UNICAMP – IMECC
Departamento de Matemática

Seminário de Sistemas Dinâmicos e Estocásticos

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Título: Renormalization and thermodynamic formalism
in subshifts

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Resumo. Bowen's work on thermodynamic formalism showed that any subshift of finite type with Hölder continuous potential ϕ admits a unique equilibrium state (which is a Gibbs measure). Moreover, the pressure function $\gamma \mapsto \mathcal{P}(-\gamma\phi)$ is real analytic and there are no phase transitions. Hofbauer was the first to find continuous non-Hölder potentials for the full 2-shift (Σ, σ) allowing a phase transition.

The present work is a joint work with Henk Bruin; it investigates the connections between phase transition in the full 2-shift, renormalization for potentials, renormalization for maps (in complex dynamics) and substitutions in the full 2-shift. The basic questions answered is whether fixed points V of a renormalization operator $\mathcal{R}$ acting on the space of potentials are such that $\gamma \mapsto \mathcal{P}(-\gamma V)$ exhibits phase transition and if they can be realized as a $\log f'$ for some good dynamics $f : [0, 1] \to [0, 1]$.

This extends the work by Baraviera, Leplaideur and Lopes on the Manneville-Pomeau map, where such phase transitions were indeed detected. However, the attractor of renormalization is here a Cantor set (rather than a single fixed point). It is generated in the shift by the Thue-Morse substitution, and is related to the Feigenbaum map

in complex dynamics.