Lecturer: Enrique Pujals
Title: From zero to positive entropy

Abstract: Throughout these four classes, we will try to understand the dynamical mechanisms responsible for the fluctuation of topological entropy. We will primarily concentrate on comprehending one-dimensional endomorphisms of the interval and dissipative diffeomorphisms acting on the disk. Should time allow, at the end we'll also explore analogous issues in domains different from the disk and speculate on what it might be like in higher dimensions.

Topics to be covered:

1. Topological entropy: Understanding the measure of chaos in dynamical systems.
2. Basic examples with zero entropy: Morse-Smale systems and Odometers.
3. Basic examples with positive entropy: Cantor map and Horseshoes.
4. Soft introduction to basic results in one-dimensional dynamics of the interval.
5. One-parameter families of unimodal maps exhibiting variation of entropy.
6. Characterization of unimodal maps with zero entropy.
7. Basic results about surface diffeomorphisms with focus in dissipative and mild dissipative diffeomorphisms of the disk.
8. One-parameter families of diffeomorphisms of the disk exhibiting variation of entropy.
9. Henon family.
10. Characterization of dissipative diffeomorphisms of the disk with zero entropy and few words about two-dimensional renormalization.

Bibliography:

From zero to positive entropy
S. Crovisier, E. Pujals https://www.ams.org/journals/notices/202205/
rnoti-p748.pdf

One-dimensional dynamics
W. de Melo, S. van Strien
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Mildly dissipative diffeos of the disk with zero entropy
S. Crovisier, E. Pujals, C. Tresser
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https://arxiv.org/abs/2005.14278