

IV Workshop on Dynamics, Numeration, and Tilings (IV FloripaDynSys)

April 29 – May 03, 2019
Florianópolis, Brazil



Organization committee

Ali Messaoudi (Universidade Estadual Paulista, Brasil)
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Programação IV FloripaDynSys (29/04/2019 – 03/05/2019)
 26 conferências de 40 minutos + 10 minutos; 1 sessão de posters.

Monday 29	
08:00 09:20	Registration
09:20 10:00	Opening
10:00 10:40	Alcides Buss
10:50 11:30	Samuel Senti
14:30 15:10	Rodrigo Bissacot Proença
15:20 16:00	Coffee break
16:00 16:40	Dante van Wyk
16:50 17:30	Carlos Gustavo Moreira
18:45 20:45	Cocktail

Tuesday 30	
09:10 09:50	Artur Lopes
10:00 10:30	Coffee break
10:30 11:10	Alexandre Baraviera
11:20 12:00	Nilson da Costa Bernardes
14:00 14:40	Benito Pires
14:50 15:30	Fábio Tal
15:40 16:10	Coffee break
16:10 16:50	Glauco Valle Coelho
17:00 17:40	Regis Varão

Wednesday 01	
09:10 09:50	Sébastien Ferenczi
10:00 10:40	Fagner Bernardini
10:40 12:00	Poster session

Thursday 02	
09:10 09:50	Krerley Oliveira
10:00 10:30	Coffee break
10:30 11:10	Udayan Darji
11:20 12:00	Patricia Romano Cirilo
14:00 14:40	Christian Mauduit
14:50 15:30	Eduardo Garibaldi
15:40 16:10	Coffee break
16:10 16:50	Maryam Hosseini
17:00 17:40	Bruno Brogni Uggioni

Friday 03	
09:10 09:50	Luciana Luna Anna Lomonaco
10:00 10:30	Coffee break
10:30 11:10	Dina Buric
11:20 12:00	Sergii Bezuglyi
14:00 14:40	Rodrigo Treviño
14:50 15:30	Thierry Giordano
15:40 16:00	Closure

KMS states for Quantum Spins Systems with Decaying fields

Lucas Affonso – University of São Paulo, Brazil

(Poster)

The Quantum Ising model was introduced in the 1960' s for the study of ferromagnets where the quantum effects are relevant, but only recently new phenomena are being discovered. We study the phase diagram of this model using a technique introduced in the 1970' s by Araki and Ion, where a relation between the DLR formalism and the KMS condition was established. As consequence, we prove that, when the transverse field is summable and the classical field is decaying as $|i|^{-\gamma}$, the model undergoes a phase transition for $\gamma > 1$ and has uniqueness when $\gamma < 1$.

This is joint work with Rodrigo Bissacot. This work was supported by FAPESP grant 2017/18152.2.

Amenable actions and crossed products

Alcides Buss – UFSC, Brazil

(Talk)

In this talk we discuss the problem of characterising equality of (full and reduced) crossed products for an action of a group on a C^* -algebra in terms of some amenability condition on the action.

This is joint work with Siegfried Echterhoff and Rufus Willett.

Stationary measures for some stochastic processes defined on graphs

Alexandre Tavares Baraviera – IM-UFRGS, Brazil

(Talk)

In this work we explore the isospectral reduction theory developed by Bunimovich and Webb in order to show the existence of stationary probabilities for certain stochastic processes defined on graphs.

This is a joint work with Pedro Duarte (Univ. Lisboa) and Joana Torres (Univ. Minho).

Some properties of locally scaling functions

Jéfferson L R Bastos – UNESP - Ibilce - São José do Rio Preto (Brazil)

(Poster)

In <http://arxiv.org/abs/0903.4226v1> the authors proved that (p^{-k}, p^k) locally scaling functions are conjugate to S^k , where S is the shift map. In this work we prove that (p^{-k}, p^k) locally scaling functions have the shadowing property and, using this property, we prove, by a different way, that these functions are conjugate to S^k . We also prove that (p^{-k}, p^{k-l}) locally scaling functions have shadowing property and they are structurally stable.

This is a joint work with A. Messaoudi and D. Caprio.

Shadowing and Structural Stability in Linear Dynamical Systems

Nilson C. Bernardes Jr. – Universidade Federal do Rio de Janeiro (UFRJ)

(Talk)

A well-known result in the area of dynamical systems asserts that any invertible hyperbolic operator on any Banach space is structurally stable. This result was originally obtained by P. Hartman in 1960 for operators on finite-dimensional spaces. The general case was independently obtained by J. Palis and C. Pugh around 1968. We will exhibit examples of structurally stable operators that are not hyperbolic, thereby showing that the converse of the above-mentioned result is false in general. We will also prove that an invertible operator on a Banach space is hyperbolic if and only if it is expansive and has the shadowing property. Moreover, we will show that if a structurally stable operator is expansive, then it must be uniformly expansive. Finally, we will characterize the weighted shifts on the spaces $c_0(\mathbb{Z})$ and $\ell_p(\mathbb{Z})$ ($1 \leq p < \infty$) that satisfy the shadowing property.

This is a joint work with Ali Messaoudi (IBILCE-UNESP). This work was partially supported by grant 2017/22588-0, São Paulo Research Foundation (FAPESP).

Exact number of ergodic measures for Cantor dynamical systems

Sergey Bezuglyi – University of Iowa (USA)

(Talk)

For a Bratteli diagram B (equivalently, for a Cantor dynamical system), we study the simplex $M_1(B)$ of probability measures on the path space of B which are invariant with respect to the tail equivalence relation. We study relations between the number of ergodic measures from $M_1(B)$ and the structure and properties of the diagram B . We prove a criterion and find sufficient conditions of unique ergodicity of a Bratteli diagram, For a finite rank k Bratteli diagram B having exactly $l \leq k$ ergodic invariant measures, we explicitly describe the structure of the diagram and find the subdiagrams which support these measures. We find sufficient conditions under which: (i) a Bratteli diagram has a prescribed number (finite or infinite) of ergodic invariant measures, and (ii) the extension of a measure from a uniquely ergodic subdiagram gives a finite ergodic invariant measure. Several examples, including stationary Bratteli diagrams, Pascal-Bratteli diagrams, and Toeplitz flows, are considered.

This is a joint work with O.Karpel (AGH University, Krakow, Poland) and J. Kwiatkowski (Kotarbinski University, Olsztyn, Poland).

Phase Transitions on Generalized Shift Spaces

Rodrigo Bissacot – University of São Paulo (USP), (Brazil)

(Talk)

Given an infinite matrix A of zeros and ones we can consider the standard countable Markov shift Σ_A associated with this matrix studied by the dynamicists. When A is just transitive (or topologically mixing) the space Σ_A is not locally compact and, despite the thermodynamic formalism have been developed in the last 20 years by O. Sarig and others, even the definition of the dual of the Ruelle operator should be considered in a weak sense. In 1999, see [1], R. Exel and M. Laca defined a locally compact space X_A which contains Σ_A as a dense subspace. The X_A can be seen as a locally compact version of the standard symbolic space Σ_A since they coincide when Σ_A is locally compact. This talk is based on an ongoing project, for the two first papers see [2, 3], where we are developing the thermodynamic formalism for the space X_A . We study conformal and DLR measures on it, and we show that we can recover the classical objects from the thermodynamic formalism on countable Markov shifts and also prove the existence of new conformal and DLR measures on this setting. Jointly work with Ruy Exel (UFSC/University of Nebraska-Lincoln), Rodrigo Frausino (IME-USP) and Thiago Raszeja (IME-USP).

This is a joint work with Ruy Exel (UFSC/University of Nebraska-Lincoln), Rodrigo Frausino (IME-USP) and Thiago Raszeja (IME-USP). This work was supported by CNPq, CAPES and FAPESP, Brazil. The author thanks to FAPESP for the grant number 17/26645-9, which make possible the visit of Ruy Exel at IME-USP where part of this work was done.

Splitting Factor Maps into u - and s -Bijective Maps.

Dina Buric – University of Victoria (Canada)

(Talk)

We consider three types of dynamical systems: shifts of finite type (SFT), substitution tilings spaces, and hyperbolic toral automorphisms (HTA). A Markov partition on a HTA gives a finite-to-one factor map between two of these spaces, a SFT onto the HTA. We investigate when such a factor map can be split as a composition of u - and s -bijective maps. It has already been shown that if the tiling system, given by the Markov partition, satisfies the forcing the border condition, then a splitting exists. We will show a partial converse, namely if a splitting exists then the Markov partition must satisfy a certain condition. Finally, we will show that the existence of a splitting does not imply that the tiling system forces its border.

This is a joint work with Ian F. Putnam (Canada).

Generalized hyperbolicity for linear operators

Patricia Cirilo – Federal University of São Paulo (Brazil)

(Talk)

It is introduced an open class of linear operators on Banach and Hilbert spaces such that their non-wandering set is an infinite dimensional topologically mixing subspace. In certain cases, it coincides with the whole space. One of the most interesting dynamical consequences is that for that class of operators the non-wandering set is an infinite dimensional robustly transitive set.

This is a joint work with B. Gollobite (Graduate Center-CUNY, USA), E. Pujals (Graduate Center-USA). This work was supported by FAPESP Brazil.

Linear dynamics induced by nonsingular odometers

U. B . Darji – University of Louisville, USP Ribeirão Preto

(Talk)

In this talk, we study operators on L^p induced by measures on nonsingular odometers. In particular, we characterize those operators which are transitive and topologically mixing.

This is a joint work with D. Bongiorno (U Palermo), E. D' Aniello (U Caserta), L. Di Piazza (U Palermo).

On Veech 1969 - type interval exchanges

S. Ferenczi – CNRS - Marseille

(Talk)

These famous examples are two-point extensions of rotations of angle α with a marked point β ; for particular α they provide the first known examples of minimal non uniquely ergodic interval exchanges. We generalize them by allowing several marked points and taking d -point extensions. In this class, we give criteria of minimality (with a complete characterization, hitherto unknown, for the original examples) and unique ergodicity, and study the problem of measure-theoretic rigidity, using the Ostrowski approximation of the marked points by α .

Joint work with P. Hubert.

Ergodic optimization for random subshifts of finite type

Eduardo Garibaldi – University of Campinas (Brazil)

(Talk)

We consider the problem of optimization of invariant probabilities for random subshifts of finite type. In particular, we show that a probability is maximizing if, and only if, its support lies on the contact locus of a sub-action. In order to do that, we propose a random version of the concept of sub-action, and we prove that Holder random potentials admit random sub-actions. Our proof is based on the study of the asymptotic behavior of the eigenfunctions of the transfer operator in the context of random subshifts of finite type.

This is a joint work with L. R. Ferreira Junior (Unicamp, Brazil). This work was supported by FAPESP Brazil.

On the first cohomology group of a free minimal \mathbb{Z}^d -action on the Cantor set

Thierry Giordano – U. of Ottawa, Canada

(Talk)

In this talk, I will review properties of $H^1(X; \phi)$ for a free minimal \mathbb{Z}^d -action on the Cantor set and present results obtained recently and in progress.

Joint work with Ian Putnam (University of Victoria, Canada) and Christian Skau (NTNU, Trondheim, Norway).

On (weak) mixing properties of substitutions

Maryam Hosseini – I. for Research in Fundamental Sciences, Iran

(Talk)

Mixing properties of substitutions was firstly studied by M. Keane and F. M. Dekking in 1976 where they proved that substitutions dynamical systems can neither be measure theoretically mixing nor topological mixing of all orders. In 2005 necessary and sufficient conditions for topological mixing of substitutions of rank 2 were investigated by B. Solomyak, R. Kenyon and L. Sadun when the norm of the non-Perron eigenvalue of the substitution matrix has absolute value not equal to 1. The situation is unclear even about weak mixing property when the non-Perron eigenvalue has absolute value equal to 1. In this talk we will consider this case and give some sufficient conditions for weak mixing property of substitutions and in general for minimal systems on Cantor set.

This talk is based on a work in progress with Fabien Durand and Samuel Petite and a recent published paper by Thierry Giordano and David Handelman.

Quasi-conformally equivalent satellite copies of the Mandelbrot set

Luciana Luna Anna Lomonaco – USP, Brazil

(Talk)

Quasi-conformally equivalent satellite copies of the Mandelbrot set. Abstract: Douady and Hubbard proved the existence of homeomorphic copies of the Mandelbrot set M inside of M . These copies can be primitive (roughly speaking the ones with a cusp) or satellite (without a cusp). Lyubich proved that the primitive copies of M are quasiconformally homeomorphic to M , and that the satellite ones are quasiconformally homeomorphic to M outside any small neighbourhood of the root. The satellite copies are clearly not quasiconformally homeomorphic to M (since we cannot straight a cusp quasiconformally). With C. Petersen we proved that in general they are also not mutually quasiconformally homeomorphic. Anyway, we are now proving that in specific cases (the hyperbolic distance of the Log-multipliers of the beta fixed points of the correspondent polynomial-like restrictions is uniformly bounded) the satellite copies are qc homeomorphic. In this talk I will give the strategy of the proof -which is still a work in progress.

Dynamical defined groupoids, Haar systems, quasi invariant probabilities and non commutative integration

Artur O. Lopes – UFRGS (Brazil)

(Talk)

We will analyze measure theoretical dynamical properties of groupoids, Haar systems and modular functions on the symbolic space. We describe the role of the associated quasi-invariant probability in Non Commutative Integration and we relate it to Thermodynamic Formalism.

This is a joint work with G. Castro, G. Mantovani, E. Oliveira and J. Mengue. This work was partially supported by CNPq Brazil.

On the representation of prime numbers in two bases

Christian Mauduit – Université Aix-Marseille, France

(Talk)

"If q is an integer greater or equal to 2, we say that a function $f : \mathbb{N} \rightarrow U$ is strongly q -multiplicative if for all $(a, b) \in \mathbb{N} \times \{0, \dots, q-1\}$, we have

$$f(aq + b) = f(a) \cdot f(b).$$

Let f_1 and f_2 be respectively a strongly q_1 -multiplicative and q_2 -multiplicative function of modulus 1 with $(q_1, q_2) = 1$ and ϑ a real number. The goal of this work is to estimate the sums

$$\sum_{n \leq x} \Lambda(n) f_1(n) f_2(n) \exp(2i\pi\vartheta n) \quad \text{and} \quad \sum_{n \leq x} \mu(n) f_1(n) f_2(n) \exp(2i\pi\vartheta n),$$

where Λ denotes the von Mangoldt function and μ the Möbius function. The methods we introduce to study these sums involving simultaneously two different bases combine Fourier analysis, Diophantine approximation and combinatorial arguments. We deduce from these estimates a prime number theorem (and Möbius orthogonality) for sequences of integers with digit properties in two coprime bases."

This is a joint work with Michael Drmota and Joël Rivat. This work was supported by the joint ANR-FWF-project ANR-14-CE34-0009, I-1751 MUDERA.

A Class of Structurally Stable Operators

A. Messaoudi – Universidade Estadual Paulista

(Poster)

In this work, we construct a large class C of non hyperbolic but structurally stable operators on Banach spaces. As a consequence, we give an extension of Hartman-Grobman Theorem. In particular, we prove that given a Banach space X and f a continuously differentiable diffeomorphism on X . If p is a fixed point of f such that its linearization belongs to the class C . Then f is locally topologically conjugated to its linearization. Moreover the linearization is Hölder continuous for θ sufficiently small.

This is a joint work with Nilson Bernardes.

Fractal geometry of the Markov and Lagrange spectra and symbolic dynamics

Carlos Gustavo Moreira – IMPA (Rio de Janeiro, Brazil)

(Talk)

We will discuss some recent results on the fractal geometry of the Markov and Lagrange spectra from Diophantine approximations, and their set difference. We will relate these results to symbolic dynamics, continued fractions and to regular Cantor sets (particularly the so-called Gauss-Cantor sets, the regular Cantor sets defined by restrictions of the Gauss map $g(x) = 1/x$).

This is a joint work with C. Matheus (CNRS, École Polytechnique, France). This work was supported by FAPERJ and CNPq (Brazil).

Uniqueness of equilibrium states for partially hyperbolic horseshoes

Krerley Oliveira – Universidade Federal de Alagoas

(Talk)

We discuss uniqueness of equilibrium states for Partially Hyperbolic Horseshoes studied in a previous article with R. Leplaideur and I. Rios (<https://goo.gl/8LsZVd>). These families of horseshoes have interesting features, as dense sets of segments in its central direction on its non-wandering set. They have heteroclinical cycles and are extensions of the golden shift. From one hand, they have phase transitions for smooth potentials and from the other hand, one expect uniqueness for potentials that are close to zero. We make use of the semiconjugacy to build induced maps conjugated to infinite shifts and obtain explicitly a set of Holder potentials with unique equilibrium state.

This is a joint work with M. Santos.

Symbolic dynamics of piecewise contractions

Benito Pires – University of São Paulo (Brazil)

(Talk)

A map $f : [0, 1] \rightarrow [0, 1]$ is a *piecewise contraction* if locally f contracts distance, i.e., if there exist $0 < \lambda < 1$ and a partition of $[0, 1]$ into intervals I_1, I_2, \dots, I_n such that $|f(x) - f(y)| \leq \lambda|x - y|$ for all $x, y \in I_i$ ($1 \leq i \leq n$). Piecewise contractions describe the dynamics of many systems such as traffic control systems, queueing systems, outer billiards and Cherry flows. Here I am interested in the symbolic dynamics of such maps. More precisely, we say that an infinite word $i_0 i_1 i_2 \dots$ over the alphabet $\mathcal{A} = \{1, 2, \dots, n\}$ is the *natural coding* of $x \in [0, 1]$ if $f^k(x) \in I_{i_k}$ for all $k \geq 0$. The aim of this talk is to provide a complete classification of the words that appear as natural codings of injective piecewise contractions.

This work was supported by São Paulo Research Foundation (FAPESP) and by National Council for Scientific and Technological Development (CNPq).

Thermodynamic Formalism and Conformal Measures on Generalized Shift Spaces

Thiago Raszeja – University of São Paulo (Brazil)

(Poster)

Countable Markov shifts, which we denote by Σ_A for a $0-1$ infinite matrix A , are central objects in symbolic dynamics and ergodic theory. The corresponding operator algebras have been introduced by M. Laca and R. Exel as a generalization of the Cuntz-Krieger algebras for the case of an infinite and countable alphabet. By a result of J. Renault, this generalization may be realized as the C^* -algebra of the Renault-Deaconu groupoid for a partially defined shift map σ defined on a locally compact set X_A which is a spectrum of a certain C^* -algebra. This set X_A contains Σ_A as a dense subset. We introduced the notion of conformal measures in X_A and, inspired by the thermodynamic formalism for renewal shifts on classical countable Markov shifts, we show that a f depending on the first coordinate can presents a phase transition, in other words, we have existence and also absence of conformal measures μ_β for βf for different values of β . These conformal measures, when do exist for some β , satisfy $\mu_\beta(\Sigma_A) = 0$. We have shown the existence of conformal probability measures which are not detected by the classical thermodynamic formalism when the matrix A is not row-finite. In particular, for the constant potential there exists a critical inverse of temperature $\beta_c = \ln 2$ for which there exists a unique conformal measure μ_β and the net of measures $\{\mu_\beta\}_{\beta > \ln 2}$ converges on the weak* topology to ν , this limit measure is a conformal measure in the standard sense, living on Σ_A .

This is a joint work with R. Bissacot (USP, Brazil), R. Exel (UFSC, Brazil), and R. Frausino (USP, Brazil). This work was supported by CNPq Brazil.

Some dynamical aspects of semigroup actions: topological entropy and metric mean dimension

Fagner B. Rodrigues – Federal University of Rio Grande do Sul

(Talk)

In this talk we present some recent advances in the semigroup action setting. Being more precise, we are interested in define and study dynamical aspects of actions as tological entropy.

This is a joint work with Paulo Varandas and Maria Carvalho (Porto University). This work was supported in the beginning by BREUDS.

Fluctuations of Ergodic Sums on Periodic Orbits under Specification

Samuel Senti – Federal University of Rio de Janeiro (UFRJ, Brazil)

(Talk)

We study the fluctuations of ergodic sums by the means of global and local specifications on periodic points and obtain Lindeberg-type central limit theorems. As an application we can prove the weak convergence of ergodic sums to a mixture of normal distributions for systems with a unique measure of maximal entropy. Our results suggest to decompose the variances of ergodic sums according to global and local sources.

This is a joint work with Manfred Denker (PSU, USA) and Xuan Zhang (IME-USP, Brazil). This work was supported by CNPq Brazil.

Non-compact group shifts over countable group alphabets

Marcelo Sobottka – Federal University of Santa Catarina (Brazil)

(Poster)

Let (G, \cdot) be a countable group. Consider the group $(G^{\mathbb{Z}}, *)$ where $*$ is the piecewise operation defined from operation \cdot on G . Given $F \subset \bigcup_{n \geq 1} G^n$, define

$$X_F := \{(g_i)_{i \in \mathbb{Z}} : (g_i)_{m \leq i \leq n} \notin F, \forall m, n \in \mathbb{Z}\}.$$

We will characterize when X_F is a subgroup of $G^{\mathbb{Z}}$.

This work was supported by CNPq Brazil.

Some combinatorial properties of the convex-hull.

Tatiana M. Rodrigues de Souza – UNESP

(Poster)

This initial research introduces a combinatorial properties of the convex-hull of a tiling generated by a Pisot unit number of degree 3. Consider the polynomial $P(x) = x^3 - ax^2 - bx - 1$, where $a, b \in \mathbb{N}$ and $a \geq b \geq 1$. It is known that $P(x)$ has a real root $\beta > 1$ and two roots α and α' of modulus < 1 . Put $\theta = \alpha$ if $\alpha' = \bar{\alpha} \in \mathbb{C}$ and $\theta = (\alpha, \alpha')$ if $\alpha, \alpha' \in \mathbb{R}$. The Rauzy fractal is the set

$$\mathcal{E}_{a, b} = \left\{ \sum_{i=0}^{+\infty} \varepsilon_i \theta^i; \forall i \geq 0, \varepsilon_i = 0, 1, \dots, a, \varepsilon_i \varepsilon_{i-1} \varepsilon_{i-2} <_{lex} ab1, \varepsilon_i \right\}.$$

This set was discovered by G. Rauzy em 1982 and studied by many mathematiciens. The Rauzy fractal has many beautiful properties. It is a compact set. Its boundary is a fractal set, and it induces a periodic tiling of the plane. It was connected to many topics as: numeration systems, geometrical representation of symbolic dynamical system, multidimensional continued fractions and simultaneous approximations, auto-similar tilings and Markov partitions of Hyperbolic automorphisms of Torus. In this paper, we study the arithmetical properties of the convex hull by

$$\mathcal{E}_{a, -1} = \left\{ \sum_{i=2}^{+\infty} a_i \alpha^i, a_i \in \{0, 1, \dots, a-1\}, a_i a_{i-1} a_{i-2} a_{i-3} < (a-1)(a-1)01 \right\}, \forall a \geq 2.$$

Joint work with Gustavo A. Pavani - UEMS.

Forcing theory applications for homeomorphisms of the closed annulus

Fabio Armando Tal – Universidade de São Paulo

(Talk)

We will present some applications of forcing theory for the study of rotation sets of homeomorphisms of the closed annulus preserving boundary components and orientation. We will show the strong version of Boyland's conjecture holds, that is, that if such a homeomorphism preserves area and its rotation interval is not trivial, then the rotation number of the lebesgue measure lies in the interior of the rotation interval. We will also show that, if f is area preserving, then every rotation vector in the rotation set is realized by a compact invariant set, extending a result by Le Calvez previously known for diffeomorphisms.

This is a joint work with J. Conejeros (Universidad de Santiago de Chile). This work was supported by CNPq Brazil and Fapesp.

Tilings, traces and triangles

Rodrigo Treviño – University of Maryland (USA)

(Talk)

By using an example involving triangles, I'll talk about a new result on the statistical properties of tilings of a very general type. The main result is one of the deviation of ergodic averages, and it is proved using renormalization tools in the realm of operator algebras.

Supported by NSF DMS grant 1665100.

Ultragraph shift spaces and chaos

Bruno Brogni Uggioni – Federal Institute of Rio Grande do Sul (Brazil)

(Talk)

Motivated by C^* -algebra theory, ultragraph edge shift spaces generalize shifts of finite type to the infinite alphabet case. In this talk we remember several notions of chaos for ultragraph shift spaces and more specifically, we give an idea that Li-Yorke, Devaney and distributional chaos are equivalent conditions for ultragraph shift spaces, and characterize this condition in terms of a combinatorial property of the underlying ultragraph. Furthermore, we will mention that such properties imply the existence of a compact, perfect set which is distributionally scrambled of type 1 in the ultragraph shift space (a result that is not known for a labelled edge shift (with the product topology) of an infinite graph).

This is a joint work with Daniel Gonçalves (UFSC). This work was supported by CNPq Brazil.

Stochastic adding machines for vershik maps on bratteli diagrams

Glauco Valle – Universidade Federal do Rio de Janeiro (Brazil)

(Talk)

We define some Markov Chains associated to Vershik maps on Bratteli diagrams. We study probabilistic and spectral properties of their transition operators and we prove that the spectra of these operators are connected to Julia sets in higher dimensions. We also study topological properties of these spectra.

This is a joint work with A. Messaoudi (UNESP-São Jose do Rio Preto) and D. Caprio (UNESP-São Jose do Rio Preto). This work was supported by CNPq and FAPESP.

Measure rigidity for leafwise weakly rigid actions

Régis Varão – Universidade Estadual de Campinas (Unicamp)

(Talk)

Given a Borel action G on X , we introduce a new approach to obtain classification of conditional measures along a G -invariant foliation along which G has a controlled behavior. Given a Borel action G on X over a Lebesgue space X we show that if the action G on X preserves an invariant system of metrics along a Borel lamination \mathcal{F} , which satisfy a good packing estimative hypothesis, then the ergodic measures preserved by the action are rigid in the sense that the system of conditional measures with respect to the partition \mathcal{F} are the Hausdorff measures given by the metric system or are supported in a countable number of boundaries of balls.

This is a joint work with G. Ponce (Unicamp). This work was supported by CNPq Brazil and Fapesp.

Labelled space C^* -algebras as partial crossed products

Daniel W. van Wyk – UFSC, Brazil

(Talk)

It is well known that we can associate a C^* -algebra with every directed graph. Carlsen and Larsen showed how to associate a partial action with a graph such that the partial crossed product and the graph C^* -algebras are isomorphic. Labelled spaces are generalisations of graphs, and similarly to graphs have an associated C^* -algebra. In this talk we show how to extend Carlsen and Larsen's results to labelled spaces. In particular, we show that there is a partial action associated with a labelled space such that the labelled space C^* -algebra and the partial crossed product C^* -algebras are isomorphic.

This is a joint work with G. de Castro (UFSC, Brasil). This work was supported by a CAPES scholarship in Brazil.