Oitavo Workshop de Sistemas Dinâmicos
Universidade Federal do Rio Grande do Sul
04 a 08 de Novembro de 2024

CADERNO DE RESUMOS

Comitê Científico

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Porto Alegre
Novembro 2024

Apoio:

<div align="center">Palestrantes</div>

- Alex Becker (UFSM)
- Carlos Reyes (UASLP - México)
- Daniel Smania (USP)
- Eduardo Scarparo (UFPEL)
- Juliana Xavier (Udelar - Uruguai)
- Luna Lomonaco (IMPA)
- Marcelo Sobottka (UFSC)
- Martin Sambarino (Udelar - Uruguai)
- Pablo Lessa (Udelar - Uruguai)
- Sergi Burniol (Udelar - Uruguai)
- Sebastien Alvarez (Udelar - Uruguai)

<div align="center">Programa</div>

Segunda-feira, 04 de novembro
- 14h   Pablo Lessa (Udelar - Uruguai)
- 15h   Intervalo para o café
- 15h30   Alex Becker (UFSM)

Terça-feira, 05 de novembro
- 14h   Sebastien Alvarez (Udelar - Uruguai)
- 15h   Intervalo para o café
- 15h30   Marcelo Sobottka (UFSC)

Quarta-feira, 06 de novembro
- 14h   Martin Sambarino (Udelar - Uruguai)
- 15h   Intervalo para o café
- 15h30   Daniel Smania (USP)

Quinta-feira, 07 de novembro
- 14h   Juliana Xavier (Udelar - Uruguai)
- 15h   Intervalo para o café
- 15h30   Carlos Reyes (UASLP - México)
- 16h30   Intervalo para o café
- 16h45   Eduardo Scarparo (UFPEL)

Sexta-feira, 8 de Novembro
- 14h   Sergi Burniol (Udelar - Uruguai)
- 15h   Intervalo para o café
- 15h30   Luna Lomonaco (IMPA)

Propriedades da dimensão métrica média e dimensão Hausdorff média

Alex Becker (UFSM)

Abstract: Nesta palestra pretendo apresentar resultados a respeito da dependência da Dimensão Métrica Média $\mathrm{mdim}_M(\mathbb{M}, d, f)$ e da Dimensão Hausdorff Média $\mathrm{mdim}_H(\mathbb{M}, d, f)$ em relação a métrica. Tais conceitos foram propostos como estimativas para a Dimensão Média, um invariante dinâmico da Dimensão Topológica do espaço. Uma questão relacionada, é se existe uma métrica tal que a dimensão média e a dimensão métrica média são iguais, para qualquer sistema dinâmico agindo no espaço de fase. Irei apresentar algumas formas de gerar métricas equivalentes a d, ou seja, métricas geram a mesma topologia, e como $\mathrm{mdim}_M(\mathbb{M}, d, f)$ e $\mathrm{mdim}_H(\mathbb{M}, d, f)$ podem ser comportar para tais métricas. Por exemplo, se existe dependência contínua com relação a métrica e ainda, alguns problemas relacionados. Este é um trabalho em colaboração com Alexandre T. Baraviera, Érick Scopel e Jeovanny Muentes.

Intrinsic ergodicity in bounded density subshifts

Carlos Reyes (UASLP - México)

Abstract: Bounded density shifts are examples of hereditary subshifts. Bounded density shifts are defined by disallowing words whose sum of entries exceeds a value depending on the length of the word. After presenting some examples and reviewing the concepts of topological entropy and measure-theoretic entropy, we will provide sufficient conditions for bounded density shifts to have a unique measure of maximal entropy. This is joint work with Felipe García-Ramos and Ronnie Pavlov.

Deformations of one-dimensional dynamical systems

Daniel Smania (USP)

Abstract: Perhaps one of the main features of one-dimensional dynamics (either real or complex) is that the theory of deformations is rich. By this we mean that the topological classes of such maps often are infinite dimensional manifolds, but with finite codimension. They are kind of "almost" structurally stable! Moreover for smooth families of maps inside a given topological class the associated family of conjugacies also moves in a smooth way. There are various applications in the study of renormalisation theory and linear response theory. There is a nice theory in complex dynamics but for real maps with finite smoothness on the interval our current understanding is far behind the complex setting. We will discuss recent

developments obtained in joint work with Clodoaldo Ragazzo but also some results with Viviane Baladi and Amanda de Lima. Ergodic theory will be a crucial tool.

Homological invariants of topological dynamical systems

Eduardo Scarparo (UFPEL)

Abstract: We will discuss homological invariants of actions of the infinite dihedral group on the Cantor set. This class of dynamical systems includes interesting examples like odometers, irrational rotations and palindromic shift spaces like the one coming from the Thue-Morse sequence. We will also present the connection of these invariants with topological full groups of Cantor minimal systems. Based on joint work with Eduard Ortega.

Cómo ser topóloga y poner figuras de conjuntos de Julia en las charlas

Juliana Xavier (Udelar - Uruguai)

Abstract: Es un problema abierto si el Julia de una función racional puede ser un continuo indescomponible. Se conjetura que una función f de clase C^1 de la esfera S^2 debe tener crecimiento exponencial de la cantidad de puntos fijos de f^n. En esta charla mostraré cómo se puede trabajar en estos temas aunque no te guste la derivada.

The Mandelbrot set and its Satellite copies

Luna Lomonaco (IMPA)

Abstract: For a polynomial on the Riemann sphere, infinity is a (super) attracting fixed point, and the filled Julia set is the set of points with bounded orbit. Consider the quadratic family $P_c(z) = z^2 + c$. The Mandelbrot set M is the set of parameters c such that the filled Julia set of P_c is connected.

Computer experiments quickly reveal the existence of small homeomorphic copies of M inside itself; the existence of such copies was proved by Douady and Hubbard. Each little copy is either primitive (with a cusp on the boundary of its main cardioid region) or a satellite (without a cusp). Lyubich proved that the primitive copies of M satisfy a stronger regularity condition: they are quasiconformally homeomorphic to M. The satellite copies are not quasiconformally homeomorphic to M (as we cannot straighten a cusp quasiconformally), but are they mutually quasiconformally homeomorphic? In joint work with C. Petersen we prove that the answer is negative in general, but positive in the case the satellite copies have rotation numbers with the same denominator.

Ergodic Optimization via Blur Shifts

Marcelo Sobottka (UFSC)

Abstract: Given a non-empty set $\mathcal{A}$ (an alphabet), we define the one-sided full shift over $\mathcal{A}$ as
$$\mathcal{A}^{\mathbb{N}} := \{(x_i)_{i\in\mathbb{N}} : x_i \in A \ \forall i \in \mathbb{N}\}$$
endowed with the pro-discret topology. On $\mathcal{A}^{\mathbb{N}}$ we consider the shift map $\sigma : \mathcal{A}^{\mathbb{N}} \to \mathcal{A}^{\mathbb{N}}$ given by
$$\sigma\big((x_i)_{i\in\mathbb{N}}\big) = (x_{i+1})_{i\in\mathbb{N}}.$$
A shift space (or subshift) is any closed set $\Lambda \subset \mathcal{A}^{\mathbb{N}}$ such that $\sigma(\Lambda) \subset \Lambda$. We call a potential any Borelian function $A : \Lambda \to \mathbb{R}$ which is bounded from above. The ergodic maximizing constant of a potential A is

$$\beta(A) := \sup\left\{\int_\Sigma A\, d\mu \ : \ \mu \text{ is } \sigma\text{-invariant probability}\right\} \in \big(-\infty, \sup A\big].$$

Ergodic optimization on shift spaces leads with the problem of finding σ-invariant probability measures μ that maximize the integral of A over Λ, i. e., $\int A\, d\mu = \beta(A)$. Whenever $\mathcal{A}$ is finite, the shift spaces are compact and there are an extensive theory about them. However, if $\mathcal{A}$ is infinite, the non-compactness (in general neither local compactness) imposes several difficulties for their studies. In this talk I shall present recent results obtained in a joint work with João T. A. Gomes (UFRB) and Eduardo Garibaldi (UNICAMP), that use Blur shifts as a compactification scheme for shift spaces over countable alphabets to provide sufficient conditions (on the shift space and on the potential) for the existence of maximizing σ-invariant probability measures.

The homological rotation vector of periodic points for C^r generic conservative surface diffeomorphisms isotopic to the identity

Martin Sambarino (Udelar - Uruguai)

Abstract: Let S be a compact surface of genus g. We show that the rotation set of a conservative surface diffeomorphism of S isotopic to the identity (under some C^r generic conditions) contains polyhedrons in $H_1(S, \mathbb{R})$ where each "rational point" in these polyhedrons is realized by a periodic orbit. The subspace generated by all these polyhedrons has dimension at least g and contains a Lagrangian subspace. This is a joint work with Patrice Le Calvez.

Counting with the thermodynamic formalism

Pablo Lessa (Udelar - Uruguai)

Abstract: In joint and ongoing work with Alex Becker we consider a counting problem which in some cases is amenable to the techniques of thermodynamic

formalism on infinite state graphs. I will discuss the background case which already appears in Shannon's early result on calculating channel capacity, and formulate some partial results we have obtained in our case. I will also discuss some open problems which remain.

Topología de los horocíclos en curvatura no positiva

Sergi Burniol (Udelar - Uruguai)

Abstract: Voy a presentar una clasificación de las clausuras horocíclicas para superficies geométricamente finitas con una métrica de curvatura no positiva. Esta clasificación ya existía si la superficie tiene curvatura estrictamente negativa. En este caso, los horociclos son cerrados o densos en el conjunto no errante. En curvatura no positiva aparece un nuevo fenómeno: hay horocíclos errantes que se acumulan en el conjunto no errante. Durante la charla intentaré explicar la relación entre los horociclos, los rayos geodésicos asociados y los fines de la superficie.

Ações de $PSL(2, \mathbb{R})$ e equidistribuição de superfícies em 3-variedades hiperbólicas

Sebastien Alvarez (Udelar - Uruguai)

Abstract: Nesta palestra estou interessado em certas ações do $PSL(2, \mathbb{R})$ que quero ver como um análogo do fluxo geodésico. Esses sistemas dinâmicos aparecem em trabalhos recentes sobre distribuição e contagem de superfícies em variedades 3 hiperbólicas. Vou me concentrar nas propriedades dinâmicas dessas ações e em como a teoria de Ratner permite obter resultados de rigidez geométrica. É um trabalho em conjunto com Ben Lowe (Universidade de Chicago) e Graham Smith (PUC Rio de Janeiro).