

Course Title: Introduction to Dynamical Systems and Fractal Sets

Lecturer: Pierre Arnoux

This is an introductory lecture to the basic concepts used in the school: dynamical systems and fractal sets. We start with continuous endomorphisms of compact metric sets, the basic definitions (orbit, periodicity, recurrence, wandering set, minimality, etc.), the notion of conjugacy, and basic theorems (genericity of the set of points with dense orbits). Afterwards, we will define the Hausdorff dimension and other definition of dimension, give their basic properties, and show how fractal sets can be defined by iterated function systems. We conclude the lecture by giving some generalizations (\mathbb{Z} -actions, \mathbb{R} -actions and flows, group actions) and, in conjunction with the lectures of K. Dajani, draw a parallel between topological dynamics and ergodic theory. There will be an emphasis on many classical examples.