Combinatorics Seminar

Friday May 10, 2013 at 2PM

Room MS.04

Florian Lehner

(Graz University of Technology)

Symmetry breaking in graphs

Let $G = (V, E)$ be a graph and let $c : V \to C$ be a colouring of the vertices of G. Then c is said to be distinguishing if it is not preserved by any non-trivial automorphism of G. The distinguishing number of a graph is the least number of colours needed for a distinguishing colouring.

Assume that there is a finite constant m such that the automorphism group of G contains at most $2^{m/2}$ elements and each non-trivial automorphism of G moves at least m vertices. Then it is known that there is a distinguishing 2-colouring of G. The same has been conjectured to be true for locally finite graphs and $m = \aleph_0$.

We give several classes of graphs where this conjecture is known to be true and show that random 2-colourings have a good chance of being distinguishing.

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