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O Riordan (riordan@maths.ox.ac.uk). *Clique percolation.*

The topic of clique percolation was introduced by Palla, Derényi and Vicsek, motivated by the study of the connections between communities in social networks. The simplest mathematical model is to take a random graph, here $G(n, p)$, and construct from it an auxiliary graph. The vertices of this new graph are all complete subgraphs of a certain size k , and two such cliques are joined if they share at least l vertices.

Given k and l , it turns out that as p increases the auxiliary graph undergoes a percolation-type phase transition: above a certain threshold a giant component appears. Palla, Derényi and Vicsek gave heuristic determinations of this threshold when $k = l - 1$.

In joint work with Béla Bollobás we (rigorously) determine this threshold for all k and l , as well as proving corresponding results for a variety of related models. These models may be considered as a type of dependent percolation model: for many values of the parameters, the auxiliary graph contains many more vertices than $G(n, p)$, so its edges are necessarily highly dependent. This complicates the analysis considerably. (Received February 12, 2008)