Amir Dembo
Stanford University

Extremal Cuts of Sparse Random Graphs

Abstract:

The Max-Cut problem seeks to determine the maximal cut size in a given graph. With no polynomial-time efficient approximation for Max-Cut (unless \(P=NP\)), its asymptotic for a typical large sparse graph is of considerable interest. We prove that for uniformly random \(d\)-regular graph of \(N\) vertices, and for the uniformly chosen Erdos-Renyi graph of \(M=Nd/2\) edges, the leading correction to \(M/2\) (the typical cut size), is \(P?sqrt(NM/2)\). Here \(P?\) is the ground state energy of the Sherrington-Kirkpatrick model, expressed analytically via Parisi's formula.

This talk is based on a joint work with Subhabrata Sen and Andrea Montanari.