Graz University of Technology

Institut für Diskrete Mathematik

Friday 28th April 11:00

SR 2 Geometry Institute, Kopernikusgasse 24

The Erdős-Rényi component phenomenon: component sizes in percolation on high-dimensional product graphs

Sahar Diskin

(Tel Aviv University)

In the bond (edge) percolation model, a random subgraph G_p is formed by retaining every edge of G independently with probability p. In 1960, Erdős and Rényi showed that $(K_n)_p$ undergoes a fundamental change around $p = 1/n$: with high probability (that is, with probability tending to 1 as n tends to infinity), from components of order at most logarithmic to a unique giant component of linear order, with all other components of logarithmic order. Similar behaviour has been shown in other models. One well-researched example is the percolated hypercube Q_p^d around the probability $p = 1/d$, as shown by Ajtai, Komlós, and Szemerédi in 1982 and Bollobás, Kohayakawa, and Łuczak in 1991. We generalise these results and show that such behaviour holds typically for all Cartesian products of many regular graphs of bounded order. Joint work with Joshua Erde, Mihyun Kang and Michael Krivelevich.