CMUP
Centro de **Matemática**
Universidade do Porto

Dynamical Systems Seminar

Date. May 24, 14h30

Place. Room M031

Speaker. Helder Vilarinho[1] (UBI)

Title. Statistical Stability for Multi-Substitution Tiling Spaces

Abstract. Roughly speaking, a *tiling* is an arrangement of tiles that covers $\mathbb{R}^d$ without overlapping. An important class of tilings is that of *self-similar tilings*. In order to construct a self-similar tiling, one starts with a finite number (up to translation) of tiles and a *substitution map* that determines how to inflate and subdivide these tiles into certain configurations of the same tiles. Increasingly larger patches of such tilings can be obtained by applying consecutively the substitution map to some initial tile.

In this talk we deal with *multi-substitution tiling spaces*, determined by a finite set $\mathcal{S}$ of substitution maps, acting on a finite set of tiles, and a sequence of substitution maps in $\mathcal{S}$ that determines which substitution (inflation/subdivision) is made in each step. We consider dynamical systems given by the continuous action of translations on a multi-substitution tiling space and prove that those systems have an unique ergodic probability measure, which is closely related with the patch frequencies. Moreover, we prove that the ergodic limits of patch frequencies vary continuously with the sequence of substitutions and we also give some results on mixing properties for multi-substitution dynamical systems.

This is a joint work with Rui Pacheco.

Remark. Coffee with the speaker is served after the talk (15h30 - 16h00)

[1]Helder Vilarinho is currently Assistant Professor at University of Beira Interior (UBI). He obtained the M.Sc. (2003) and Ph.D (2010) degrees in *Mathematics* at University of Porto, under the supervision of Prof. José Ferreira Alves. Helder is particularly interested in Dynamical systems and Ergodic theory (non-uniformly hyperbolic/expanding maps, SRB measures, random dynamical systems, linear cocycles, linear differential systems, Lyapunov exponents,...), as also Ramsey theory and Tilings. Helder's homepage is www.mat.ubi.pt/∼helder

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