

SEMINARIO

SISTEMAS DINAMICOS

EXPOSITOR

PROF. ARNALDO NOGUEIRA
INSTITUT DE MATHÉMATIQUES DE MARSEILLE

TITULO

TOPOLOGICAL DYNAMICS OF PIECEWISE λ -AFFINE MAPS OF THE INTERVAL

ABSTRACT:

Let $0 < a < 1$, $0 \leq b < 1$ and $I = [0,1)$. We call contracted rotation the interval map $\phi_{a,b} : x \in I \rightarrow ax+b \bmod 1$. Once a is fixed, we are interested in the dynamics of the one-parameter family $\phi_{a,b}$, where b runs on the interval $[0, 1)$. Any contracted rotation has a rotation number $\rho_{a,b}$ which describes the asymptotic behavior of $\phi_{a,b}$. In the first part of the talk, we analyze the numerical relation between the parameters a , b and $\rho_{a,b}$ and discuss some applications of the map $\phi_{a,b}$. Next, we introduce a generalization of contracted rotations. Let $-1 < \lambda < 1$ and $f : [0, 1) \rightarrow \mathbb{R}$ be a piecewise λ -affine contraction, that is, there exist points $0 = c_0 < c_1 < \dots < c_{n-1} < c_n = 1$ and real numbers $b_1, \dots, b_n$ such that $f(x) = \lambda x + b_i$ for every $x \in [c_{i-1}, c_i)$. We prove that, for Lebesgue almost every $\delta \in \mathbb{R}$, the map $f_\delta = f + \delta \pmod{1}$ is asymptotically periodic. More precisely, f_δ has at most $n + 1$ periodic orbits and the ω -limit set of every $x \in [0, 1)$ is a periodic orbit.

Lunes 17 de Abril del 2017 a las 16:00 hrs. Sala de Seminarios John Von Neumann CMM, séptimo piso de la Torre Norte de Beauchef 851.