

Abstracts: Dynamics on Lie Groups Conference

Lodha Mathematical Sciences Institute

31 August - 4 September, 2026

This week-long conference brings together researchers working on surface group representations, higher Teichmüller theory, and analytic group theory, with daily talks running through the mornings and most afternoons from 31 August to 4 September.

Speaker: Prasuna Bandi

Title: Submanifold genericity for higher-rank actions on homogeneous spaces

Abstract: We study pointwise ergodic averages for $\mathbb{R}^d$ -actions taken along dilates of lower-dimensional submanifolds of the acting group. We introduce a notion of submanifold genericity and establish quantitative equidistribution results for higher-rank actions on homogeneous spaces. We will discuss how these dynamical results, together with the correspondence between Diophantine approximation and trajectories in the space of lattices, lead to new results in uniform multiplicative Diophantine approximation.

Speaker: Fernando Al Asal

Title: Counting nearly Fuchsian surfaces

Abstract: Let M be a closed hyperbolic 3-manifold. We will show that for any $\epsilon > 0$, the number of $(1+\epsilon)$ -quasifuchsian surfaces in M of genus up to g , considered modulo conjugacy and commensurability, is at least $(cg)^{2g-2}$ for a constant c depending on ϵ .

Speaker: Sourav Ghosh

Title: Anosov representations and proper actions

Abstract: In this talk, I will introduce Anosov representations and explain how they can be used to obtain proper actions on affine spaces and group manifolds. Part of this talk will be based on forthcoming joint work with Toshiyuki Kobayashi.

Speaker: Andrea Tamburelli

Title: Hitchin builds on Wall: topology of domains of discontinuity

Abstract: By work of Guichard-Wienhard and Kapovich-Leeb-Porti, an $SL(n, \mathbb{R})$ -Hitchin representation of a surface group acts properly discontinuously on a domain in the partial flag manifold of line-hyperplane pairs, which turns out to be a fiber bundle over the universal cover of the surface. In a joint work with Parker Evans, we use recent techniques developed by Colin Davalo and Parker Evans as well as surgery theory and Wall's classification of highly-connected high-dimensional smooth manifolds to establish the topology of the fiber of this bundle for all n .

Speaker: Konstantinos Tsouvalas

Title: Matrix entries, unipotents and linearity of amalgams

Abstract: In this talk, we consider the question of whether amalgams of linear groups are still linear. By analyzing matrix entries and unipotent elements, we will discuss linearity for specific algebraic "doubles" and obtain new examples of finitely generated, residually finite, non-linear groups. This is joint work with Sami Douba.

Speaker: Giuseppe Martone

Title: Holmes-Thompson area estimates for convex real projective surfaces and Fock-Goncharov coordinates

Abstract: Holmes and Thompson introduced a notion of volume that extends the standard Riemannian definition to Finsler manifolds, such as convex real projective surfaces. In this talk, we will focus on finite-area convex real projective structures on a thrice-punctured sphere and describe a lower bound on their Holmes-Thompson area in terms of their Fock and Goncharov coordinates. This is based on joint work with Xenia Flamm.

Speaker: Xian Dai

Title: Chain recurrence at the intersection of Thurston's metric and Lagrangian dynamics

Abstract: We introduce a notion of maximal stretch for general variable negatively curved metrics, motivated by the study of Thurston's asymmetric metric in Teichmüller space. Associated to this construction are several natural objects, including Mather set, Aubry set, Peierls barrier zero set and stretch locus. We discuss the relationships among these sets. We further examine the chain recurrence properties that arise in this setting from different perspectives. A large part of the talk is based on joint work with Gerhard Knieper.

Speaker: Inhyeok Choi

Title: Counting curves for subgroups of mapping class group.

Abstract: Let c be a simple closed curve on a hyperbolic surface. How many curves are there with the same type as c and with hyperbolic length less than L ? This question is concerning the mapping class group orbit of c , and Mirzakhani proved that the counting function is asymptotic to L^{6g-6} . One can then ask a similar question for subgroups of mapping class groups. In this talk, I will describe answers to this generalization for non-elementary/convex-cocompact subgroups. Joint work with Dongryul M. Kim.

Speaker: (Vicky) Rou Wen

Title: Criterion for Finiteness of BMS Measure

Abstract: In many useful settings, having a finite BMS measure on a flow space allows people to normalize the BMS measure into a probability measure and facilitates powerful ergodic theoretic tools. This often leads to equidistribution results and asymptotic estimates for counting orbital points. Hence, it is important to know when a dynamical system admits a finite BMS measure. In this talk, I will talk about the criterion for the finiteness of the BMS measure on the unit tangent bundle of a negatively curved manifold introduced by Pit-Schapira. I will also present my recent work that extends this criterion to the setting of transverse subgroups of higher rank semisimple Lie groups.

Speaker: Francois Gueritaud

Title: Limit cones and quasi-laminations

Abstract: In this report about ongoing joint work with J.Danciger and F.Kassel, I will draw a connection between the boundary shapes of limit cones of discrete groups in higher-rank Weyl chambers, and the field of dynamics known as ergodic optimization. This touches and expands on Thurston's study of maximally stretched geodesic laminations between two hyperbolic surfaces, introducing their fashionable cousins (quasi-laminations) and evil twins (anti-laminations).

Speaker: Max Riestenberg

Title: Stability, harmonic maps and the universal Hitchin component

Abstract: Let X be a complete Riemannian manifold with Ricci curvature bounded below, and let Y be a Hadamard space. We define a notion of stability for coarse Lipschitz maps $f: X \rightarrow Y$, and show that every stable map from X to Y is at bounded distance from a harmonic map. This harmonic map is unique when X and Y are symmetric spaces.

As an application, we define a universal Hitchin component in the style suggested by Labourie and Fock-Goncharov. It can be understood either as a space of positive quasi-symmetric maps from $\mathbb{RP}^1$ to the flag variety of $\mathrm{SL}_n(\mathbb{R})$ or as a space of certain harmonic quasi-isometric embeddings from $\mathbb{H}^2$ to the symmetric space of $\mathrm{SL}_n(\mathbb{R})$. This is all joint work with Peter Smillie.

Speaker: Pabitra Barman

Title: Entropy and domination for quasi-Hitchin representations

Abstract: How do the geometry and dynamics of a Hitchin representation change when it is bent along a geodesic lamination?

In this talk, we show that the original, unbent representation strictly dominates its bent counterparts in both the Hilbert and translation-length spectra. Building on this geometric domination, we prove an entropy rigidity result: bending strictly increases the associated entropies. I will outline the proof, highlighting how we bridge combinatorics and dynamics by connecting weighted planar networks with the equidistributional of closed geodesics. This is joint work with Subhojoy Gupta.

Speaker: Debanjan Nandi

Title: Shadow lemmas and applications

Abstract: I will discuss horospherical volume estimates in non-compact symmetric spaces and some shadow estimates for Patterson-Sullivan-type measures for a class of discrete groups acting by isometries in these spaces. This includes non-uniform lattices and some relatively Anosov representations.

The above-mentioned estimates lead to a unified geometric framework for describing aspects of cusp excursions for the locally symmetric spaces obtained from the subgroups, which I will also discuss if time permits.

Speaker: Indranil Bhattacharyya

Title: Dendrites and Scaling limit trees

Abstract: A real tree is a 0-hyperbolic metric space, and a dendrite is a compact, uniquely arc-connected metric space. Suppose that $\phi \in \mathrm{Aut}(F_n)$ is fully irreducible and that the mapping torus $F_n \rtimes_{\phi} \mathbb{Z}$ is Gromov hyperbolic. This gives rise to a metric graph bundle over $\mathbb{R}$ in the sense of Mj and Sardar. The restricted metric graph bundle over $[0, \infty)$ is also Gromov hyperbolic. Bowditch proved that the boundary of such a metric

graph bundle over $[0, \infty)$ is a dendrite D . On the other hand, by the work of Bestvina and Handel, ϕ admits a train-track representative. Using the associated train-track constants, we rescale the metric on the train-track representative and obtain an $\mathbb{R}$ -tree T as a scaling limit. Endowing $T^{\circ} = T \cup \partial T$ with the observers' topology, we obtain a dendrite. We show that there is an F_n -equivariant homeomorphism between D and

T° . This is joint work with Mahan Mj.

Speaker: Rana Sardar

Title: Boundary Maps and Quasi-Isometries for Relatively Hyperbolic Groups

Abstract. A central problem in geometric group theory is the classification of finitely generated groups up to quasi-isometry. For hyperbolic and relatively hyperbolic groups, the boundary at infinity plays an important role as a quasi-isometry invariant. In this direction, a motivating result, given by F. Paulin, showed that two hyperbolic groups are quasi-isometric if and only if their Gromov boundaries are quasi-Möbius or quasiconformally equivalent.

In this talk, we generalize Paulin's result to the setting of relatively hyperbolic groups and their Bowditch boundaries. We begin with the basics of hyperbolic and relatively hyperbolic groups, their boundaries, quasi-isometries, and the relationship between boundary homeomorphisms and quasi-isometries. Next, we recall the notion of quasi-Möbius maps and develop its relative version by introducing the relative cross-ratio and relative quasi-Möbius maps. We study some of their basic properties and explain how these boundary maps are related to quasi-isometries between relatively hyperbolic groups. Finally, we turn to quasiconformal maps and introduce the notion of quasiconformal maps that coarsely preserve shadows of horoballs. We show that such boundary maps induce quasi-isometries between the corresponding relatively hyperbolic groups, thereby obtaining a relative analogue of Paulin's result.

Speaker: Gobinda Sau

Title: Harmonic map heat flow and framed surface-group representations

Abstract: Given an element X of the enhanced Teichmüller space $\mathcal{T}^{\pm}_g$ and a type-preserving framed ρ -representation $\hat{\rho} = (\rho, \beta)$, there is a ρ -equivariant harmonic map $f: \mathbb{H}^2 \rightarrow \mathbb{H}^3$ that is asymptotic to the framing β . Here, the domain is the universal cover of the punctured Riemann surface obtained from a conformal completion of X . The proof uses the harmonic map heat flow.

Speaker: Shreyasi Datta

Title: Counting Rational Points Near Manifolds

Abstract: We will discuss ongoing work with Victor Beresnevich on counting rational points near manifolds and explain how this problem connects with homogeneous dynamics. In particular, we will present an improvement of the quantitative nondivergence estimates of Bernik--Kleinbock--Margulis. As an application, this yields an improved exponent for counting rational points beyond the conjectural range.

Speaker: Daniel Douglas

Title: Webs

Abstract: For an algebraic group G , the point of view of "G-webs" offers a pictorial way to think about the coordinate ring of the algebraic variety of G -characters on a manifold with a finitely generated fundamental group. Webs also appear at the intersection of (quantum) topology and statistical mechanics, in the context of "G-dimer models". We will discuss recent work at this intersection. This is joint work with Richard Kenyon, Nicholas Ovenhouse, Samuel Panitch, and Sri Tata.