

## Institut für Diskrete Mathematik

## **Combinatorics Seminar**

Friday 21st March 12:30

AE06, Steyrergasse 30

## Independent sets in percolated graphs via the Ising model

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Given a bipartite, regular graph G with certain expansion properties, we explore the partition function of the independence polynomial of G. If the graph G is deterministic, this leads to studying the hard-core model on independent sets. Using the cluster expansion method, one can obtain arbitrarily precise asymptotics for the number of independent sets. Once the graph  $G_p$  is percolated, i.e., each edge is present with probability p, independently, we explore a connection to the Ising model. Using this, we are able to extend the work on deterministic graphs and provide an expansion of the expected number of independent sets in  $G_p$ .

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