Universidade Federal de São Carlos
Departamento de Matemática

Colóquio 2017

Fernando Lenarduzzi
(DM–UFSCar)

Falará sobre

Infinite Ergodic Theory and Generalized Hénon-Devaney Maps

The standard assumption that developed the study of this classic behavior is the fact that the measure associated to this kind of problem has to be *finite*. The *Poincarré Recurrence Theorem* is false if we remove this condition, i.e., we may not have any recurrence at all, and the *Birkhoff's Ergodic Theorem* does not give any kind of useful information, the averages always vanish. That is where Infinite Ergodic Theory started to deal with those problems.

Hénon's Generating Families and his approach to the Three-Body Problem has been studied exhaustively by different areas. Recently at IMPA, S. Muñoz proved that a two-parameter family derived by these Generating Families is robust transitive. The object I worked with is the map that appears when we look at he asymptotic behavior of the Three-Body Problem as presented by Hénon which in known today as the *Hénon-Devaney map*

$$H : \mathbb{R}^2 \setminus \{y = 0\} \quad \to \quad \mathbb{R}^2$$
$$(x,y) \quad \mapsto \quad \left(x + \frac{1}{y}, y - \frac{1}{y} - x\right)$$

which preserves the Lebesgue measure in the whole plane. We consider a two-parameter family that generalizes this map and look for topological, invariant transversal foliations and ergodic properties.

In this talk we will introduce briefly some nomenclature, explain some results from my thesis in joint work with Enrique Pujals and present the next steps that we are currently working on.

References

[1] J. Aaronson: *An Introduction to Infinite Ergodic Theory*. AMS 1997.

[2] Devaney, R. L.: *The Baker Transformation and a Mapping Associated to the Restricted Three Body Problem*, Commun. Math. Phys. 80, 465-476, 1981.

[3] Hénon, M.: *Generating Families in the Restricted Three-Body Problem*, Springer-Verlag, 1997.

[4] Moñoz, S.: *Robust transitivity and ergodicity of transformations on the real line and the real plane*, Phd Thesis 2010.

Quarta-feira, 19 de abril, às 16 h no Auditório