Graz University of Technology

Institut für Diskrete Mathematik

Combinatorics Seminar

Friday 17th December 14:15

Online meeting (Webex)

The jump of the clique chromatic number of random graphs

Dieter Mitsche

(Institut Camille Jordan, Lyon)

The clique chromatic number of a graph is the smallest number of colours in a vertex colouring so that no maximal clique is monochromatic. In 2016 together with McDiarmid and Pralat we noted that around $p = n^{-\frac{1}{2}}$ the clique chromatic number of the random graph $G(n,p)$ changes by $n^{\Omega(1)}$ when we increase the edge-probability p by $n^{o(1)}$, but left the details of this surprising phenomenon as an open problem.

In this paper we settle this problem, i.e., resolve the nature of this polynomial 'jump' of the clique chromatic number of the random graph $G(n,p)$ around edge-probability $p = n^{-\frac{1}{2}}$. Our proof uses a mix of approximation and concentration arguments, which enables us (i) to go beyond Janson's inequality used in previous work and (ii) to determine the clique chromatic number of $G(n,p)$ up to logarithmic factors for any edge-probability p.

Joint work with Lyuben Lichev and Lutz Warnke.

Meeting link:

https://tugraz.webex.com/tugraz/j.php?MTID=ma70275cd258e7748417214793956c7bf

Meeting number: 188 980 7021

Password: ahMZ84fJYQ2

Joshua Erde, Mihyun Kang