



## Probability Seminar

**Title:** Traffic Jams, Infinite Post Offices and Combinatorial Identities

**Speaker:** Jessica Jay (University of Bristol)

**Date:** Wed 15th November 2023 at 3:00PM

**Location:** E0.32 (beside Pi restaurant)

**Abstract:** Interacting Particle Systems are probabilistic models describing the movement of particles under certain conditions. In recent years, work has shown that studying natural distributional questions for such systems can lead to probabilistic proofs of both old and new combinatorial identities. In this talk we will see how models for traffic jams (asymmetric simple exclusion process) and infinite post offices (asymmetric zero-range process) are equivalent and lead to probabilistic proofs of classical identities such as the Jacobi triple product and Durfee rectangles identities. We will also see how studying generalisations of these models lead to proofs of new combinatorial identities. This is based on joint works with Daniel Adams, Márton Balázs and Dan Fretwell.