

Institut für Diskrete Mathematik

Combinatorics Seminar

Friday 16th May 13:00

AE06, Steyrergasse 30

Unified study of block-weighted planar maps: combinatorial and probabilistic properties

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This talk focuses on classes of planar maps with a weight u > 0 on certain components called *blocks*. In collaboration with Fleurat, we study the decomposition of generic planar maps into 2-connected components, revealing a phase transition between the universality classes of maps (converging to the Brownian sphere) and plane trees (converging to the Brownian tree), depending on the value of u. We identify a new class with the stable tree of parameter 3/2 as the scaling limit in the critical case, and obtain precise results on block sizes in each phase. In a subsequent work, I show that it is possible to study many decomposition schemes along similar lines to shed light on a phase transition. I explain how to obtain enumerative results, block sizes and scaling limits for each phase. Finally, with Albenque and Fusy, we studied tree-rooted random planar maps decomposed into tree-rooted 2-connected blocks, where a spanning tree is drawn simultaneously with the map. This model, which is of interest in theoretical physics, shows new behaviours. We determine the asymptotic behaviour of 2-connected tree-rooted maps, reveal a phase transition, and study the properties of each phase.

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