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Clusters of solutions to random linear equations

Strong evidence from statistical physics indicates that for many models of random constraint satisfaction problems (eg. random k -SAT, random graph colouring) the set of solutions partitions into *clusters*. We can move throughout the solutions of a cluster by making small local changes, but moving to another cluster requires a large global change.

Clustering is best understood, rigorously, for a random system of boolean linear equations, each on exactly k variables. We discuss this model, including when the density is within the clustering window.

This includes joint work with Dimitris Achlioptas and with Jane Gao.