CAFE-Dyn
Workshop in Complexity, Aperiodicity, Fractal and Ergodicity in Dynamics

PROGRAM

Dates: February 10, 11 and 12, 2026
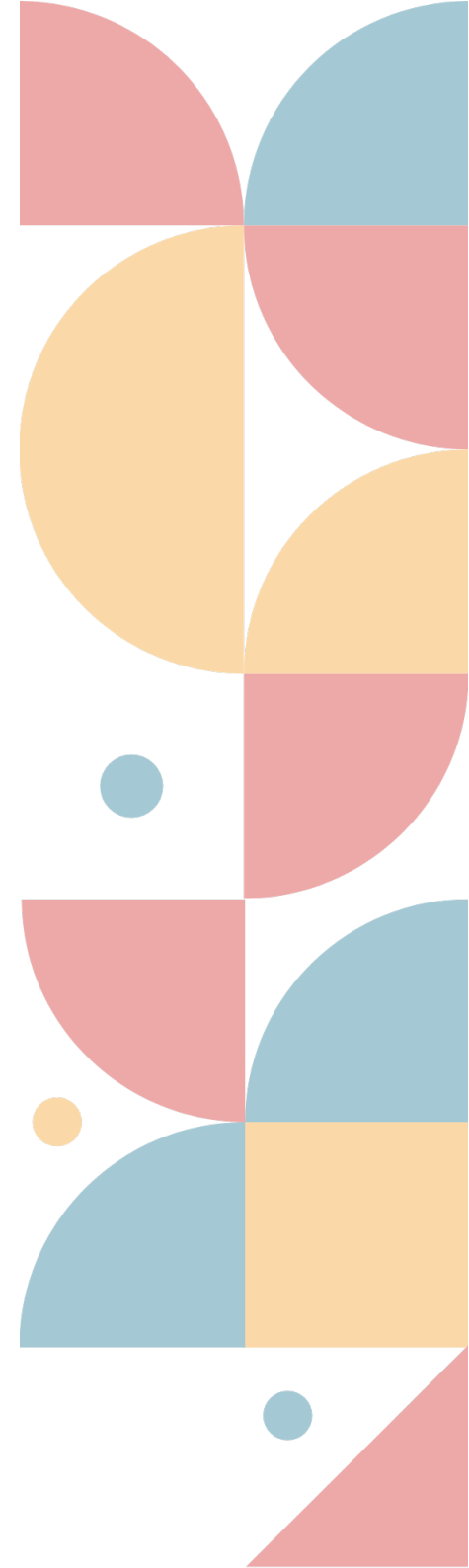
Site: https://cafe-dyn.sciencesconf.org/

Venue: Institute of Mathematics, Statistics and Scientific Computing (IMECC)

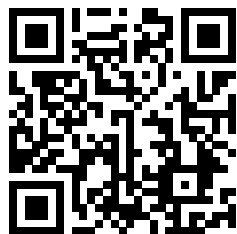University of Campinas (UNICAMP)

Organizing Committee:

Eduardo Garibaldi (Univ. de Campinas, Brazil)

João Tiago A. Gomes (Univ. Federal do Recôncavo da Bahia, Brazil)

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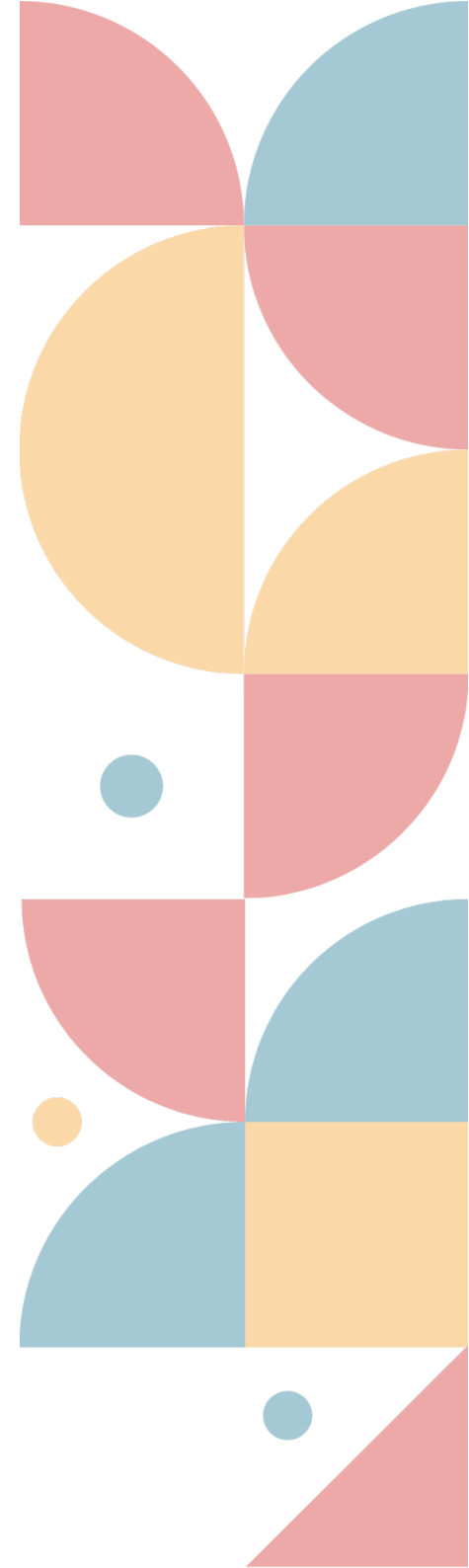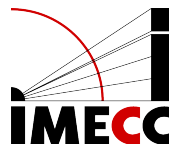
PROGRAM

Tuesday, February 10, 2026

253 - Thesis Defense Room - 2nd Floor IMECC

Time	Speaker	Title
9:30 - 10:00		Reception
10:00 - 11:00	Ali Messaoudi	Symbolic Dynamical Systems on Infinite Alphabet
11:00 - 12:00	Irene Inoquio-Renteria	Exponentially Mixing Gibbs States of Intermittent Maps
12:00 - 14:00		Lunch
14:00 - 15:00	Christian Rodrigues	Geometric Properties of Disintegration of Measures
15:00 - 16:00	José Tofanin	Weighted Shift with Diagonal: Spectrum and Linear Dynamics
16:00 - 17:00		Coffee break

CAFE-Dyn

Workshop in Complexity, Aperiodicity, Fractal and Ergodicity in Dynamics

PROGRAM

Wednesday, February 11, 2026

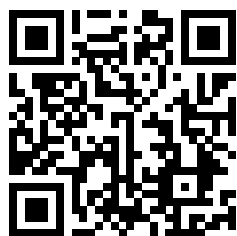### 253 - Thesis Defense Room - 2nd Floor IMECC

10:00 - 11:00	Tullio Ceccherini-Silberstein	A Garden of Eden Theorem for Smale Spaces
11:00 - 12:00	Ioannis Tsokanos	Spectrum of Stochastic Adding Machines and Julia Sets
12:00 - 14:00		Lunch
14:00 - 15:00	Milton Cobo	TBA
15:00 - 16:00	Poster Session	(Main Hall IMECC - UNICAMP)
16:00 - 17:00		Coffee break
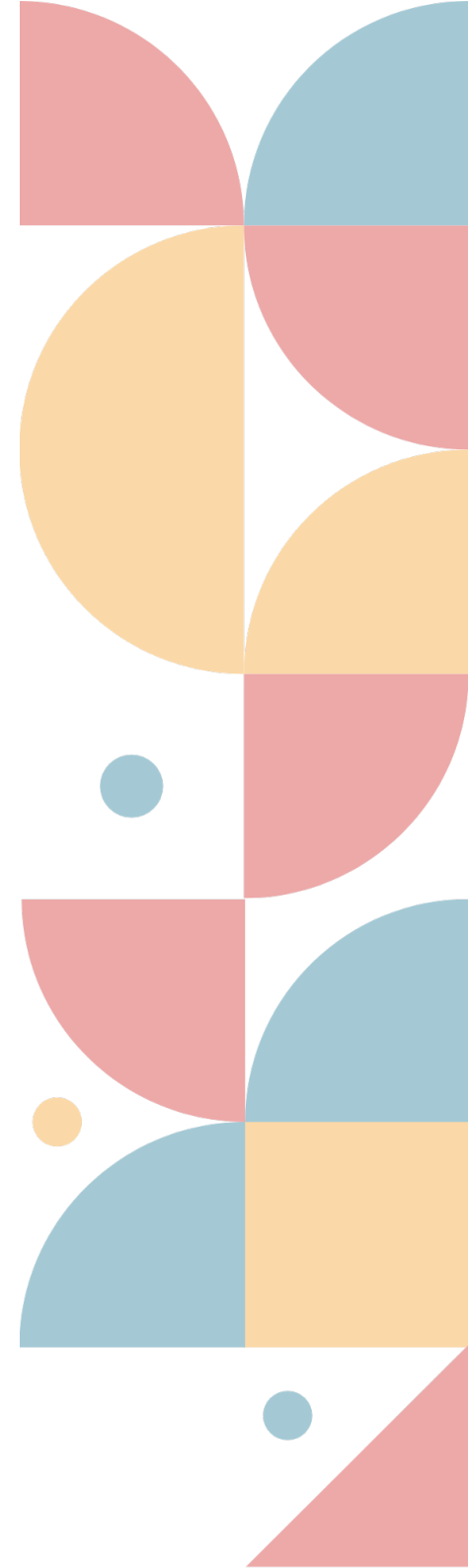
CAFE-Dyn

Workshop in Complexity, Aperiodicity, Fractal and Ergodicity in Dynamics
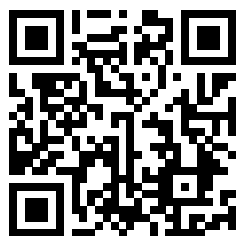
PROGRAM

Thursday, February 12, 2026

253 - Thesis Defense Room - 2nd Floor IMECC

Time	Speaker	Title
10:00 - 11:00	Philippe Thieullen	Maximizing Measures for Generic 2×2 Matrix Cocycles
11:00 - 12:00	Marcelo Sobottka	A Bestiary of Symbolic Creatures
12:00 - 14:00		Lunch
14:00 - 15:00	Alexandre Baraviera	TBA
15:00 - 16:00	Danilo Caprio	p-adic Hénon-like Maps and their Julia Sets
16:00 - 17:00		Coffee break
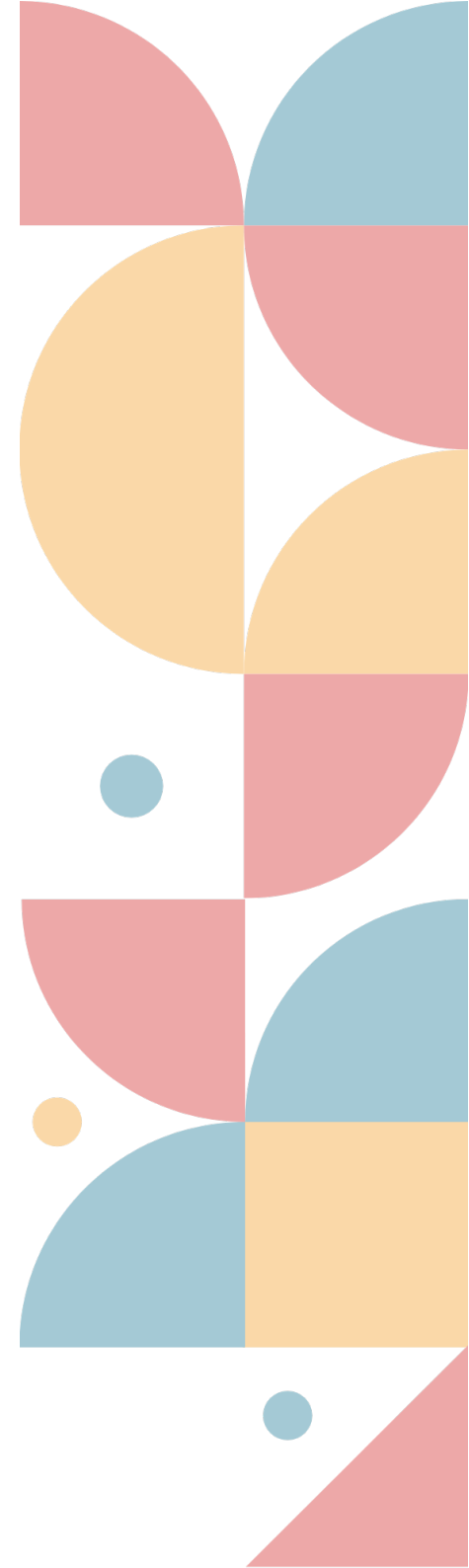
TBA

Alexandre Baraviera
Univ. Federal do Rio Grande do Sul

TBA

Thursday - February 12, 2026 - 14:00 - 15:00
253 - Thesis Defense Room - 2nd Floor IMECC

SLIDES

Symbolic Dynamical Systems on Infinite Alphabet

Ali Messaoudi

Univ. Estadual Paulista

A substitution is a map from an alphabet A to the set of finite words in A. To any substitution we can naturally associate a symbolic dynamical system that is well studied in the literature when the alphabet is a finite set and connected to several areas such as ergodic theory and number theory among others. In this work, we study ergodic and geometric properties of dynamical systems associated to substitutions in infinite alphabets. This study involves finite and infinite invariant measures, countably infinite matrices and Rauzy Fractals.

SLIDES

Tuesday - February 10, 2026 - 10:00 - 11:00
253 - Thesis Defense Room - 2nd Floor IMECC

p-adic Hénon-like Maps and their Julia Sets

Danilo Antonio Caprio

Univ. Estadual Paulista

This talk investigates the dynamics of a family of p-adic Hénon-like maps $f : \mathbb{Q}_p^2 \to \mathbb{Q}_p^2$ given by $f(x, y) = (xy + c, x)$, where $c \in \mathbb{Q}_p$ is a parameter. We analyze the topological and measure-theoretic properties of the forward filled Julia set $\mathcal{K}^+$ and the backward filled Julia set $\mathcal{K}^-$.

When $|c|_p < 1$, we prove that $\mathcal{K}^+$ has infinite Haar measure and contains $\mathbb{Z}_p^2$. Moreover, every orbit in $\mathcal{K}^+ \setminus (\mathbb{Z}_p^\times)^2$ converges to a fixed point. For $|c|_p > 1$, we characterize $\mathcal{K}^+$ as the set of points whose orbits eventually enter and remain in a specific bounded region.

Concerning the backward filled Julia set, we show that $\mathcal{K}^-$ is bounded when $|c|_p \leq 1$, but becomes unbounded with infinite Haar measure when $|c|_p > 1$.

These results extend to the non-archimedean setting results previously established for the real dynamics of this map (see [1, 2]), which are connected to stochastic adding machines and Bratteli diagrams (see [3, 4]).

This is a joint work with Jefferson Bastos and Oyran Raizzaro.

[1] S. Bonnot, A. De Carvalho and A. Messaoudi. 2018. "Julia sets for Fibonacci endomorphisms of $\mathbb{R}^2$". *Dynamical Systems* **33(4)**: 622–645. doi: 10.1080/14689367.2017.1417975.

[2] D. Caprio. 2019. "Filled Julia set of some class of Hénon-like maps". *Dynamical Systems* **35(1)**: 156–183. doi: 10.1080/14689367.2019.1663790.

[3] D. Caprio, A. Messaoudi and G. Valle. 2020. "Stochastic adding machines based on Bratteli diagrams". *Annales de l'Institut Fourier* **70(6)**: 2543–2581. doi: 10.5802/aif.3364.

[4] A. Messaoudi and D. Smania. 2010. "Eigenvalues of stochastic adding machine". *Stochastics and Dynamics*, **10(2)**: 291–313. doi: 10.1142/S0219493710002966.

SLIDES

Thursday - February 12, 2026 - 11:00 - 12:00
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Geometric Properties of Disintegration of Measures

Christian da Silva Rodrigues

Univ. Estadual de Campinas

Although some key statistical properties of dynamical systems may depend on the geometry of the space in which the dynamics takes place, very little geometric information is taken into account while studying the properties of probability spaces which encodes ergodic properties. In this talk, we shall address some geometric properties of probability spaces and investigate how they are related to disintegration of measures. This talk is based in joint work with Florentin Münch and Renata Possobon.

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Spectrum of Stochastic Adding Machines and Julia Sets

Ioannis Tsokanos
Univ. Estadual Paulista

A stochastic adding machine is a Markov chain on the set of non-negative integers $\mathbb{Z}_+$ that models the process of adding one by successively updating the digits of a number in a given numeration system. At each step, random failures may occur, interrupting the procedure and preventing it from continuing beyond a certain point.

In this work, we study a stochastic adding machine associated with a Cantor numeration system. This stochastic process naturally induces a transition operator S and a non-autonomous filled Julia set $\mathcal{E}$, which is shown to coincide with the spectrum of S.

SLIDES

Wednesday - February 11, 2026 - 11:00 - 12:00
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Exponentially Mixing Gibbs States of Intermittent Maps

Irene Inoquio-Renteria
Univ. de La Serena

We study Gibbs equilibrium states for intermittent interval maps with a neutral fixed point at zero. We discuss several aspects of the thermodynamic formalism, including the exponential mixing properties of these Gibbs states, as well as the behavior of the transfer operator and the pressure associated with Hölder continuous potentials.

SLIDES

Tuesday - February 10, 2026 - 11:00 - 12:00
253 - Thesis Defense Room - 2nd Floor IMECC

Weighted Shift with Diagonal:
Spectrum and Linear Dynamics

José Luiz Tofanin Neto
Univ. Estadual Paulista

Since the early days of linear dynamics, the weighted shifts have served as a key example for understanding important properties in the area, being one of the first examples of a hypercyclic operator. Salas gave a characterization of when weighted shift operators are hypercyclic, and in the same paper he also established sufficient conditions ensuring that the operator $B_w + I$ is hypercyclic.

In this work, we focus on the results known for weighted shifts with diagonal operator, as defined by

$$T_{d,w} = B_w + I_d,$$

acting on ℓ^p, where B_w is a weighted shift and I_d is a bounded diagonal operator. More specifically, our goal is to discuss criteria for hypercyclicity and frequent hypercyclicity.

SLIDES

Tuesday - February 10, 2026 - 15:00 - 16:00
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A Bestiary of Symbolic Creatures

Marcelo Sobottka

Univ. Federal de Santa Catarina

The aim of this talk is to present and describe some classes of shift spaces, in the spirit of medieval bestiaries. While traditional bestiaries describe fantastic creatures, this bestiary is devoted to creatures that, though symbolic, are no less real than a lion or an elephant (and no less amazing and enchanting than a siren).

Given a non-empty countable set (an alphabet), the full shift over it is the set of all sequences over the alphabet indexed either by the non-negative integers (the one-sided shift) or by the integers (the two-sided shift). A shift space (or subshift) is a subset of the full shift consisting of all sequences that avoid a given set of forbidden finite words.

It is well known that if the alphabet is finite, then only *sofic shifts* can be presented by finite directed labeled graphs (in fact, to be presented by such a graph is an alternative definition for finite-alphabet sofic shifts). In contrast, it is easy to check that every countable-alphabet one-sided shift space can be presented by a countable directed labeled graph.

In this talk, I will present definitions of **shifts of finite type (SFT)** and **sofic shifts** that apply in a general setting and coincide with the classical ones for finite-alphabet shifts. Based on these definitions, I will introduce two new classes of shift spaces that properly exist only in the infinite-alphabet context: **weakly sofic shifts** and **shifts of variable length (SVL)**. I will then investigate when a two-sided shift space can be presented by a countable directed labeled graph, and present results characterizing graphs that present one- or two-sided shifts of finite type and (weakly) sofic shifts.

Thursday - February 12, 2026 - 11:00 - 12:00
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SLIDES

TBA

Milton Cobo
Univ. Federal do Espírito Santo

TBA

SLIDES

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Maximizing Measures for Generic 2×2 Matrix Cocycles

Philippe Thieullen

Univ. de Bordeaux

The joint spectral radius conjecture is related to the problem of determining the set of orbits of a dynamical system that maximize the first topological Lyapunov exponent of a matrix cocycle. The Mather set is the union of the supports of all maximizing invariant measures, measures that maximize the metric Lyapunov exponent. We consider here a subshift of finite type and a Lipschitz 2×2 matrix cocycle that admits an extremal norm. We show that for any Lipschitz neighborhoods of the cocycle, there exists a cocycle with a Mather set reduced to a periodic orbit.

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Thursday - February 12, 2026 - 10:00 - 11:00
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A Garden of Eden Theorem for Smale Spaces

Tullio Ceccherini-Silberstein

Univ. degli Studi del Sannio di Benevento

Smale spaces were introduced in the late 1970s by David Ruelle in his influential monograph on thermodynamic formalism. These dynamical systems include: Anosov diffeomorphisms, non-wandering sets of Smale's Axiom A diffeomorphisms, various types of solenoids and attractors, as well as (in a symbolic dynamical setting) subshifts of finite type.

In a recent joint work with Michel Coornaert, we proved, among other things, a Garden of Eden type theorem (GOET) for irreducible Smale spaces. This generalizes previous results by Fiorenzi (GOET for irreducible subshifts of finite type) and ours (GOET for Anosov diffeomorphisms on tori). We study Gibbs equilibrium states for intermittent interval maps with a neutral fixed point at zero. We discuss several aspects of the thermodynamic formalism, including the exponential mixing properties of these Gibbs states, as well as the behavior of the transfer operator and the pressure associated with Hölder continuous potentials.

SLIDES

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Posters Section

Wednesday - February 11, 2026 - 15:00 - 16:00
Main Hall   IMECC - UNICAMP

- Dynamics of Composition Operators Induced by Odometers
  Daniel Aguilar Gomes   (UNICAMP)
  Jointly with Udayan Babubhai Darji and José Régis Azevedo Varão Filho

- Spectral Rigidity of Hyperbolic Billiards via $\mathrm{CAT}(0)$ Limits
  Douglas Luiz Finamore Barbosa   (UNICAMP)
  Jointly with Martin Leguil

- Rauzy Induction and Substitutions
  Guilherme Zahra Cundari   (UNESP)

- Best Simultaneous Diophantine Approximations for some Pairs of Cubic Algebraic Numbers
  Gustavo Antonio Pavani   (UFMS)

- Infinite-Piecewise Maps via Conformal Iterated Function Systems
  Matheus Gonçalves Cassiano da Cunha   (UNESP)
  Jointly with Douglas Duarte Novaes and Gabriel Ponce

- Ergodic Optimization for Locally Constant Potentials: An Algorithmic Perspective
  Murilo Felício Nascimento dos Santos   (UNICAMP)
  Jointly with Eduardo Garibaldi and João Tiago Assunção Gomes

- On a New Method for Constructing the Boundary of the Rauzy Fractal
  Tatiana Miguel Rodrigues   (UNESP)
  Jointly with Gustavo Pavani

- Besov Spaces and Statistical Properties of the Shift
  Pedro Augusto da Silva Morelli   (USP)