



Bangalore Probability Seminar

Title : Potts and random cluster measures on locally tree-like graphs

Speaker : Anirban Basak (ICTS-TIFR, Bengaluru)

Date : Monday, 24 February 2025

Time : 3:15 PM (IST)

Abstract : Statistical physics predicts that, for a wide class of ferromagnetic spin systems, the asymptotic free energy density is given by the Bethe prediction, the maximum of the Bethe free energy over all ‘meaningful’ fixed points, commonly termed as pure states, of the belief propagation equations. If the Bethe free energy is maximized by a unique pure state then the ferromagnetic spin system, in the large n limit, is further conjectured to be governed by that pure state, while if there are multiple maximizers then the system is predicted to be governed in the limit by a mixture of such maximizers. These conjectures have been in the physics literature for quite some time. However, verifying them rigorously poses serious mathematical challenges. In this talk, we discuss progress towards these conjectures for the ferromagnetic Potts model and the associated random cluster measure, with an external magnetic field, on locally tree-like graphs when the limiting tree is a regular tree. Joint work with Amir Dembo and Allan Sly.

Venue : Madhava Lecture Hall

Zoom Link: <https://us02web.zoom.us/j/88670406480>

Meeting ID: 886 7040 6480