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INSTITUTO DE CIENCIAS MATEMÁTICAS

GEOMETRY seminar

ENTROPY AND DYNAMICAL SYSTEMS IN DIMENSION 2

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PLACE: Aula Gris 1, ICMAT (Campus de Cantoblanco, Madrid)

ABSTRACT: One of the most useful tools in quantifying the complexity of a dynamical system (DS) are the concepts of topological and metric entropy. While relevant in several contexts, entropy plays a particularly important role in describing the behaviour of dynamical systems in dimension 2. For instance, a famous result by Katok shows that, for sufficiently smooth systems, the presence of strictly positive topological entropy implies that there exists a very good model for the dynamics. It is shown that, in particular, if the topological entropy is at least ln(2), then the complexity observed is at least as large as that of the classical Bernoulli system (that is, it is at least as complex as the process of flipping a honest coin infinitely many times).
On the other hand, one can consider if there exists any sort of description of the dynamics when the entropy is null. In recent works with P. Le Calvez we have shown that, at least for planar homeomorphisms, a lot of information can be derived. In particular, one can show that in many ways the phase portrait is similar to that of a flow. Furthermore, conservative systems with zero entropy behave similarly to integrable systems.

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