112º EDAÍ
27 de junho de 2025

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PGMAT-UFF
Sala 407
4º andar, Bloco H
Campus do Gragoatá

Matinê: 14h00 – 15h00

Optimal control on a network: optimization of vaccination strategies
Maria Soledad Aronna (FGV-Rio)

This talk discusses a mathematical model for optimal vaccination strategies in interconnected cities and metropolitan areas, considering commuting patterns. It is a compartmental model with a vaccination rate for each city, acting as a control function. The commuting patterns are incorporated through a weighted adjacency matrix and a parameter that selects day and night periods. The optimal control problem is formulated to minimize a functional cost that balances the number of hospitalizations and vaccines, including restrictions of a weekly availability cap and an application capacity of vaccines per unit of time. The key findings of this work are sharp bounds for the basic reproduction number. Theoretical analysis and numerical simulations provide insights into disease dynamics and the effectiveness of control measures.

Palestra 1: 15h10 – 16h10

Bilhares horosféricos
Rafael Ruggiero (PUC-Rio)

Definimos bilhares horosféricos no recubrimiento universal de superfícies compactas sem pontos focais, e baseados na geometria do bilhar heliosférico no plano hiperbólico propomos algumas noções de integrabilidade para este bilhar. Mostramos que estas noções de integrabilidade de fato implicam que a superfície tem curvatura negativa constante.

Café: 16h10 – 16h40

Palestra 2: 16h40 – 17h40

Zero-entropy conservative homeomorphisms of hyperbolic surfaces
Fabio Tal (USP)

In some sense, the action of area-preserving homeomorphisms with zero topological entropy are the tamest possible dynamical systems one can study in surfaces, but still this is a class with a few very interesting examples. Previous works (Franks-Handel, Le Calvez-T.) have shown that when the surface is the sphere, the known examples pretty much capture the full possible spectrum of phenomena that can be observed. In this talk we will remind those results and discuss the examples that can be observed when dealing with closed hyperbolic surfaces. Time permitting, we will present a full characterization result in this setting, including a reduction theorem (by the existence of an invariant "curve") for maps that are homotopic to Dehn twists.

Confraternização: Cantareira, 18h00 – ∞

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