



# Seminário de Sistemas Dinâmicos da UFF

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## STAR FLOWS, STABLE AND UNSTABLE MANIFOLDS AND CHAIN RECURRENCE CLASSES

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**Data:** 13 de Julho - Sexta-feira

**Hora:** 14h

**Local:** Sala 407, 4º Andar, Bloco H, Campus do Gragoatá.

### Resumo

A property of a dynamical system is called  $C^r$  robust if it holds on a  $C^r$  open set of systems. For diffeomorphisms or for non-singular flows, there are many results relating  $C^1$  robust properties and global structures of the dynamics, as hyperbolicity, partial hyperbolicity, dominated splitting. However, a difficulty appears when a robust property of a flow holds on a set containing recurrent orbits accumulating a singular point. This phenomenon is mainly understood in dimension 3, but in higher dimensions different tools and viewpoints are required. With Christian Bonatti we propose a general procedure for adapting the usual hyperbolic structures to this context. This allows us to recover to some extent, the relationship between the  $C^1$ -robust properties and global structures. In particular We prove that star flows are open and densely characterized by a structure in the normal space called multisingular hyperbolicity. However, as opposed to the case of diffeomorphisms, this hyperbolic structure gives us much less information on the existence and size of the stable and unstable manifolds of the points in a chain recurrence class. In this talk we will present the information we do have with respect to the size of the stable and unstable manifolds for multisingular hyperbolic flows and show some conditions that allow us to determine when a chain recurrence class is isolated or not. This is a work in progress with Javier Correa and Jin Hua Zang.