

Einladung zur öffentlichen Defensio von

Hector Homero Canales Farias

Thema der Dissertation

Geometrical and statistical properties of almost Anosov flows

Abstract:

The study of flows in surfaces and higher-dimensional manifolds has caught the interest of many scientists because of its numerous applications such as Hamiltonian flows, which arise from energy-preserving dynamical systems, billiard flows, flows from meteorological models, most notably the Lorenz model. These flows are equipped with a natural invariant measure μ , for instance SRB-measures.

The main goal is to have a better understanding of the properties of these flows, such as hyperbolicity, ergodicity, mixing and weak mixing and, in chaotic settings, rates of mixing; that is, we would like to investigate the asymptotic behaviour of the correlation coefficients

$$\rho_t(v, w) = \int_M v \cdot w \circ f^t d\mu - \int_M v d\mu \int_M w d\mu ,$$

for observables v, w chosen from an appropriate Banach space. Since mixing rates are one of the strongest statistical properties to have, other statistical laws, such as the Central Limit Theorem (CLT), usually follow. Therefore, investigate the rates of mixing is a major tool for proving other ergodic properties.

In this talk we will focus on the geometrical Lorenz flow and construct a modification of this model to produce a flow with polynomial decay of correlations. For that, we will change the nature of the saddle fixed point at the origin for a neutral fixed point and see how this change will ultimately lead us to prove polynomial decay of correlations for the modified flow.

Prüfungssenat

Univ.-Prof. Mag. Dr. Andreas Cap
(Vorsitz, Universität Wien)

Univ.-Prof. Hendrik Bruin, PhD
(Universität Wien)

Prof. Dr. Sandro Vaienti
(Centre de Physique Théorique)

Paulo Cesar Rodrigues Pinto Varandas
(University of Porto)

Zeit und Ort:

17. März 2023, 10:00 Uhr, SR13, Oskar-Morgenstern-Platz 1, 1090 Wien