Biased random k-SAT

Joint work with Klas Markström

The random k-SAT problem has become one of the most studied intersection points of combinatorics, computer science and physics. The basic problem is as follows, we have a set of n boolean variables and then pick m clauses of size k uniformly at random from the set of all such clauses on our variables (we give a more detailed definition later) and then ask: is the conjunction of these clauses satisfiable?

We consider a variation of the problem where there is a bias towards variables occuring pure rather than negated, i.e. variables occur pure w.p. $\frac{1}{2} + b$ for some $b > 0$, and study how the satisfiability threshold depends on the parameter b.