

Freezing in Hypergraph Colouring

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A hypergraph colouring is an assignment of colours to the vertices of a hypergraph so that no edge is monochromatic. This talk reports on work in progress which aims to locate the "freezing threshold" for the problem of colouring hypergraphs with a linear number of edges. At the freezing threshold the geometry of the solution space of colours changes quite remarkably. In particular, above the freezing threshold it is necessary to change the colour of linearly many vertices at a time in order to produce a new colouring. These changes in the geometry of the solution space have been hypothesised to be the cause of the algorithmic barrier faced by naive algorithms.

(Joint work with Catherine Greenhill)