Analysis Seminar

Title: Inhomogeneous random growth in half space and solutions of Painlevé equations

Speaker: Hariet Walsh

Date: Tue 24th September 2024 at 3:00PM

Location: E0.32 (beside Pi restaurant)

Abstract: I will talk about a model of two dimensional random growth (namely, polynuclear growth) which can be translated into a probability law on integer partitions (by way of the RSK algorithm). As a consequence, we can find exact expressions for statistics of this model with algebraic tools, and compute fine asymptotics. I will focus on a model in half space with external sources driving growth at the edges, and present a new asymptotic distribution governing its interface fluctuations which interpolates between different universal Tracy—Widom distributions from random matrix theory, and encodes solutions of the Painlevé II differential equation. Our approach uses connections between symmetric functions, matrix integrals, and Hankel determinants, plus a Riemann—Hilbert problem. Based on joint work with Mattia Cafasso, Alessandra Occelli and Daniel Ofner.

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