

# FRANCE-KOREA WORKSHOP ON DYNAMICAL GROUP THEORY

January 6-8, 2026

JOAQÍN BRUM

**Title:** On the number of invariant laminations for actions on the line

*Abstract:* Invariant laminations for actions on one-dimensional manifolds are abstract versions of geodesic laminations on hyperbolic surfaces. In the case of the real line, a lamination is defined as a closed family of open intervals whose union is the whole line and such that any two intervals are either disjoint or comparable by inclusion.

We first discuss why the existence of invariant laminations is common among actions by homeomorphisms on the line of some families of groups (such as solvable groups or Thompson-like groups). We then investigate the structural implications of preserving multiple invariant laminations.

This work is developed within two collaborations: one with Nicolás Matte Bon, Cristóbal Rivas, and Michele Triestino, and another with KyeongRo Kim, Nicolás Matte Bon, and Maxime Wolff.

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IN-HYEOK CHOI

**Title:** Exponential synchronization on the circle

*Abstract:* Let  $f_1, \dots, f_N$  be circle homeomorphisms and let  $i_1, i_2, \dots$  be i.i.d.'s on the index set  $\{1, \dots, N\}$ . What can we say about the random homeomorphism  $f_{i_1} \circ f_{i_2} \circ \dots \circ f_{i_k}$ , as  $k$  increases? For example, does it synchronize the trajectories of distinct points on the circle? Generalizing previous work by Antonov, Kleptsyn–Nalskii and Deroin–Kleptsyn–Navas, Malicet proved a dichotomy for this random dynamical system. Namely, unless there is a simple obstruction (e.g.  $f_1, \dots, f_N$  together preserve a probability measure), local exponential synchronization is guaranteed almost surely. In this talk, we will explain an alternative approach to Malicet's exponential synchronization via Gouëzel's pivoting technique.

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LEONARDO DINAMARCA

**Title:** Distortion in groups of generalized piecewise-linear transformations

*Abstract:* The notion of distorted elements was introduced by Gromov in a Geometric Group Theory context. The study of this notion can be done using dynamical techniques. Briefly, we will describe basic properties and open questions. Then, we will focus on the following problem: For each natural number  $n$ , we consider the subgroup  $R_n$  of  $\text{Homeo}_+(I)$  made by the elements that are linear except for a subset whose Cantor–Bendixson rank is less than or equal to  $n$ . These groups of generalized piecewise-linear transformations yield an ascending chain of groups as we increase. We study how the notion of distorted elements changes along this chain.

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NASTARAN EINABADI

**Title:** Classification of action of homeomorphisms on the fine curve graph of higher genus surfaces

*Abstract:* In their 2022 work, Bowden, Hensel, and Webb associate to a surface its fine curve graph, which is a Gromov-hyperbolic space. The homeomorphisms of the surface act as isometries on the fine curve graph, either hyperbolically, parabolically, or elliptically. It turns out that the classification problem of action of homeomorphisms on this graph, is related to their rotational behaviour. This connection has been established in the case of the torus leading to a complete classification. In this talk, I will present the progress that has been made towards solving the problem for higher genus surfaces.

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MAXIMILIANO ESCAYOLA

**Title:** Critical regularity for nested actions of a lamplighter group acting on the compact interval

*Abstract:* My talk will be based on a joint work with Victor Kleptsyn in which we answer the question of Kim, Koberda and Rivas about the critical regularity for the nested (or overlapping) actions of the direct product of  $\mathbb{Z}$  with the lamplighter group  $\mathbb{Z} \wr \mathbb{Z}$ . An overlapping action of a group  $G$  on the compact interval is a faithful action by homeomorphisms where any two non-trivial elements of  $G$  have overlapping support. Their study is linked to the study of the algebraic critical regularity (where only the faithfulness of the action is required), and understanding this type of actions can lead to understanding the algebraic critical regularity of some classes of non-nilpotent groups.

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HÉLÈNE EYNARD-BONTEMPS

**Title:** Distorted elements in groups of diffeomorphisms of one-manifolds (joint work with Emmanuel Militon)

*Abstract:* In a group  $G$ , an element  $g$  is called *distorted* if there exists a finite family  $S$  in  $G$  which generates  $g$  and such that the word-length of  $g^n$  w.r.t.  $S$  grows sublinearly in  $n$ . This very general notion of geometric group theory is particularly interesting in the context of transformation groups, as it provides obstructions for some groups to act faithfully on some spaces. In this talk, I will focus on the groups of homeo/diffeomorphisms of the line (with compact support) and of the circle, and I will give a concrete dynamical description of the distorted elements in regularity  $C^\infty$ . Interestingly, this requires ingredients which are specific to this regularity (among which a new “local uniform perfection” result), and such a description remains unknown in finite regularity.

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ANTHONY GENEVOIS

**Title:** A translation spectrum for right-angled Artin groups

*Abstract:* Given a group  $G$  acting on a metric space  $X$  by isometries, the translation spectrum  $\text{TSpec}(G, X)$  is the set of all the possible asymptotic translation lengths in  $X$  of the elements of  $G$ . What can be said about  $\text{TSpec}(G, X)$ ? After a general introduction to the subject, and motivated by mapping class groups acting on their curve graphs, I will focus on translation spectra of graph products of groups (e.g. right-angled Artin and Coxeter groups) acting on some specific hyperbolic graphs.

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MARTÍN GILABERT VIO

**Title:** Groups with classifiable actions on the line

*Abstract:* We investigate and motivate the class  $\mathcal{C}$  of countable groups  $G$  such that the conjugacy relation between minimal actions of  $G$  on  $\mathbb{R}$  admits a Borel transversal. We show several closure properties of  $\mathcal{C}$  under group-theoretic constructions, and that all finitely generated groups of piecewise affine homeomorphisms of  $\mathbb{R}$  belong to  $\mathcal{C}$ . The purpose of the talk is to define the previous terms and to outline some ideas that appear in proofs. Based on ongoing work with Joaquín Brum and Nicolás Matte Bon.

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KYEONGRO KIM

**Title:** Ping-pong dynamics of hyperbolic-like actions: beyond Hölder and Solodov's theorems

*Abstract:* In dimension 1, the dynamical properties of a group action and the algebraic properties of the group are highly intertwined. When the action satisfies the uniformly bounded fixed point condition, this relationship becomes especially apparent. In the real line, such a relationship has been completely revealed by Hölder and Solodov under the at most 1 fixed point condition. However, in the circle, the relationship is still mysterious even under the at most 2 fixed point condition. For this case, Bonatti conjectured a structure theorem. In this talk, I will introduce the conjecture of Bonatti, and discuss related questions. Also, I will introduce recent progress about Bonatti conjecture. This talk is based on a joint work with Michele Triestino.

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VICTOR KLEPTSYN

**Title:** Critical regularity for nilpotent group actions in dimension one

*Abstract:* I will speak on a recent joint work with Maximiliano Escayola on the actions of nilpotent groups in dimension one. We provide a description for the critical regularity of such actions in the algebraic terms (referring to the nilpotent group that is acting). To do so, we introduce some new technique.

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EMMANUEL MILITON

**Title:** Invariant partitions for homeomorphisms isotopic to a pseudo-Anosov homeomorphism

*Abstract:* Pseudo-Anosov homeomorphisms are a generalization of Anosov automorphisms of the 2-torus to higher genus surfaces. In this talk, we will discuss how much the dynamics of a homeomorphism isotopic to a pseudo-Anosov homeomorphism looks like the dynamics of the actual pseudo-Anosov homeomorphism. More precisely, we will discuss the connections between a semi-conjugacy result by Handel, a more precise result by Fathi which gives invariant stable and unstable partitions of the surface and a new way to obtain these partitions.

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ARNAUD NERRIÈRE

**Title:** Random dynamics on  $\mathbb{C}^2$

*Abstract:* We will consider the dynamics of random products of polynomial automorphisms of  $\mathbb{C}^2$ . Holomorphic random dynamical systems were studied by Cantat–Dujardin and Roda in the case of compact complex surfaces, and by Cantat–Dupont–Martin Baillon in the case of Markov surfaces (non compact). We will explain how the study of the (birational) dynamics at infinity of the group gives rigidity results of stationary measures.