

# Freezing in colourings of a random graph

Much of the current work on random graph colouring, random k-SAT, and other random constraint satisfaction problems focusses on some foundational hypotheses that have arisen from statistical physics, concerning the "clustering" of solutions.

In the context of colourings: It is believed that if the edge-density is sufficiently high then the colourings of a random graph can be partitioned into clusters that are, in some sense, both well-connected and well-separated. Furthermore, clusters contain a linear number of "frozen vertices", whose colours remain fixed amongst all the colourings in a cluster.

In this talk, we determine the exact value of the "freezing threshold" for random graph colouring, i.e. the edge-density at which frozen vertices appear.