



## Probability Seminar

**Title:** Duality of interacting particle systems and recursive tree processes connected to mean-field limits

**Speaker:** Anja Sturm (Goettingen)

**Date:** Wed 24th February 2021 at 3:00PM

**Location:** Online

**Abstract:** In this talk we consider interacting particle systems and their description via graphical representations (stochastic flows). We also investigate dual processes that originate from considering the (potential) genealogy of a given configuration or a set of configurations.

We then focus on systems where the underlying lattice is given by the complete graph and consider the mean-field limit for which the number of vertices tends to infinity. Here, we are not only interested in the mean-field limit of a single process, but also in how several coupled processes behave in the limit.

In this case the structure of the potential genealogy simplifies and turns out to be described by recursive tree processes (RTP), which are generalizations of Markov chains with a tree-like time parameter that were first studied by Aldous and Bandyopadhyay. RTP can also be viewed as (random) trees with an additional dynamic running towards the root. The RTP are dual to the mean-field forward equation describing the

distribution of states. We are in particular interested in fixed points of this equation which correspond to solutions of recursive distributional equations (RDE).

We illustrate our theory on a concrete example, a particle system with cooperative branching.

This is joint work with Tibor Mach and Jan Swart (Prague).

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

Meeting ID: 834 9122 8915 Passcode: 698437