CMUP
Centro de **Matemática**
Universidade do Porto

Dynamical Systems Seminar

Date. December 12th, 14h30 (Friday)

Place. Room FC1.031

Speaker. Fagner B. Rodrigues (Federal University of Rio Grande do Sul, Brazil)

Title. Nonlinear thermodynamical formalism in the infinite entropy setting

Abstract.

One of the most important notions in Dynamical Systems is the topological entropy. It is a topological invariant and, roughly speaking, measures how chaotic the system is. More precisely, it quantifies the rate of dispersal of points in the future by the action of the system on the phase space. In particular, it is an effective tool to decide whether two systems can be conjugated. However, there are plenty of systems with infinite topological entropy (actually, those form a generic set in the space of homeomorphisms of any compact manifold with dimension greater than one) and thus, in this context, the entropy is no longer a useful label. Therefore, to study this type of systems, new dynamical quantities are required.

An example of such a quantity is the metric mean dimension. This notion was introduced by Lindenstrauss and Weiss as a metric-dependent analog of the mean dimension, another topological invariant of high-complexity maps which was introduced by Gromov. The definition of metric mean dimension brings together the dynamics and the geometry of the phase space, merging the entropy and the Minkowski dimension. It has several applications, like the ones on the embedding and the compression problems.

The nonlinear thermodynamical formalism was defined by Buzzi, Kloeckner and Leplaideur. They extended classical results of thermodynamical formalism to a nonlinear topological pressure, as the variational principle, the existence of equilibrium states and properties of the equilibrium sets. This work motivated others studies and applications within this new approach. Inspired by these works, we have extended the notion of nonlinear topological pressure to the setting of dynamical systems with positive metric mean dimension. Examples of maps with infinite nonlinear topological pressure may be easily constructed, and so we believe that the notion of nonlinear metric mean dimension represents an interesting contribution in the study of continuous dynamics. In this talk, we present several examples and prove that, under mild conditions, the nonlinear metric mean dimension can be computed via a variational principle.

This is a joint work with Alex Becker (Federal University of Santa Maria, RS, Brazil) and Chunlin Liu (Dalian University of Technology, China, and Institute of Mathematics of the Polish Academy of Sciences, Poland).

There will be a coffee break after the seminar.