INVITED SPEAKERS (alphabetic order)

Sung-Soo Byun	Seoul National University
Van Hao Can	Vietnam Academy of Science and Technology
Yu-Ting Chen	University of Victoria
Yuki Chino	National Yang Ming Chiao Tung University
Bruno Hideki Fukushima-Kimura	Hokkaido University
Jack Hanson	City College of New York
Masato Hoshino	Osaka University
Po-Han Hsu	National Sun Yat-Sen University
Naotaka Kajino	Kyoto University
Yoshinori Kamijima	Toyo University
Noe Kawamoto	National Center for Theoretical Sciences
Ildoo Kim	Korea University
Kunwoo Kim	Pohang University of Science and Technology (POSTECH)
Kyung-Youn Kim	National Chung Hsing University
Yong-Woo Lee	Seoul National University
Sungbin Lim	Korea University
Luca Makowiec	National University of Singapore
Kouhei Matsuura	University of Tsukuba
Hirotatsu Nagoji	Kyoto University
Shuta Nakajima	Meiji University
Makoto Nakashima	Nagoya University
Kohei Noda	Kyushu University
Pierre Nolin	City University of Hong Kong
Wei Qian	City University of Hong Kong
Akira Sakai	Hokkaido University
Hayate Suda	Tokyo Institute of Technology
Rongfeng Sun	National University of Singapore
Li-Cheng Tsai	University of Utah
Satomi Watanabe	City University of Hong Kong
Bin Xie	Shinshu University

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- Institute of Mathematics, Academia Sinica

Taiwan Probability Workshop 2024

June 3 to 7, Auditorium, 6F, Institute of Mathematics, Academia Sinica, Taipei, Taiwan

The workshop aims to build a tighter connection in the community, inviting speakers from various stages of career. Topics include disorder systems, as well as SPDEs and heat kernels.

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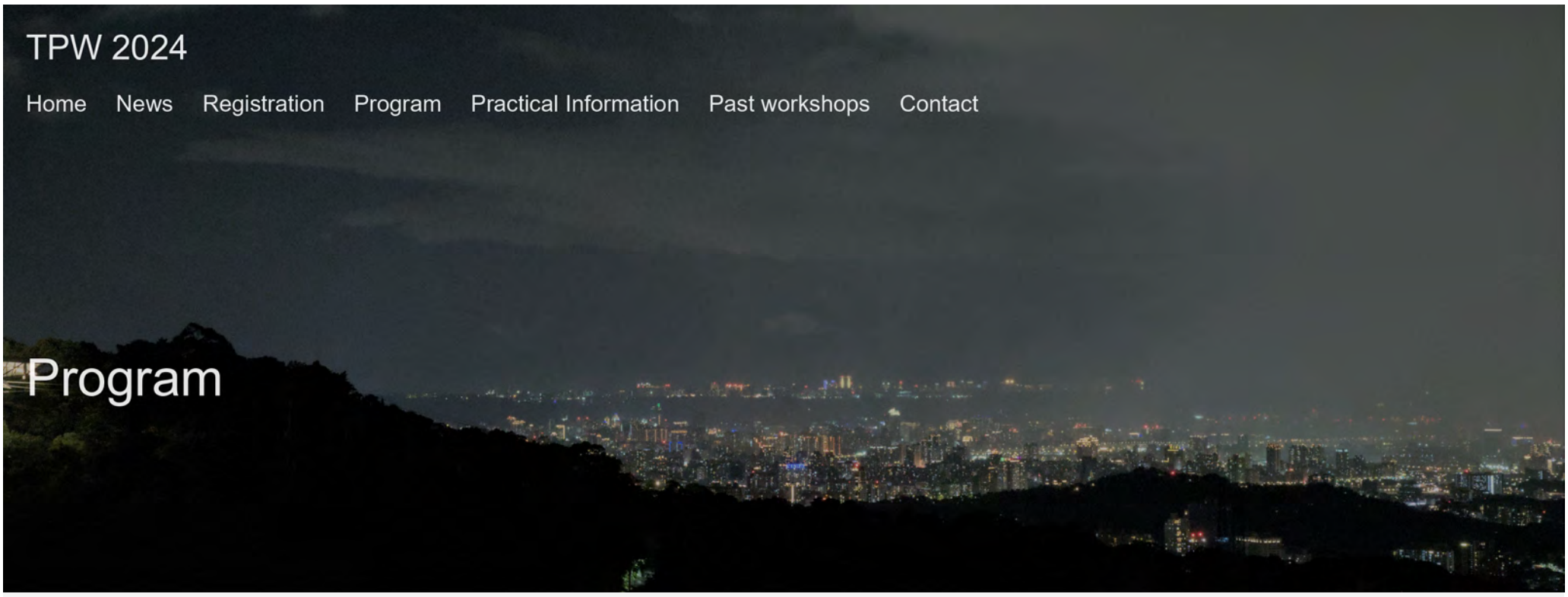

Schedule

You may click on the name of each speaker to see the detail of the talk, and click on ^ to come back to the workshop schedule.

	June 3 Monday	June 4 Tuesday	June 5 Wednesday	June 6 Thursday	June 7 Friday
9:00 - 9:30	Registration 9:20 - 9:30 Opening	Registration			
Morning chair	*Kumagai*	*Chino*	*Sheu*	*Kusuoka*	*Kyung-Youn Kim*
9:30 - 10:05	Kamijima	Nolin	Noda	Chen	Ildoo Kim
10:05 - 10:35	Tea Break	Tea Break	Tea Break	Tea Break	Tea Break
10:35 - 11:10 11:15 - 11:50	Kawamoto Suda	Can Hanson	Byun Lee	Hoshino Nagoji	Hsu Kunwoo Kim
11:50 - 13:45	Lunch				
Afternoon chair	*Hwang*	*Nolin*	*Free afternoon*	*Panki Kim*	*Ildoo Kim*
13:45 - 14:20 14:25 - 15:00	Chino Makowiec	Qian Sun		Watanabe Kyung-Youn Kim	Xie Lim
15:00 - 15:30	Tea break	Tea break		Tea break	Tea break
15:30 - 16:05 16:10 - 16:45	Nakajima 16:10 - 16:55 Sakai Fukushima-Kimura	Tsai Nakashima		Kajino Matsuura	Discussion
	17:30 - Reception			18:00 - Banquet	

Titles and Abstracts

Speaker: Sung-Soo Byun (Seoul National University) ^
Date: Wednesday, June 5
Time: 10:35 – 11:10
Title: Free energy expansion of two-dimensional determinantal and Pfaffian Coulomb gases
Abstract
The asymptotic expansion of the partition function stands as one of the cornerstones in Coulomb gas theory, as the coefficients of this expansion provide essential potential-theoretic as well as conformal geometric properties of the model. I will present recent progress on this expansion in the context of determinantal and Pfaffian Coulomb gases, for which we can make use of the integrable structure as well as techniques from random matrix theory.

Speaker: Van Hao Can (Vietnam Academy of Science and Technology) ^
Date: Tuesday, June 4
Time: 10:35 – 11:10
Title: Subdiffusive concentration for the chemical distance in Bernoulli percolation
Abstract
Considering supercritical Bernoulli percolation on the integer lattice, Garet and Marchand proved a diffusive concentration for the graph distance. We aim to refine this result by establishing a concentration inequality on a subdiffusive scale. Our approach is inspired by similar work in first-passage percolation by Damron, Hanson, and Sosoe, combined with new tools to address the infinite weight of the model. Based on joint work with Nguyen Van Quyet.

Speaker: Yu-Ting Chen (University of Victoria) ^
Date: Thursday, June 6
Time: 9:30 – 10:05
Title: Non-Gaussian stochastic path integrals
Abstract
R. Feynman’s path integral expresses the probability amplitude of a quantum mechanical system as a “sum of trajectories” of the classical system. Since this integral has not been given a satisfactory mathematical meaning, a widely accepted treatment is M. Kac’s method, which starts with the idea of rotating "real time" to "imaginary time." The corresponding path integrals are stochastic, given by exponential functionals of Brownian motion.

This talk will overview a Feynman–Kac-type formula given by a non-exponential multiplicative functional of a non-Gaussian diffusion process. The formula represents the many-body delta-Bose gas in two dimensions, extending technically the two-body case obtained earlier. A significant part of the talk will introduce the two-body case, the simplest case and one of the building blocks of the many-body case.

Speaker: Yuki Chino (National Yang Ming Chiao Tung University) ^
Date: Monday, June 3
Time: 13:45 – 14:20
Title: A characterisation of symmetric environment for RWRE
Abstract
Random Walk in Random Environment (RWRE) was introduced in biophysics to understand the behaviour of DNA chain in its replication. In mathematical literature, Solomon first proved the sufficient condition for recurrence. RWRE in the recurrent regime, sometimes called Sinai’s walk, shows some anomalous asymptotic behaviour. In this talk we will consider a characterization of symmetric environment via annealed moments condition. This talk is based on a joint work with C. da Costa (Durham University).

Speaker: Bruno Hideki Fukushima-Kimura (Hokkaido University) ^
Date: Monday, June 3
Time: 16:10 – 16:55
Title: Mathematical foundation of ground-state search MCMC methods II. Applications
Abstract
Combinatorial optimization problems, such as the famous traveling salesman problem and the max-cut problem, are ubiquitous in various fields of practical and theoretical interest. One approach to tackle those problems is to use an Ising model whose Hamiltonian H takes its minimum at a spin configuration, called a ground state, which corresponds to an optimal solution to the corresponding original problem. Standard MCMC methods, such as the Glauber dynamics and the Metropolis algorithm, have been used to sample the Gibbs distribution, which is proportional to $e^{-H/T}$, hence close to the uniform distribution over the ground states when the temperature T is close to zero. However, those MCMC methods are based on single-spin flip rules, hence prone to being slow.

Akira Sakai and I will explain three other MCMC methods, two among which are based on multi-spin flip rules, hence potentially fast. In the second part, I will show the theoretical results that support the application of our methods in practice and the contributions of our results to engineering and computer science.

Speaker: Jack Hanson (City College of New York) ^
Date: Tuesday, June 4
Time: 11:15 – 11:50
Title: Robust construction of the high-dimensional incipient infinite cluster
Abstract
In Bernoulli percolation, the incipient infinite cluster (IIC) is a version of the "open cluster of the origin at criticality, conditioned to be infinite". Since this event should have probability 0 on $\mathbb{Z}^d$, the IIC is constructed via a limiting procedure. For $d > 6$, several constructions have been given and shown to produce the same object, but many natural limiting procedures remain unexplored. For instance, it is an open question whether conditioning on $\{0 \text{ is connected to } \partial[-n,n]^d\}$ produces the IIC as $n \to \infty$. We answer this question in the affirmative as a corollary of our theorem, which roughly says "conditioning on any long open connection produces the IIC", and whose proof does not directly use lace expansion analysis.

Speaker: Masato Hoshino (Osaka University) ^
Date: Thursday, June 6
Time: 10:35 – 11:10
Title: Random models on regularity-integrability structures
Abstract
In the study of singular SPDEs, it has been a challenging problem to obtain a simple proof of a general probabilistic convergence result (BPHZ theorem). Differently from Chandra and Hairer's Feynman diagram approach, Linares, Otto, Tempelmayr, and Tsatsoulis recently proposed an inductive proof based on the spectral gap inequality by using their multiindex language. Inspired by their approach, Hairer and Steele also obtained an inductive proof by using the regularity structure language. In this talk, we introduce an extension of the regularity structure including integrability exponents and provide a simpler proof of BPHZ theorem. This talk is based on a joint work with Ismael Bailleul (Université de Bretagne Occidentale).

Speaker: Po-Han Hsu (National Sun Yat-Sen University) ^
Date: Friday, June7
Time: 10:35 – 11:10
Title: Large Deviation Principle and Exit Time Estimates
Abstract

Large deviation principle is a subject that concerns the probability distribution of rare events. Exit time estimates, also known as exponential inequalities / concentration inequalities, study the probability distribution of paths of a diffusion process that exits an r-ball before a given time T. At a glance, these two subjects seem irrelevant. In this talk, we will relate them by using the solution to stochastic Navier-Stokes equations as an example.

Speaker: Naotaka Kajino (Kyoto University) ^
Date: Thursday, June 6
Time: 15:30 – 16:05
Title: On singularity of p-energy measures among distinct values of p for some p.-c.f. self-similar sets
Abstract
For each $p \in (1,\infty)$, a *p-energy form* $(\mathcal{E}_p, \mathcal{F}_p)$, a natural L^p-analog of the standard Dirichlet form for $p=2$, was constructed on the (two-dimensional standard) Sierpiński gasket K by Herman—Peirone—Strichartz [Potential Anal. **20** (2004), 125—148]. As in the case of $p=2$, it satisfies the *self-similarity (scale invariance)*

$$\mathcal{E}_p(u) = \sum_{j=1} \rho_p \mathcal{E}_p(u \circ F_j), \qquad u \in \mathcal{F}_p,$$

where $\{F_j\}_{j=1}^3$ are the contraction maps on $\mathbb{R}^2$ defining K through the equation $K = \bigcup_{j=1}^3 F_j(K)$ and $\rho_p \in (1,\infty)$ is a scaling factor determined uniquely by $(K, \{F_i\}_{i=1}^3)$ and p. While the construction of $(\mathcal{E}_p, \mathcal{F}_p)$ has been extended to general p.-c.f. self-similar sets by Cao—Gu—Qiu (2022), to Sierpiński carpets by Shimizu (2024) and Murugan—Shimizu (2024+) and to a large class of infinitely ramified self-similar fractals by Kigami (2023), very little has been understood concerning properties of important analytic objects associated with $(\mathcal{E}_p, \mathcal{F}_p)$ such as p-harmonic functions and p-energy measures, even in the (arguably simplest) case of the Sierpiński gasket.

This talk is aimed at presenting the result of the speaker's on-going joint work with Ryosuke Shimizu (Waseda University) that, *for a class of p.-c.f. self-similar sets with very good geometric symmetry, the p-energy measure $\mu^p_{\langle u \rangle}$ of any $u \in \mathcal{F}_p$ and the q-energy measure $\mu^q_{\langle v \rangle}$ of any $v \in \mathcal{F}_q$ are mutually singular for any $p, q \in (1,\infty)$ with $p \neq q$*. The keys to the proof are (1) new explicit descriptions of the global and local behavior of p-harmonic functions in terms of ρ_p, and (2) the highly non-trivial fact that $\rho_p^{1/(p-1)}$ *is strictly increasing in $p \in (1,\infty)$*, whose proof relies heavily on (1).

Speaker: Yoshinori Kamijima (Toyo University) ^
Date: Monday, June 3
Time: 9:30 – 10:05
Title: Derivation of a lace expansion for the Ising model by a random current representation on space-time
Abstract
The lace expansion is one of the powerful tools to investigate critical phenomena. It has succeeded in getting an asymptotic expansion for the critical point for several models, e.g., the self-avoiding walk, ordinary/oriented percolation, the contact process, etc. Our purpose is to obtain such an asymptotic expansion for the quantum Ising model, in which the different type of phase transition from the classical Ising model is caused by a transverse field, by use of a lace expansion. The lace expansion for the classical Ising model was derived in [Sakai (2007) *Commun. Math. Phys.*], whereas it has not been derived for the quantum Ising model yet.

In this talk, I show a new derivation of a lace expansion for the classical Ising model, which is the special case of the quantum Ising model without the transverse field. The Hamiltonian in the

quantum Ising model is expressed by operators. Thanks to the Lie-Trotter product formula, it is enough to consider the $(d+1)$-dimensional space-time Ising model, which is not given by operator language, instead of the d-dimensional Ising model. So far, we have derived a new type of lace expansion without the transverse field based on the random current representation [Björnberg and Grimmett (2009) *J. Stat. Phys.*] [Crawford and Ioffe (2010) *Commun. Math. Phys.*] on the space-time. We also expect that this approach helps us to derive a lace expansion in the case that the transverse field is finite.

This talk is based on joint work with Akira Sakai (Hokkaido University, Japan).

Speaker: Noe Kawamoto (NCTS)
Date: Monday, June 3
Time: 10:35 – 11:10
Title: Gaussian deconvolution and the lace expansion for long-range models
Abstract
We consider long-range statistical mechanical models characterized by power-law decaying pair potentials of the form $D(x) \asymp |x|^{-d-\alpha}$, where $\alpha \in (0,2)$. It has been established by L-C. Chen and A. Sakai (2015) that the critical two-point function for each long-range model above their upper critical dimension exhibits $|x|^{-(d-\alpha)}$ decay for large $|x|$. Their proof depend on intricate Fourier analysis and convolution estimate. In this talk , we offer a simpler and more transparent approach to $|x|^{-(d-\alpha)}$ decay of crirtical two point function, in which we apply the Gaussian deconvolution theorem introduced by Y. Liu and G. Slade (2023). This talk is based on ongoing joint work with Lung-Chi Chen from NCCU.

Speaker: Ildoo Kim (Korea University)
Date: Friday, June7
Time: 9:30 – 10:05
Title: An existence and uniqueness theory to stochastic partial equations with sign-changing time-measurable pseudo-differential operators driven by space-time white noises
Abstract
In this talk, we introduce a new weak formulation to guarantee existence and uniqueness of a solution to stochastic partial differential equations with sign-changing time-measurable pseudo-differential operators driven by space-time white noises.

Speaker: Kunwoo Kim (Pohang University of Science and Technology (POSTECH))
Date: Friday, June7
Time: 11:15 – 11:50
Title: Long-time behavior of stochastic heat equations
Abstract
We investigate the long-time behavior of stochastic heat equations perturbed by space-time white noise on one-dimensional domains such as a torus and the real line. The long-time behavior depends on the spatial domain and also initial functions. We show how the spatial domain and the initial function influence the long-time behavior of the solution. This is based on joint works with Davar Khoshnevisan and Carl Mueller.

Speaker: Kyung-Youn Kim (National Chung Hsing University)
Date: Thursday, June 6
Time: 14:25 – 15:00
Title: Dirichlet Heat Kernel Estimates for Anisotropic Markov Processes
Abstract
We discuss heat kernel bounds for non-local operators with singular kernels. We consider anisotropic Markov processes $Z := (Z^1, \ldots, Z^d)$ where each coordinate Z^i is an identical independent 1-dimensional symmetric processes. It has a jump kernel comparable to that of

various order described by a weak scaling function. We obtain heat kernel estimates on $C^{1,1}$–open set $D \subset \mathbb{R}^d$, and discuss Green function estimates as its application. This is the joint work with Lidan Wang.

Speaker: Yong-Woo Lee (Seoul National University) ^
Date: Wednesday, June 5
Time: 11:15 – 11:50
Title: Finite size corrections for real eigenvalue densities of random matrices
Abstract
The elliptic Ginibre orthogonal ensemble (eGinOE) is a one-parameter family of random matrix models which interpolate between the Gaussian orthogonal ensemble and the Ginibre orthogonal ensemble. An interesting common feature of the models is presence of real eigenvalues. The distributions of real eigenvalues depend on the parameter, and two different regimes can be observed.

We study the finite size corrections of the real eigenvalue densities for the eGinOE. Especially, the corrections to the universal limit are shown to be dependent on the parameter. This is based on a joint work with Sung-Soo Byun.

Speaker: Sungbin Lim (Korea University) ^
Date: Friday, June7
Time: 14:25 – 15:00
Title: Score-based Generative Modeling through Stochastic Evolution Equations in Hilbert Spaces
Abstract
Diffusion models have recently gained significant attention in probabilistic machine learning due to their theoretical properties and impressive applications in generative AI, including Stable Diffusion and DALL-E. This talk will provide a brief introduction to the theory of score-based diffusion models in Euclidean space. It will also present recent findings on score-based generative modeling in infinite-dimensional spaces, based on the time reversal theory of diffusion processes in Hilbert space. This talk is based on the following paper presented at NeurIPS 2023 (https://openreview.net/forum?id=GrElRvXnEj).

Speaker: Luca Makowiec (National University of Singapore) ^
Date: Monday, June 3
Time: 14:25 – 15:00
Title: Diameter of Random Spanning Trees in Random Environment
Abstract
We will introduce Random Spanning Trees in Random Environment, a disordered system on spanning trees. Our primary goal is to determine the order of the diameter of a (typical) spanning tree, a crucial step towards the pursuit of a non-trivial scaling limit. For the complete graph, we will give upper and lower bounds for a phase transition where we either observe the diameter of the Uniform Spanning Tree or that of the Minimum Spanning Tree, which scale with different power laws. Lastly, we discuss a conjecture about the order of the diameter inside the critical window.

Speaker: Kouhei Matsuura (University of Tsukuba) ^
Date: Thursday, June 6
Time: 16:10 – 16:45
Title: Discrete approximation of reflected Brownian motions by Markov chains on partitions of domains
Abstract
In this talk, we consider discrete approximation of reflected Brownian motions on domains in

Euclidean space. Our approximation is given by a sequence of Markov chains on partitions of the domain, where we allow uneven or random partitions. We provide sufficient conditions for the weak convergence of the Markov chains. This is a joint work with Masanori Hino (Kyoto University) and Arata Maki.

Speaker: Hirotatsu Nagoji (Kyoto University) ^
Date: Thursday, June 6
Time: 11:15 – 11:50
Title: Normalizability of the Gibbs measures associated with multivariate version of $P(\Phi)_2$ model
Abstract
We consider the Gibbs measures associated with multivariate version of $P(\Phi)_2$ quantum field model on the torus. We observe the (non-)normalizability of the measures by applying the Boué-Dupuis formula. We also consider some other related models.

Speaker: Shuta Nakajima (Meiji University) ^
Date: Monday, June 3
Time: 15:30 – 16:05
Title: Sharp threshold sequence and universality for Ising perceptron models
Abstract
In this talk, we discuss a family of Ising perceptron models with {0,1}-valued activation functions. This includes the classical half-space models and some of the symmetric models considered in recent works. For each of these models, we show that the free energy is self-averaging, there is a sharp threshold sequence, and the free energy is universal concerning the disorder. A prior work by Xu (2019) used very different methods to show a sharp threshold sequence in the half-space Ising perceptron with Bernoulli disorder. Recent works of Perkins-Xu (2021) and Abbe-Li-Sly (2021) determined the sharp threshold and the limiting free energy in a symmetric perceptron model. The results apply in more general settings and are based on new "add one constraint" estimates extending Talagrand's estimates for the half-space model. This talk is based on joint work with Nike Sun (MIT).

Speaker: Makoto Nakashima (Nagoya University) ^
Date: Tuesday, June 4
Time: 14:25 – 15:00
Title: 2d critical stochastic heat flow as measure valued process
Abstract
Caravenna, Sun, Zygouras constructed a $2d$ *critical stochastic heat flow* as the limit of the rescaled discrete stochastic heat equations in $\mathbb{Z}^2$ with a suitable renormalization of noise. In this talk, we will see it as a measure valued process and discuss an associated martingale problem like super-Brownian motion.

Speaker: Kohei Noda (Kyushu University) ^
Date: Wednesday, June 5
Time: 9:30 – 10:05
Title: Scaling limits of non-Hermitian Wishart ensembles
Abstract
Non-Hermitian Wishart matrices were introduced in the context of quantum chromodynamics with a baryon chemical potential. These are non-Hermitian extensions of the classical Wishart/ Laguerre ensembles. In this talk, I will discuss correlations for eigenvalues of non-Hermitian Wishart matrices in the symmetry classes of complex and symplectic Ginibre ensembles. After introducing a generalized Christoffel-Darboux formula in the form of a second-order differential equation, I will show bulk and edge scaling limits for correlation functions of eigenvalues at both strong and weak non-Hermiticity. This talk is based on joint work (arXiv:2402.18257) with Sung-Soo Byun (Seoul National University).

Speaker: Pierre Nolin (City University of Hong Kong) ^
Date: Tuesday, June 4
Time: 9:30 – 10:05
Title: Monochromatic exponents for two-dimensional percolation
Abstract
We consider Bernoulli percolation in dimension two, obtained by coloring independently, black or white, the vertices of an infinite lattice. In order to describe its phase transition, arm events (at or near criticality) play an instrumental role. Roughly speaking, in any annulus on the lattice, such events require the existence of a given number of crossing paths, whose colors are specified by some sequence (in cyclic order). The asymptotic behavior of "polychromatic" arm events, when arms of both colors are present in the sequence, is now very well understood. We discuss the monochromatic case, i.e. the case when all arms have the same color.

In particular, we derive an exact expression for the celebrated backbone exponent, corresponding to two disjoint black arms. This exponent was first considered in statistical physics in the 1970's, and determining its value had remained an open question since then. It turns out to be a root of an elementary function, and contrary to previously-known arm exponents for 2D percolation, which are all rational, it has a transcendental value. More specifically, we use techniques which have been developed recently to compute the conformal radii of random domains defined by SLE curves, based on the coupling between SLE and Liouville quantum gravity (LQG), and using crucially input from Liouville conformal field theory (LCFT).

This talk is based on a joint work with Wei Qian, Xin Sun and Zijie Zhuang.

Speaker: Wei Qian (City University of Hong Kong) ^
Date: Tuesday, June 4
Time: 13:45 – 14:20
Title: Parity questions in planar critical loop soups
Abstract
We study how much information the occupation field of a critical loop soup provides about the loop soup. Among other things, we show that the exact set of points that are actually visited by some loops in the loop soup is not determined by these fields. We further prove that given the fields, a dense family of special points will each have a conditional probability 1/2 of being part of the loop soup. We also exhibit another instance where the possible decompositions (given the field) into individual loops and excursions can be grouped into two clearly different groups, each having a conditional probability 1/2 of occurring.

Speaker: Akira Sakai (Hokkaido University) ^
Date: Monday, June 3
Time: 16:10 – 16:55
Title: Mathematical foundation of ground-state search MCMC methods I. Theory
Abstract
Combinatorial optimization problems, such as the famous traveling salesman problem and the max-cut problem, are ubiquitous in various fields of practical and theoretical interest. One approach to tackle those problems is to use an Ising model whose Hamiltonian H takes its minimum at a spin configuration, called a ground state, which corresponds to an optimal solution to the corresponding original problem. Standard MCMC methods, such as the Glauber dynamics and the Metropolis algorithm, have been used to sample the Gibbs distribution, which is proportional to $e^{-H/T}$, hence close to the uniform distribution over the ground states when the temperature T is close to zero. However, those MCMC methods are based on single-spin flip rules, hence prone to being slow.

In Part I, I will explain general theory of MCs and introduce the so-called virtual energy, which

plays the key role to characterize the equilibrium distribution. (In Part II, Bruno Hideki Fukushima-Kimura will explain three unusual MCs, two among which are based on multi-spin flip rules, hence potentially fast.)

Speaker: Hayate Suda (Keio University) ^
Date: Monday, June 3
Time: 11:15 – 11:50
Title: Scaling limits of the tagged soliton in the randomized box-ball system
Abstract
The box-ball system (BBS) is a cellular automaton that exhibits the solitonic behavior. In recent years, with the rapid progress in the study of the hydrodynamics of integrable systems, there has been a growing interest in BBS with random initial distribution. In this talk, we consider the scaling limits for the tagged soliton in the BBS starting from certain stationary distribution. This is an ongoing work with Stefano Olla and Makiko Sasada.

Speaker: Rongfeng Sun (National University of Singapore) ^
Date: Tuesday, June 4
Time: 16:10 – 16:45
Title: The critical 2d stochastic heat flow
Abstract
We consider directed polymers in random environment in the critical dimension $d = 2$, focusing on the intermediate disorder regime when the model undergoes a phase transition. We prove that, at criticality, the diffusively rescaled random field of partition functions has a unique scaling limit: a process of random measures on $\mathbb{R}^2$ with logarithmic correlations, which we call the critical 2d stochastic heat flow (SHF). It is a natural candidate for the solution of the critical 2d stochastic heat equation with multiplicative space-time white noise. We will also discuss some properties of the critical 2d SHF. Joint work with F. Caravenna and N. Zygouras.

Speaker: Li-Cheng Tsai (University of Utah) ^
Date: Tuesday, June 4
Time: 15:30 – 16:05
Title: Large deviations of the KPZ equation via moments of the stochastic heat equation
Abstract
Consider the n-point, fixed-time large deviations of the Kardar–Parisi–Zhang (KPZ) equation with the narrow wedge initial condition. The scope consists of concave-configured, upper-tail deviations and a range of scaling regimes that allows time to be short, unit-order, and long. I will present a result, joint with Yier Lin, on the n-point Large Deviation Principle (LDP) and the corresponding spacetime limit shape. The proof is based on another work on the multipoint moments of the Stochastic Heat Equation.

Speaker: Satomi Watanabe (City University of Hong Kong) ^
Date: Thursday, June 6
Time: 13:45 – 14:20
Title: Annealed heat kernel for random walk on loop-erased random walk
Abstract
Random walks on random graphs are associated with diffusion phenomena in disordered media. This talk focuses on the simple random walks on loop-erased random walks (LERW). We will discuss the sub-Gaussian estimate for the annealed off-diagonal heat kernel of the simple random walk on high-dimensional LERWs. In the course of the proof, we will demonstrate the Gaussian-type local central limit theorem of high-dimensional LERWs.

Speaker: Bin Xie (Shinshu University) ^
Date: Friday, June7
Time: 13:45 – 14:20

Title: Long time behavior of singular quasilinear stochastic partial differential equations

Abstract

In this talk, we consider singular quasilinear stochastic PDEs with spatial white noise as its potential on 1-dimensional torus. Such singular stochastic PDEs are relative to a study of the hydrodynamic scaling limit of a microscopic interacting particle system in a random environment. Under sufficient conditions on coefficients and noise, we study the global existence of solutions in paracontrolled sense, and we also show the convergence of the solutions to the stationary solutions as time goes to infinity. To prove the main results, the proper energy functional is introduced and the approach based on energy inequality and Poincaré inequality is used. This talk is based on the joint work with T. Funaki.