

MINI COURSE

Non-uniform hyperbolicity and symbolic dynamics

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SCHEDULE:	Lecture 1: Tuesday, April 4, 2017, 10:30–12:00
	Lecture 2: Tuesday, April 4, 2017, 14:00–15:30
	Lecture 3: Thursday, April 6, 2017, 10:30–12:00
	Lecture 4: Thursday, April 6, 2017, 14:00–15:30
VENUE:	Lecture Hall 2, IPM Niavaran Bldg., Niavaran Square, Tehran

Abstract. Symbolic dynamics are an important step towards the study of chaotic systems, since they simplify the study of dynamical properties in various aspects, e.g. the counting of closed orbits and the classification of equilibrium measures. It is known for almost fifty years that uniformly hyperbolic systems have good symbolic codings (Adler-Weiss, Sinai, Bowen, Ratner). For non-uniformly hyperbolic systems, Sarig recently constructed good symbolic codings for surface diffeomorphisms that go beyond the previous work of Katok on the nowadays called “Katok horseshoes”.

The aim of this minicourse is to introduce the basic tools of Sarig’s methods, and to discuss the recent developments of the field, treating the cases of three dimensional flows, Bunimovich billiards, multimodal maps of the interval, and their higher dimensional counterparts.

References

- [1] **R. Bowen**, *Equilibrium states and the ergodic theory of Anosov diffeomorphisms*. Second revised edition. With a preface by David Ruelle. Edited by Jean-Ren Chazottes, Lecture Notes in Mathematics, 470 (2008).
- [2] **A. Katok**, *Lyapunov exponents, entropy and periodic orbits for diffeomorphisms*, Inst. Hautes Études Sci. Publ. Math. No. 51 (1980), 137–173.
- [3] **Y. Lima**, *Symbolic dynamics for one dimensional maps with positive entropy*, 30 pages, available under request.
- [4] **Y. Lima and C. Matheus**, *Symbolic dynamics for non-uniformly hyperbolic surface maps with discontinuities*, 36 pages, available at <http://arxiv.org/abs/1606.05863>. To appear in Ann. Sci. Éc. Norm. Supér.
- [5] **Y. Lima and O. Sarig**, *Symbolic dynamics for three dimensional flows with positive entropy*, 50 pages, available at <http://arxiv.org/abs/1408.3427>. To appear in J. Eur. Math. Soc.
- [6] **O. Sarig**, *Symbolic dynamics for surface diffeomorphisms with positive entropy*, J. Amer. Math. Soc. **26** (2013), no. 2, 341–426.