110º EDAÍ
11 abril de 2025

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DMAT-PUC-Rio
Sala de Reuniões do Decanato do CTC
12 andar prédio Leme

Matinê: 14h00 – 15h00
Dynamics in infinite dimensions
Juliana Fernandes (UFRJ, Rio de Janeiro, Brasil)

Poincaré's work in the 1890s laid the groundwork for dynamical systems, and together with Lyapunov and Birkhoff, he emerged as a co-founder of this field. Their early developments laid the foundation for modern dynamical systems, including both finite and infinite-dimensional problems. This talk addresses the "Infinite Dimensional Challenge": the analysis of the longtime dynamics of solutions to partial differential equations (PDEs). In the context of parabolic or hyperbolic PDEs, solutions can be seen as trajectories in Banach spaces, governed by linear or nonlinear evolutionary equations. However, even the proper definition of a solution in infinite dimensions is more complex. This challenge will be illustrated by a reaction-diffusion equation, whose solution semigroups exhibit dissipation and compactness properties, leading to global attractors that capture the system's longtime behavior.

Palestra 2: 15h10 – 16h10
Mostly contracting random maps
Pablo G. Barrientos (UFF, Niterói, Brasil)

We study the long-term behavior of the iteration of a random map consisting of Lipschitz transformations on a compact metric space, randomly selected according to a fixed probability measure. Such a random map is said to be mostly contracting if all Lyapunov exponents associated with stationary measures are negative. We show in this case that the associated annealed Koopman operator is quasi-compact. This implies many statistical properties, such as the global Palis conjecture on the finiteness of physical measures, central limit theorems, large deviations, statistical stability, and the continuity and Hölder continuity of Lyapunov exponents.
Examples from this class of random maps include random products of circle diffeomorphisms, interval diffeomorphisms onto their images, and diffeomorphisms of a Cantor set on a line, all considered under the assumption of no common invariant measure. This class also includes projective actions of locally constant linear cocycles under the assumptions of the simplicity of the first Lyapunov exponent and a certain type of irreducibility.
One of the main tools to prove the above results is the generalization of Kingman's subadditive ergodic theorem and the uniform Kingmans subadditive ergodic theorem for general Markov operators. These results are of independent interest, as they may have broad applications in other contexts.

Café: 16h10 – 16h40

Palestra 3: 16h40 – 17h40
Intermittent two-point dynamics at the transition to chaos for random circle endomorphisms
Jeroen S.W. Lamb, (Imperial College, Londres, Reino Unido)

We establish the existence of intermittent two-point dynamics and infinite stationary ergodic measures for a class of random circle endomorphisms with zero Lyapunov exponent, as a dynamical characterisation of the transition from synchronisation (negative Lyapunov exponent) to chaos (positive Lyapunov exponent). This is joint work with Vincent Goverse (Imperial College London) and Ale Jan Homburg (University of Amsterdam).

Confraternização: Local a determinar, 19h00 – ∞

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