



## Probability Seminar

**Title:** Universal structure of  $n$ -point correlations in non-equilibrium open systems via orthogonal polynomial dualities

**Speaker:** Federico Sau (IST Austria)

**Date:** Wed 17th February 2021 at 3:00PM

**Location:** Online

**Abstract:** In non-equilibrium statistical physics, boundary driven interacting particle systems play an important role in the understanding of microscopic and scaling properties of non-equilibrium steady states. For the one-dimensional symmetric simple exclusion process (SSEP) in contact with two particle reservoirs at different densities much has been said, with the matrix approach due to Derrida et al. (1993) representing the most powerful tool to recover explicit formulas for the non-equilibrium steady state. For systems other than one-dimensional (a)symmetric exclusion processes, this exact method has proved to be generally ineffective.

The aim of this talk is to show that some of the properties of non-equilibrium steady states, such as the emergence of long-range correlations and their dependence on the reservoir densities' gradient, are common to a larger class of boundary driven systems, outside the specific realm of exactly solvable one-dimensional exclusion processes. The main tool that we employ is (stochastic) duality; in particular, we discuss the role of orthogonal polynomial dualities in recovering the structure of the truncated  $n$ -point correlations explicitly found in Derrida et al. (2007) for SSEP via the matrix approach.

If time permits, we will also discuss other recent applications of these orthogonal polynomial dualities.

Joint work with S. Floreani and F. Redig (TU Delft).

Zoom Link: <https://ucd-ie.zoom.us/j/83491228915?pwd=WWV3ZkNGNzVXdGxLRlR0dkdMYUtMZz0>

Meeting ID: 834 9122 8915 Passcode: 698437