CMUP

Centro de **Matemática**
Universidade do Porto

Dynamical Systems Seminar

Date. May 10, 14h30

Place. Room M031

Speaker. Rui Pacheco[1] (UBI)

Title. An Application of Brown's Lemma to Tiling Theory

Abstract. The main idea of Ramsey theory is that arbitrarily large sets cannot avoid a certain degree of "regularity". This is exemplarily illustrated by Gallai's theorem, a multidimensional version of the seminal van der Waerden's theorem, which asserts that, given a finite coloring of $\mathbb{Z}^n$, any finite subset F of $\mathbb{Z}^n$ has a monochromatic homothetic copy $\lambda F + \vec{t}$, for some real number λ. A not so famous Ramsey-type result is the so called Brown's lemma: in the setting of Gallai's theorem, one can take any λ once "bounded perturbations" in the structure of the homothetic copies of F are allowed, in other words, any finite coloring of $\mathbb{Z}^n$ produces monochromatic *piecewise syndetic* sets. In this talk we describe an application of a topological dynamical version of this result to (euclidean space) tiling theory and compare it with previous applications of topological dynamical systems results to tiling theory by De La Llave & Windsor and Radin & Wolff.

Joint work with Helder Vilarinho.

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

[1]Rui Pacheco is currently Assistant Professor at University of Beira Interior (UBI). He obtained the M.Sc. degree in 1999 at University of Lisbon under the supervision of Prof. Armando Machado and he obtained the Ph.D. degree in Mathematics at University of Bath (U.K.) under the supervision of Prof. Francis Burstall, in 2004. Rui is particularly interested in Differential Geometry, specifically harmonic applications, integrable surfaces and Tiling theory.

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