

Abstracts: Dynamics Day

24th July, 2026 | Venue: Harish Chandra Hall, LMSI

Speaker: Aritro Pathak

Title: On the dimension drop for harmonic measure on uniformly non-flat Ahlfors-David regular
Boundaries

Abstract: We extend earlier results of Azzam on the dimension drop of the harmonic measure for a domain $\Omega \subset \mathbb{R}^n$ with $n \geq 3$, with Ahlfors-David regular boundary $\partial \Omega$ of dimension s with $n-1-\delta_0 \leq s \leq n-1$, that is uniformly non flat. Here δ_0 is a small positive constant dependent on the parameters of the problem. Our novel construction relies on elementary geometric and potential theoretic considerations. We avoid the use of Riesz transforms and compactness arguments, and also give quantitative bounds on the δ_0 parameter.

Speaker: Sundara Narasimhan

Title: Extreme value theory for fixed-shift inhomogeneous Diophantine approximation

Abstract:

I will discuss recent work on extreme-value problems arising in inhomogeneous Diophantine approximation on the circle with a fixed shift.

We establish Weibull limit laws for the minima of suitably normalized r -th nearest-neighbour approximation functions associated with a fixed Diophantine shift, along sufficiently lacunary sequences. We also prove corresponding logarithm laws describing the almost-everywhere asymptotic behaviour of these functions.

This talk is based on joint work with Sourav Das and Anish Ghosh.

Speaker: Sourav Das

Title: Probabilistic aspects in Diophantine approximation and homogeneous dynamics

Abstract: In this talk, we explore some probabilistic aspects in number theory using tools from homogeneous dynamics. Generalizing a result of Dolgopyat, Fayad, and Vinogradov, we prove a central limit theorem for inhomogeneous Diophantine approximation with a fixed shift, provided the shift is non-Liouville.

To prove this, we translate the number-theoretic problem into the language of dynamics on homogeneous spaces. In the latter setting, we prove an effective multi-equidistribution result for diagonal translates of unipotent flows. This is accomplished by combining a recent breakthrough of Kim and the height function machinery developed by Shi. Finally, we deduce the central limit theorem by applying the method of cumulants pioneered by Björklund and Gorodnik.

This is joint work with Gaurav Aggarwal and Anish Ghosh.

Speaker: Jayadev Athreya

Title: 3-Dot Densities

Abstract: We discuss some results related to a beautiful example of Ledrappier, the 3-dot shift system, a Z^2 -shift which is 2-mixing but not mixing of all orders. We describe the example, the connection to formal Laurent series over finite fields, and some recent work-in-progress on providing a simple numerical certificate for the existence of many distinct invariant measures (as shown by Einsiedler). This is joint work in progress with Abrams, Costa, Harriss, Kassabov, and Whitney, and grew out of drawing pictures of dots on graph paper.