



## Probability Seminar

**Title:** Scaling limits for planar aggregation with subcritical fluctuations

**Speaker:** Amanda Turner

**Date:** Wed 11th March 2020 at 2:00PM

**Location:** Seminar Room SCN 1.25

**Abstract:** Planar random growth processes occur widely in the physical world. Examples include diffusion-limited aggregation (DLA) for mineral deposition and the Eden model for biological cell growth. One approach to mathematically modelling such processes is to represent the randomly growing clusters as compositions of conformal mappings. In 1998, Hastings and Levitov proposed one such family of models, which includes versions of the physical processes described above. An intriguing property of their model is a conjectured phase transition between models that converge to growing disks, and 'turbulent' non-disk like models. In this talk I will describe a natural generalisation of the Hastings-Levitov family in which the location of each successive particle is distributed according to the density of harmonic measure on the cluster boundary, raised to some power. In recent joint work with Norris and Silvestri, we show that when this power lies within a particular range, the macroscopic shape of the cluster converges to a disk, but that as the power approaches the edge of this range the fluctuations approach a critical point, which is a limit of stability. This phase transition in fluctuations can be interpreted as the beginnings of a macroscopic phase transition from disks to non-disks analogous to that present in the Hastings-Levitov family.

<mailto:neil.oconnell@ucd.ie>