Géométrie et dynamique dans les espaces de modules

(Giovanni Forni, Carlos Matheus et Anton Zorich)

Deux mercredis (exceptionnellement) au mois de Juin à l'**Institut Henri Poincaré**.

Deuxième séminaire du mois:

- **14/06/2023 - Jon Chaika** (University of Utah)

  de **14h à 15h**, **salle Olga Ladyjenskaïa (ex-salle 01)**

  Titre: *There is a weakly mixing billiard in a polygon*

  Résumé: Consider a point mass traveling in a polygon. It travels in a straight line, with constant speed, until it hits a side, at which point it obeys the rules of elastic collision. The main result of this talk is that there is such a flow that is weakly mixing with respect to the natural 3 dimensional volume on the unit tangent bundle to the polygon. This strengthens an earlier result of Kerckhoff, Masur and Smillie who proved the analogous result for ergodicity. Like Kerckhoff, Masur and Smillie's result, this follows from a theorem about translation surfaces, in our case that for every translation surface, for almost every pair of directions, a, b we have that $(F_a^t \text{ x } F_b^t)$ is ergodic with respect to the Lebesgue measure on the product of the surface with itself. This is joint work with Giovanni Forni.

- **14/06/2023 - Francisco Arana-Herrera** (University of Maryland)

  de **15h15 à 16h15**, **salle Olga Ladyjenskaïa (ex-salle 01)**

  Titre: *Algebraic v/s geometric complexity of simple closed curves*

  Résumé: Motivated by open questions of Sarnak, we explore the relation between algebraic and geometric complexity of simple closed curves on surfaces. We introduce a conjecture on the homological complexity of long simple closed hyperbolic geodesics and proceed to discuss a more accessible problem regarding the action in cohomology of mapping class groups. We explain the relation between these questions and mixing limit theorems for the Kontsevich-Zorich cocycle. We discuss a general framework for upgrading limit theorems to mixing limit theorems for dynamical systems under mild hyperbolicity and ergodicity assumptions. Parts of this talk are joint work in progress with Pouya Honaryar and other parts are joint work in progress with Giovanni Forni.

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