Graz University of Technology

Institut für Diskrete Mathematik

Combinatorics Seminar

Friday 10th November 12:30

AE06, Steyrergasse 30

Planar maps of the disk coupled with statistical physics models : Enumeration and limits

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(University of Vienna)

First, I give a brief overview about planar maps of the disk, and what was previously known on those decorated with a statistical physics model. The main focus of the talk will be on the Ising model. As in my joint works with Linxiao Chen, we start from a purely combinatorial problem of random planar triangulations of the disk coupled with the Ising model with Dobrushin boundary conditions and at a fixed temperature (and without external magnetic field). We identify rigorously a phase transition by analysing the critical behaviour of the partition functions of a large disk at and around the critical point. Moreover, we study the random geometric implications of this, in particular by constructing a local limit when the disk perimeter tends to infinity. At the critical temperature, we also find some explicit scaling limits of observables related to the interface lengths. The two key techniques in use are singularity analysis of rational parametrizations of generating functions, as well as a peeling process following the Ising interface. At the end of the talk and time permitting, I will explain how some of the ideas can be adapted to study random maps of the disk decorated with $O(n)$ loop models (where rational parametrizations do not necessarily exist)

Meeting link:

https://tugraz.webex.com/tugraz/j.php?MTID=mab523a645de428d5301998280dc510ed

Joshua Erde, Mihyun Kang