



## Mathematics and CS Seminar

# GeomTop Seminar: Connectivity of the Flip-Graph of Triangulations

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**Host: Uli Wagner**

We investigate the connectivity of the flip-graph of all (full ) triangulations of a given finite planar point set  $P$  in general position and prove that, for  $n:=|P|$  large enough, both edge- and vertex-connectivity are determined by the minimum degree occurring in the flip-graph, i.e. the minimum number of flippable edges in any triangulation of  $P$ . It is known that every triangulation allows at least  $(n-4)/2$  edge-flips.

This result is extended to so-called subtriangulations, i.e. the set of all triangulations of subsets of  $P$  which contain all extreme points of  $P$ , where the flip operation is extended to bistellar flips (edge-flips, and insertion and removal of an inner vertex of degree three). Here we prove  $(n-3)$ -edge-connectedness (for all  $P$ ) and  $(n-3)$ -vertex-connectedness of  $n$  large enough ( $(n-3)$  is tight, since there is always a subtriangulation which allows exactly  $n-3$  bistellar flips). This matches the situation known (through the secondary polytope) for so-called regular triangulations.

(joint work with Uli Wagner, IST Austria)

**Wednesday, March 6, 2019 01:00pm - 02:15pm**

IST Austria Campus Mondi Seminar Room 3, Central Building



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