



Probability Seminar

Title: Catalan percolation

Speaker: Eleanor Archer (Université Paris-Dauphine)

Date: Wed 5th February 2025 at 2:00PM

Location: E0.32 (beside Pi restaurant)

Abstract: Catalan percolation is a model introduced by Gravner and Kolesnik (2023) to represent the effect of censorship on the spread of information in a network. In the model, we consider a graph on the positive integers $1, \dots, n$. All (undirected) edges i, j are independently declared open with probability p , and otherwise closed (or censored). Given this initial randomness, the dynamics are then defined deterministically as follows: all nearest-neighbour edges of the form $i, i + 1$ are initially declared occupied, then at each step an open edge i, j is declared occupied if there exists a pair of edges i, k and k, j with $i < k < j$ that are both occupied. Closed edges can never become occupied. It was shown by Gravner and Kolesnik that this model undergoes a constant order phase transition in terms of the final occupation density of long open edges. In this talk we will discuss some non-trivial bounds on the critical probability, on the one hand using a comparison with Catalan structures, and on the other hand using a coupling with an oriented percolation model. Based on joint work with Ivailo Hartarsky, Brett Kolesnik, Sam Olesker-Taylor, Bruno Schapira and Daniel Valesin.