Semi-annual Workshop in Dynamical Systems and Related Topics
Pennsylvania State University, December 3–6, 2026

Organizers: Svetlana Katok, Federico Rodriguez Hertz and Jonathan DeWitt

Schedule of Talks

Thursday, December 3, 2026

1:00–1:50 PM	Registration
1:50–2:00 PM	Opening remarks
2:00–2:50 PM	ZELEROWICZ
3:00–3:30 PM	*Departmental Tea*
3:30–4:30 PM	Colloquium: FLAMINIO

Friday, December 4, 2026

9:00–9:50 AM	GOGOLEV
10:00–10:20 AM	*Coffee break*
10:20–11:10 AM	LIGHTNING TALKS
11:20–12:10 PM	SOLAN
12:30–2:00 PM	*Lunch break*

Special Session "Recent Developments in Symplectic Dynamics"

2:00–2:50 PM	ABBONDANDOLO
3:00–3:50 PM	MAZZUCCHELLI
4:00–4:30 AM	*Coffee break*
4:30–5:20 PM	ZAVIDOVIQUE
5:30–6:20 PM	SORRENTINO

7:30–9:30 PM	*BANQUET*

Saturday, December 5, 2026

Special Session in Memory of Sheldon Newhouse

9:00–9:50 AM	PUJALS
10:00–10:30 AM	*Coffee break*
10:30–11:20 AM	BUZZI
11:30–12:20 PM	JAKOBSON
12:30–2:00 PM	*Lunch break*

The 6th Michael Brin Dynamical Systems Prize for Young Mathematicians

2:00–2:30 PM	PRIZE CEREMONY
2:30–3:20 PM	
3:30–4:00 PM	*Coffee break*
4:00–4:50 PM	

Sunday, December 6, 2026

9:00–9:50 AM	OH
10:00–10:20 AM	*Coffee break*
10:20–11:10 AM	LIGHTNING TALKS
11:20–12:10 PM	FILIP
12:20–1:10 PM	DOLGOPYAT

Titles and Abstracts

Alberto Abbondandolo (Ruhr-Universität Bochum)
Title: *Gibbs Measures on Infinite Trees and Homoclinic Points.*
Abstract: I will discuss homogeneous Markov Gibbs measures on Cayley trees and how the question of their existence and multiplicity is related to homoclinic points of non-smooth symplectomorphisms and more general Lagrangian correspondences. This talk is based on a joint work with Pietro Majer.

Jérôme Buzzi (Université Paris-Saclay)
Title: *Newhouse and the dynamics beyond uniform hyperbolicity.*
Abstract: I will try to describe how Newhouse's discoveries have shed light on dynamics beyond uniform hyperbolicity. On the one hand, almost everywhere behavior might often be too complex to describe. On the other hand, maximal entropy measures can inherit many "uniform" properties in many settings.

Dmitry Dolgopyat (University of Maryland, College Park)
Title: *TBA*
Abstract: TBA

Simion Filip (University of Chicago)
Title: *Invariant distributions and entropy*
Abstract: For a dynamical system in continuous or discrete time on a compact smooth manifold, it can be useful to consider invariant distributions, i.e. invariant generalized functions, or more generally eigen-distributions. These can be related to ergodic averages of smooth observables, as well as the spectral theory of the dynamics. A conjecture of Katok and Greenfield—Wallach is that the absence of invariant distributions (in a quantitative sense) implies a rigidity property of the flow. I will discuss some results related to this question, and relations to the entropy of the flow.

Livio Flaminio (University of Lille)
Title: *Equidistribution in homogeneous dynamics.*
Abstract: Closed orbits on a torus equidistribute as their period grows, and a simple Fourier argument tells us exactly how fast. In dimension three and up this rate depends on Diophantine properties of the direction, not just its size. The same mechanism, recast via invariant distributions and the cohomological equation, governs orbit equidistribution on constant-negative-curvature surfaces, and on the Heisenberg nilmanifold. General mathematical audience; no background beyond linear algebra and Fourier series assumed.

Andrey Gogolev (Ohio State University)
Title: *OpenAI's counterexample to the Shub Entropy Conjecture.*
Abstract: I will outline a construction of a $C^r, r \geq 1$, map $f : M \to M$ which has vanishing topological entropy and acts as $\times 2$ on the second homology $H_2(M)$. The example is due to OpenAI and humanity. If time permits I will also indicate how to modify the construction to make an invertible 60-dimensional diffeomorphism.

Michael Jakobson (University of Maryland, College Park))
Title: *SRB measures for certain Henon-like families. Distortion and parameter estimates. Michael Jakobson and Sheldon Newhouse.*
Abstract: A major part of the proof of the existence of SRB measures for Henon like families are inductive estimates of distortions and parameter dependence for iterates of the original map f. A goal is to construct a power map F which has an SRB measure ν. Then an f-invariant SRB measure μ can be constructed from ν and ergodic properties of μ can be studied. In this paper we consider some piecewise smooth families of 2-d maps which are not small perturbations of 1-d maps, and prove that the power map F as above exists for a set of parameters of positive Lebesgue measure.

Marco Mazzucchelli (Institut de Mathématiques de Jussieu and IAS)
Title: *Klingenberg's theorem on Anosov geodesic flows.*
Abstract: In 1970, Klingenberg proved a fundamental result on closed Riemannian manifolds with Anosov geodesic flows, asserting that such manifolds are without conjugate points. The proof, based on the Morse theory of the energy functional, had crucial gaps pointed out by Anosov, who saved the theorem by providing

a completely independent proof. In this talk, based on joint work with Rotem Assouline, I will provide a full Morse-theoretic proof of Klingenberg's theorem, filling the gaps of the original argument.

Hee Oh (Yale University)
Title: *Beyond Howe–Moore: Local Mixing for Cusped Positive Representations.*
Abstract: We study the asymptotic behavior of correlations with respect to the Haar measure for diagonal flows on quotients of semisimple Lie groups by discrete subgroups. While the classical Howe–Moore theorem characterizes their limiting behavior in finite volume, correlations vanish in infinite volume, and the problem of local mixing seeks a suitable renormalization that yields a nontrivial limit. Such asymptotics are currently understood for only a few classes of discrete subgroups.

In recent joint work with Dongryul Kim and Wenyu Pan, we establish local mixing for cusped positive representations of surface groups. In particular, we obtain complete asymptotic expansions of correlations for Bowen–Margulis–Sullivan measures, alongside uniform Gaussian asymptotics in transverse directions. Combining these results with work of Edwards–Lee–Oh, we derive normalized asymptotics for matrix coefficients with a polynomially decaying error term, as well as corresponding orbital counting asymptotics.

Enrique Pujals (CUNY, Graduate Center)
Title: *Sheldon's Tangencies: How a Simple Construction Opened a Wild World.*
Abstract: In the 1960s, the prevailing expectation was that hyperbolic dynamics would be typical, and that the complexity of the horseshoe and Anosov systems was essentially the whole story. In the early 1970s, Sheldon Newhouse showed otherwise. By combining a homoclinic tangency with the fine geometry of Cantor sets, he proved that tangencies can persist on open sets of diffeomorphisms, so non-hyperbolicity is robust. The construction is strikingly elementary, yet its consequences were not: residual sets of diffeomorphisms with infinitely many sinks, wild hyperbolic sets, and a persistent coexistence of very different dynamical behaviors. In this talk I will explain the construction and survey the wild world that followed in surfaces, in higher dimensions, and in the complex setting. I will also describe how several different approaches to wild dynamics grew out of his ideas. More than fifty years later, these ideas remain a living source of inspiration for current efforts to give a global, organizing description of these phenomena.

Omri Solan (IAS)
Title: *Horocycle-invariant measures on the moduli space of translation surfaces*
Abstract: The group $SL_2(R)$ acts on the moduli space of translation surfaces with volume 1 and genus g. We will discuss an ongoing project of classifying the probability measures on the moduli space that are invariant under the horocycle action. This result extends and is built upon a result of Eskin and Mirzakhani that classifies $SL_2(R)$ invariant measures. We will discuss an application to billiard dynamics and some of the difficulties in the proof.

Alfonso Sorrentino (University of Rome Tor Vergata and IAS)
Title: *Unbounded orbits in Outer Billiards.*
Abstract: Outer billiards is a simple dynamical system played outside a convex table in the plane. A question made famous by Moser and Neumann asks whether orbits always stay within a bounded region, or whether some can drift off to infinity. In this talk, I will address this question and show that for a typical centrally symmetric, strictly convex C^1 table, there exist orbits that escape to infinity.

Maxime Zavidovique (Institut de Mathématiques de Jussieu and IAS)
Title: *Tonelli conformal Hamiltonian flows without conjugate points.*
Abstract: We study conformally symplectic flows on $T^*\mathbb{T}^d$ associated to Hamiltonians that are convex and superlinear in the momentum. They contract the symplectic form in positive time. The goal is to understand dynamical properties of such flows that do not have conjugate points. We will explain that the absence of conjugate points imply that there is a global attractor that is a Lipschitz Lagrangian graph. This is based on work with Marie-Claude Arnaud and Xifeng Su.

Agnieszka Zelerowicz (University of California, Riverside)
Title: *Measures of Maximal Entropy for Skew products.*
Abstract: In this joint work with Zhenghe Zhang we present a construction of measures of maximal entropy (MME) for maps $F : \Omega \times \mathbb{T}^d \to \Omega \times \mathbb{T}^d$ defined as a skew product: $F(\omega, v) = (T\omega, A(\omega)v)$, where $T : \Omega \to \Omega$

is a topologically mixing subshift of finite type and $A(\omega) \in SL(d, \mathbb{Z})$ depends Hölder continuously on ω. If $d = 2$, we show that the measures obtained through our construction are fully supported. We observe an interesting phenomenon in the special case when the matrices $A(\omega)$ commute.