Quinto Workshop de Sistemas Dinâmicos
Universidade Federal do Rio Grande do Sul
Edição on-line
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BOOK OF ABSTRACTS

Comitê Organizador
- Alexandre Baraviera (UFRGS)
- Lucas Backes (UFRGS)
- Lucas Oliveira (UFRGS)

Porto Alegre
December 2021

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

- Konstantin Khanin (University of Toronto - Canadá)
- Luna Lomonaco (IMPA)
- Marco Martens (Stony Brook - Estados Unidos)
- Maria Joana Torres (Universidade do Minho - Portugal)
- Núria Fagella (Universitat de Barcelona - Espanha)
- Rafael Potrie (Udelar - Uruguai)

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

Provisional schedule.

Monday, December 06
- 14h00   Rafael Potrie (Udelar)
- 15h00   Maria Joana Torres (Universidade do Minho)
- 16h00   Konstantin Khanin (University of Toronto)
- 17h00   Marco Martens (Stony Brook)

Tuesday, December 07
- 14h00   Núria Fagella (Universitat de Barcelona)
- 15h00   Luna Lomonaco (IMPA)

TBA

Konstantin Khanin (University of Toronto)

Abstract: TBA

Mating quadratic maps with the modular group

Luna Lomonaco (IMPA)

Abstract: Holomorphic correspondences are polynomial relations $P(z, w) = 0$, which can be regarded as multi-valued self-maps of the Riemann sphere, this is implicit maps sending z to w. The iteration of such a multi-valued map generates a dynamical system on the Riemann sphere: dynamical system which generalises rational maps and finitely generated Kleinian groups. We consider a specific 1-(complex)parameter family of $(2 : 2)$ correspondences F_a (introduced by S. Bullett and C. Penrose in 1994), which we describe dynamically. In particular, we show that for every parameter in a subset of the parameter plane called 'the connectedness locus' and denoted by M_Γ, this family behaves as rational maps on a subset of the Riemann sphere and as the modular group on the complement: in other words, these correspondences are mating between the modular group and rational maps (in the family $\mathrm{Per}_1(1)$). Moreover, we develop for this family of correspondences a complete dynamical theory which parallels the Douady-Hubbard theory of quadratic polynomials, and we show that M_Γ is homeomorphic to the parabolic Mandelbrot set M_1. This is joint work with S. Bullett (QMUL).

Renormalization beyond circle and unimodal dynamics

Marco Martens (Stony Brook)

Abstract: Examples of renormalization in one and two dimensional dynamics will be discuss. The goal is to illustrate that the renormalization phenomena as seen in circle diffeomorphisms and unimodal maps have a more intricate form in more general context.

Stationary measures on infinite graphs

Maria Joana Torres (Universidade do Minho)

Abstract: In this talk we describe an application of the isospectral reduction theory, introduced by L. Bunimovich and B. Webb in the context of finite graph theory, to the problem of existence and approximation of stationary measures on infinite graphs.

This is a joint work with Alexandre Baraviera and Pedro Duarte.

Referências

[1] Leonid A. Bunimovich and Benjamin Z. Webb, *Isospectral graph transformations, spectral equivalence, and global stability of dynamical networks*, Nonlinearity **25** (2012), 211-254.

[2] Pedro Duarte and Maria Joana Torres, *Eigenvectors of isospectral graph transformations*, Linear Algebra and its Applications **474** (2015), 110-123.

[3] Pedro Duarte and Maria Joana Torres, *Isospectral Reduction in Infinite Graphs*, Journal of Spectral Theory, **10**(3) (2020), 955-989.

[4] Alexandre Baraviera, Pedro Duarte and Maria Joana Torres, *Stationary measures on infinite graphs*, Communications in Contemporary Mathematics, online ready (2021), to appear.

Wandering domains in complex dynamics

Núria Fagella (Universitat de Barcelona)

Abstract: Iterating functions on the complex plane goes back to root-finding algorithms like Newton's method, but the basis of the rich theory that lies behind has its origin at the beginning of the 20th century. The dynamics inside periodic components of the stable set has a strong link with classical theorems of complex analysis like the Denjoy-Wolff Theorem about analytic maps of the unit disk. The fractal boundaries of such components arising so naturally from iteration often present interesting topological properties which may play a role when trying to transfer results from the unit disk back to the dynamical plane.

However, if the components are not periodic but wandering, we need to reach further and consider non-autonomous iteration. Wandering domains are the least understood among all stable components. In this talk we will present some recent results about the dynamics inside wandering domains and also some work in progress about dynamics on the boundary.

Symmetries of Anosov flows as models for partially hyperbolic diffeomorphisms

Rafael Potrie (Udelar)

Abstract: Given an Anosov flow on a closed 3 manifold, a self orbit equivalence is a homeomorphism which maps (oriented) orbits of the flow to other (oriented) orbits of the flow. The purpose of the talk is to explain the link between this objects and partially hyperbolic diffeomorphisms.