Garry Bowlin (Binghamton)

Spin Glasses and Graph Theory

Abstract for the Combinatorics Seminar 2006 September 26

A spin glass is a disordered material that has a large number of lowest-energy states (ground states), which might not be easily found. One graph-theoretical model of spin glasses is called the Ising model. I will discuss some nice properties of this model when the graph is planar, such as the relationship between frustrated plaquettes and the dual graph. I will use these properties to show that the energy of a ground state can be found in polynomial time with the aid of a matching algorithm

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