

Percolation in the Product of Many Regular Graphs

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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 $p = 1/n$: **whp**, 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 **whp** for all Cartesian products of many regular graphs of bounded order.

Joint work with Joshua Erde, Mihyun Kang and Michael Krivelevich.