ICTS Seminar

Title : Local weak limit of ferromagnetic Ising measure on locally tree-like Graphs

Speaker : Anirban Basak, Weizmann Institute of Science, Israel

Date : Wednesday, October 11, 2017

Time : 11:00 AM

Venue : Emmy Noether Seminar Room, ICTS Campus, Bangalore

Abstract : The study of statistical physics models on sparse graphs is motivated by numerous examples in combinatorics, computer science, and statistical inference. The Ising model is a paradigm model in statistical physics. It is believed that for a wide class of large graphs the Ising measure decomposes into a convex combination of well-separated simple components. Loosely speaking, in locally tree-like graphs the neighborhood of a typical vertex has approximately the law of the neighborhood of the root of a randomly chosen limiting tree. In the context of locally tree-like graphs, the decomposition of the Ising measure was previously proven only for k-regular limit.

In this talk, I will describe that the Ising measure on a general sequence of locally tree-like graphs converges to the symmetric mixture of the plus and minus Ising measure on the limiting tree, yielding the universality of the above phenomenon. I will also illustrate that the Ising measure conditioned on the sum of spins being positive on locally tree-like expander graphs converges to the plus Ising measure on the limiting tree. These results unify to provide a thorough understanding of the Ising measure on locally tree-like graphs.

This is a joint work with Amir Dembo.