Probability Seminar

Title: Large Deviations for the Height Function of the q-Deformed Polynuclear Growth

Speaker: Matteo Mucciconi (University of Warwick)

Date: Wed 8th November 2023 at 3:00PM

Location: E0.32 (beside Pi restaurant)

Abstract: The q-deformed polynuclear growth is a growth process that generalizes the polynuclear growth studied in the context of KPZ universality class. In this talk, I will discuss the mathematical derivation of large time deviations for the height function. Rare events, as functions of the time t, display distinct decay rates based on whether the height function grows significantly larger (upper tail) or smaller (lower tail) than the expected value. Upper tails exhibit an exponential decay with rate function which we determine explicitly. Conversely, the lower tails experience a more rapid decay the rate function is given in terms of a variational problem.

Our analysis relies on connections between the height function h and two important measures on the set of integer partitions, the Poissonized Plancherel measure and the cylindric Plancherel measure, which stem from nontrivial applications of the celebrated Robinson-Schensted-Knuth correspondence. The main novelty of our approach is the use of logarithmic concavity properties of these symmetric polynomials, which allow a sharp control of the rate function.

This is a joint work with S.Das (Chicago) and Y.Liao (Wisconsin-Madison).