



Theoretical Statistics and Mathematics Unit

Indian Statistical Institute

203 B.T. Road, Kolkata - 700108

SEMINAR

Date: July 23, 2026

Time: 02:30 PM

VENUE:

L-Infinity, 5th Floor, A.N. Kolmogorov Bhavan, ISI Kolkata

SPEAKER:

Tathagata Basak

Iowa State University, USA

TITLE:

Building hyperbolic lattices

ABSTRACT:

Given a graph D such that the second largest eigenvalue of its adjacency matrix is a positive integer, one can define an integer lattice L of signature $(g, 1)$ such that the symmetries of D act on L . This kind of construction goes back to at least [Neumaier and Seidel, 1983] and is analogous to building a root lattice from a Dynkin diagram.

The aim of this talk is to illustrate that this kind of construction produces interesting Lorentzian lattices and interesting complex reflection groups in $U(g, 1)$. In particular, an example in $U(4, 1)$ is related to the moduli space of cubic surfaces, and an example in $U(13, 1)$ is conjecturally related to the monster simple group.

We'll try to describe the new information we obtain about the moduli space of cubic surfaces from this point of view.

Some of this is joint work with Daniel Allcock and Eduard Looijenga and some of this is joint work with Jon McCammond.

ALL ARE CORDIALLY INVITED

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