

Title: The Speed of a Second Class Particle in the ASEP

Abstract: In this talk, we discuss the application of the Yang-Baxter equation for the quantum affine lie algebra $U_q(\widehat{\mathfrak{sl}_{n+1}})$ to interacting particle systems.

The asymmetric simple exclusion process (ASEP) is a continuous-time Markov process of interacting particles on the integer lattice. We distinguish particles to be either a first class or a second class particle. In particular, the second class particles are blocked in their movement by all other particles, while the first class particles are only blocked by other first class particles. We consider the step initial conditions so that all non-negative integer positions are occupied and all other positions are vacant at time zero. Moreover, we take exactly L second class particles to be located at the very front of the configuration at time zero. Then, using recent results of [Tracy-Widom \(2017\)](#) and [Borodin-Wheeler \(2018\)](#), we compute the asymptotic speed of the leftmost second class particle.

This is joint work with Promit Ghosal (Columbia University) and Ethan Zell (University of Virginia) in [arXiv:1903.09615](#).