



# INDIAN STATISTICAL INSTITUTE

Theoretical Statistics and Mathematics Unit, Kolkata

## SEMINAR

Date: August 02, 2023, Wednesday  
Time: 04:15 PM

### VENUE:

**L-infinity**  
(5<sup>th</sup> Floor, A.N. Kolmogorov Bhavan), ISI Kolkata

### TITLE:

Characterizations of amenability through stochastic domination and finitary codings

### SPEAKER:

**Gourab Roy**  
University of Victoria

### ABSTRACT:

*Can we guess the geometry of a space by running some random process on it? This question has a long history: we add to the knowledge of this area by focussing on two probabilistic/ergodic theoretic subjects: stochastic domination and finitary codings. In particular, we establish new characterizations of amenability of graphs through these two notions.*

*On the stochastic domination side, we show, among other things, that the plus state of the Ising model at very low temperature stochastically dominates a high density Bernoulli percolation if and only if the underlying graph is nonamenable. This answers a question of Liggett and Steif. We prove a similar result for the “infinite cluster process” of Bernoulli percolation.*

*Along the way, we explore various ways to exploit the so-called Holley’s criterion in different graph geometries by a ‘dilution mechanism’ and establish some general tools to do so. The finitary factor results are based on the stochastic domination results and a dynamical construction involving bounding chains, along with a new technique to analyze coupling from the past in infinite-range processes via a novel disease spreading model, which may be of independent interest.*

*Joint work with Y. Spinka.*

**ALL ARE CORDIALLY INVITED**