CAFE-Dyn
Workshop in Complexity, Aperiodicity, Fractal and Ergodicity in Dynamics
February 10, 11 and 12, 2026 *IMECC - UNICAMP - Campinas (Brazil)*

p-adic Hénon-like Maps and their Julia Sets

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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
253 - Thesis Defense Room - 2nd Floor IMECC