Abstracts: Dynamics of Lie Group I

Lodha Mathematical Sciences Institute

August 24 – 28, 2026

Abstracts

Speaker: Prasuna Bandi
Title: Homogeneous dynamics and diophantine approximation
Abstract: I will introduce some central ideas in homogeneous dynamics, with emphasis on their connections with number theory. We will focus on homogeneous spaces of the form G/ Γ, particularly the space of unimodular lattices $SL_d(R)/SL_d(Z)$, and study the dynamics of unipotent and diagonal subgroup actions on these spaces. We will discuss some of the major results that illustrate the distinctive behavior of these actions. Along the way, we will see how questions in Diophantine approximation can be translated into dynamical questions on spaces of lattices, providing concrete arithmetic applications of homogeneous dynamics.

Speaker: Jean-Marc Schlenker
Title: Volumes and boundary data of convex hyperbolic manifolds
Abstract: Quasifuchsian hyperbolic manifolds, and more generally convex co-compact hyperbolic manifolds, provide a bridge between the "hyperbolic" Teichmüller theory on the boundary of their convex core, and the "complex" Teichmüller theory on the asymptotic boundary. We will describe the two sides, with particular emphasis on the analogies between the boundary data and the volumes associated to each. We will

then focus on properties of the renormalized volume, such as its gradient flow.

Speaker: Ishan Banerjee

Title: An introduction to character varieties

Abstract: In this 3-part lecture series, I will define representation varieties and character varieties, and discuss some basic properties of them. If time permits, I may discuss some features of the mapping class group action on these varieties. Here is a tentative outline of the lectures.

Lecture 1: I will define representation varieties and compute the Zariski tangent spaces to representation varieties of surface groups. I will then begin to discuss the conjugation action on representation varieties and discuss why the naive quotient may fail to be Hausdorff.

Lecture 2: I will define the GIT quotient of the representation variety. I will begin with reviewing some algebraic geometry and then defining the GIT quotient, I will then discuss what the points of the GIT quotient look like.

Lecture 3: This is to be decided. A possible topic may be the proof of Goldman and Xia that the mapping class group acts ergodically on SU_2 character varieties.