From 2000 to 2005, FdH was scientific director of the European research institute EURANDOM in Eindhoven, The Nether-lands. From 2002 to 2007, he was chair of the Scientific Programme Random Dynamics of Spatially Extended Systems of the European Science Foundation, involving 13 European countries. In 2005, he was elected to the Royal Netherlands Academy of Sciences. In 2016, he was named Knight in the Order of the Dutch Lion. In 2018, he received a Humboldt Research Award from the Alexander Humboldt Foundation.

From disordered Ising model to random walks in random environments, through products of random matrices

Giambattista Giacomin
University of Padova, Italy

Key Words: Top Lyapunov exponents, disordered systems, diffusion limits

Abstract: The plan is to give an overview of a line of research that focuses on the singular behavior of Lyapunov exponents of products of certain classes of random matrices. These random matrix models arise in several statistical mechanics models of disordered systems. Along the way, random walks in random environments naturally emerge at several levels of the analysis. Partly for reasons of time, the presentation will mostly focus on Ising models and on the so called «critical» case.

Constrained Brownian motion – Limited time outside an interval and small deviations

Franck Aurzada
Technische Universität Darmstadt

Key Words: Brownian motion, restricted occupation time, small norm

Abstract: Conditioning stochastic processes on events with zero probability (in the limit) is a powerful way to reveal new effective dynamics. Classic examples are Brownian motion conditioned on not exiting a bounded interval (which results in the taboo process) or Brownian motion conditioned to be positive (which is a 3d Bessel process). In this talk, I will discuss three instances where we impose "budget constraints" on a Brownian motion or an Ornstein-Uhlenbeck process.

First, I will discuss conditioning Brownian motion to spend only a total time s>0 outside a bounded interval. Surprisingly, in the long-time limit the process does not use any of the allowed "outside time" and converges to the taboo process. This is an extreme form of entropic repulsion.

Secondly, I will turn to conditioning Brownian motion on an atypically small L2-norm over a long time horizon - a nonlocal constraint that is not checkable "on the fly".

Finally, I will discuss the same question (atypically small L2 norm) for the Ornstein-Uhlenbeck process.

Biography:

- F.A., Martin Kolb, Dominic Schickentanz. Brownian motion conditioned to spend limited time outside a bounded interval - an extreme example of entropic repulsion. Bernoulli 2025.

- F.A.., Mikhail Lifshits, Dominic Schickentanz. Brownian motion conditioned to have restricted L_2-norm. Annales de l'Institut Henri Poincaré - Probabilités et Statistiques, to appear.

- F.A.., Mikhail Lifshits, Max Wiegand. Ornstein-Uhlenbeck process conditioned to have restricted L_2-norm. Forthcoming.

TBA

王皎皎 **Minmin Wang**
University of Sussex

Key Words: TBA

Abstract: TBA

Biography: TBA

Conditioned local limit theorems for random walks on linear groups

肖惠 **Hui Xiao**
Chinese Academy of Sciences

Key Words: local limit theorem, random walks on groups, harmonic measure

Abstract: In this talk, we begin by presenting new results on Gaussian heat kernel approximations for the persistence probability in the classical setting of sums of independent and identically distributed real-valued random variables. We then show some recent progress on conditioned local limit theorems for products of random matrices. In this setting, the proof requires the construction of a target harmonic measure, which is a key element in formulating the local limit theorem for conditioned random walks on linear groups. The main difficulty arises from analyzing the reversed random walk, whose increments depend on the entire future trajectory in the context of random walks on linear groups. To address this difficulty, we introduce a reversed sequence that can be described as a dual random walk perturbed by future observations, and develop an approach based on the finite-size approximation of these perturbations.

Biography:

Hui Xiao is an associate professor at the Academy of Mathematics and Systems Science, Chinese Academy of Sciences. His research focuses on probability theory, with particular interest on limit theorems for products of random matrices, branching random walks, random walks on groups, as well as related areas like hyperbolic dynamical systems. His research papers have been published in J. Eur. Math. Soc., Ann. Probab., Ergodic Theory Dynam. Systems, Ann. Inst. Henri Poincaré Probab. Stat., Stochastic Process. Appl., Electron. J. Probab., J. Differential Equations, J. Theoret. Probab., and Sci. China Math.

TBA

罗亮晖 **Lianghui Luo**
Université Toulouse III Paul Sabatier

Key Words: TBA

Abstract: TBA

Biography: TBA

January 30, 2026 - Friday, Room A-211

From directed polymers to spatial corrected KPZ equation in any dimensions

胡耀忠 **Yaozhong Hu**
University of Alberta

Key Words: directed polymers, KPZ equation, negative moments

Abstract: I will present a joint work with Dr. Meng Wang on the convergence from directed polymers to spatial corrected KPZ equation in any dimensions. It is well-studied about the convergence of directed polymers to stochastic heat equation in the process level in one spatial dimension. Since the Cole-Hopf transformation can relate stochastic heat equation to KPZ equation, we expect that the same transformation of the directed polymer will converge to the KPZ equation. One of the main difficulties for this to be true is the uniform boundedness of negative moments, which is always a difficult problem in probability theory. In this talk I will present our recent progress on this negative moment problem, which yields the convergence to KPZ in process level. In fact, much of our effort is also devoted to the extension to multi-dimension as well.

Biography:

Yaozhong Hu got his Ph.D in 1992 at University of Strasbourg, France under the supervision of Paul Andre Meyer and is now a professor from 2017 at University of Alberta, Canada. From 1997 to 2017 he is an assistant professor, associate professor and full professor at University of Kansas.

Branching random walks with exponentially decreasing steps

王龙敏 **Longmin Wang**
Nankai University

Key Words: Stochastically self-similarmeasure, branching Brownian motion, hyperbolicplane

Abstract: We consider a branching random walk on the real line whose step size decreasesby a fixed factor at each generation. This process exhibits a natural connection tobranching Brownian motion onthe hyperbolic plane, and generates astochastically self-similar measure.We discuss the dimension of this measure andconclude with several open questions.

Biography:

Longmin Wang is a professor at School of Statistics and Data Science, Nankai University. His research is focused on random walks and statistical physics models on groups, potential theory for non-local operators, etc.

Some properties of the Derrida-Retaux recursive system

陈新兴 **Xinxing Chen**
Shanghai Jiao Tong University

Key Words: Derrida-Retaux recursive system, free energy, critical behavior

Abstract: We consider a simple max-type recursive model which was introduced in the study of depinning transition in presence of strong disorder, see Derrida-Retaux (JSP 2014) and Collet-Eckmann-Glaser-Martin (CMP1984). Our interest is focused on the critical regime and the nearly supercritical regime, for which we study the free energy, the sustainability probability and the moment generating function.

Biography:

Xinxing Chen, Professor, School of Mathematical Sciences, Shanghai Jiaotong University. Xinxing Chen obtained his PhD in 2007 from Fudan University. Subsequently, he completed a postdoctoral research at Peking University from 2007 to 2009. Since 2009, he has been working at Shanghai Jiao Tong University. During 2012–2013, he was a visiting scholar at the University of British Columbia in Canada. His research focuses on the field of random walks, random graphs and related topics. His works have been published in academic journals such as AOP, PTRF, AIHP, and Sci China Math.

Titles and Abstracts

Room A-110

January 26, 2026 - Monday, Room A-110

Bergman kernels and equidistribution for sequences of line bundles on Kahler manifolds

麻小南 **Xiaonan Ma**
Nankai University

Key Words: Bergman kernel, equidistribution

Abstract: We will review first the story on Bergman kernel. Given a sequence of positive Hermitian holomorphic line bundles (L_p, h_p)on a Kähler manifold X, we establish the asymptotic expansion of the Bergman kernel of the space of global holomorphic sections of L_p, under a natural convergence assumption on the sequence of curvatures $c_1(L_p, h_p)$. We then apply this to study the asymptotic distribution of common sets zeros of random sequences of m-tuples of sections of L_p as $p \to +\infty$.

Biography:

麻小南 , 现为南开大学讲席教授，国际数学家大会（ICM）报告人。麻小南的主要研究领域为微分几何、复几何以及拓扑。他尤其专注于流形上的指标理论以及整体分析的研究，主要研究 eta 不变量和解析挠率的解析、微分 - 拓扑性质，椭圆亏格，Bergman 核，几何量子化以及相关课题。麻小南与张伟平曾运用解析局部化的思想和技巧，解决了法国科学院院士 Vergne 在 2006 年国际数学家大会全会报告中提出的非紧空间上的几何量子化猜想。麻小南曾多次获得国际大奖：2006 年西班牙费兰 · 苏涅尔 · 巴拉格尔（Ferran Sunyer i Balaguer）奖、2017 年法国科学院索菲 · 热尔曼（Sophie Germain）年度大奖、2022 年德国 盖 · 吕萨克 — 洪堡（Gay-Lussac–Humboldt）奖。

Transport map, sampling, zero-order optimization algorithm

张希承 **Xicheng Zhang**
Beijing Institute of Technology

Key Words: Transport map, sampling, zero-order optimization algorithm

Abstract: We present a unified theoretical and computational framework for constructing stochastic transport maps between probability distributions using diffusion processes. First, we show that the time-marginal distribution of the sum of two independent diffusion processes obeys a Fokker-Planck equation. Using this result and the Ambrosio-Figalli-Trevisan superposition principle, we establish the existence and uniqueness of solutions to the associated stochastic differential equation (SDE). Building on these theoretical results, we introduce a novel method for constructing stochastic transport maps between arbitrary distributions via dynamical ODEs/SDEs. Our framework generalizes and unifies a broad class of diffusion-based generative models while introducing new sampling techniques. Moreover, we derive convergence rates for particle approximations of the underlying SDEs, offering rigorous guarantees for practical implementations. Basing on this, we also devise a zero-order optimization algorithm.

Biography:

张希承，北京理工大学数学与统计学院教授。研究方向主要为随机分析及其应用。2013 年获国家自然科学基金杰出青年项目资助，2016 年获教育部"长江学者"特聘教授。

Quantitative homogenization for long range random walks in dynamic random environments

陈振庆 **Zhenqing Chen**
University of Washington

Key Words: Long range random walk; dynamic random environment; stochastic homogenization; stable-like process; regional parabolic equation; multi-scale Poincare inequality

Abstract: In this talk, I will present quantitative homogenization results for stable-like long range random walks in time-dependent random conductance models, where the conductance is bounded above but can be degenerate. Based on joint work with X. Chen, T. Kumagai and J. Wang.

Biography:

Zhen-Qing Chen is a Professor of Mathematics at the University of Washington. His research is in probability theory and its applications, with particular emphasis on stochastic analysis, Markov processes, Dirichlet form theory, potential theory, diffusion and anomalous subdiffusions, stochastic processes in random environments, stochastic optimal control, and probabilistic methods in analysis and partial differential equations. He is an elected Fellow of the American Mathematical Society (AMS) and the Institute of Mathematical Statistics (IMS). In 2019, he was awarded the Itô Prize by the Bernoulli Society for Mathematical Statistics and Probability. Since 2015, he has served as the Editor-in-Chief of Potential Analysis, an international journal dedicated to the interplay among potential theory, probability theory, geometry, and functional analysis.

Approximate factorizations of non-symmetric jump processes

宋仁明 **Renming Song**
University of Illinois Urbana-Champaign

Key Words: Markov Processes, heat kernel estimates, regional fractional Laplacian

Abstract: In this talk, I will talk about a recent paper with Soobin Cho. In this paper, we first extend the approximate factorization for purely discontinuous Markov processes established by Cho-Kim-Song-Vondracek in 2020 by getting rid of some of the conditions. Then we apply the approximate factorization to obtain two-sided heat kernel estimates for three classes of processes: stable-like processes with stable killings in $C^{1,Dini}$ open sets; killed stable-like processes in the setting of the recent preprint by Kim-Weidner in $C^{1,\epsilon}$ open sets; and non-symmetric stable processes in what we call $C^{1,2-Dini}$ open sets. In particular, we obtain explicit sharp two-sided heat kernel estimates of killed $_\alpha$-stable processes in $C^{1,Dini}$ open sets for all $\alpha \in (0,2)$ and of censored $_\alpha$-stable processes in $C^{1,Dini}$ open sets for $\alpha \in (1,2)$.

Biography:

Renming Song got his PhD from the University of Florida in 1993. After spending a year in

Northwestern University and three years at the University of Michigan, he joined the University of Illinois Urbana-Champaign, where he is now professor of mathematics. His main research interests are Markov processes, potential theory, branching processes and stochastic analysis.

TBA

Arvind Singh
CNRS et Université Paris-Saclay

Key Words: TBA

Abstract: TBA

Biography: TBA

The largest fragment in self-similar fragmentation processes

Sandra Palau

Key Words: Self-similar, fragmentation, branching process

Abstract: In this talk we analyse the asymptotic behaviour of the largest and smallest fragment in self-similar fragmentation processes, which are stochastic processes modelling the evolution of an object breaking apart as time passes. To describe this behaviour, we will relate the log-sizes of the fragments to a time-changed branching process.

This is joint work with Samuel Johnston, Piotr Dyszewski, and Joscha Prochno.

Biography:

Sandra Palau is a researcher and the Chair of the Department of Probability and Statistics at IIMAS, UNAM (Mexico). She did her PhD at CIMAT under the supervision of Juan Carlos Pardo and Andreas Kyprianou.

Her research include branching process, random environment, self-similar Markov processes, Lévy processes, mathematical biology and coalescent processes.

January 27, 2026 - Tuesday, Room A-110

Noncommutative multiplicative cascades

Alain Rouault
Université Paris-Saclay

Key Words: Cascades, random matrices, smoothing transform

Abstract: In 2021, I. McKeague introduced a model of noncommutative cascades as a nice generalization of scalar Mandelbrot cascades in the context of free probability. In this talk we give a slight generalization of this and fills up a missing link at the random matrix level (joint work with Quansheng Liu).

Biography:

Alain Rouault, professor of Université de Versailles-Saint-Quentin.

Personal data:

Born April 30, 1949 in Rennes (France).

Nationality : French

Married, 2 children, 5 grand-children

Personal address : 113 rue de la Glacière, 75013-Paris

Studies:

Ecole Normale Supérieure de Cachan (1968-1972)

Agrégation 1971

Thèse de Troisième Cycle (1972) Paris XI-Orsay

Thèse d'Etat (1986) Paris XI-Orsay

Positions:

Assistant and Maître de Conférences Paris-XI (1972-1987).

Professor Université Le Havre (1987-1992)

Professor Université Versailles Saint-Quentin (UVSQ) Secund Class (1992-1998), First Class (1998-2011),

Emeritus since 2011.

Other position : 1976-1978 : Professor at the Universidad Autónoma Metropolitana in México..

On the maximal displacement of critical branching random walk in random environment

洪文明 **Wenming Hong**
Beijing Normal University.

Key Words: Branching random walk/Random environment/Maximal displacement

Abstract: We consider the maximal displacement of critical branching random walk in random environment. Let M_n be the maximal displacement of a particle in generation n , and Z_n be the total population in generation n, M be therightmost point ever reached by the branching random walk. Under somereasonable conditions, we prove a conditional limit theorem:$\mathcal{L}\left(\sigma^{-1/2}n^{-3/4}M_n \mid Z_n > 0\right) \xrightarrow{d} \mathcal{L}\left(A_\Lambda\right)$, Where random variable A_Λ is related to a standard Brownian meander. And there exist some positive constants C_1 and C_2, such tha $_{\mathrm{t}} C_1 \leqslant \liminf_{x\to\infty} x^{-2/3}\P(M > x) \leqslant \limsup_{x\to\infty} x^{-2/3}\P(M > x) \leqslant C_2$. Compared with the constant environment case (Lalley and Shao (2015)), it reveals that, the conditional limit speed for M_n in random environment(i.e., $n^{3/4}$) is significantly greater than that of constant environment case(i.e., $n^{1/2}$), and so is the tail probability for M (i.e., $x^{-2/3}$ vs x^{-2}). Our method is based on the path large deviation for the reduced critical branching random walk in random environment. This is a joint work with Wenxin Fu.

Biography:

洪文明，理学博士，北京师范大学数学学院教授。研究方向为马尔可夫过程，主要涉及随机环境中的随机游动，分枝过程以及分枝随机游动等方面。

Limit theorems for products of positive random matrices and applications to multitype branching processes in random environments.

刘全升 **Quansheng Liu**
University of South Brittany (Université de Bretagne-Sud, France)

Key Words: Products of random matrices, limit theorems, multitype branching processes

Abstract: In this talk, I will present recent progress on limit theorems for products of positive random matrices, with applications to multitype branching processes in random environments. Specifically, I will discuss convergence rates in central limit theorems, convergence to stable laws, stable convergence and moment estimates.

(Based on joint papers with Ion Grama, Jianzhang Mei, Thi Trang Nguyen, and Hui Xiao.)

Biography:

Quansheng Liu is currently a Full Professor of Exceptional Class at the University of South Brittany (Université Bretagne Sud, France). He served as Director of the Laboratory of Mathematics at the University of South Brittany from 2007 to 2013 and from 2017 to 2022. He was project leader and head (Directeur d'Études) for the DESS “Modélisation, Simulation, Optimisation” and the Master in Mathematics and Applications of Mathematics, from 2002 to 2012. He has been a

recipient of the French Research and Doctoral Supervision Award (PEDR / PES) several times.

He received his B.S. (1984) and M.S. (1987) degrees in Mathematics from Wuhan University, and his Ph.D. in Probability from Université Paris 6 in 1993, under the supervision of Prof. Yves Guivarc'h.. He was Maître de Conférences at the University of Rennes 1 from 1993 to 2000 , and has been a professor in the University of South Brittany since 2000.

His research interests include probability theory and image processing. He has published over 100 research articles in journals such as Journal of the European Mathematical Society, Probability Theory and Related Fields, Annals of Probability, Annals of Applied Probability, IEEE Transactions on Image Processing, Journal of Scientific Computing, among others.

Self-interacting random walks beyond exchangeability

Pierre Tarres
NYU Shanghai

Key Words: Reinforced random walks

Abstract: We discuss a new approach for the quantitative analysis of once-reinforced random walks (ORRW) on general graphs, based on a novel change of measure formula.

This approach enables us to prove that ORRW is transient on all non-amenable graphs for small reinforcement, and to obtain large deviations estimates for the range of the walk to have cardinality of the order $N^{\frac{d}{d+2}}$ in dimension larger than or equal than two.

Finally, we present new local time formulas for a general self-interacting random walks, including random walks in random environment and general reinforced processes on oriented graphs.

Biography:

Pierre Tarrès is NYU Shanghai's Associate Provost for Strategic Initiatives. He is working on the university strategy on research and on the graduate school, and on the collaboration across programs and disciplines. He is also the Co-Director of the NYU-ECNU Institute of Mathematical Sciences at NYU Shanghai.Pierre Tarrès pursued his studies at the École Normale Supérieure de Paris, where he graduated with a Master's in Mathematics in 1998. He also holds a Master's in the field of Mathematics of Artificial Intelligence and a PhD in Mathematics from the École Normale Supérieure Paris-Saclay. He joined us in 2016, initially in a visiting position. Since 2020 he is a Professor of Mathematics at NYU Shanghai, and an Associated Professor at the Courant Institute of Mathematical Sciences in New York. He was a Research Director at the National Center for Scientific Research (CNRS) in Paris from 2014 to 2016, and an Associate Professor at the University of Oxford from 2005 to 2014. Prof. Tarrès is an expert on self-interacting random processes, particularly reinforced random walks, and their relationship with stochastic algorithms and learning processes in game theory. He was awarded a Leverhulme Prize in 2006, the Prix des Annales de l'Institut Henri Poincaré in 2008. He has been an Associate Editor at the Annals of Applied Probability since 2019.

Self-Interacting Random Walks beyond exchangeability

Andrea Collevecchio
Monash University

Key Words: Once-reinforced Random walks, local time density, large deviations.

Abstract: We present the first rigorous quantitative analysis of once-reinforced random walks (ORRW) on general graphs, based on a novel change of measure formula. This enables us to prove large deviations estimates for the range of the walk to have cardinality in dimension larger than or equal than two. We also prove that ORRW is transient on all non-amenable graphs for small reinforcement. Moreover, we study the shape of oriented ORRW on euclidean lattices.

We also provide a new approach to the study of general self-interacting random walk, which we apply to random walk in random environment, reinforced processes on oriented graphs, including the directed ORRW. Joint work with Pierre Tarrès.

Biography:

I obtained my Phd in Statistics (2004), Purdue University. My expertise is in probability and its applications to physics, game theory, networks.

Research Opportunities

2004-2005 Post-doc in probability at the University Chieti-Pescara.

2005-2006 Post-doc at Leipzig University.

2006-2012 Assistant Professor (tenured) in the Applied Mathematics Department of University Ca'Foscari- Venice, School of Economics.

2012-2015 Research Fellow at the School of Mathematics at Monash University.

2015-2020 Senior Lecturer, School of Mathematics Monash.

2020 - 2025 Associate Professor, School of Mathematics Monash.

2025 - Professor, School of Mathematics Monash.

Research My work lies in the intersection between Probability, Analysis and Mathematical Physics. I worked on problems related to long-memory processes, systems of interacting particles, mixing time for Markov chains, and the geometry of Nash Equilibria in random games.

Relation between the geometry of sign clusters of the 2D GFF and its Wick powers

Titus Lupu
Sorbonne Université

Key Words: Gaussian free field; Wick renormalization; Brownian motion

Abstract: In 1990 Le Gall showed an asymptotic expansion of the epsilon-neighborhood of a planar Brownian trajectory (Wiener sausage) into powers of 1/|log eps|, that involves the renormalized self-intersection local times. In my talk I will present an analogue of this in the case of the 2D GFF. In the latter case, there is an asymptotic expansion of the epsilon-neighborhood of a sign cluster of the 2D GFF into half-integer powers of 1/|log eps|, with the coefficients of the expansion being related to the renormalized (Wick) powers of the GFF.

Biography:

Titus Lupu is a CNRS researcher at Sorbonne Université in Paris, since 2018. He obtained his Ph.D. in Mathematics at Université Paris-Sud, Orsay, in 2015, under the direction of Prof. Yves Le Jan. From 2015 to 2017 he was a Junior Fellow at the Institute for Theoretical Studies at ETH Zurich. Titus Lupu works in Probability Theory. He is interested in the Gaussian free field, Brownian

motion, SLE processes, long-range percolation models, logarithmically correlated fields and Wick renormalization.

The infection tree

Igor Kortchemski
CNRS & DMA, ENS, PSL

Key Words: Random trees, scaling limits, Bienaymé Galton-Watson-Trees

Abstract: An SIR epidemic does not only have a curve - it has a genealogy. From patient zero, we build the infection tree (the "who-infected-whom" network) and investigate its geometry, in particular its height. Joint work with Emmanuel Kammerer and Delphin Sénizergues.

Biography:

Igor Kortchemski is a CNRS researcher based at École Normale Supérieure in Paris. His main interests focus on scaling limits of various discrete combinatorial random structures such as random trees and random maps, with connections to statistical physics. In his spare time, he enjoys latte art, wingfoiling and molecular mixology.

January 28, 2026 - Wednesday, Room A-110

Hitting probabilities, thermal capacity, and Hausdorff dimension results for the Brownian sheet

肖益民 **Yimin Xiao**
Michigan State University

Key Words: The Brownian sheet, hitting probability, thermal capacity.

Abstract: Let $W = \{W(t) : t \in \mathbb{R}^N_+\}$ be an (N, d)-Brownian sheet and let $E \subset (0, \infty)^N$ and $F \subset \mathbb{R}^d$ be compact sets. We prove a necessary and sufficient condition for $W(E)$ to intersect F with positive probability and determine the essential supremum of the Hausdorff dimension of the intersection set $W(E) \cap F$ in terms of the thermal capacity of $E \times F$. These results extend the seminal work of Khoshnevisan and Shi (1999) for the Brownian sheet and the results of Khoshnevisan and Xiao (2015) for Brownian motion. This is joint work with Cheuk Yin Lee.

Biography:

Yimin Xiao is an MSU Research Foundation Professor in Statistics and Probability at Michigan State University. He received his Ph.D. from the Ohio State University in 1996. After completing his postdocs at the University of Utah and Microsoft Research, he joined Michigan State University in 2000. His research interests include random fields, Gaussian and Lévy processes, stochastic partial differential equations, extreme value theory, random fractals, and statistical analysis of spatial and spatio-temporal models. He has published about 160 articles in peer-reviewed journals.

TBA

王健 **Jian Wang**
Fujian Normal University

Key Words: TBA

Abstract: TBA

Biography: TBA

Regularization by Noise

刘伟 **Wei Liu**
Jiangsu Normal University

Key Words: Navier-Stokes equations; regularization; well-posedness

Abstract: This talk focuses on the global existence, uniqueness and the Feller property for a class of stochastic partial differential equations with suitable nonlinear noise, while the corresponding deterministic equations may only have local solutions. In particular, we discover a new phenomenon

that for a potentially explosive deterministic system, an appropriate intervention of nonlinear noise can not only prevent blow-up but also lead to the finite time extinction of the associated stochastic system. Our main results have various applications, including not only all locally monotone stochastic equations in the variational framework, but also several new models such as stochastic 3D Navier-Stokes equations, stochastic p-Laplace equations with heat sources, stochastic quasi-geostrophic equations and stochastic surface growth models.

Biography:

Liu Wei, Professor at the School of Mathematics and Statistics, Jiangsu Normal University. His primary research focuses on stochastic analysis and stochastic partial differential equations. He has published one English monograph with Springer and over 50 research papers in peer-reviewed journals such as Math. Ann., PTRF, AAP, JFA and SIMA. He has been honored with the Second Prize of Natural Science Award of the Ministry of Education, the Jiangsu Outstanding Mathematical Achievement Award, and the Youth Science and Technology Award of Jiangsu Province.

January 29, 2026 - Thursday, Room A-110

TBA

陈增敬 **Zengjing Chen**
Shandong University

Key Words: TBA

Abstract: TBA

Biography: TBA

The Brownian Marble

Andreas Kyprianou
University of Warwick

Key Words: Fragmentation-coalescence, Brownian Web, Bessel Processes

Abstract: Fundamentally motivated by the two opposing phenomena of fragmentation and coalescence, we introduce a new stochastic object which is both a process and a geometry. The Brownian marble is built from coalescing Brownian motions on the real line, with further coalescing Brownian motions introduced through time in the gaps between yet to coalesce Brownian paths. The instantaneous rate at which we introduce more Brownian paths is given by λ/g^2 where g is the gap between two adjacent existing Brownian paths. We show that the process "comes down from infinity" when $0 < \lambda < 6$ and the resulting space-time graph of the process is a strict subset of the Brownian Web on $\mathbb{R}x[0,\infty)$. When $\lambda \geq 6$, the resulting process "does not come down from infinity" and the resulting range of the process agrees with the Brownian Web.

Biography:

Andreas Kyprianou is a professor of probability at the Department of Statistics, University of Warwick. At Warwick, he is also director of the Centre for Applications of Mathematical and Computing Sciences. He moved to this position in 2023 following nearly 17 years at the University of Bath. Whilst at Bath he founded and grew the Probability Laboratory (Prob-L@B) and led the doctoral centre Statistical Applied Mathematics at Bath (SAMBa) for ten years. He also served as Director of the Institute of Mathematical Innovation at Bath for three years.

The strong law of large numbers and a functional central limit theorem for general Markov additive processes

Victor Rivero
the Center of Research in Mathematics in Guanajuato, Mexico

Abstract: In this talk we will revisit the fundamental question of the strong law of large numbers

and central limit theorem for processes in continuous time with conditional stationary and independent increments. For convenience we refer to them as Markov additive processes, or MAPs for short. Historically used in the setting of queuing theory, MAPs have often been written about when the underlying modulating process is an ergodic Markov chain on a finite state space. Recent works have addressed the strong law of large numbers when the underlying modulating process is a general Markov processes. We add to the latter with a different approach based on an ergodic theorem for additive functionals and on the semi-martingale structure of the additive part. This approach also allows us to deal with the setting that the modulator of the MAP is either positive or null recurrent. The methodology additionally inspires a Functional Central Limit Theorem-type result.

Biography:

Víctor Rivero is a mathematician working in the Department of Probability and Statistics in the Center of Research in Mathematics in Guanajuato (CIMAT), Mexico. He obtained his PhD in the University Paris VI, Pierre et Marie Curie, in France, in 2004. His research interest are diverse and include: fluctuation theory of real valued Lévy processes and of Markov additive processes, stable processes and self-similar Markov processes, excursion theory of Markov processes, branching processes, and regenerative sets.

Victor maintains a rich collaboration with colleagues from France and from the UK. He has served as associate editor and reviewer in several of the leading journals in the world, and since 2025 he is Editor in chief of ALEA. For the period 2017-2022 he served as Director of CIMAT.

https://sites.google.com/view/victor-rivero/welcome?authuser=0

Convergence to the Brownian CRT for critical branching Markov processes

Emma Horton
University of Warwick

Key Words: Non-local branching processes, criticality, Brownian continuum random tree, metric measure spaces

Abstract: In this talk, I will present a recent result that establishes a universal scaling limit for critical finite variance branching processes. Precisely, we will see that the genealogical tree associated with such a branching processes, when viewed as a random compact metric measure space, converges under rescaling to the Brownian continuum random tree. This is based on joint work with Ellen Powell.

TBA

Jesús Contreras
Beijing Institute of Technology

Key Words: TBA

Abstract: TBA

Biography: TBA

TBA

William Da Silva
Universitat Wien

Key Words: TBA

Abstract: TBA

Biography: TBA

TBA

王诚石 **Chengshi Wang**
Fudan University

Key Words: TBA

Abstract: TBA

Biography: TBA

January 30, 2026 - Friday, Room A-110

Random walk on dynamical percolation

Yuval Peres
Beijing Institute of Math. Sciences and Applications (BIMSA)

Abstract: In Dynamical Percolation each edge is open with probability p, refreshing its status at rate $r > 0$. This process was introduced in the 1990s by Haggstrom, Steif and the speaker, motivated by a question of Malliavin. Remarkable results on exceptional times in two dimensions were obtained by Schramm, Steif, Garban and Pete.

We study random walk on dynamical percolation in the d dimensional lattice, where the walk moves along open edges at rate 1. In the critical regime $p = p_c$, we prove that if $d = 2$ or $d > 10$, then the mean squared displacement is $O(tr^a)$ where $a = a(d) > 0$. For $p > p_c$, we prove that the mean squared displacement is of order t, uniformly in $0 < r < 1$, refining earlier results obtained by the speaker with Sousi and Steif. We also analyze the rate of escape on nonamenable groups. I will show simulations to illustrate the process. (Joint work with Chenlin Gu, Jianping Jiang, Zhan Shi, Hao Wu and Fan Yang.)

Biography:

Yuval Peres was a Professor in Jerusalem and Berkeley and a Principal researcher at Microsoft. In 2023, he joined the Beijing Institute of Mathematical Sciences and Applications. He has written 350 papers, four of them with Zhan Shi. He co-authored books on Markov chains, probability on graphs, game theory and Brownian motion. He is a recipient of the Rollo Davidson prize and the Loeve prize. He has mentored 21 PhD students including Elchanan Mossel, Jian Ding and Balint Virag. He was an invited speaker at the 2002 ICM in Beijing, at the 2008 European Math congress, and at the 2017 Math Congress of the Americas. In 2016, he was elected to the US National Academy of Science.

A shuffle invariance of the uniform infinite d-Catalan tree

向开南 **Kainan Xiang**
Xiangtan University

Key Words: 洗牌不变性，一致无穷 d-Catalan 树，雅可比猜想

Abstract: E. Bisi, P. Dyszewski, N. Gantert, S. G. G. Johnston, J. Prochno and D. Schmid [(2023). Random planar trees and the Jacobian conjecture. arXiv:2301.08221v3 [math.CO], Preprint.] 提出了如下进攻雅可比猜想（The Jacobian Conjecture）的组合途径和概率途径： （1）若存在自然数使得对所有的自然数，在足够大的 -Catalan 树构成的集合上，常数函数 1 属于由所有 - 洗牌类的示性函数生成的线性空间；则雅可比猜想成立。（2）若存在自然数使得对所有的自然数，在足够大的 -Catalan 树上存在一个以一致 (均匀) 分布为不变分布的 - 洗牌 Markov 链；则雅可比猜想成立。若此概率途径可行，则一致无穷 -Catalan 树在某非平凡 - 洗牌作用下应具有不变性；我们确认一致无穷 -Catalan 树具有这个有其自身独立价值的性质，从而在一定意义上支持了所论概率途径（但并不表明其真的可行）。此外，我们提出且讨论几个相关的组合问题、概率问题。雅可比猜想由德国数学家 Ott-Heinrich Keller 于 1939 年提出： 上任意

的其雅可比行列式是非零常数的多项式映射是可逆的且其逆仍是多项式映射。作为数学（特别地，代数几何）中十分杰出的公开问题，雅可比猜想被 Steve Smale 在 1998 年列为给 21 世纪的 18 个数学问题之一；它等价于（关于 Weyl 代数的）Dixmier 猜想、（关于 Poisson 代数的）Poisson 猜想、（关于交换环和交换代数的）单模猜想。

Biography:

向开南，1993 年 6 月本科毕业于湘潭大学数学系；1993.9-1996.6 在北京师范大学数学系读硕士；1996.9-1999.6 在中国科学院应用数学研究所读博士；1999.7-2001.6 在北京大学数学科学学院做博士后；2001 年 6 月博士后出站后进入湖南师范大学工作；2007 年 3 月调往南开大学；2019 年 3 月回湘潭大学工作；当前研究兴趣是群和图上的概率与几何 (渗流、Ising 模型、随机图、概率组合、随机游走、几何群论、无穷图论)。

Strong law of large numbers for a function of the local times of a transient random walk on groups

常寅山 **Yinshan Chang**
Sichuan University

Key Words: random walk, local time, strong law of large numbers

Abstract: We present the strong law of large numbers for a function of the local times of a transient random walk on groups, confirming a conjecture in the paper of Asymontand Korshunov for random walks on the integer lattice Z_d. The proof is mainly based on the subadditive ergodic theorem.

Biography:

The speaker is an associate professor at Sichuan University. He is mainly interested in discrete probability models like random walks, percolations and spin models.