

Institut für Optimierung und Diskrete Mathematik

## Vortrag im Seminar Diskrete Mathematik und Optimierung

Dienstag 2.6.2015, 14:15

Seminarraum C208, Steyrergasse 30, 2. Stock

# Enumeration of cubic multigraphs on orientable surfaces

MICHAEL MOSSHAMMER

(TU Graz)

In recent years there have been various results in counting graphs embeddable on orientable surfaces, especially for planar graphs. For example the number of embeddable graphs with  $n$  vertices and  $m$  edges with  $m < n$  is known for planar graphs but not for graphs embeddable on surfaces of higher genus. One way to count such graphs is a constructive decomposition resulting in the problem of counting cubic multigraphs on orientable surfaces.

In this talk we will show the asymptotic number of cubic multigraphs embeddable on an orientable surface of genus  $g$  to be asymptotically

$$c_g \gamma^n n^{5/2(g-1)-1} n!,$$

where  $c_g$  is a constant depending on the genus and the growth constant  $\gamma$  is independent of the genus. To do this, methods from analytic combinatorics and structural graph theory will be used as well as results from Gao on triangulations.

In a second part of the talk, we will show how the above result can be used to study the number and the structure of general graphs embeddable on a surface.

Mihyun Kang