PATRICE FEST
PROGRAM

MONDAY

1. Franks

Nonexpansiveness in Z^2 symbolic dynamics

We consider Z^2-subshifts, i.e. closed Z^2-invariant subsets of A^{Z^2} where A is a finite alphabet. Our focus is on how the geometry of nonexpansive subspaces controls the propagation of information in such systems.

2. Navas

On conjugates and the asymptotic distortion of 1-dimensional diffeomorphisms of Denjoy regularity

We show that every circle diffeomorphism in the Denjoy class that has abosulte continuous derivative and irrational rotation number has a sequence of conjugates converging in the Denjoy class to the corresponding rotation. We introduce the notion of asymptotic distortion for a diffeomorphism, and show how this is related to to the conjugacy problem. We discuss the case of the interval, providing several (counter)examples.

3. LeRoux

Barcodes for hamiltonian homeomorphisms on surfaces (joint work with Sobhan Seyfaddini and Claude Viterbo)

The barcode is a conjugacy invariant for hamiltonian diffeomorphisms, that has been introduced recently by L. Polterovich and E. Shelukhin. On surfaces, we extend barcodes to hamiltonian homeomorphisms.

4. Arnaud

Denjoy dynamics and horseshoes on surfaces

I will continue the study of Denjoy subsystem, a notion that we constructed with Patrice in 2017. After introducing Denjoy subsystems and the notion of rotation number that can be attached to them, I will explain in which sense they are parts of horseshoe dynamics: - any horseshoe of a surface contains a lot of continuous Denjoy dynamics with various rotation numbers; - in the specific case of generic area preserving twist diffeomorphism of the annulus, most of the Aubry-Mather sets are contained in some horseshoes with no conjugate point.

TUESDAY

5. Passeggi

Generic rotation sets in hyperbolic surfaces

We will present the following result:

Given any closed hyperbolic surface of genus g, for a generic homeomorphisms in the homotopy class of the identity the homological rotation set is given by a union of at most

$$4.2^{5(g-1)}$$

convex sets, all of them containing zero.

This is joint work with Juan Alonso and Joaquin Brum.

6. Hernandez

Rotation of accessible points and prime ends

Given an invariant annular continua X in the open annulus $\mathbb{A}$, we show that the rotation of the points of X which are *accessible* from $\mathbb{A} \setminus X$ is determined to a great extent by rotation number of the prime ends associated to the complementary regions. More precisely, if ρ is the prime end rotation number associated to U, c.c. of $\mathbb{A} \setminus X$, the rotation number of all the forward or backward orbits of the points of X accessible from U is equal to ρ. Moreover, if the forward orbit of an accessible point drifts linearly from the rotation by ρ then all the backward orbits of accessible points have bounded deviation.

7. Beguin

How many Anosov flows does a three-dimensional manifold carry ?

I will explain what is known about the questions in the title, from classical results by J. Plante and E. Ghys, to more recent results by C. Bonatti, Yu B. and myself.

8. Fayad

KAM tori are no more than sticky

When a Gevrey smooth perturbation is applied to a quasi-convex integrable Hamiltonian, it is known that the KAM invariant tori that survive are sticky, i.e. doubly exponentially stable. We show the optimality of this effective stability.

WEDNESDAY

9. Zanata

On diffeomorphisms whose rotation sets are segments with only one rational point

joint work with Xiaochuan Liu (IMEUSP)

In this work we consider non-wandering diffeomorphisms of the torus homotopic to the identity, whose rotation sets are segments with only one rational point, that we assume to be $(0, 0)$. Our first result says that, if a non-wandering diffeomorphism

f has no periodic point with 1 as an eigenvalue and there are no saddle connections, then the rotation set of f can not be a segment with only one rational point. Still restricted to the set of non-wandering diffeos, we consider, in a not very formal way, the least degenerate diffeos which have such a rotation set. And we characterize some of their dynamical properties, existence of Brouwer lines, how they can be perturbed and some more.

10. Ribon

Fixed points of nilpotent actions on $\mathbb{R}^2$

We show several results providing global fixed points for nilpotent groups of orientation-preserving C^1 diffeomorphisms of the plane $\mathbb{R}^2$. First, we consider groups of diffeomorphisms of the sphere such that ∞ is a global fixed point. This case is technically simpler and we display several conditions that assure the existence of a second global fixed point provided that they are satisfied for at least one element of the group.

We also consider the cases of groups of diffeomorphisms preserving a non-empty compact set and groups of diffeomorphisms preserving a probability measure. Let us focus in the latter one. There exists a global fixed point for a finitely generated abelian of C^1 diffeomorphisms (preserving a Borel probability measure) of $\mathbb{R}^2$ that satisfies some bounded linking property and some technical condition by a theorem of Béguin, Firmo, Le Calvez and Miernowski. We generalize such result to nilpotent groups and remove the finite generation and the technical hypotheses. In order to accomplish this task, we combine two methods of finding global fixed points. Namely, the idea of finding rotation centers for the dynamics (fixed points P for some element ϕ of the group such that the support of the measure somehow rotates around P by the action of ϕ) by Béguin, Firmo, Le Calvez and Miernowski and localizing techniques à la Franks, Handel and Parwani. This is a joint work with Sebastião Firmo (UFF) and Patrice Le Calvez (IMJ-PRG).

11. Tal

Forcing theory applications for homeomorphisms of the closed annulus

We will present some applications of forcing theory for the study of rotation sets of homeomorphisms of the closed annulus preserving boundary components and orientation. We will show the strong version of Boyland's conjecture holds, that is, that if such a homeomorphism preserves area and its rotation interval is not trivial, then the rotation number of the lebesgue measure lies in the interior of the rotation interval. We will also show that, if f is area preserving, then every rotation vector in the rotation set is realized by a compact invariant set, extending a result by Le Calvez previously known for diffeomorphisms. Joint work with Jonathan Conejeros.

12. Avila

Renormalization of one-frequency cocycles with values on compact groups

We consider some local and global aspects of the renormalization operator acting on spaces of one-frequency cocycles, with emphasis on the case of compact groups. This is work in progress with Raphael Krikorian and Yi Pan.

13. Matsumoto

Works of Patrice Le Calvez

THURSDAY

14. Ponce

A geometric approach to the cohomological equation for isometries cocycles

We propose some geometric based approaches to the existence of solutions to the cohomological equation in the context of cocycles by isometries in nonpositevely curved metric spaces. We relate boundary at infinity solutions with actual solutions in many situations.

15. Koropecki

A model factor for certain toral maps

We show that if a $C^{1+\alpha}$ diffeomorphism f of $\mathbb{T}^2$ homotopic to the identity has a rotation set with nonempty interior, then it is monotonically semiconjugate to a homeomorphism F of $\mathbb{T}^2$ which is area-preserving, topologically mixing, has dense periodic points and every point has a nontrivial stable and unstable set. Moreover, it has a strong form of continuum-wise expansiveness. The rotation set of F is the same of f, so one consequence is that every rotation set (with interior) realizable by a $C^{1+\alpha}$ diffeomorphism is also realizable by an area-preserving homeomorphism with all these properties. This is a joint work with A. de Carvalho and F. A. Tal.