The Asymmetric Simple Exclusion Process: October 2-6, 2023

Events for:
Monday, October 2nd - Friday, October 6th

Monday, October 2nd

9:00am **Workshop: Breakfast - SCGP Cafe**

Title: Breakfast

9:30am **Workshop: Jeremy Quastel - SCCP 102**

Speaker: Jeremy Quastel

Title: Convergence of ASEP to the KPZ fixed point

Abstract: We give an overview of the method. This will also allow us to correct some mistakes in the original proof. Joint with Sourav Sarkar.

10:00am **Workshop: Promit Ghosal - SCGP 102**

Speaker: Promit Ghosal

Title: The ASEP speed process

Abstract: ASEP stands as a cornerstone model in the exploration of non-equilibrium statistical mechanics. Within this presentation, we delve into the multi-species ASEP situated on a linear lattice Z, where each site harbors a particle distinguished by a unique label. Initially, the particles are assigned labels corresponding to their positions. Our study reveals a compelling convergence phenomenon: the velocity of any particle exhibits almost sure convergence to a uniform distribution over the interval [-1,1]. This discussion draws from collaborative research with Amol Aggarwal and Ivan Corwin.

10:30am **Workshop: Coffee Break - SCGP Cafe**

Title: Coffee Break

11:00am **Workshop: Guillaume Barraquand - SCGP 1012**

Speaker: Guillaume Barraquand

Title: Stationary measures in last passage percolation

Abstract: Old results in queuing theory imply that geometric (or exponential) last passage percolation in the Z^2 lattice admits stationary measures, where local increments of last passage times are distributed as geometric (or exponential) random variables, independent over different spatial locations. As it is the case for (T)ASEP, the presence of boundaries makes stationary measures more complicated, with non-trivial spatial correlations. In this talk, I will describe stationary measures of last passage percolation in either a half-quadrant or a strip in the Z^2 lattice. Our method does not involve matrix product ansatz, and applies to other models in the KPZ class. Based on joint works with Ivan Corwin and Zongrui Yang.

11:30am **Workshop: Evan Sorenson - SCGP 102**

Speaker: Evan Sorenson

Title: The stationary horizon as the central multi-type invariant measure in the KPZ universality class

Abstract: The stationary horizon (SH) is a stochastic process of coupled Brownian motions, indexed by their drifts. It was first constructed by Busani as the scaling limit of the Busemann process in exponential last-passage percolation. I will discuss two joint works with Busani and Seppalainen where we establish the central role of the SH in the KPZ universality class. First, the SH describes the unique jointly invariant measure for the KPZ fixed point, under the coupling of solutions defined by the directed landscape (DL). This has several geometric consequences for the structure of semi-infinite geodesics in the DL across all directions. Second, I will discuss how the SH appears as the scaling limit of the TASEP speed process introduced by Amir, Angel, and Valko. In particular, the finite-dimensional marginals of the SH give the scaling limit of the multi-species invariant measures for TASEP studied first for two species by Angel and for arbitrary species by Ferrari and Martin.

12:00pm **Workshop: Lunch - SCGP Cafe**

Title: Lunch

1:30pm **Workshop: Hindy Drillick - SCGP 102**

Speaker: Hindy Drillick

Title: The KPZ equation limit of sticky Brownian motion

Abstract: Sticky Brownian motion is a continuum model for multiple particles diffusing in a shared random environment, which can be obtained as a certain scaling limit of a random walk in a random environment. In this talk, we will present some recent results on the weak convergence of sticky Brownian motion to the KPZ equation in the moderate deviation regime. We will also discuss an application to the fluctuations of the maximal particle of sticky Brownian motion. This is joint work with Sayan Das and Shalin Parekh.

2:00pm **Workshop: Milind Hedge - SCGP 102**

Speaker: Milind Hedge

Title: The scaling limit of the geodesic in the directed landscape and continuum directed random polymer under upper tail conditioning

Abstract: Consider the geodesic in the directed landscape between (0, 0) and (0,1), and condition on the event that its weight is at least some large value L. It was proven by Zhipeng Liu using formulas from integrable probability that the one-point distribution of the geodesic under this conditioning, o nthe scale L^{-1/4}, converges as L tends to infinity to the one-point distribution of the Brownian bridge, and he conjectured that the convergence holds as a process (in line with an earlier analogous conjecture in discrete last passage percolation models under the upper large deviation conditioning made by Basu, Ganguly, and Sly). We will discuss work in progress with Shirshendu Ganguly and Lingfu Zhang proving this conjecture in zero temperature as well as a positive temperature analogue for the continuum directed random polymer. Our approach does not rely on exact formulas but instead makes crucial use of the parabolic Airy and KPZ line ensembles, their Brownian Gibbs resampling properties, and a recent description developed with Ganguly of how they look under the upper tail conditioning.

2:30pm **Workshop: Olya Mandelshtam - SCGP 102**

Speaker: Olya Mandelshtam

Title: Formulas for Macdonald polynomials via interacting particle systems

Abstract: We describe some recently discovered connections between one-dimensional interacting particle systems and Macdonald polynomials and show the combinatorial objects that make this connection explicit. The first such model is the multispecies asymmetric simple exclusion process (ASEP) on a ring, linked to the symmetric Macdonald polynomial $P_{\lambda}(X;q,t)$ through its partition function, with multiline queues as the corresponding combinatorial object. The second particle model is the multispecies totally asymmetric zero range process (TAZRP) on a ring, which was recently found to have an analogous connection to the modified Macdonald polynomial $\widetilde{H}_{\lambda}(X;q,t)$. The combinatorial object interpolating between probabilities of the TAZRP and the modified Macdonald polynomials turn out to be tableaux with a queue inversion statistic. We explain the plethystic relationship between multiline queues and queue inversion tableaux, and along the way, derive a new formula for $P_{\lambda}(X;q,t)$ using the queue inversion statistic. This plethystic correspondence is closely related to fusion in the integrab systems setting.

3:30pm **Workshop: Tea Time - SCGP Cafe**

Title: Tea Time

Tuesday, October 3rd

9:00am **Workshop: Breakfast - SCGP Cafe**

Title: Breakfast

9:30am **Workshop: Xuan Wu - SCGP 102**

Speaker: Xuan Wu

Title: From the KPZ equation to the directed landscape

Abstract: This talk presents the convergence of the KPZ equation to the directed landscape, which is the central object in the KPZ universality class. This convergence result is the first to the directed landscape among the positive temperature models.

10:00am **Workshop: Zhipeng Liu - SCGP 102**

Speaker: Zhipeng Liu

Title: Pinched-up periodic KPZ fixed point

Abstract: The KPZ fixed point is a 2-dimensional random field to which the height functions of the models in the Kardar-Parisi-Zhang universality class on the line are expected to converge in the large-time limit. If we consider the models defined on a ring instead of the line, then the ring size affects the height functions. If the ring size itself grows with time and they are tuned appropriately, then a new field emerges that takes into account the domain effect to the height function. The conjectural limiting 2-dimensional field in this setting can be called the periodic KPZ fixed point. In this talk, we consider the periodic KPZ fixed point conditioned on the value of the height function at one point goes to infinity. We obtain the limiting fluctuations of the field for the time before the "pinch-up". The limiting field depends on how fast the height L of the pinch-up goes to infinity compared with the period p of the periodic KPZ fixed point. Especially, when the period p>> L^{-1/4}, we recover a similar result for the KPZ fixed point by Liu and Wang in 2022. This is a joint work with Jinho Baik.

10:30am **Workshop: Coffee Break - SCGP Cafe**

Title: Coffee Break

11:00am **Workshop: Jimmy He - SCGP 102**

Speaker: Jimmy He

Title: Limit profile of the ASEP with one open boundary

Abstract: Consider the ASEP on a finite interval with one open boundary. This system will eventually reach equilibrium, but how long does this take? This question was studied by Gantert, Nestoridi, and Schmid, who established the cutoff phenomenon for this Markov chain which says that the first order behavior is a sharp transition to equilibrium. We refine their result, studying the shape of the convergence. The proof uses ideas from integrable probability.

11:30am **Workshop: Lingfu Zhang - SCGP 102**

Speaker: Lingfu Zhang

Title: Cutoff of the colored ASEP and a systematic Metropolis scan

Abstract: I will discuss the colored Asymmetric Simple Exclusion Process (ASEP) in a finite interval. This Markov chain is also known as the random Metropolis scan, and its study dates back to Diaconis-Ram (2000). A total-variation cutoff was proved for this chain a few years ago using hydrodynamic techniques (Labbé-Lacoin, 2016). I will explain how to obtain more precise information on its cutoff, specifically to establish the conjectured GOE Tracy-Widom cutoff profile. The proof relies on coupling arguments, as well as symmetries obtained from the Hecke algebra. I will also discuss how the techniques could be adapted to analyze and prove the cutoff of a related systematic Metropolis scan, also proposed in the paper by Diaconis and Ram.

12:00pm **Workshop: Group Photo - SCGP 102**

Title: Group Photo

12:00pm **Workshop: Lunch - SCGP Cafe**

Title: Lunch

1:15pm **Workshop & SCGP Weekly Talk Speaker: Amol Aggarwal - SCGP 102**

Speaker: Amol Aggarwal

Title: A Characterization for the Airy Line Ensemble

Abstract: The Airy line ensemble is a universal scaling limit that is believed (and in some cases proven) to govern the fluctuations of many probabilistic systems, such as random surfaces, interacting particle systems, and stochastic interfaces. It is an example of a "Brownian line ensemble," which informally means that it is an infinite, ordered sequence of random continuous curves that look like non-intersecting Brownian motions. In this talk we survey recent results characterizing the Airy line ensemble as the unique Brownian line ensemble whose top curve decays parabolically, and we explain why this result is useful for proving convergence theorems for various discrete stochastic models.

2:30pm **Workshop: Alexei Borodin - SBU Math Dept Colloquium - SCGP 103 - Auditorium**

Title: SBU Math Colloquium - Alexei Borodin

3:30pm **Workshop: Tea Time - SCGP Cafe**

Title: Tea Time

Wednesday, October 4th

9:00am **Workshop: Breakfast - SCGP Cafe**

Title: Breakfast

9:30am **Workshop: Lauren Williams - SCGP 102**

Speaker: Lauren Williams

Title: Rhombic staircase tableaux and Koornwinder polynomials

Abstract: In earlier work with Corteel and Mandelshtam, we introduced rhombic staircase tableaux and used them to give a combinatorial formula for the stationary distribution of the two-species ASEP on a line with open boundaries. I will discuss work-in-progress in which we use these tableaux to give formulas for some special Koornwinder polynomials.

10:00am **Workshop: Woldek Bryc - SCGP 102**

Speaker: Woldek Bryc

Title: Weighted random Motzkin paths and the stationary distribution for an open Asymmetric Simple Exclusion Process

Abstract: This expository talk explains how one can use non-uniformly weighted random Motzkin paths to describe the stationary distribution for an open Asymmetric Simple Exclusion Process (ASEP) in the fan region. This relationship motivated the study of asymptotics for random Motzkin paths in several recent papers with Yizao Wang, Jacek Wesolowski, and Alexey Kuznetsov. The connections between Motzkin paths and ASEP have been known in the literature for a while, but the relation to be presented has not been widely used. It is implicit in the matrix model of Enaud and Derrida (2004) and appears explicitly in Derrida, Enaud, and Lebowitz (2004), and in a somewhat different form in Barraquand and Le Doussal (2023). The stationary distribution of ASEP was also expressed in terms of weighted Motzkin path in Brak, Corteel, Essam, Parviainen, and Rechnitzer (2006) and in Corteel, Josuat-Vergès, and Williams (2011), which were based on the well-known matrix model of Uchiyama, Sasamoto, and Wadati (2004). The latter representation of the stationary distribution of ASEP is also discussed in a recent paper Nestoridi and Schmid (2023). In this talk, I will first review the Motzkin paths and the stationary distribution of ASEP. I will then discuss the relationship between the them. If time permits, I will discuss some of the results on asymptotics for random Motzkin paths.

10:30am **Workshop: Coffee Break - SCGP Cafe**

Title: Coffee Break

11:30am **Workshop: Tomohiro Sasamoto - SCGP 102**

Speaker: Tomohiro Sasamoto

Title: Current fluctuations for symmetric processes

Abstract: In the field of integrable probability, it has been common to study “asymmetric models” in which particles hop with asymmetric rates in left and right and then often show KPZ behaviors. But their symmetric versions already show various non-trivial behaviors and there remain various interesting questions. In this presentation we will explain how one can study current fluctuations of symmetric models. The main focus would be on the case of one-dimensional symmetric exclusion but we may also discuss other processes. The talk is mainly based on a joint work with Takashi Imamura and Kirone Mallick [1], and discussions with Cristian Giardina. Also the talk is somewhat complimentary to the talk by Kirone Mallick. References: [1] T. Imamura, K. Mallick, T. Sasamoto, Distribution of a tagged particle position in the one-dimensional symmetric simple exclusion process with two-sided Bernoulli initial condition, Commun. Math. Phys. 384: 1409-1444, 2021.

12:00pm **Workshop: Lunch - SCGP Cafe**

Title: Lunch

1:30pm **Workshop: Ofer Busani - SCGP 102**

Speaker: Ofer Busani

Title: Decorrelation of the KPZ fixed point from the flat initial condition

Abstract: The KPZ class is a set of 1+1 random growth interface models that are believed to model the statistics of an interface of a growing two dimensional surface. Upon a time-space scaling , it is believed (and was proven for a handful of models) that all such models should converge to a universal scaling limit called the KPZ-fixed point. We shall discuss spatial decorrelation for the KPZ-fixed point. In particular, when the KPZ-fixed point starts from a specific initial condition called 'flat', we obtain the first order term in the exponent of the decay. Joint work with Riddhipratim Basu and Patrik Ferrari.

2:00pm **Workshop: Jacek Wesolowski - SCGP 102**

Speaker: Jacek Wesolowski

Title: Infinitesimal generators of quadratic harnesses - an algebraic approach

Abstract: Quadratic harnesses (equivalently, Askey-Wilson processes) appeared to be useful in studying properties of the ASEP with open boundaries under the stationary measure. Quadratic harnesses (QH processes) are typically determined by 5 numerical constants and thus denoted by QH(\eta,\theta,\sigma,\tau,\gamma). In particular, in BW(2017) we used infinitesimal generators of QH(\eta,\theta,0,0,\gamma) (the bi-Poisson process) to derive formulas for difference of average occupancy of neighbouring sites. In this talk we will show that infinitesimal generators of QH processes are special integro-differential operators parametrized by a measure of integration, which often can be associated to some Askey-Wilson measure (or special conditional distribution of some QH process). In AW(2015) we introduced some algebraic methodology which appears to be quite useful in studying infinitesimal generators of QH processes. In particular, this methodology lead to the form of the operator for "free" QH process, (\gamma=-\sigma\tau). Recently, with my PhD student, A. Zieba, this algebraic methodology was considerably extended. Firstly, the method was extended to cover the case of QH(\eta,\theta,0,\tau,\gamma) (see WZ(2023)) and then the full range of parameters was covered in a clever, though quite complicated, algebraic proof given in Z(2023). References: BW(2015): W. Bryc, J. Wesolowski, Infinitesimal generators for a class of polynomialprocesses. Studia Math., 229(1) (2015):73–93. BW(2017): W. Bryc, J. Wesolowski, Asymmetric simple exclusion process with open boundaries and quadratic harnesses. J. Stat. Phys., 167(2) (2017): 383–415. WZ(2023): J. Wesolowski, A. Zieba,Infinitesimal generators for a family of polynomial processes – an algebraic approach. arXiv: 2305.00198 (2023): 1-21. Z(2023): A. Zieba, Infinitesimal generators of quadratic harnesses, PhD Thesis, Warsaw Uni. Tech., 2023: 1-133.

2:30pm **Workshop: Alessandra Occelli - SCGP 102**

Speaker: Alessandra Occelli

Title: Universality for multicomponent stochastic systems

Abstract: We study the equilibrium fluctuations of an interacting particle system evolv- ing on the discrete ring TN with three species of particles that we name A,B and C, subject to the exclusion rule: at each site there is only one particle. The interaction rates depend on the type of particles involved via three constants EA, EB and EC, and on the size of the system. This model can be seen as a multi-species generalisation of the weakly asymmetric simple exclusion process. We analyse proper choices of the density fluctuation fields associated to the conserved quantities (the densities of particles for each species), that are given by linear combinations of the fields that match those from nonlinear fluctuating hydrodynamics theory [1]: we show that they converge, in the limit N ? ?, to a system of stochastic partial differential equations, that, according to the asymmetry of the jumps, can either be the Ornstein–Uhlenbeck equation or the Stochastic Burgers' equation. Based on a joint work with G. Cannizzaro, P. Gon ?calves and R. Misturini. [1] Spohn, H. Nonlinear Fluctuating Hydrodynamics for Anharmonic Chains, Journal of Statistical Physics, 154.5, 1191–1227 (2014).

3:00pm **Workshop: Kirone Mallick - SCGP 102**

Speaker: Kirone Mallick

Title: Exact solutions of the macroscopic fluctuation theory for the symmetric exclusion process

Abstract: At hydrodynamic scale, large deviations if symmetric exclusion process can can studied from a variational principle – due to Kipnis, Olla and Varadhan and generalized to diffusive processes by G. Jona-Lasinio and his collaborators. This framework, known as the Macroscopic Fluctuation Theory (MFT), expresses the optimal rare fluctuations as the solutions of two coupled non-linear PDEs with mixed and non-local boundary conditions conditions. In this talk, we shall show that, for the exclusion process, the MFT equations are classically integrable in the sense of Liouville and Lax, by using the inverse scattering method. By solving exactly the associated Riemann- Hilbert problem, we shall calculate the large deviation function of the cur- rent (that embodies its statistics) and the optimal evolution that generates a required fluctuation, both at initial and final times [1]. This work, at macro- scopic level, complements the microscopic integrability approach, presented by Tomohiro Sasamoto. [1] K. Mallick, H. Moriya and T. Sasamoto, Exact Solution of the Macroscopic Fluctuation Theory for the Symmetric Exclusion Process, Phys. Rev. Lett. 129, 040601 (2022).

3:30pm **Workshop: Tea Time - SCGP Cafe**

Title: Tea Time

4:00pm **Workshop: Fabian Essler - SCGP 102**

Speaker: Fabian Essler

Title: Exact Solution of a Lifted Asymmetric Exclusion Process

Abstract: Markov-chain Monte Carlo has countless applications in science and technology. The underlying Markov chains are typically taken to be time-reversible and satisfy the detailed-balance condition, which encodes the absence of flows. The resulting exploration of sample space is diffusive and hence slow. In recent years the use of non-reversible Markov chains has been explored. In particular expanding the sample space through a procedure called lifting has been shown to lead to substantial speedups in converging to steady states a range of problems. I introduce the “lifted” totally asymmetric simple exclusion process (TASEP) as a solvable paradigm for lifted non-reversible Markov chains. I then show that it can be solved by a coordinate Bethe Ansatz with some unusual features. By working out the leading eigenvalues of the transition matrix from the Bethe Ansatz and comparing them to numerical simulations I show that the lifted TASEP indeed reaches the steady state faster than the TASEP.

6:00pm **Workshop: Banquet Dinner - SCGP Cafe**

Title: Banquet Dinner

Thursday, October 5th

9:00am **Workshop: Breakfast - SCGP Cafe**

Title: Breakfast

9:30am **Workshop: Patrik Ferrari - SCGP 102**

Speaker: Patrik Ferrari

Title: TASEP with a moving wall

Abstract: We study TASEP on Z with the step initial condition, under the additional restriction that the first particle cannot cross a deterministically moving wall. We prove that such a wall may induce asymptotic fluctuation distributions of particle positions equal to the probability that the Airy2 process is below a barrier function g. This is the same class of distributions that arises as one-point asymptotic fluctuations of TASEPs with arbitrary initial conditions.

10:00am **Workshop: Yizao Wang - SCGP 102**

Speaker: Yizao Wang

Title: On the computation of limits of stationary measures of open ASEP

Abstract: Recently, several advances have been made on limits of stationary measures of open ASEP. This talk will present an overview on the method underlying many of these developments. The starting point of the method is a new representation of the probability generating function of stationary measures of open ASEP in terms of the so-called Askey-Wilson Markov processes introduced by Bryc and Wesolowski (2010, 2017). Compared to the well-known Derrida's matrix ansatz from the 1990s, the advantage of this new representation is that for the Laplace transform of stationary measures of open ASEP it becomes much easier to compute its asymptotics. Computing the limit of Laplace transform then leads to the limit of stationary measures. This conceptually straightforward computation, however, consists of two further delicate steps. One is the computation of the so-called tangent process of Askey-Wilson process, and the other is the derivation of a duality formula of Laplace transforms of certain Markov processes. The talk shall present how the method has been applied and adapted, particularly regarding these two steps, in various setups of open ASEP, and comment on other potential applications. Based on a series of joint works with Wlodek Bryc, Alexey Kuznetsov, Jacek Wesolowski and Zongrui Yang.

10:30am **Workshop: Coffee Break - SCGP Cafe**

Title: Coffee Break

11:00am **Workshop: Alan Hammond - SCGP 102**

Speaker: Alan Hammond

Title: Tagged particles, voter models and fractional Gaussian noise

Abstract: Let 2N+1 independent one-dimensional Brownian motions begin at the origin. By considering the order statistics of this system, we may locate a bulk curve that has N motions above it, and N below. As Dürr, Goldstein and Lebowitz showed, the law of the bulk curve asymptotically in high N is a Gaussian process with t^{1/4}-order fluctuations. In this talk, we will discuss fractional Gaussian fields and how they arise from models such as the tagged particle in the symmetric simple exclusion process and power-law Polya urns and voter models.

11:30am **Workshop: Pierre Le Doussal - SCGP 102**

Speaker: Pierre Le Doussal

Title: Large deviations for diffusion in random media: integrable crossover from macroscopic fluctuation theory to weak noise KPZ equation

Abstract: The large deviations for the diffusion of a tracer in a 1D time dependent medium can be described, on diffusive scales, by the macroscopic fluctuation theory (MFT). The corresponding MFT variational equations are mapped to the integrable derivative non-linear Schrodinger equation. We provide a solution using inverse scattering methods, and obtain the large deviation rate function for the sample to sample fluctuation of the probability of the tracer position. Furthermore by varying the position of the tracer, i.e. the asymmetry, we uncover the full integrable crossover from the MFT to the weak noise theory of the KPZ equation, matching our previous results for the latter problem. Based on Krajenbrink, A., & Le Doussal, P. (2023). Crossover from the macroscopic fluctuation theory to the Kardar-Parisi-Zhang equation controls the large deviations beyond Einstein's diffusion. Physical Review E, 107(1), 014137.

12:00pm **Workshop: Lunch - SCGP Cafe**

Title: Lunch

1:00pm **Workshop: Peter Nejjar - SCGP 102**

Speaker: Peter Nejjar

Title: The second class particle shock process in TASEP

Abstract: We consider TASEP with initial data such that a shock is created, and a second class particle following the shock. We show that the particle's limit process is the difference of two independent limit processes, coming from the left resp. the right of the shock. We directly relate the particle's position to the difference of height functions and show that the latter decouple, avoiding any usage of LPP. Joint work with Patrik Ferrari.

1:30pm **Workshop: Timo Seppäläinen - SCGP 102**

Speaker: Timo Seppäläinen

Title: Ergodic stationary measures of the Kardar-Parisi-Zhang equation

Abstract: This talk describes multifunction invariant distributions of the KPZ equation on the line. These measures are finite-dimensional distributions of the function-valued Busemann process, indexed by the asymptotic spatial slope which is a conserved quantity. These functions are eternal solutions of the equation and attractors of the evolution. The Busemann process has a countable dense set of discontinuities in the slope variable. These are values of the conserved slope at which there are multiple eternal solutions, thereby breaking the one force-one solution principle. Based on joint projects with Sean Groathouse (Utah), Chris Janjigian (Purdue), Firas Rassoul-Agha (Utah), Evan Sorensen (Columbia).

2:00pm **- SCGP 103**

Title: ?Della Pietra Lecture Series: Technical Talk for Faculty by Ian Stewart

3:30pm **Workshop: Tea Time - SCGP Cafe**

Title: Tea Time

Friday, October 6th

9:00am **Workshop: Breakfast - SCGP Cafe**

Title: Breakfast

9:30am **Workshop: Zongrui Yang - SCGP 102**

Speaker: Zongrui Yang

Title: Askey-Wilson signed measures and open ASEP in the shock region

Abstract: In this talk, we will present a new method for studying the stationary measure of the open asymmetric simple exclusion process (ASEP) in the shock region. We introduce a family of multi-dimensional Askey-Wilson signed measures and then describe the joint generating function of the open ASEP stationary measure in terms of integrations with respect to these Askey-Wilson signed measures. As an application, we offer a rigorous derivation of the density profile and limit fluctuations of the open ASEP in the shock region, confirming the existing physics postulations. This is a joint work with Yizao Wang and Jacek Wesolowski.

10:00am **Workshop: Dor Elboim - SCGP 102**

Speaker: Dor Elboim

Title: The influence of edges in first-passage percolation on Z^d

Abstract: We study the probability that a geodesic passes through a prescribed edge in first-passage percolation on. Benjamini, Kalai and Schramm famously conjectured that this probability tends to zero as the length of the geodesic tends to infinity, as long as the edge is not too close to the endpoints of the geodesic. I will present a short proof that this probability is arbitrarily small for all edges except for constantly many of them. This is a joint work with Ron Peled and Barbara Dembin.

10:30am **Workshop: Coffee Break - SCGP Cafe**

Title: Coffee Break

11:00am **Workshop: Leonid Petrov - SCGP 102**

Speaker: Leonid Petrov

Title: Colored Interacting Particle Systems on the Ring: Stationarity from Yang-Baxter

Abstract: Recently, there has been much progress in understanding stationary measures for colored (also called multi-species or multi-type) interacting particle systems motivated by asymptotic phenomena and rich underlying algebraic and combinatorial structures (such as nonsymmetric Macdonald polynomials). I will describe a unified approach to constructing stationary measures for colored ASEP, q-Boson, and q-PushTASEP systems based on integrable stochastic vertex models and the Yang-Baxter equation. Stationary measures become partition functions of new "queue vertex models" on the cylinder, and stationarity is a direct consequence of the Yang-Baxter equation. Our construction recovers and generalizes known stationary measures constructed using multiline queues and the Matrix Product Ansatz. In the quadrant, Yang-Baxter implies a colored version of Burke's theorem, which produces stationary measures for particle systems on the line. We also compute the colored particle currents in stationarity. Joint work with Amol Aggarwal and Matthew Nicoletti.

12:00pm **Workshop: Lunch - SCGP Cafe**

Title: Lunch

3:30pm **Workshop: Tea Time - SCGP Cafe**

Title: Tea Time